

Leadership behaviour, job satisfaction and the
professional identity of medical laboratory staff in
Saudi Arabia: An exploratory study

Rayan Abdullah Khayat

Supervised by

Professor Daniel Kelly

Dr Angela Parry

Dr Sarah Fry

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Abstract

The medical laboratory profession is a highly demanding discipline featuring complex and multi-faceted areas. Its role is to assist healthcare professionals with the diagnosis and treatment of patients and to help control the spread of disease. This study aims to explore the professional identities and job satisfaction of medical laboratory staff (MLS) in two settings in Saudi Arabia (SA) together with the leadership behaviour of their medical laboratory leaders. There is a dearth of studies which have been conducted on MLS in SA, whilst professional identity has yet to be examined.

A mixed method study, employing a sequential design was implemented to answer the study's questions, this employed a range of data collection approaches and took place in two hospitals in SA. The design enabled the researcher to collect various data through questionnaires, in-depth interviews, focus groups, and non-participant observations. Three areas were explored and described: the status of the professional identity and job satisfaction of MLS and the leadership behaviour of medical personnel laboratory directors.

In phase one, 99 MLS (response rate 66%) responded to the questionnaires exploring professional identity and job satisfaction, as well as the leadership behaviour of medical laboratory directors. The first phase of the quantitative data was analysed using SPSS software, with descriptive analysis also used. In phase two, in-depth interviews were conducted with purposive sampling of MLS (n=7), supervisors (n=8) and leaders (n=2). Two focus groups were conducted in both settings, and these involved 10 MLS in total. Observational data were also collected, this totalled 96 hours within the work environments of MLS. Interview data, focus groups and observations then all underwent thematic analysis.

Phase one demonstrated that MLS scored themselves as average for professional identity and job satisfaction whereas the leadership behaviour scores for the two laboratories were dissimilar. The information in the qualitative findings generally agreed with, and helped to explain, the outcomes of the quantitative data. The phase two qualitative findings identified three main themes for each area. Professional identity themes included the belief in the job's importance, the need for professional recognition alongside a current lack of role clarity and feeling valued. Job satisfaction themes included job factors,

disadvantages of an MLS career and supervisory style and workplace environment. Leadership behaviour themes included effective leadership, as well as the impact of ineffective leadership and leadership challenges on medical laboratories services such as culture, communication and quality. Generally, in SA the medical laboratory specialty would benefit from further promotion to improve its identity, and the MLS require additional development and training to satisfy their needs. Leadership qualities and skills presented were various and required the development of a culturally competent development programme.

As a consequence of these findings, a framework based on the Healthcare Science in NHS Wales programme has been proposed. This was modified to suit the context of SA and would run alongside the Vision 2030 campaign in SA. This is built on three areas of priority; workforce, culture and service.

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Dedication

This thesis is dedicated to my loving parents who have encouraged and motivated me from the beginning to the end of my doctoral journey.

Also, I dedicate this accomplishment to my loving wife Maha Maghrabi for her understanding and support throughout this journey and to my kids Leen, Rafeef and Rafah.

I would also like to dedicate this work to my father-in-law who unfortunately passed away before I submitted my thesis.

CHAPTER ONE - Introduction

1.1 Introduction

The present research focuses on exploring professional identity and the job satisfaction of MLS, together with leadership behaviour of medical laboratory leaders, in the Saudi Arabian hospital setting. One of the primary branches of contemporary medicine is medical laboratory science, or clinical laboratory science. This profession is a key player in the provision of safe healthcare. In this study, medical laboratory staff (MLS) were defined as employees of a medical laboratory whose roles entailed collecting and analysing the blood and body fluid specimens of patients in order to provide data that is critical for diagnosing diseases and monitoring the way the body responds to disease or treatment. Assessments showed that between 60% and 70% of diagnostic and therapeutic medical decisions were driven by laboratory results (Dighe et al. 2007).

A person's professional identity has been defined as an amalgamation of their opinions, ethics, knowledge, beliefs, and abilities, shared with others in a group of professionals (Adams et al. 2006). For the purpose of this thesis, leadership is defined as "a process whereby an individual influences a group of individuals to achieve a common goal" (Northouse 2019, p. 43). Strong leadership is widely regarded as a vital component of any successful organisation (Daresh 2002). Additionally, the notion of job satisfaction is associated with how satisfied a person is with their role. There are numerous psychological and environmental aspects, these include affective, cognitive, and behavioural responses all of which can shape peoples' feelings about their jobs (Spector 1997).

This chapter includes the problem of practice, the study's aims, research questions, a Saudi Arabia overview including details of Vision 2030 and medical laboratory in Makkah government hospitals: an overview.

1.2 Problem of Practice

Health care teams are comprised of a variety of professions. Whilst nurses and physicians are probably the most commonly known, numerous other professions also play a vital role in patient diagnosis, care, and treatment. MLS is one of those key professions. It is a highly technical and specialised healthcare discipline (Camillo 2019). Working in this profession

requires comprehensive knowledge of a highly specific content associated with the examination and testing of patient samples. Professionals are required to ensure that their knowledge is up to date with the continual advances in medicine (ASCLS 2015). Despite the significant role this profession plays in the provision of healthcare it is misunderstood and does not always obtain the recognition it deserves.

Academic research on nursing has established that professional identity was the main element impacting on levels of retention, engagement, and job satisfaction (Kabeel and Eisa 2017). Moreover, there was a correlation between higher professional identity and a lower rate of turnover (Sabanciogullari and Dogan 2015). To the best of the researchers' knowledge, no previous studies have explored the relationship between the professional identity and job satisfaction of MLS. As a result, it was considered important to examine and identify the factors affecting the level of job satisfaction of MLS in SA. One of these factors is the leadership style of the medical laboratory leader.

Hospital laboratory departments are complex, people-driven systems that require powerful leadership and effective management to provide accurate, timely and reliable test results (Ferraro et al. 2016). The role of leaders in hospital laboratories is a pivotal one; a good leader can energise and inspire their followers to provide optimal healthcare services. Hospital laboratory leaders need to develop a culture of empowered individuals with the freedom to show self-direction towards achieving the mission and goals of the laboratory (Mass 2002). The professional growth and productivity of MLS is a requirement for total laboratory performance, productivity and success (Cameron 1994). Therefore, leaders in the hospital laboratory department should give high priority to maintaining the satisfaction level of their employees. In the medical field, leaders are required to choose the appropriate leadership style that matches the situation, requirements, the ability of medical professionals and the work environment.

1.3 Aim

The aim of this study was to use a descriptive exploratory approach to examine the professional identities and job satisfaction of MLS in SA together with consideration of the leadership behaviour of their medical laboratory leaders. In addition, it aimed to generate a holistic description for the current practices and contextual features which shape the

nature of leadership in SA laboratory services. Furthermore, because very few studies have been undertaken in SA amongst MLS, there is a limited research background for such a study.

1.4 Research questions

1. How do MLS describe their professional identity?
2. What are the possible relationships between MLS' perceptions of professional identity and job satisfaction?
3. a) What is the leadership behaviour of medical laboratory leaders, and B) how might this affect the professional identity and job satisfaction of MLS?

1.5 Saudi Arabia and its health system: an overview

1.5.1 Geographical features

Geographically, SA is positioned at the centre of the Arabian Peninsula, in the Arabic Gulf region, this is commonly referred to as the Middle East. Eight countries share their borders with SA: Iraq, Kuwait, Bahrain, Qatar, the UAE, Oman, Yemen, and Jordan (see Figure 1). The total area of the country is approximately 2,149,690 sq. km and there are five major cities, these are Riyadh (capital city), Jeddah, Mecca, Medina and Ad Dammam. The formal language is Arabic and the main religion is Islam.

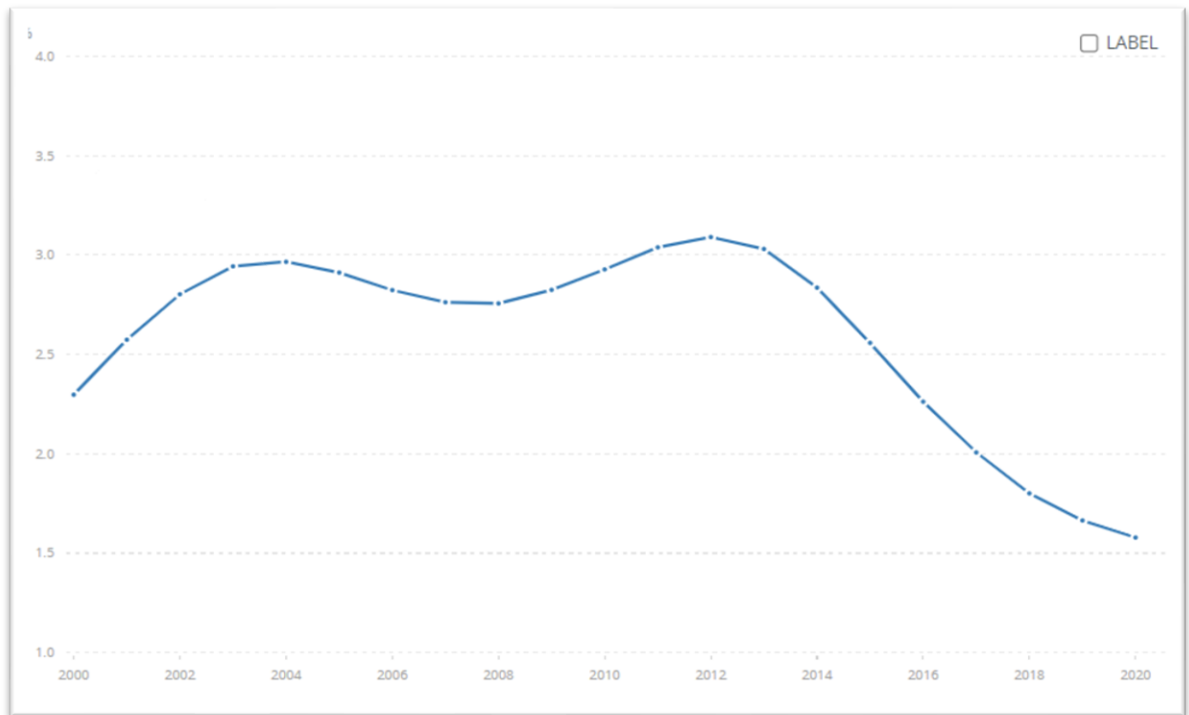
Figure 1 The map of Saudi Arabia



1.5.2 Demographic

The annual average population growth rate in SA is 1.6% (The world bank 2020a) (see Figure 2). The total population of SA is estimated at 34.8 million (The world bank 2020b). Makkah region has a population of around 8.3 million people, this is considered the most densely populated city in the kingdom. The capital city Riyadh is the first region in terms of Saudi residence distribution, and this is followed by Makkah. Thus, the highest density of population and of non-Saudi residences is in Makkah whilst the highest percentage of Saudi residences is in Riyadh (General Authority for Statistics 2016).

Figure 2 The annual average population growth rate in SA



Source: The world bank (2020a)

Regarding the structure of the population in terms of age, the latest results of a demographic survey showed that the largest age group in Makkah is comprised of those aged between 15-64 years (72.9%), this refers to the working age group. The next age group is 0-14 years (23.4%), these are school age. The final group is that of retired people aged over 65 (3.62%) (General Authority for Statistics 2016).

Healthcare system of SA

Healthcare provision is a fundamental right for all citizens based on the constitution of SA (Mufti 2000). This means all citizens have free universal access to healthcare since the healthcare system started in 1949. Currently, SA has a sum of 504 hospitals affording 78,596 beds, which makes hospital bed capacity about (2.2 beds per 1000 population) (Ministry of Health 2021). Healthcare services in SA are provided through three layers which are primary, secondary and tertiary levels. Two main suppliers for healthcare services are the government sector and the private sector. The Ministry of Health (MoH) is responsible for funding the government sector that covers 60% of the total healthcare services in SA (Puteh et al. 2020). The expenditure of the government on healthcare

services was around US\$35 billion in 2014 and raised to US\$46.6 billion in 2020 (Ministry of Finance 2020).

1.5.3 Prevalent Leadership Styles in SA

There was little information on the leadership styles prevalent in the SA. Nevertheless, one study did successfully identify three leadership styles in SA, as follows (Dirani et al. 2017): Autocratic leadership, paternalistic leadership and consultative leadership.

Autocratic leadership

The autocratic leadership style is probably the most adopted style amongst Saudi leaders (Dirani et al. 2017). They tend to control all decisions and carry out crucial tasks themselves, opting not to delegate authority (Altheeb 2020). It pleases such leaders when employees abide by these decisions without debate. Furthermore, they disregard the ideas of their subordinates in lower positions, and they do not prefer to interact with smart individuals or those who have superior qualifications (Dirani et al. 2017).

Paternalistic leadership

Paternalistic leadership, also referred to as authoritarian leadership, is another leadership type that is common in SA. There are strong similarities between the paternalistic and autocratic styles. Under this leadership style, the leaders act as father figures who look after their subordinates. Paternalistic leaders demand total loyalty, commitment, and obedience from their subordinates. Furthermore, they adopt a social role whereby Saudi Arabian leaders frequently join social events with their subordinates (Dirani et al. 2017).

Consultative leadership

The consultative leadership style is often adopted by leaders who have strong links with tribal norms and values. This is because they are skilled listeners and ensure that decisions are made with group input (Dirani et al. 2017). A strength of this style is that subordinates have opportunities to enhance their problem-solving skills. Conversely, a weakness of this approach is that theoretically, the opinions of older and more experienced employees are readily accepted, whereas younger subordinates are expected to listen, learn, and enhance

their leadership skills (Dirani et al. 2017). Furthermore, once the leader has reached a decision, all employees must abide by and implement their instructions (Dirani et al. 2017).

1.5.4 History


There is no doubt that history plays a vital role in crafting people's personalities, behaviour and daily interactions in the workplace. According to Bass (1990), the study of history can reveal the ways in which past leaders have influenced events during the period being studied. Historically SA was inhabited by Semitic-speaking people for approximately 3,000 years, those people structured their lifestyle in ways that enabled them to live in the harsh environment of the desert. They were known to have pride in their ancestry, were generous, followed the Islamic religion and spoke Arabic. SA has some of the holiest cities in the world, for example, Makkah and Medina.

1.5.5 Islamic tourism and MoH health services preparation in Makkah

Annually millions of Muslims visit Makkah from all over the world to perform Umrah, this can take place at any time of the year whereas al-hajj only takes place at a specific time of the year (General Authority for Statistics 2016). Makkah city is located in the Makkah region, the western province of SA, and it is known as the capital city of this region. Makkah is primarily known for being the holiest city of the Islamic religion and its total area is 153,128km².

Every year more than two million pilgrims arrive in Makkah city to perform rituals, this leads to severe congestion and increases the potential risk of infectious diseases that could become epidemics (see Table 1). The arrival of such a large number of people is accompanied by various hazards. For example, a crane collapsed in the holy mosque of Makkah, this led to 107 deaths and 230 were injured. The high number of deaths and injuries was significant for a city such as Makkah, most of the dead and injured were visitors performing specific religious worship (Al-Shareef et al. 2017).

Table 1 Number of pilgrims in ten years

Total pilgrims in Ten years 2008 - 2017		General Authority for Statistics 
Number of pilgrims	Year	
2,408,849	2008	
2,313,278	2009	
2,789,399	2010	
2,927,717	2011	
3,161,573	2012	
1,980,249	2013	
2,085,238	2014	
1,952,817	2015	
1,862,909	2016	
2,352,122	2017	

Source: General Authority for statistics (2017)

The diseases in these seasons can be classified as communicable and non-communicable. Firstly, in terms of non-communicable diseases the most common reason for death during the Hajj is cardiovascular diseases such as heart failure and myocardial infarction at 18.4% and 15.4%, respectively (Ministry of Health, 2016). According to the MoH, during the al-Hajj season in Makkah approximately 9 open heart operations are performed and 142 cardiac catheterisations (General Authority for statistics 2019). Trauma injuries result in 35% of pilgrim admissions to surgical departments and intensive care units. The remainder of the non-communicable diseases are preventable and can be managed, for example, fire-related injury, environmental heat injury and occupational hazards of abattoir workers.

Conversely, communicable diseases are complex and unexpected, prevention and treatment is difficult. The authorities refine their management procedures on an annual basis.

The MoH implemented a prevention strategy programme for infectious diseases, for example, they introduced compulsory vaccination for pilgrims and vaccination campaigns for residents living in areas which pilgrims visit, this aimed to limit the spread of disease (Ministry of Health 2017a). According to the MoH, 119,323 pilgrims have been immunised against polio, 279,625 against meningitis and 80,518 pilgrims have received preventive

immunisation through health control centres of King Abdul-Aziz airport in Jeddah and Jeddah seaport (Ministry of Health 2017b).

Health control centres at SA international borders work as a primary defence for disease prevention and management. In the case of a suspected patient, a blood sample is taken for confirmation purposes, the patient is isolated, and a prophylactic is administered (Ministry of Health 2017b; Saudi Gazette 2017). Thus, the role of MLS is essential, additional information on medical laboratories is provided later in the thesis.

1.5.6 Saudi Arabian Culture and transition

The description that follows provides some context for the Saudi culture. It describes Saudi cultural intricacies and offers clear insight into the culture. Saudi Arabia's population emerged from an ancient desert society which was immersed in the Islamic religion. All Saudi Arabian citizens are either Arab or Muslim, making it the most homogeneous of all Arab nations (Long 2005). As previously mentioned, there are two holy Islamic mosques at Makkah and Medina. An important point of note is that the word 'Islam' means the submission of peace; therefore, Islam is entrenched in all elements of Saudi culture, and this is bolstered by their highly cohesive social values and morals. Moreover, the significant effect that Islam has had on the Saudi culture demonstrates that the nation has embraced Islam from the time of the Prophet Muhammad up to the present day. Islamic and traditional values have enabled Saudi citizens to overcome many difficulties generated by Western technological progress, which could have affected the traditions and culture of Islam. The primary issue faced was how to modernise without secularisation (Long 2005).

Behaviour related to human relationships is another Saudi cultural issue. Behaviour in this context is reliant on personal trust, particularly in governmental or social exchanges as these are very personal in nature. Interpersonal relationships and social norms are inextricably linked, and as with any close relationship, the presence of sincerity and trust are crucial (Long 2005). Culture has been referred to as a dynamic phenomenon that is both persuasive and influential in many aspects, developed via interactions with others, thereby shaping behaviour (Schein 2010). This is incorporated into the current study which investigates job satisfaction and professional identity amongst MLS and the laboratory leaders. The hospital is a mixed-gender workplace, the genders are required to interact and

communicate. Due to the Saudi culture being entrenched in Islamic rules, this can create a strange situation for healthcare professionals. Culture is considered to be comprised of environmental, religious, economic, educational, and race factors (Al-Shahri 2002). Thus, healthcare professionals carrying out their role in a workplace, as described above, may find that the provision of healthcare is impacted by the influence of culture on their working relationships and that this has a significant bearing on job satisfaction.

It is apparent that the values of the Saudi Arabian community are strongly driven by Islam and tradition. All aspects of Saudi Arabian life have been, are, and will continue to be impacted by Islam, including behaviour, morals, and the rules that form the basis of their family, community, and work relationships, thus forging the Saudi national identity. Furthermore, it has shaped thinking and behaviour in SA, this has informed the approach adopted by the nations' leaders. Another important aspect is that leadership practices in SA are strongly linked to other elements such as traditions, culture, and triable, which are all components of the Saudi community and history (Dirani et al. 2017). Fundamentally, leadership and leaders' behaviour is significantly impacted by Saudis' social tapestry. However, in the current era the Saudi social community is profoundly influenced by the standing of the economy, social networks, and globalisation. Nevertheless, Saudi citizens remain strongly tied to their family and tribal identities.

Family allegiance

Family is of utmost importance under Islamic and Arabic customs, whereby the strengthening of family ties is prioritised, and it is expected that family members care for their relatives (Muna 1980; Moran et al. 2014; Aldhobaib 2017). Saudi society differs significantly from other communities in that it is an Islamic and Arabian society which considers the family unit to be the core social framework to which they are loyal (Alsaeeeri 1993). Other academics have reported comparable findings (e.g., (Alsarhani 2005)). In Saudi society, there is a hierarchal structure within the family. Family identity is linked to the father, who is the decision-maker and has chief responsibility for the family. According to Saudi tradition, in the absence or death of a father, the eldest son assumes this role, caring for his mother and younger family members. Thus, the Saudi family structure can extend beyond the traditional or nuclear family, often parents, grandparents, brothers (and

their own families), sisters, and occasionally aunts and uncles, live together in one household in Saudi cities (Al-Saif 1997).

The values of this society have significant implications for Saudi organisations and work groups. Most importantly, Saudi society considers work to be a way of promoting family interests and enhancing its reputation (Ali et al. 1991; Aldhobaib 2017). A family's prestige and image will clearly be improved when the family members work in valued positions, such as in the medical field. Under both family and tribal traditions, where an individual has the capacity to work, it is socially frowned upon to be unemployed, or even to hold a position that is considered low status. There are subjective aspects to MLS role recruitment and how attractive these roles are, as well as how turnover, job satisfaction and organisational culture impact influence at the individual level (e.g., (O'Reilly et al. 1991)).

Status of women in Saudi Arabian culture

Conventionally, women are treated with much care in the light of Saudi social traditions and Islamic teaching. Whilst this element exceeds the scope of the current study, it does appear to be highly significant for the comprehension of Saudi culture and the position of women in the workplace. Both social and Islamic traditions advocate taking care of women's needs; this is primarily in the context of protection and finances (Al Lily 2011; Abalkhail and Allan 2015). Therefore, in SA, if a daughter is single, she lives in her family's home, following marriage she lives in her husband's home and he is responsible for providing adequate shelter and a suitable income for the family (Al-Munajjid 2008; Abalkhail and Allan 2015). If a woman is widowed or divorced her closest male relative, for instance, her father, brother, or uncle, is both legally and culturally obligated to provide her with any support she requires. In the case of divorce, the husband is temporarily responsible for financial support if the couple have nursing children.

Male relatives can be referred to as *Mahram*, this title encompasses anyone that a woman cannot marry. With *Mahram*, a Muslim woman is not obligated to wear *Abaya* or *Hijab*, which is the clothing that Muslim women must wear in public or in the presence of other males (Al-Munajjid 1999). This is a core explanation for the gender segregation, non-mixed professional environment in SA, although others may hold a different opinion or even entirely disagree (Meijer 2010; Abalkhail and Allan 2015; Al Alhareth et al. 2015). *Mahram*

have innumerable responsibilities; most importantly helping a woman during travel and providing protection if desired. In this context, Islamic teaching forbids women from travelling without *Mahram*, with the only exception being when her trip is essential and the *Mahram* cannot accompany her (Al-Munajjid 2012). This is possibly a reason for the government policy that states women should seek permission from their *Mahram* prior to travelling internationally (Al Lily 2011). However, a new policy issued recently allowed women to travel and to be issued with a new passport without a male's permission (the kingdom is now in a transition phase).

Typically, women's position in Saudi society is to maintain the family structure which ultimately leads to the upholding of society (Alireza 1987). However, in accordance with Islamic teaching, women should be free to work or pursue an education, particularly if they meet specific criteria. For instance, the job should be appropriate for her temperament and should not pose a threat to her life (e.g., heavy labour), and that the requirements of the work or education and the environment do not contravene Islamic teaching (e.g., she must remove her *Abaya* or *Hijab*, or find an equivalent uniform for the job) (The Ministry of Labor and Social Development 2020).

Gender segregation

Throughout the 1970s and 1980s, cultural norms and many Islamic schools in SA campaigned for gender segregation (Cohen 2011), this was backed by a radical conservative movement. The ramifications of this endured for 30 years and resulted in an entire generation being transformed in line with a conservative religious ideology under the façade of privacy or safety concerns (Human Rights Watch 2008).

The first co-educational university was established in 2009, it facilitated mixed-gender education which sparked a massive debate about gender segregation in SA (Saudi Gazette 2010). Hospitals and medical schools are one of the very few exceptions to the gender segregation norm in SA (Meijer 2010). However, female Saudi patients prefer to be cared for by female professionals only, and likewise, male patients typically demonstrate a preference for healthcare provision by male professionals alone. In line with the heightened gender integration in many aspects of Saudi society, the norm of gender separation has begun to evolve (Husain 2007).

Transition

Since 2016 and more specifically following the commencement of Vision 2030, significant changes took place in SA and more specifically in the role of women in society. The role of a radical conservative speech has less relevance nowadays and the role of gender segregation has become less defined (Bloomberg 2021). All these changes paved the way for women to become more publicly engaged in areas such as the labour market, police and being permitted to drive. At the present time, non-related males and females can freely interact in restaurants. Other areas where gender segregation has been relaxed include offices, businesses, professional conferences, and music festivals. Furthermore, women are permitted to be spectators at football matches (Bloomberg 2021). One possible reason for the increased number of females in many workplaces is the rise in living costs in SA. The Saudi government cut fuel and electricity subsidies and implemented new taxes and fees (such as a 15% value-added tax) (Bloomberg 2021). Therefore, households in SA have become increasingly reliant on the additional wage being brought into the household by women. Boys and girls receive mixed education from year one to year three and are taught by women teachers (Al Arabiya news 2019). As a result, the new generation may be more open to accepting the new norms in comparison with the older generation who are more likely to show resistance. The consequence of these changes may be that communication barriers are relaxed in public places and in the workplace. Women will be more accepted and able to work in mixed workplaces as this move was supported by government policy and the imposing of a law which criminalises sexual harassment in the kingdom (Al Arabiya news 2021). The attitude of society towards females will therefore change and they will have more freedom to practice their rights within Islamic regulations.

To sum up, it would appear that contemporary family values are still the driving force for Saudi employees, this indicates that options for women remain relatively controlled. Furthermore, it is apparent that Saudi women's issues in their places of work interfere substantially with their professional identity and job satisfaction and are a significant challenge for leaders. This shift in society will influence the new generation, it means that some of the issues apparent in current literature will not be applicable in future. This shift influences both society and the economy of the kingdom, and is discussed below.

1.5.7 Economy

SA is recognised as a leading oil producer. The nation owns approximately 17% of the global petroleum reserves, thereby securing a top position in the Organisation of Petroleum Exporting Countries (OPEC). Saudi Vision 2030 is striving to make the Saudi economy oil independent and to identify other sustainable resources. This necessitates effective leadership; thus, it is crucial to understand the leadership behaviour and skills that are necessary to foster effective strategic thinking (Haykel et al. 2015). From 1970 onwards, SA issued five-year strategic plans, this has resulted in significant developments within the Kingdom, for example, in areas such as culture, health, the economy, and education. Vision 2030 advocates an amalgamation of foreign investment, local education, and leadership development skills, coupled with stringent oversight by the nations' highest authorities, asserting that this is necessary to accomplish the reform goals (Vision 2030 2016). Vision 2030 was introduced by the Kingdom of SA in 2016 with the aim of leading the Kingdom forward in a manner that would ensure it is sustainable, maintaining pace with global developments, improving the quality of life, and diversifying the economy.

1.6 Saudi Arabia towards a thriving future (Saudi's vision 2030)

Vision 2030 is comprised of three primary themes (Vision 2030 2016):

- A vibrant society
- A thriving economy
- An ambitious nation

Each of the above themes is expanded in the subsequent paragraphs, the commitments and goals are described in detail. The healthcare system was one area which underwent radical reform.

Firstly, a vibrant society is recognised as being highly important in general, and more specifically, critical to accomplishing the Vision and building a strong basis for economic success. Saudi citizens live in harmony with the most of Islamic principles of moderation. They take pride in their national identity and their ancient cultural heritage. They take pleasure in living in a beautiful environment and enjoy the protection of their loving

families and the support of a social and healthcare system working for their benefit (Vision 2030 2016).

Secondly, a thriving economy offers great opportunities to all citizens by creating an educational system in accordance with market needs. This opens up economic opportunities for entrepreneurs, small enterprises, and large corporations alike. The intention is to develop investment tools which will encourage potentially valuable economic sectors, diversify the economy, and create opportunities for work, especially prioritising the engagement of females in the labour market. Efforts will be made to grow the economy and to enhance the quality of services through the privatisation of several government services. Additionally, the business environment will be improved, this will attract the finest talent and encourage optimal investment from all over the world. Finally, Saudi Arabia's exceptional strategic location will be leveraged to link three continents (Vision 2030 2016).

Thirdly, SA is an ambitious nation in terms of planned accomplishments. Efficiency and responsibility will be implemented at all levels. The government is expected to be effective, transparent, accountable, enabling, and high performing. In addition, a suitable environment will be fostered for the Saudi people, in both the private and non-profit sectors, encouraging them to shoulder their responsibilities and show initiative in relation to addressing challenges and taking advantages of opportunities (Vision 2030 2016).

1.6.1 Vision 2030 and healthcare system

Despite the significant progress made by SA over the last few decades in improving the health of the population, the healthcare system nevertheless requires significant modernisation in order to accomplish the goals of Vision 2030 (Chowdhury et al. 2021). To achieve this, the Kingdom initiated a National Transformation Programme (NTP) in 2016, this is documented in the Vision 2030 plan. Healthcare transformation is one of the eight NTP themes. There is almost 100-years history of healthcare facilities in the Kingdom.

A further measure taken to achieve the goal was the development of the Council of Economic and Development Affairs and vision realisation programmes (VRPs), these were implemented in governmental, private, and non-profit organisations. In brief, the Council

of Economic and Development Affairs established a practical and integrated governance model to translate Vision 2030 into numerous VRPs working as counterparts to accomplish the strategic objectives and realise the vision (Chowdhury et al. 2021).


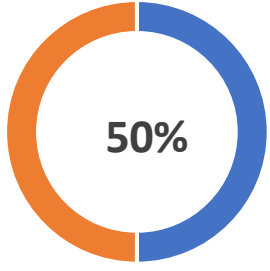
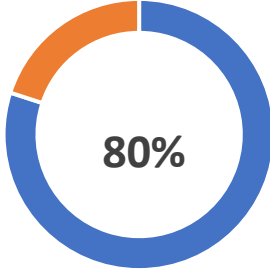

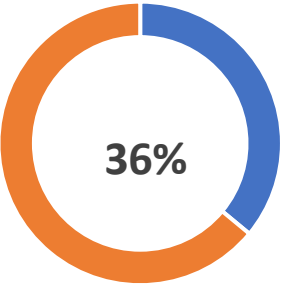
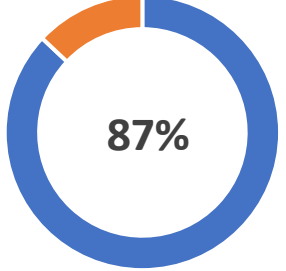

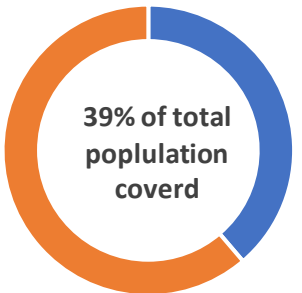
As the population increases, the Saudi health sector will come under significant pressure, it is experiencing major reforms in line with regional and global trends. The first NTP theme is 'Transform health care', this plans to restructure the health industry in order to make it a comprehensive and efficient system. Public health, focusing on awareness and prevention, will be promoted in Saudi society via a new Model of Care (MOC). The notion of the MOC began with understanding the present status and gathering information (Chowdhury et al. 2021). It is based on the six Systems of Care (SOC), which are: (i) keeping well; (ii) planned procedure; (iii) women and children; (iv) urgent problems; (v) chronic conditions; and (vi) the last phase of life. The SOC was introduced across various 'service layers' in order to help citizens to remain healthy or to regain their health when care is required. The MOC's ensure that the health services are accessible via optimal coverage, equitable geographical distribution, and comprehensive and expanded e-health services and digital solutions. Furthermore, they will focus on the continuous improvement of health services by striving to understand the experiences and satisfaction level of users, this information will then be compared against international standards and best practice (Chowdhury et al. 2021). This has clear implications for all staff groups, including MLS.

Some of the main organisations involved in healthcare transformation are the MOH, the Saudi Health Council, the King Faisal Specialist Hospital and Research Centre, the Saudi Food and Drug Authority, the Saudi Red Crescent Authority, and the Ministry of Education. The MOC highlighted three substantial challenges, these are: (i) lack of access to health services; (ii) low quality and inefficient health services; (iii) weak preventative healthcare. The NTP developed strategies to address these challenges. Firstly, they planned to increase the number of health facilities, this entailed infrastructure improvements such as an increase in the number of healthcare workers and the number of beds available. The actions were aimed at improving the accessibility of healthcare services for the Saudi people. Effective geographical distribution safeguards affordable services, enables straightforward specialised consultation (via workforce organisation, redistribution of responsibilities, and enhancing the referral and appointments systems), and accessible

emergency medical care by promoting associated medical professions. Secondly, the plan was designed to improve clinical effectiveness and patient experience, enhance safety, improve sustainability and make it financially transparent. Thirdly, in terms of promoting prevention against health risks, control of communicable and non-communicable diseases (see Table 2), and enhancing preparedness for confronting health disasters (Chowdhury et al. 2021), the NTP embraced digital transformation, this was driven by COVID-19.

The onset of the COVID-19 pandemic facilitated the promotion and testing of this digital transformation. Table 3 visualises and summarises one of the numerous applications for a range of health sectors during the COVID-19 pandemic in SA (Hassounah et al. 2020). The most important application currently is Tawakkalna, it links with the results from the medical laboratory regarding COVID. If a person has been infected, the health status of this person will be amended accordingly. The application Tawakkalna acts as an electronic health certificate which enables people to enter commercial activities, workplaces, closed and open places. Tawakkalna is now considered as a health passport or travel pass because it has been accepted by the International Air Transport Association (2021).

Table 2 Infographic achievements of NTP until 2021 (limited to the health sector) source (Vision 2030 2021)

Achievement	Before vision 2016	By 2020
 <p>The availability of medical consultation within 4 weeks</p>	 <p>50%</p>	 <p>80%</p>
 <p>Percentage of facilitating access to emergency health services within 4 hours since the patient entered the emergency gate to his discharge</p>	 <p>36%</p>	 <p>87%</p>
 <p>Launched 10 health clusters to serve 12.95 million patients</p>	<p>No data</p>	 <p>39% of total population covered</p>




 <p>Reducing referrals outside the patient's areas of residence to inside the Kingdom by 50%.</p>	<p>No data</p>	
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Table 3 Electronic applications linked with NTP and the COVID pandemic

Application name	Type	Short description	Provider
 <p>Tawakkalna</p>	<p>Smartphone app (iOS/Android)</p>	<p>The purpose is to suppress the proliferation of COVID-19. Details of people quarantining, and isolating are presented. It is an app fitted with GPS to monitor and limit the movement of people during lockdown hours, or those infected with COVID. It can issue permits for work and exceptions travelling. It displays the vaccine certification. It facilitates COVID vaccine bookings.</p>	<p>MoH and Ministry of interior</p>

Source: Hassounah et al. (2020)

1.7 Medical laboratory in Makkah government hospitals: an overview

Due to the varied and multifaceted testing approaches being employed, the field of laboratory medicine is progressing. Both laboratory directors and managers have encountered difficulties in managing technical staff and complying with standard operating

procedures, policies, and guidelines. Furthermore, accrediting certificates such as the College of American Pathologists (CAP) and the Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI), which help to raise the quality of laboratory services and ensure patient safety, increase the burden on laboratory directors and laboratory supervisors. Staff growth and development is the effective way to improve practice and to provide a safe service for patients. Therefore, proper health leadership is essential if hospital laboratory directors are to achieve the aforementioned requirements.

This review describes the organisational structure, responsibility, and functions of the hospital laboratories in Makkah city. It provides a brief overview of Makkah city, includes hospital laboratory services structure and workforce, the role of MLS and the importance of quality and leadership for hospital laboratories.

1.8 Hospital laboratory services description, structure and workforce.

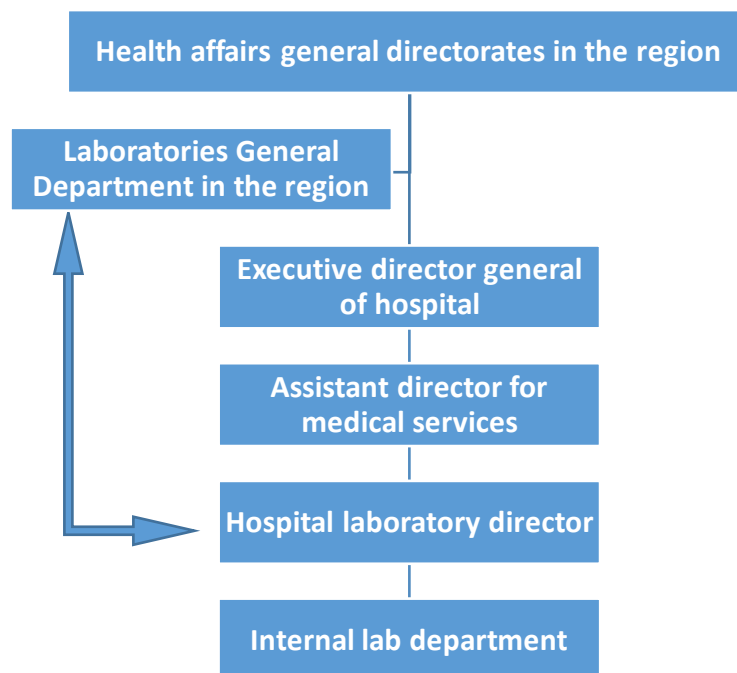
In SA, government hospitals and associated laboratory services are financed and overseen by the MoH through regional health affairs general directorates and the Laboratories General Department. Free laboratory test services are provided for Saudi citizens, pilgrims and visitors who are in the area for religious purposes (Al-Tawfiq and Memish 2012).

Medical laboratories are classified by volume, small, medium, or large, according to the extent of testing and the range of services offered. Typically, large volume laboratories handle hundreds or even thousands of specimens each day, and conduct tests of varying degrees of difficulty. All laboratories are bound by extremely strict regulations, these were introduced to determine the qualifications and skills of the people conducting the analysis and interpreting the test results (CBAHI 2021a). All government hospitals in the Kingdom have their own laboratory and a blood bank functioning as a separate department under the main laboratory. Furthermore, each region has a central blood bank. The process of blood banking is the collection, separation, and storing of blood. Currently, blood banks collect blood and divide it into its different components in order to address efficiently and effectively complex patient needs.

A hospital laboratory is accountable to the assistant director of medical services, he/she links with the executive director general of the hospital. The hospital director is supervised by health affairs general directorates in the region.

The hospital laboratory is also supervised by the Laboratories General Department of the region, which is under the supervision of health affairs general directorates of the region. Each hospital laboratory department has a director and a deputy director. Each internal department in the laboratory, such as chemistry, haematology, parasitology, serology, microbiology, molecular biology and blood bank, has a supervisor and a senior manager. Furthermore, hospital laboratories have quality and safety units, infection disease units, training and development units and logistics units (see Figure 3).

Figure 3 Structure of hospital laboratory of MOH in Makkah city



In Makkah city, there are seven government hospitals with seven laboratories providing routine laboratory test services.

The first hospital, Al-Noor specialised hospital, is considered to be a tertiary hospital and is located in Makkah region. It has critical care departments such as a cardiology centre,

neurosurgery department and a diabetes centre. Al-Noor hospital laboratory is equipped with excellent laboratory equipment and is accredited by JCI and CBAHI (Al-Noor Hospital 2017).

The maternity and children's hospital is considered as a basic reference for paediatrics, gynaecology and obstetrics in Makkah. The hospital predominantly provides medical services for paediatric patients, there is a 76 bed intensive care unit for neonates, a 19 bed intensive care unit for children and an emergency unit for paediatrics with a 21 bed capacity. Additionally, the hospital has other specialist areas for children, for example, neurology, heart and cardiac catheterisation, surgery, urology surgery unit, day surgery unit, blood diseases, genetic diseases, a speech and hearing unit and a rehabilitation centre with a total capacity of around 250 clinical beds. The hospital also provides specialised medical services in gynaecology and paediatrics including an intensive-medium care section with a 19 bed capacity, delivery section with 23 bed capacity and a women's emergency section with a 13 bed capacity. The maternity and children's hospital has various medical units such as endoscopy, infertility treatment, embryology, women's urology and a day-surgery unit. Clinics provide follow up for all pregnancy stages and childbirth with a total capacity of 257 beds (Ministry of Health 2012).

The hospital of King Abdullah medical city is the largest hospital in Makkah and the third largest referral specialist medical city in the kingdom (Ministry of Health 2009). It provides specialist medical services and only receives patients from tertiary and general hospitals as well as emergency cases. It is considered as a reference hospital for oncology, cancer and cardiac surgery and covers most rare specialisations. Its area is around 800,000 square metres and the capacity is around 1500 beds, of which 500 beds have been allocated to the specialist referral hospital (Ministry of Health 2009).

Finally, King Faisal hospital, King Abdul-Aziz hospital and Hera hospital are general hospitals. These hospitals are not specialised; their labs run basic laboratory tests such as chemistry, hormones, microbiology, pathology, serology, blood bank and phlebotomy. For those hospitals, if a test is requested and the hospital laboratory is not able to provide the service it will be sent out to the regional laboratory which provides non-routine advanced tests to intranational laboratories.

Workforce

Although many healthcare systems suffer from a shortage of MLS, SA has a more than adequate supply of graduated students, it exceeds demand. There are a number of possible reasons for this, SA provides a free education for citizens up until tertiary school level and approximately 40 colleges (private and government) offer MLS degree (Saudi Commission for Health Specialities 2018). It is important that this situation is maintained and that MLS experience job satisfaction in their roles within the hospital environment because there is a shortage of government jobs (Saudi Commission for Health Specialities 2018) for MLS and they are unlikely to leave or move on to another job. This may affect their productivity negatively as well as the quality of results. Beck and Doig (2005) highlighted the fact that the majority of MLS who left their positions moved on to another laboratory. They also identified that some MLS left the career because of job stress, they sought further education for a non-laboratory career and left the field. Interestingly, these reasons seem to be valid as they are compatible with a recent study on medical professionals (Schill 2017).

In SA, healthcare practitioners generally prefer to work in government hospitals rather than in private sector hospitals due to the higher salaries and greater opportunities for promotion.

In SA, there are 11,360 MLS, 10,753 are Saudi and 607 are non-Saudis working for the MoH (Ministry of Health 2016). In Makkah city, the number of MLS working in hospitals of the MoH is around 600 (see Table 4). In 2016 the hospital laboratories of the MoH conducted around 145 million laboratory investigations in the whole kingdom. In Makkah, the total number of laboratory tests conducted by the MoH was 12,270,611 (Ministry of Health 2016).

Table 4 Numbers of hospital laboratory staff of MoH in Makkah City

Hospital name	Al-Noor hospital	KFH	KAH	KAMC	M&C	Hera hospital	Total
Staff number	152	70	75	160	75	70	602
Supervisor	9	8	8	9	9	9	52
Senior manager	9	8	8	9	9	9	52
Lab director	1	1	1	1	1	1	6
Total							712

The role of MLS

The laboratory department in the hospital is dominated by a number of different professionals, these include pathologists, medical laboratory technologists and medical technicians. The level of responsibility for each profession is dependent on the formal educational qualification held (see Table 5). This study uses the term ‘medical laboratory staff’ (MLS), this includes Medical Laboratory Technicians and Medical Laboratory Technologists. The services provided by MLS can be defined “as members of the health care delivery team, are responsible for assuring reliable and accurate laboratory test results which contribute to the diagnosis, treatment, prognosis, and prevention of physiological and pathological conditions in humans” (The American Society for Clinical Laboratory Science 2012, para.6).

Table 5 Education level, position and responsibility of medical laboratory staff

Education level	Position	Responsibility
Two-Year College Degree	Medical Laboratory Technician	Conducts supervised clinical laboratory testing and the capacity for independent judgement is restricted. This can range from operating highly-automated equipment to bench testing with manually-prepared solutions.
Four-Year College Degree	Medical Laboratory Technologist (or scientist)	Conducts clinical laboratory testing and has the capacity to use independent judgement and responsibility. This can range from operating highly-automated equipment to bench testing with manually-prepared solutions and analysis of results.
Medical Degree (M.D.) and Residency Training Or PhD with the appropriate experience	Pathologist	Assesses blood, urine, and other non-tissue specimens. Encompasses associated activities including setting guidelines for blood transfusion practice.

The role of MLS is to perform a broad range of medical laboratory tests in order to aid physicians with diagnoses. Typically, these tests are categorised into key departments, as follows (Karni 2002) (See Table 6).

Table 6 Laboratory departments and their functions

Laboratory department	Function
Haematology department -	investigation of blood diseases such as anaemia and leukaemia
Coagulation or haemostasis department	investigation of bleeding and clotting issues
Urinalysis department	-investigation of urine at the physical, chemical, and microscopic levels
Clinical chemistry department	- analysis of bodily fluids for chemical constituents for the purpose of detecting diseases and disorders
Immunoematology department (blood bank)	- transfusion medicine that ensures safe and compatible blood products for transfusion
Immunology or serology department	- investigation of the body's immune system to detect infectious diseases and capacity for tissue transplantation
Microbiology department includes bacteriology, virology, parasitology and mycology.	- detection of microorganisms that cause infections and/or diseases
Histopathology department	examining the tissues and detect diseases.

MLS primarily interact with two types of physicians in hospital medical laboratory departments. Firstly pathologists, they head the majority of hospital laboratory departments as they are specialists in disease diagnosis. Secondly clients, this refers to physicians who are the end-users of laboratory test results; meaning that the clients request laboratory tests for their patients (Darr and Scarselletta 2002). MLS communicate

with physicians if they require more information about the tests that are being requested. A point of importance is the significance of communication in decreasing errors in medical laboratories (Dintzis et al. 2011). In fact, effective communication between MLS and other healthcare personnel, such as nurses and doctors, can facilitate the identification of the sources of errors promptly and enable preventative action to be taken. However, Darr and Scarselletta (2002) opined that the relationship between MLS and physicians was not sufficiently strong and that effective communication would improve this. The relationship between MLS and physicians will be discussed in the ensuing sections.

The importance of Hospital laboratory services, quality standards and leadership

Hospital laboratory services are very important, they are considered to be the backbone of a hospital as they play a vital role in controlling infectious and hereditary diseases. For example, they work as initial investigators for epidemics, outbreaks and premarital screening. Physicians are the primary clients of hospital laboratories, decisions on surgical intervention and prescriptions for medication are based on completed blood test profiles. Thus, they require results to be of the highest quality and reliability in order to avoid an adverse reaction and to ensure the best possible outcome for patient health (Teklemariam et al. 2013; Zaini et al. 2015). Unfortunately, laboratory staff spend much of their time on the management of machinery and equipment (Ferraro et al. 2016). However, the role requires professional people with the ability to investigate, analyse and report results in a professional way, thus enabling physicians to take important decisions which can save people's lives. In SA, it is mandatory for laboratory specialists and technicians to complete a set number of continued medical education (CME) hours to renew their licences and remain eligible to practise (Alkhazim et al. 2015). The purpose of CME is to ensure laboratory practitioners are up to date with the latest trends and cutting-edge technology in order to maintain and improve quality. (Alkhazim et al. 2015). Finally, laboratory results are not only important for physicians, they also act as a mirror for the healthcare disease profile of the country (Ferraro et al. 2015).

Therefore, it is important for hospital laboratory services to produce quality results, this can only be achieved by following local or international standards (accreditation). In SA, some laboratories have international accreditation, this can be awarded by a number of

different bodies, for example: the College of American Pathologists (CAP) and Joint Commission International (JCI) or local accreditation such as the Saudi Central Board for Accreditation of Healthcare Institutes (CBAHI) (see Table 7).

Table 7 Hospitals and accreditation types in Makkah city

Accreditation/ Hospital			
Al-Noor hospital	Accredited		
KAMC	Accredited		Accredited
The maternity and children hospital	Accredited		
King Abdul-Aziz hospital	Accredited		
King Faisal hospital	Conditional		
Hera General hospital	Accredited		

Sources: (CBAHI 2021b; College of American Pathologists 2021; Joint Commission International 2021)

Two studies have been undertaken in Makkah city, one was conducted in the maternity and children’s hospital and the other in KFH. Both studies evaluated physician satisfaction, physicians are the primary clients of laboratory services. The studies demonstrated that respondents (physicians) were dissatisfied with the following: issues related to administration, communication, quality, delay in routine test turnaround time (TAT) and

missing laboratory test results (Zaini 2015; Zaini et al. 2015). Braithwaite et al. (2010), identified that accreditation standards programmes were positively associated with clinical performance, leadership, organisational culture, quality of care and communication, teamwork and decision making. A lack of strong leadership delayed the implementation and activation of accreditation programmes standards, the leader's role is vital in sharing vision, empowering and inspiring followers to apply these standards.

The availability of effective leadership is an important factor for growth, improvement and operational excellence, it also has an impact on quality standards in the workplace. Leaders have a key role in influencing workplace culture and improving the quality and rate of laboratory progress over time. Yenice (2020) identified three core qualities which steer laboratory medicine, these are mindset, curiosity and the ability to adapt. There is much uncertainty and diversity within the healthcare setting, particularly within medical laboratories, and leaders deal with a variety of professions, from phlebotomists to consultants.

Leadership approaches are determined by diverse factors, these include personality, culture, country and beliefs. The role of leadership is the action of leading personnel to attain a unique organisational goal. Therefore, leaders must be aware of and have an understanding of the culture, they are required to bring together groups from various backgrounds in order to achieve the same mission. Nahavandi (2009) stated that: "Understanding leadership requires an understanding of the cultural context in which it takes place" (p. 243). Consequently, a serious question may arise: Which approach to leadership is required in today's hospital laboratory in SA? To understand the cultural requirements for leadership and leadership evolution in the Saudi context, an overview of the history, economy and religion has been provided.

Active communication and interaction are crucial for laboratory leaders to build a cohesive team. The focus of a leader's energy should be on selecting the right people and developing their intellectual skills, this in turn can critically enhance a leaders' capability to build up a strong collaborative relationship. It is essential that MLS in laboratories keep pace with evolving technology. A core aspect of leadership in the laboratory is communication with front-line healthcare providers, this involves the hospital administration, maintenance and

development of clinical laboratory services to meet needs. Information is the most important contribution the medical laboratory can provide to healthcare services. Therefore, laboratory leaders must ensure that the service delivered is appropriate, accurate and timely where possible to add value to services.

1.9 Thesis outline:

In addition to this introductory chapter, there are six further key chapters in this thesis, as follows:

Chapter Two:

This chapter reviews the existing literature that explores professional identity, job satisfaction, and leadership behaviours in the context of hospital laboratories. Chapter two focuses firstly on professional identity. This encompasses the following: a definition of professional identity in the context of MLS, details about the professional identity of MLS, the conceptualisation of organisational behaviour theory - professional identity and the significance of professional identity for MLS. It then moves on to the topic of job satisfaction and includes the following aspects: a definition of job satisfaction, the significance of job satisfaction for MLS and the association between professional identity and job satisfaction. Finally, the focus is on leadership behaviours in hospital laboratories, leadership definition, leadership in the medical laboratory, leadership and management in medical laboratory task-oriented and people-oriented leadership.

Chapter Three:

This chapter outlines the methodology chosen for this study. It discusses the key themes: the aim of the research and questions to be addressed. It also provides a discussion about the selected conceptual framework. The underlying philosophical perspective and research models will be presented, and subsequently the research rationale and adoption of a mixed-methods, sequential explanatory study design will be explained. The discussion of the study phase one (quantitative) and phase two (qualitative) is presented sequentially, touching upon the employed techniques of design, data collection, and data analysis. The standards complied with in order to guarantee research rigour and quality will be outlined

also. Finally, the procedure for obtaining ethical approval and the matters of ethics, confidentiality, and informed consent will be described.

Chapter Four:

This is the first of three findings chapters. This chapter provides answers in relation to the professional identity of the MLS. This study's findings will be presented in three separate chapters. The MLS participants' demographic characteristics are also described in Chapter Four. Information is provided on Normality testing and the application of the Central Limit Theorem (CLT) for the purpose of conducting parametric tests. The chapter contains three parts: Part I offers the statistical evidence that addresses the research questions. Part II provides the results of the qualitative analysis of the data collected during the interviews and observational data. Part III presents the chapter's conclusion and mixed-method inferences.

Chapter Five:

This chapter provides answers to the third research question of the study about the leadership behaviour of MLS leaders. It commences with a description of leadership styles within hospital laboratories and considers which leadership style is the most effective for leading MLS. The challenges facing leaders and supervisors will be examined and the effect of leadership on professional identity will be explored. The findings are presented in three parts: Part I offers the statistical evidence which addressed the research questions and informed the qualitative data. Part II provides the results of the qualitative analysis of the data collected during the interviews and observational data. Part III presents the chapter's conclusion.

Chapter Six:

This is the final findings chapter, it provides answers in relation to the job satisfaction of MLS in two hospitals. A detailed description of MLS' job satisfaction is presented. This is followed by an examination of the association between MLS job satisfaction and professional identity, and association between job satisfaction and leadership behaviour to answer the second and the third question of the study, respectively. The findings are presented in three parts: Part I offers the statistical evidence that addresses the research

questions, and which informs the qualitative data. Part II provides the results of the qualitative analysis data collected during the interviews and observational data. Part III presents the chapter's conclusion and mixed-method inferences.

Chapter Seven:

The final chapter of the thesis discusses key findings in relation to the SA context and existing literature. This chapter discusses the relevance of these findings from the study to explore the professional identity, job satisfaction and leadership behaviour of MLS in Saudi Arabian hospital laboratory settings. The chapter begins by providing an overview of the medical laboratory staff's (MLS) demographic data. This is followed by a discussion of the key research findings for each of the three research questions, the implications of those findings for MLS and the contribution to existing knowledge. Consideration is also given to the limitations of the study and the effectiveness of the design, this is followed by recommendations for MLS leadership, MLS education and MLS practice in relation to cultural competence. Finally, the conclusion will close this research study.

CHAPTER TWO - Literature review

2.1 Introduction

This chapter reviews the existing literature that explores professional identity, job satisfaction, and leadership behaviours in the context of hospital laboratories. Chapter 1 primarily explored SA and its culture in order to facilitate an in-depth comprehension of its impact on workplaces, such as healthcare settings. Subsequently, it provided an overview of MLS in SA. Chapter 2 focuses firstly on professional identity. This encompasses the following: a definition of professional identity in the context of MLS, details about the professional identity of MLS, the conceptualisation of organisational behaviour theory and professional identity and the significance of professional identity for MLS. It then moves on to the topic of job satisfaction and includes the following aspects: a definition of job satisfaction, the significance of job satisfaction for MLS and the association between professional identity and job satisfaction. Finally, the focus is on leadership behaviours in hospital laboratories, leadership definition, leadership in medical laboratory, leadership and management in medical laboratory task-oriented and people-oriented leadership. While the literature addresses a broad range of common leadership studies in medical laboratories and the associations between leadership behaviour, job satisfaction and professional identity.

2.2 Literature Review

2.2.1 Literature Search Strategy and Keywords

Literature in the field of MLS was reviewed, focusing specifically on professional identity, job satisfaction, and leadership research. This section details the databases, keywords, and inclusion and exclusion criteria that were employed in order to obtain comprehensive information.

2.2.2 Databases

The following multi-databases were used to ensure a full literature retrieval:

- CINAHL via EBSCO
- MEDLINE via OvidSP (incorporation PsycINFO)

- Web of Science
- Scopus
- Google Scholar

2.2.3 *Primary keywords*

The following primary keywords were utilised as search terms:

- Professional identity/ status/ prestige / self-esteem/ self- perception/ perception
- Medical/clinical laboratory staff/technologies/scientist/ science
- Job/ career/ employees / workers satisfaction.
- Leadership behaviour/ style/ theories
- Saudi Arabia

2.2.4 *Inclusion criteria*

The inclusion criteria for the search was as follows:

- Studies that explored professional identity, job satisfaction and leadership behaviours in the MLS field.
- Studies that examined the association between professional identity and job satisfaction, looking at aspects including performance, quality of work etc.
- Studies that explored how job satisfaction or professional identity are affected by the type of leadership behaviours.
- The researcher will focus on studies from 2000 since the area of MLS is linked with high advanced technology. This means the researcher will review old studies only if needed.
- Studies in English.
- Studies performed in a healthcare setting; for instance, a hospital or other relevant settings.

2.2.5 *Exclusion criteria*

The exclusion criteria for the search was as follows:

- Studies that explored professional identity and job satisfaction in students.
- Studies that adopted a generalised approach to business leadership.

- Studies that examined various instruments of leadership, job satisfaction and/or professional identity.
- Studies published prior to January 2000 (although some pre-2000 studies may be reviewed).

2.2.6 Review structure

The literature review is comprised of three sections: professional identity, job satisfaction, and leadership. The first section on professional identity encompasses its definition, the conceptualization of organisational behaviour theory in the context of professional identity, and the significance of professional identity. The second section defines job satisfaction, discusses its significance for the MLS field, and examines the correlation between professional identity and job satisfaction. The third section examines leadership.

This is not an all-inclusive review as professional identity, job satisfaction, and leadership are all broad subjects; therefore, it is not possible to include all relevant research. The goal here is to provide an overview of the present knowledge relevant to this study.

2.3 Professional Identity

2.3.1 Definition of Professional Identity

One perspective of professional identity is that professionals are frequently defined by what it that is they do rather than their place of work (Pratt et al. 2006). While some studies have investigated professional identity in terms of MLS, the definition remains largely ambiguous (Trede et al. 2012; Nadelson et al. 2017). For example, one study defined professional identity as self-concept, which is a general term that describes self-assessment of who we are, encompassing self-esteem, self-image and self-worth, and while they are frequently considered synonymous, the characteristics of each are distinctive and unique (McLeod 2008). Another view is that professional identity could be described by the following three features: (i) possessing knowledge, skills, and values that are common with others in the profession; (ii) distinct from other professions; (iii) being strongly linked with the profession (Trede et al. 2012; Jackson 2016). The term 'profession' refers to an occupation that society considers provides a valuable service, has a unique knowledge-

base, and that overseas and maintains its members (Pratt et al. 2006; Barbara-i-Molinero et al. 2017). In accordance with these criteria, MLS can be deemed a profession.

2.3.2 *Professional Identity of MLS*

Background

MLS as a profession has found it difficult to establish a definitive identity. Research on clinical laboratory science tends to focus on the individual clinical laboratory scientists' professional identities. The existing literature on MLS, which is primarily US-based, concentrates on ascertaining, usually from the laboratory managers' perspective, the reasons why the profession has lower retention rates, and also examines the formal training before commencing employment (O'Connell-Spalla 2021). In fact, no studies were identified that examine the professional identity of MLS specifically, based in SA.

Within a clinical laboratory setting, there is a hierarchy of roles according to education, responsibilities, and skills. Members of the laboratory team include clerks, laboratory assistants, medical laboratory scientists, medical technicians, pathologists, and phlebotomists (O'Connell-Spalla 2021). For each of their roles, there are specific requirements in terms of education and skills. Amongst other healthcare professionals and administrators, there is frequently a lack of awareness about the different roles and extent of practice within the laboratory, which feeds the ongoing generalisations (for instance, "lab" or "lab people") when referring to any member of the laboratory, which clearly is another hindrance to developing positive professional identity (Braithwaite et al. 2016). This ambiguity or confusion over titles and responsibility is not generally seen in other healthcare disciplines. Typically, administrators, healthcare professionals, and community members recognise the diversity in responsibility of physicians or physician assistants, and in registered nurses or nursing assistants; however, the ongoing lack of awareness and erroneous stereotypes regarding the laboratory context have a negative impact on the future of the profession and are also detrimental to the recruitment and retention of qualified professionals (Caza and Creary 2016).

In the context of the US, the professional organisations connected to the laboratory have managed to overcome a challenging history and have collaborated to positively impact

MLSs (O'Connell-Spalla 2021). In November 2020, the American Society for Clinical Pathology (ASCP) and the American Society for Clinical Laboratory Science (ASCLS) published a position statement about the ambiguous history of the titles given to laboratory professionals. There was a recognition that clarity was necessary, therefore a rationale was implemented for utilisation of the present titles of medical laboratory technician (MLT) and medical laboratory scientist (MLS). Consistency in the use of titles elevated the professions' scope and offered more clarity, which was substantial progress towards unification and professional identity. However, regrettably, laboratory professionals have since been reticent to adopt these titles, with some preferring instead to continue to use outdated titles in both an educational and professional context (O'Connell-Spalla 2021). This ongoing usage of multiple titles creates more uncertainty for those who are not familiar with the internal laboratory structure (The American Society for Clinical Laboratory Science 2020).

Some academics assert that because pathologists and physicians have attempted to dominate the laboratory for many years, the professional identity of MLS professionals has been impacted negatively as they have been prevented from playing a leading role in the healthcare environment (Evans 1968; Grant 2007). They also added that this has been the primary obstacle to the establishment and advancement of the MLS professional identity. As a consequence, professional autonomy has also been affected when MLS are not given freedom of judgement or decisions in their role. This is a continuing concern, especially when MLS professionals show no desire other than to obey the orders of the physician, even in circumstances when they are aware of a better test or approach that will garner more valuable information or when they know that an incorrect or inappropriate test has been requested based on the patients' clinical status (Ferraro et al. 2016). Additionally, other researchers have put forward the argument that the professional identity of MLS has been hampered because laboratory professionals have been discouraged from distinguishing or separating themselves from pathologists (Kotlarz 1998a, 1999b). Although this work is now rather old, the messages are still valid till today.

Literature review

A recent study was carried out examining several elements of professional identity, including awareness, respect, and recognition of the MLS within the healthcare community, for the purpose of identifying the extent of professional engagement and career satisfaction (O'Connell-Spalla 2021). The study employed a longitudinal survey presenting data from samples of medical laboratory professionals (or MLPs) gathered both pre- and post-COVID-19 pandemic (n=371 and n=380, respectively). The validity and reliability of the surveys used in this study were not reported (Heale and Twycross 2015). The results suggest that over 50% of respondents do not believe that other healthcare professionals have respect for them, and in excess of 90% reported that other healthcare professionals do not comprehend the MLP's educational requirements and degree of responsibility. The outcomes of the study clearly show that particularly among other healthcare professionals, increasing awareness and respect, and better comprehending the positive role of MLS is essential (O'Connell-Spalla 2021).

Another study exploring the professional identity of MLS professionals established that laboratory professionals consider their work to be highly significant and that their contribution is valuable for patients (Butina and Schell 2011). However, they do not feel that their work is appreciated by other non-laboratory healthcare professionals (Butina and Schell 2011). The study adopted narrative inquiry as the methodology as the researchers felt that the participants' descriptions would inform the self-image of MLPs. Furthermore, the researchers contended that a negative self-image or negative public image could dissuade people from becoming a medical laboratory science professional. The researchers identified three dominant issues, as follows: (i) laboratory professionals felt misunderstood; (ii) laboratory professionals believe there is a lack of awareness about their profession; (iii) laboratory personnel consider their role in healthcare to be essential. The first shared view identified from the participants was that their healthcare professional peers misunderstood them (Butina and Schell 2011). Firstly, the researchers reported that during the participant interviews, the laboratory professionals displayed exasperation that physicians and nurses do not have an in-depth comprehension of laboratory testing, and subsequently, may have impractical expectations of the laboratory. Secondly, the participants expressed that the general public did not have an awareness of the medical

laboratory science profession. Thirdly, and more positively, most of the participants consider that their profession makes a valuable difference to the patient or family members' life (Butina and Schell 2011). The medical laboratory participants considered their role in a patients' diagnosis and treatment to be key. Of these three themes that arose, the researchers suggested that the first two could be detrimental to recruitment and retention levels, but that the third could actually be applied as a recruitment aid (Butina and Schell 2011). The study showed adequate level of trustworthiness as the researcher used a member checking technique to enhance the credibility of results (Birt et al. 2016). Another MLS study agreed that the general public is mostly unaware of the MLS profession, which exacerbates the lack of a professional identity for MLS (Evans 1968). While this study does not meet the criteria for inclusion in this current research, it does confirm that the MLS profession has had a weak professional identity for decades.

Another study was performed on the professional identity of MLS for both recent graduates and novice staff (under one year work experience and between one and three years' work experience, respectively (Schill 2017). This study adopted a mixed-methods approach which included quantitative analysis utilising Hall's Professionalism Scale (1968) and qualitative focus group interviews. It aimed to ascertain the professional behaviours and attitudes, feeling of belonging, and professional socialisation of early career clinical laboratory scientists. The study used reliable and valid survey tools that have been used to measure professional identity in other disciplines (Sullivan 2011). The outcome was that novice staff had lower professional identity scores than the recent graduates in the context of the following four elements: (i) professional identity (such as professional organisations); (ii) duty to the public; (iii) calling to the field; (iv) self-regulation expect professional autonomy. These results were as expected due to the lesser experience of the recent graduates. A concern is that the novice staff may transmit their negative professional self-image to the new staff (Schill 2017); thus, it is vital to develop and enhance the current MLSs professional identity.

2.3.3 Conceptualization of Organizational Behaviour Theory - Professional Identity

A survey to measure opinions linked to the latent principles of professionalism across a range of professions was formulated by Richard H. Hall towards the end of the 1960s (Hall

1968). A point of note here is that a comprehensive delve into the difference between professionalism and professional identity is outside the scope of this chapter, which will instead offer a brief overview.

Fundamentally, the difference between professional identity and professionalism is that the former is based on an individual level while the latter is built by the community and medical profession in its entirety (Lane 2018). The community and societal standards are stated in professional codes, institutional frameworks, and formal medical curricula; however, there is some debate as to how realistic they are. Nevertheless, professional identity is grounded in realism that may not correlate to the standard for reasons that could be considered legitimate or illegitimate. It is founded on the individuals' belief about what constitutes being a professional, and so, the beliefs held by a doctor for instance, may diverge from those held by the community or other health professionals (Lane 2018). Consequently, a professional identity that is both reactive and contemplative will probably be formed where there is an association between others' understandings and expectations, self-identity and individual values, the professional groups' social identity, and the professional environments' cultural context. Identity suggests goals and values, therefore it will also drive motivation. For this reason, it has significant implications for self-regulated education. Accordingly, the meaning of professionalism must be determined by the individual and they must ensure that their individual beliefs and notion of the meaning of professionalism align with those of society and the organisations in which they function (Lane, 2018).

The following sections detail the principles of professional identity introduced by Hall (1968) reviewed by Snizek (1972):

Reference to a professional organisation

Organisations usually underline their identity through the accordance of beliefs and values that their members share. This 'shared consciousness' is enriched by the exploration of common interests carried out by the members and the dispersion of the amassed knowledge acquired through a centralised resource, such as a professional journal on these subjects (Frankford et al. 2000). Membership meetings enable peers to informally interact

and share information which emphasises group norms and encourages higher standards of practise amongst members.

Belief in Service to the Public

A belief in service to the public suggests an altruistic commitment made by the professionals to both themselves and the public. Professionals acquire self-fulfilment while acting in a manner that benefits the public. They believe themselves to be an indispensable component of society. Further evidence of this is the lifelong commitment by the medical practitioner to provide care wherever and to whoever it is required (Adams et al. 2006).

Belief in Self-Regulation

Self-regulation primarily revolves around self-control. Frequently, highly specialised and expert professionals are of the opinion that their work can only be judged by their professional peers and colleagues (Snizek 1972).

Sense of Calling to the Field

The sense of calling to the field is a conviction held by a professional whereby they make a lifelong commitment of dedication and sacrifice to their work, where work is described as not just a means to an end, rather it is an end itself (Snizek 1972). Oftentimes, professionals consider their work to be a permanent career rather than simply a step on the path to another profession (Goode 1957). Being willing to remain in a profession despite limited extrinsic rewards is one of the most dominant traits of a professional. The internal belief that their presence is required offers satisfaction that does not fall within the economic notion of exchanging service for value. In the context of the medical profession, a belief that they have been called to serve enables the professional to provide healing on a personal level without consideration of compensation or reward being introduced (Snizek 1972).

Feeling of Autonomy

Autonomy is widely acknowledged as being the most significant characteristic of professionals as it fundamentally impacts their behaviour. This belief is constructed on the assumption that professionals should have the freedom to make their own decisions and

judgments without the influence of any external pressures, such as those exerted by employers or clients (Hall 1968; Snizek 1972). Professional autonomy relates to the responsibility that tertiary education and status within a community place on professionals. Unsuitable and unwarranted control on the autonomy of professionals could potentially cause tensions to arise between the professional and their organisation (Raelin 1989). Hence, the general consensus is that professionals can demonstrate a higher degree of professionalism within organisations that bestow greater autonomy on their employees.

2.3.4 The Importance of Professional Identity

Research on the formation of a professional identity for the Information Systems research community provided several reasons as to why professional identity is important (Benbasat and Zmud 2003). Firstly, there is a set of standards that are accepted by the professions' population, which are academically investigated by members of the profession. They form a strong basis, boundaries and knowledge that are unique to that group. Considering that laboratory medicine is a continuously evolving field; and will impact the need for recurrent updates in the MLS knowledge-base, and this is also an area in which professional identity of the MLS may be impacted.

The second reason for the significance of professional identity is to do with legitimacy; either cognitive or socio-political legitimacy (Benbasat and Zmud 2003). Cognitive legitimacy refers to researchers within the profession investigating its nature in a manner that keeps the fundamental knowledge of the profession intact. If this is not done, the academic outcomes of the profession may be ambiguous and lack clarity (Camillo 2019). However, increased workload and insufficient staff numbers can create dissatisfaction within the profession (Doig and Beck 2005; Doby 2016). Furthermore, the ability to perform research would be impacted. In addition, hospital administrations typically seldom support participation in professional undertakings such as research as they believe that such activities detract from patient care, and because the hospital will not always be recompensed (Camillo 2019). This scant support for research limits opportunities for growth and recognition of professionals, which further exacerbates the problem of retention (Doig and Beck 2005) and damages the socio-political legitimacy of MLS (Benbasat and Zmud 2003).

MLS socio-political legitimacy is the aspect of professional identity that has the greatest potential for improvement. It refers to the profession gaining acceptance from significant stakeholders, such as the general public, the government, and other leaders (Benbasat and Zmud 2003). It has been highlighted that if important stakeholders cannot understand the nature, importance, and uniqueness of the role played by the profession, then it is improbable that they will acknowledge its legitimacy (Benbasat and Zmud 2003). The MLS profession has always fought for recognition from the general public and other healthcare professionals (Kotlarz 2001; Butina and Schell 2011; Schill 2017b; Camillo 2019; O'Connell-Spalla 2021). This absence of socio-political legitimacy remains an issue for MLS, especially as it is associated with employee retention and attrition (Beck and Doig 2005). Furthermore, recognition from the general public could aid with understanding the benefits of laboratory work and improve recruitment, thereby attracting new students to the profession. It is important to attend to this aspect of professional identity in order to enhance the prospects of the profession, as it is likely that the staffing deficiencies will endure (Beck and Doig 2005).

However, the significance of professional identity is associated with more than just staff retention and commitment to the field. There is a substantial body of existing literature on nursing focusing on professional identity that determined its value to its members, their clients, and the organisations. A strong professional identity can help to raise levels of productivity and consequently efficiency within organisations (Johnson et al. 2012). Empirical observation has shown that strong professional identity increases levels of satisfaction and decreases levels of burnout amongst employees (Cowin et al. 2008; Sabanciogullari and Dogan 2015). This literature has also established that there is a correlation between professional identity and job satisfaction.

2.3.5 Summary

The medical laboratory field has a weak reputation and appears to lack prestige (Stuart 2005; Butina and Schell 2011). This can be attributed to multiple factors. Firstly, the profession is invisible, meaning that society is unaware of the key contribution of the medical laboratory (Rohde and Noblit 2016). Secondly, within medical society, the contribution of MLS is neither understood nor recognised by other health practitioners; in

particular, by physicians and nurses who order laboratory tests for their patients (Butina and Schell 2011). Thirdly, within the laboratory itself, MLS experts tend to have a negative perspective of their profession which transfers to the new employees, and as a result, they have low professional identity (Schill 2017). Fourthly, education (both formal and informal) and the curriculum do not contribute to constructing or supporting professional identity in MLS. The combination of these factors has consequently been summarised as dissatisfaction with a career in the medical laboratory and a general lack of respect and recognition for the profession (Doig and Beck 2005; Butina 2010; Butina and Schell 2011; Schill 2017).

As mentioned earlier, it has been observed that the majority of studies exploring MLS are US-based, and focused mainly on the issues of staff shortages and retention in the medical laboratory (Kotlarz 2001; Butina and Schell 2011; Schill 2017b; O'Connell-Spalla 2021). Another study (also conducted in the US) aimed to enhance the professional identity of MLS (Camillo 2019). The researcher attempted to define and comprehend the disciplinary literacy practices of MLS, examined its professional identity, and contemplated how a stronger professional identity could be built from those disciplinary literacy practices. This brings up several questions including: why are most MLS studies performed in the US? Does MLS have stronger professional identity in other countries? Is there a correlation between the education system and culture? A country such as the US has a strong economy, yet the staff shortages there place it in the same category of studies carried out in developing nations such as Africa, that also exhibited staff shortages due to scant resources (Mayaki and Stewart 2020). The above literature review shows that there are limited MLS studies, which highlights a gap in the research in measuring and exploring the MLS professional identity. The aim of this current study is to explore the professional identity of MLS in SA. An important point is that SA does not experience MLS staff shortages, which could be attributable to the free education system. However, there are no studies on MLS which focus on professional identity in SA. As discussed, in the next section, professional identity is also strongly associated with job satisfaction.

2.4 Job satisfaction of MLS

Over the last decades, the field of MLS has grown and evolved with the introduction of new laboratory tests and technologies. However, the area of MLS requires substantially more research as there are ongoing issues that must be addressed and resolved. A search of the existing literature shows that issues associated with MLS were first raised in the mid-twentieth century; for example, job satisfaction, staff shortages, salaries, and job stress (Harting and Oliver 1978). Researchers in the field of healthcare have compiled a vast body of literature on job satisfaction (Bhatnagar and Srivastava 2012) and numerous studies have been carried out in the medical laboratory field (Harting and Oliver 1978; Maher 1996; Doig and Beck 2005; Alrawahi et al. 2018; Kenwright 2018).

The results of one study suggest that understanding the elements that impact the job satisfaction level of nurses is essential as it is directly related to both the satisfaction level of patients and the quality of care delivered (Al-Qahtani et al. 2020). Amongst laboratory professionals, understanding job satisfaction is of comparable importance due to the diversity of this group; it is comprised pathologists and residents with differing subspecialties, all of which can impact patient care.

2.4.1 Definition of Job Satisfaction

As with professional identity, there is no universally accepted definition of job satisfaction that encompasses all of its facets. The majority of definitions focus on the extent to which people enjoy carrying out their roles. Job satisfaction has been described as an individuals' attitude towards their job and a set up positive feelings or desires they hold about their role and their overall employment in their organisation (Judge and Klinger 2008). In the field of organisational psychology, job satisfaction is the topic that receives the most attention. All aspects of an organisation impact job satisfaction across cultures; it includes the nature of the work, the individuals' personality, and the relationship between these two elements (Judge et al. 2001).

2.4.2 Literature Review

One research entailed a survey of medical laboratory professionals with at least five years of clinical laboratory experience in order to establish the level of job satisfaction and

determine the factors that contribute to this satisfaction (Doig and Beck 2005). The researchers asked 800 laboratory managers who were Clinical Laboratory Management Association members to distribute the study's surveys. Each manager was given five surveys and asked to forward them to their non-supervisory staff members for completion. Out of a potential sample size of 4,000 participants, a total of 595 completed surveys with a response rate (20%) and met the criteria for inclusion in the study. The surveys revealed that circa 80% of participants were employed in a hospital or medical centre laboratory. The researchers ascertained that the vast majority of participants (81%) reported feeling either 'very satisfied' or 'somewhat satisfied' with their careers. Higher job satisfaction levels were observed amongst laboratory personnel who felt that their salary was sufficient, their work was appreciated, and they had autonomy in their role. The participants were asked to select factors that motivated them to remain in the laboratory, and the top five were reported as follows: (i) interesting work; (ii) job security; (iii) colleagues; (iv) location; (v) challenging work (Doig and Beck 2005). However, it is important to highlight that there is a possibility that the study was biased, as the laboratory managers were allowed to select the five employees for the survey at their discretion; therefore, the lab managers could have deliberately only selected participants with a positive attitude to work who they believed would partake in and complete the survey (Delgado-Rodriguez and Llorca 2004).

A similar Kuwait-based study was carried out to ascertain if a correlation exists between the job satisfaction of medical laboratory scientists and their work environment or organisational structure (Al-Enezi et al. 2008). The survey had an 80% response rate. The reported results were that 56% of the participants were satisfied and 44% were not satisfied with their jobs. All of the participants were hospital laboratory employees. The researchers found that three elements contributed to the general level of job satisfaction of medical laboratory scientists, as follows: (i) collegiality in the laboratory; (ii) the opportunity to apply the knowledge and skills acquired in school; (iii) supervision by one manager. Collegiality generates a sense of inclusivity (Betzler and Lösckke 2021), while the application of knowledge and skills increases the employees' sense of competency. In contrast, the researchers discovered that the medical laboratory scientists who reported being dissatisfied with their jobs expressed that the primary factors are: (i) a lack of

independence in their role; (ii) tension with co-workers; (iii) displeasure with the work environment; however, they did not report salary to be an issue (Al-Enezi et al. 2008).

Another study endeavoured to evaluate the factors that impact satisfaction and incentives for job retention of laboratory professionals at supported sites in seven African nations (Marinucci et al. 2013). The medical laboratory technologists reported that the greatest impact on their job satisfaction was the lack of professional development and training opportunities (90%, or 202 of 224 participants). This was followed by working environment/working conditions (42%, or 95 of 224 participants), and then benefits (38%, or 85 of 224 participants). Appreciation and recognition from management and/or hospital administration was ranked fourth, with only 28% (64 of 224 participants) selecting the 'most/very important' option. Finally, only 4% (9 of 224 participants) rated vacation time as 'most/very important'. The researchers highlighted a limitation of the study, stating that it lacked the inclusion of many laboratories in urban areas, as most healthcare facilities being assessed were situated in rural and peri-urban areas (Marinucci et al. 2013). Looking at the health system on this level, the demographics and other factors, including working environment, working conditions, and benefits were significantly different in these areas than in urban environments and highly specialist laboratories. Nevertheless, the results of this study were deemed acceptable because of the scant resources in this developing nation and the difficulty in terms of generalizability for developed nations or stronger economies.

Another study focusing on MLS aimed to ascertain which job features drive motivation and career satisfaction to retain staff in the medical laboratory profession (Kenwright 2017). This study deployed a survey comprised of 33 questions that attempted to obtain the opinions of medical laboratory professionals working in the United States with a minimum of one year experience. The survey was distributed online and posted on social media sites, and ultimately secured 333 participants. The survey employed in the study was new, so its reliability has not been established whereas it showed adequate validity (Heale and Twycross 2015). The findings indicated that medical laboratory personnel are more satisfied with their job when they feel a sense of inclusivity with other healthcare professionals, make choices that are important to them personally, and find their work challenging. A higher level of satisfaction amongst current professionals means a greater

likelihood that they remain in the workforce. Additionally, new laboratory professionals may find the profession more appealing, which could contribute to relieving the deficit of medical laboratory scientists (Kenwright 2017).

Another study examined job dissatisfaction amongst employees and established that it is primarily caused by staff shortages and an increased workload, which can result in employees engaging in negative behaviours like having an aggressive attitude and high levels of absenteeism and turnover (Alrawahi et al. 2018). Several factors impact job dissatisfaction, including workload, promotion, health and safety in the laboratory, relationship with superiors, professional status (recognition and appreciation), and certain hospital policies. Another aspect is the promotion system that had been in place since 2014. The medical laboratory technologists considered it unfair as it did not differentiate between old and new employees, and did not reward people based on experience (Alrawahi et al. 2018). As per this system, promotion is not automatically awarded according to the length of employment; instead, a promotion can only be acquired if a new position is advertised or if another employee leaves, thereby vacating the post. In that case, once they meet all specified criteria, any interested parties must submit an application in order to secure the position (Alrawahi et al. 2018). The promotion policy was aimed at appealing to new staff, however, it was not well-considered, as it negatively affected the satisfaction levels of the existing staff. The study showed adequate credibility as these authors used analyst triangulation of data sources (Jonsen and Jehn 2009).

Further research evaluated the interrelationship between the behaviours of a transformational leader and the satisfaction level of medical professionals in their positions in the laboratory and blood bank department in the Eastern Province of SA (Albeladi and Elrayah 2018). The study adopted a quantitative approach to measure the job satisfaction of MLS and the leadership behaviour of the leader. The surveys have been used in this study were reported as valid and reliable. However, the response rate reported was 32%, this means 68% may lead to nonresponse bias that may impact the validity and reliability of results (Fincham 2008). In terms of job satisfaction, the study determined that MLS were dissatisfied with five key factors, as follows: (i) the possibility of advancement in their current role; (ii) the freedom to utilise their own judgement; (iii) the opportunity to try their

own approaches to tasks; (iv) the working conditions; (v) the level of praise for a strong performance.

A Zambia-based quantitative study attempted to examine the correlation between the perceived competencies and the job satisfaction of Biomedical Technologists (Chaava 2020). The Self-determination theory was adopted as the foundation for comprehending this correlation and the Perception of Competence Questionnaire and the Abridged Work Satisfaction Index measured the level of job satisfaction. The study used valid and reliable surveys. However, the author administered the survey online, this means sampling bias may impact the quality of results (Ball 2019). The researchers found that the participating Biomedical Technologists expressed dissatisfaction with their roles, particularly in terms of their pay and their opportunities for promotion (Chaava 2020). Another qualitative study of laboratorians conducted in Oman ascertained that job dissatisfaction centred on promotion and other factors (Alrawahi et al. 2019). These findings appear to support the overall picture emerging from the literature review that MLS job satisfaction is frequently interspersed with dissatisfaction about pay, promotion, and operating conditions.

Research on MLS carried out this year endeavoured firstly to evaluate the job satisfaction of the Registered Medical Technologists employed in Metro Manila in the Philippines during the COVID-19 pandemic, and secondly, to ascertain the factors that have a strong impact on job satisfaction (Abel et al. 2021). The research adopted a cross-sectional survey using a purposive sampling method and had a total of 97 participants. The study used valid and reliable surveys; however, they were administered online that may impact the quality of the findings (Ball 2019). The majority (68.04%) expressed ambivalence in terms of the general level of job satisfaction. Overall, the participants reported dissatisfaction with pay (56.70%), operating conditions (52.58%), promotion (45.36%), and contingent rewards (44.33%). Conversely, satisfaction was expressed with supervision (74.23%), nature of the work (73.2%), communication (59.79%), and co-workers (47.42%). Finally, a sizeable proportion of the participants (40.21%) expressed both dissatisfaction and ambivalence about the fringe benefits (Abel et al. 2021).

A recent study based in Riyadh, SA investigated the factors that impact turnover, evaluated satisfaction with the current Incentive Management System, and measured the degree to

which it influences employees (Al-Qathmi and Zedan 2021). Validity and reliability were reported however, the response rate was 40% it is not adequate as surveys were paper based (Nulty 2008). Fincham (2008) stated that at least 60% response rate should be the aim for researchers. In terms of job satisfaction, the findings showed that medical laboratory technologists are generally dissatisfied (average score of 2.6 on the five-point Likert scale). Furthermore, it was determined that the participants were dissatisfied with the workload, their allowance, the level of management support, the working hours, and the opportunities for promotion. The medical laboratory technologists expressed that their priority is opportunities for career growth and higher pay, and they ranked both factors as motivations to remain. Moreover, extra vacation time and peer support were reported to be least important aspects (Al-Qathmi and Zedan 2021).

2.4.3 Summary

The studies included in the above literature review utilised diverse samples of medical laboratory science professionals and produced some disparate outcomes. However, most of the studies that assessed job satisfaction aimed to ascertain the reasons for and establish strategies to improve the issues of staff shortages and retention (Beck and Doig 2005b; Marinucci et al. 2013; Kenwright 2017). Therefore, it can be concluded that job satisfaction is significant to staff retention and commitment to the organisation. However, as there is no issue with MLS staff shortage in SA, this finding is less immediately significant to this current study. Job satisfaction is, however, very important in decreasing the turnover rates and improving the quality of service delivered (Marinucci et al. 2013).

It is vital to measure job satisfaction as it could be an important factor in terms of job performance, which could impact a professionals' productivity and efficiency in performing their role in the healthcare system (Abel et al. 2021). Many studies have frequently highlighted the following factors as having the most substantial impact on the job satisfaction levels of healthcare professionals:

- Positive work environment
- Competitive salary
- Good compensation and benefits
- Well-treated

- Teamwork and cooperation with co-workers
- Recognition and appreciation from superiors
- Effective communication with various laboratory personnel
- Enhanced MLS via training and guidance provided by the organisation
- Workload level

There are several other relevant factors including the policies of the organisation, the rules and procedures related to the role, the opportunity to apply the knowledge and skills in a real laboratory situation, and the degree of autonomy afforded to the professional. Another point from the review was that the job title of laboratory workers differed widely in the US, Africa, Oman, and SA that is making comparisons more challenging.

A noteworthy variance in these studies was that the US and Africa experienced staff shortages, whereas this was not such an important issue in research carried out in the Middle East, such as in the studies based in SA, Kuwait, and Oman. While many elements of professional identity, such as autonomy, were measured by the surveys on job satisfaction, one study investigated the connection between professional identity and job satisfaction by examining these characteristics in the context of MLS (O'Connell-Spalla, 2021).

2.4.4 The Correlation between Job Satisfaction and Professional Identity

To date, there has been minimal research on the association between job satisfaction and professional identity in the medical laboratories field. In the recent past, strategies that have been employed, have not substantially altered the perception of healthcare professionals of MLS, and the effect on job satisfaction has received little attention (O'Connell-Spalla 2021). One study investigated the impact of recognition, respect, and value in the workplace, focusing specifically on the necessity to increase both peers and administrators' understanding (O'Connell-Spalla 2021). The outcomes of this study revealed that more than 50% of respondents feel that they are not respected by other healthcare professionals, and over 90% reported that other healthcare professionals do not understand the educational requirements and the extent of responsibility of the medical laboratory professionals. Further analysis showed that the perceived lack of respect and understanding from other healthcare professionals has a statistically

significant impact on MLS job satisfaction levels (O'Connell-Spalla 2021). The study emphasised the necessity, for other healthcare professionals especially, to consider awareness and respect, and comprehend the valuable contribution made by MLS. Within the healthcare profession, the ramifications of implementing changes associated with respect, recognition, and awareness is seen as path to creating positive professional identity and status.

In addition, both the general public and other healthcare professionals have a lack of awareness about the educational background and skills required of laboratory professionals (O'Connell-Spalla 2021). Within a hospital environment, senior administrators typically do not possess some knowledge of the required qualifications and valuable contributions of highly trained laboratory professionals (Kaplan and Burgess 2010). The invisibility of the staff who work behind the scenes may help to create a stereotypical perception of laboratory professionals and further contributes to the generalisation of all laboratory employees. This is extremely dismissive of the degree of diversity in the background and scope of practice that is present amongst laboratory professionals (Rohde et al. 2015). The amalgamation of the lack of awareness and recognition, and stereotypical perceptions, which are all components of professional identity, form a substantial detrimental to MLS overall levels of welfare and job satisfaction.

One study conducted recently on wellbeing and burnout highlight workload and salary as being the most important elements, but recognition and career advancement continue to be highly significant in terms of dissatisfaction (Garcia et al. 2020). In the last ten years, professional organisations have banded together to try to address the ongoing issues with the recruitment and retention of qualified laboratory professionals. The ASCLS and the American Society for Clinical Pathology (ASCP) have worked collaboratively to promote the field and raise awareness of the valuable efforts of the behind the scenes' employees (Bennett et al. 2014; The American Society for Clinical Laboratory Science 2020). Regardless, the endeavours over the years to add insight and solutions have made little impact, as the same issues persist. In the US, salary has continuously been highlighted as a negative factor in terms of job satisfaction, and while MLS salary has risen minimally over the years, it is not at the same level as other healthcare professions (McClure 2008; Lewin 2016).

Moreover, the lack of advancement opportunity has continuously been emphasised as damaging to job satisfaction levels. A positive occurrence is that recently in the US, a doctorate degree in clinical laboratory science has been introduced, which offers a promising role for the MLS with a greater degree of integration. The new advanced practice degree gives the MLS an opportunity to collaborate with nurses and physicians to provide expert advice in terms of the use and interpretation of clinical tests. Potentially, this can address the invisibility gap and develop more in-depth comprehension and cooperation between laboratory professionals and other healthcare professionals (Ames 2020). The advanced practice role is a new model that will need time to ascertain its efficacy and acceptance of integration. The perception of the MLS role can be improved by essentially removing the physical barrier that the laboratory puts up and collaborating more with other healthcare team members. Yet, even with all of the research and heightened attempts to promote the field as a career path, there is still an acute staff shortage, low levels of recruitment and retention, and substantial job dissatisfaction (Garcia et al. 2020).

Thus, the nursing literature was also reviewed to identify and reflect on the impact of professional identity on job satisfaction (Sabanciogullari and Dogan 2015). A Turkey-based study examining the correlation between job satisfaction, professional identity, and intention to leave the field in the nursing profession undertook a cross-sectional, descriptive and correlational approach, with 2,122 participating nurses (Sabanciogullari and Dogan 2015). The researchers found that job satisfaction is impacted by professional identity.

Another study focusing on nursing attempted to ascertain the relationship between professional identity and job satisfaction amongst psychiatric (Kabeel and Eisa 2017). This study adopted a descriptive correlation research design. As per the outcomes, a positive significant correlation between job satisfaction and professional identity was established, and the researchers concluded that professional identity indeed impacts job satisfaction. However, a point of note is that the researchers did not provide information about the tool employed to measure the professional identity.

Evidently, low professional identity negatively impacts job satisfaction and the quality of the healthcare services delivered (Hillis and Grigg 2015). Therefore, appropriate and effective leadership is considered necessary.

2.5 Leadership in Hospital Laboratories

2.5.1 Definition of Leadership

A definition of leadership is the leaders' skill in offering their followers a clear plan and motivating them to endeavour to accomplish the set objectives (Mathews 2016). Additionally, it is the capacity to lead ordinary people to generate extraordinary results (Eagly and Chin 2010). Therefore, it could be argued that leadership is a core aspect of daily life. A leader is an individual who offers guidance and lights a path forward (Eagly and Chin 2010). Thus, leaders must be more experienced, knowledgeable, and developed than their followers. Leaders are instrumental in forming visions, missions, and a sense of teamwork to motivate their followers to great achievements (Krause and Semadeni 2013).

2.5.2 Leadership in Medical Laboratories

Laboratory departments in hospitals are multifaceted, people driven systems that require strong leadership and effective management to ensure the provision of accurate, timely, and reliable clinical test results (Ferraro et al. 2016). Leaders play a key role in hospital laboratories, as they can motivate and drive their followers to produce prime healthcare services. In the context of laboratory medicine, effective leadership entails numerous aspects. Figure 4 below portrays five roles of the clinical laboratory leader, as follows (Yenice and Randell 2018): Competency in practice, participation in quality management (QM), good problem solver and strategist, seeker of improvement and superior service and driver of the development and sustainability of this service.

Laboratory leaders must also be competent in collaborating with other laboratory science, patient safety, technology, epidemiology, informatics, and communication experts, as well as the general public and other healthcare professionals (Albetkova et al. 2019). Two other elements of leadership are also important in laboratory medicine which are competency in a speciality field and the ability to recognise new and advantageous developments. This type of leader is known as a "Hybrid leader" (Jørgensen 2017).

Laboratory leaders should possess a comprehensive knowledge of the laboratory's operations and are well-placed to conduct investigations aimed at enhancing service quality and efficiency (Yenice and Randell 2018). The leader needs also to perform applied laboratory research to deal with health issues. An effective laboratory leader, it is suggested, never stops learning; they frequently attend and participate in seminars, journal reading, and annual professional conferences, and also present the outcomes of their own investigations in order to improve and advance the field. A leader is actively involved in the laboratory quality management system (QMS). As a driver of quality of care and patient safety, a laboratory leader arranges in-depth laboratory safety and risk assessments, and ensures that such activities are central to the local workplace culture (Yenice and Randell 2018).

Furthermore, a laboratory leader is an influencer for the monitoring and assessment of laboratory services through regular attendance of meetings and events that will help to facilitate laboratory service delivery. Leaders can be expected to push for more effective integration and use of the laboratory services to patient care in order to enhance medical decision-making and outcomes (World Health Organization 2011).

Figure 4 Roles of the Clinical Laboratory Leader



Some of the core features of effective leadership include self-mastery, strong management of others, and actively being a visionary. These attributes are examined more comprehensively later in this chapter. Good leadership is based on a vision, and from that vision, subsequently leading strongly and clearly by mandate (World Health Organization 2011). The main mandate of laboratory workplaces and services is safely safeguarding and enhancing patient well-being. This mandate emerges from the vision and missions of the medical laboratory and its organisation (World Health Organization 2011). It determines and influences the roles and responsibilities of both the laboratory leader and other staff.

There are numerous challenges involved with the endeavours to ensure patient safety. The most common is to keep the laboratory to run at high productivity but lower costs (Epner 2013). As the primary objective of healthcare is to enhance patient outcomes, this paradigm can generate challenges. Such a challenge can put the laboratory leader and staff in an ongoing difficult situation, as they need to balance between the obligation to produce high-quality patient results, acceptable levels of productivity, and safeguarding the services' financial viability (Lippi and Mattiuzzi 2019). In the face of such challenges, the laboratory director or manager is central to balancing policies, decisions, and actions in order to ensure that all three elements are covered at all times during the delivery of service. Therefore, the collaborative and coherent efforts of all staff members are required rather than simply laboratory leadership acting in a solo capacity. An effective laboratory leader is defined by their ability to address and overcome these challenges (Yenice and Randell 2018).

One sign that effective leadership is in place is when the whole laboratory organisation works from a common goal of enhanced patient care and safety. This vision and the actions of laboratory staff must be aligned, and this must be supported by endeavours that exceed simply expressing and promoting the vision; instead, leaders must clearly show their commitment to the vision via their actions and decisions. This involves careful contemplation of the possible effect their decisions will have on their staff. This additional element means that the leader must engage in effectual reflection and encourage their staff members to put forward their different viewpoints by affording them the freedom to

do so. Hence, building consensus rather than obedience to leadership directives is a more effective strategy (Yenice and Randell 2018).

In addition to being a visionary and championing this vision, laboratory leadership entails self-mastery through self-awareness. Leaders can become ineffective by not recognising their individual weaknesses or blind-spots. These blind-spots can emerge from an overly-inflated sense of self-importance and undisclosed personal agendas, and consequently, they can make subordinates are less confidence in their leader (Rost 1998). Awareness and self-mastery are crucial for the identification of behaviours that can weaken or even damage the established vision. It is therefore vital that leaders are aware of their own biases and defects, this will help them to take action to correct them and stop their impact. A leader that lacks self-awareness and is temperamental in nature may assume that the employee has bad intentions, whereas a more measured response may consider that a misunderstanding has possibly occurred, or may even respect and take on board the different perspectives or assumptions (Covey 2004).

This necessitates that the leader is self-aware and capable of responding in a manner that invokes self-control. An effective leader is a good listener, and careful listening facilitates a clearer understanding (Yenice and Randell 2018). Essentially, while laboratory leaders do portray the authority that their position holds, they still require the support of their subordinates as this is key to achieving the goals and vision of the laboratory organisation. This is reflected in the third feature of good leadership, which is being an effective manager of people. Effective people management earns the fervent support of staff members, which subsequently improves the motivation of the leader and plays a key role in accomplishing the common vision expressed by leadership. Becoming a successful clinical laboratory leader can be achieved by the following key elements (Yenice and Randell 2018):

- Defining and striving to accomplish the vision of enhanced patient care and safety, and making this a priority of employees
- Having an awareness of their own biases (both intentional and unintentional) and blind-spots
- Mastering self
- Delivering effective management

2.5.3 Leadership and Management in Medical Laboratories

Laboratory service delivery relies heavily on both leadership and management. While there are some similarities between the two, they entail diverse viewpoints, skills, and behaviours. Leaders need good management skills in order to be effective, and effective managers try to be good leaders (Casterline and Snyder 2014; Yenice and Randell 2018).

A leader, it is suggested, can achieve a vision through regular communications to others and strategies development. Leaders encourage others and are capable of securing the resources and support systems required to attain their vision (World Health Organization 2011). In contrast, managers make sure that available resources are effectually arranged and implemented to generate the optimal results. In a challenging environment where resources are limited, leadership is fundamental to the organisation's success (Rost 1998).

Clinical laboratories have various staff members, such as pathologists, scientists, managers, and supervisors, are all involved in aspects of leadership to varying degrees. However, the quality of their leadership can impact patient care. An important point of note is that regardless of such positions, each staff member must take responsibility for leading themselves. While there is a significant body of literature on general leadership theories, characteristics, and styles, there are relatively few studies on their application in the context of clinical laboratories (Weiss 2011). The management of staff members plays a key role in the provision of a successful and quality laboratory service; therefore, any individual in a position of management in the laboratory must be capable of transforming and preventing inappropriate behaviour or negative attitudes. Success in the aforementioned roles is dependent on the individuals' leadership qualities and skills. Generally, laboratory professionals have little knowledge about leadership and management (Van Noorden 2018); instead, they are stronger in terms of their technical capabilities and scientific thinking skills. Managing and leading the laboratory social environment can be aided by embracing a variety of leadership styles (Yenice and Randell 2018).

Effective leaders can make a positive contribution merely by participating in teams. They are inspirational, motivating and can express things in a manner that helps people to understand what is required of them. Various styles of leadership have been demonstrated

by different leaders and could potentially be beneficial when applied in medical laboratory environments, including the following (Yenice and Randell 2018) (see Table 8).

Table 8 Examples of leadership styles can be applied in medical laboratories

Leadership style	Characteristics
Charismatic	Charming; builds a sociable and pleasant environment; gives staff a sense that their opinions carry weight.
Participative or Democratic	Fosters a united group with a shared mindset to achieve goals.
Situational	Capable of effectively adjusting and leading through constraints.
Transactional	Uses punishment and reward within a defined command chain to motivate staff.
Transformational	Inspirational; empowers staff; influences through their beliefs and individual strengths.
Servant	Servant to others; inspires rather than compels behaviours and actions.

Source: Yenice and Randell (2018)

2.5.4 *Task-Oriented and Relationship-Oriented (People-Oriented) Leadership*

The behavioural approach has been classified into two core aspects of: task orientation and relationship orientation (Northouse 2016). The Northouse leadership approach built on the Ohio State studies and identified two kinds of leadership behaviours: Initiating Structure (which falls under task orientation) and Consideration (which falls under relationship orientation). Following this, the University of Michigan determined two other forms of leadership behaviours: Production Orientation (which again falls under task orientation) and Employee Orientation (which falls under relationship orientation). However, although the researchers from Michigan considered each behaviour to be opposing ends of one single spectrum (Northouse, 2016), meaning that leaders who were more task-oriented would be less relationship-oriented. Michigan researchers reconceptualised the two components, and as with the researchers from Ohio State, considered them to be

independent orientations, meaning that a leader could be high or low in both orientations, simultaneously (Northouse 2016). The Leadership (Managerial) Grid (Blake and Mouton 1964) contained two leadership elements: Concern for Production (task-oriented) and Concern for People (relationship-oriented).

Task-Oriented Leadership

Task-oriented leadership can be defined as a behavioural approach which entails the leader concentrating on the tasks that must be carried out to achieve specific goals or a specified standard of performance (Taberner et al. 2009). The task-oriented leadership style encompasses some elements of task management. Task management necessitates the organisation of job-related activities, in which it prioritises administrative activities, monitors product quality, and compiles financial reports. Therefore, it can be concluded that leaders who embrace the task-oriented leadership style emphasise completing required tasks to accomplish organisational targets. One of the distinctive traits of such leaders is that they give less consideration to the employees, who actually play a pivotal role in accomplishing the specified goals. Conversely, they are more focused on following a plan to reach certain organisational targets (Forsyth 2010).

Advantages of task-oriented leadership

A primary advantage of task-oriented leadership is that all tasks are completed accurately and in a timely manner, thereby ensuring that employees develop strong time-management skills. Additionally, task-oriented leaders set an example for their employees by concentrating on the required workplace processes in relation to how duties are completed. This enables them to delegate tasks and ensure that they are achieved in a timely and beneficial way (Anzalone 2012). Another advantage of task-oriented leadership is that there is a high level of clarity and precision in the goals and task definitions. Leaders may accept communication in the context that they want to ensure that the employees clearly understand the targets. Moreover, they assign teams to particular tasks and provide group members with clear guidelines and structure for their roles. Thus, it can be concluded that this task-oriented leadership is appropriate for well-structured work settings such as manufacturing assembly lines in which the repetition of well-established and clearly

defined procedures generates high levels of productivity and quality (Fiedler 1964; Taberero et al. 2009).

Disadvantages of task-oriented leadership

One disadvantage of a task-oriented style is a high level of turnover. This is attributable to employees being afraid of drifting outside the set boundaries, which may generate a lack of creativity and low morale. Additionally, when employees are fearful of breaking rules, they can be hesitant to take any risks, which could lead to low levels of innovation. Furthermore, highly creative employees may feel demoralised, meaning that they are more likely to leave their job to seek more attractive opportunities elsewhere (Bass and Stogdill 1990; Taberero et al. 2009).

Relationship-Oriented Leadership

Relationship-oriented leadership emphasises employees' job satisfaction, motivation, and work-life balance (Taberero et al. 2009). Under this style, leaders prioritise supporting, motivating, and developing their subordinates. They promote teamwork and collaboration by building relationships and fostering open communication. Relationship-oriented leaders focus on safeguarding the welfare of each employee and are quick to input time and effort to address their individual needs. To this end, Relationship-oriented leaders offer incentives such as bonuses, attempt to handle workplace conflicts, participate in more casual communications and interactions with employees in order to know their strengths and weaknesses, and foster a non-competitive workplace atmosphere (Reilly 1968; Taberero et al. 2009).

Advantages of relationship-oriented leadership

An advantage of this leadership style is that leaders form an excellent team in which all individuals wish to join in. The features of this team are high productivity and embracing to take risks as they are aware that any necessary support will be provided by the leader (Arana et al. 2009). Another advantage of leaders who follow relationship-oriented leadership is that the subordinates are in an atmosphere in which their welfare is prioritised. Relationship-oriented leaders know that workplace productivity requires a positive environment in which subordinates feel motivated. Thus, they focus on people,

thereby alleviating issues such as dissatisfaction, trust, mutual respect, workplace conflicts, and high levels of turnover (Burke et al. 2006). Leaders that adopt relationship-oriented leadership are entirely concentrated on coordinating, supporting, and developing their subordinates. This approach is typically fosters strong teamwork and collaboration.

Disadvantages of relationship-oriented leadership

A disadvantage of this leadership approach is that the focus on fostering team spirit may be detrimental to actually completing the tasks and accomplishing the desired goals (Burke et al. 2006). Some leaders can be too extreme in this approach, in which they place team development too far above tasks and project instructions. Moreover, in the absence of guidance from the leader, employees can have excessive responsibility which can lead to problems with decision-making. This may lead to lower their performance, higher employee turnover, client dissatisfaction, and reduced profitability (Taberner et al. 2009).

2.5.5 Task-Oriented, Relationship-Oriented, or a Combination of Both

Based on the reviews of task-oriented and relationship-oriented leadership styles, it is clear that leaders are expected to strike a harmonious balance between them. It is important that their strengths and weaknesses are understood, and that the leader has adequate knowledge of the theoretical history of leadership. The primary goal of a leader is to motivate subordinates to achieve a specified goal (Casterline and Snyder 2014). Hence, reviewing the theories that underpin effective leadership will aid in establishing a certain degree of harmony between tasks and relationships. It will also clarify which aspects of leadership the leader needs to focus on in order to generate positive outcomes (Hersey et al. 2013; Henkel et al. 2019).

Each specific situation must be evaluated on its own merits to find out the necessary harmonious balance to generate a positive outcome (Henkel et al. 2019). There is no specific formula that can be applied to determine the balance ratio, however employing the existing theories of leadership will undoubtedly provide leaders with a clearer comprehension of their particular leadership style and how they can successfully apply that style to any particular circumstance.

When attempting to determine the optimal balance between both leadership behaviours, leaders need to identify whether their personal style leans more towards one than the other. There are numerous studies such as the Northouse and Ohio State studies that offer surveys to evaluate leadership orientation. Once the dominant leadership style has been determined, the second step is that the leader should attempt to incorporate both orientations in their leadership in a manner that creates the preferred balance (Henkel et al. 2019).

It is important to have a clear understanding of why this harmony between tasks and relationships is key in becoming an effective leader (Henkel et al. 2019). The primary reason is that it will enable the leader to identify, understand, and address their strengths and weaknesses. A hospital laboratory is a multifaceted and dynamic environment that necessitates effective leadership, and the style of leadership has a significant impact on the atmosphere and results produced.

2.5.6 Literature Review

2.5.6.1 Leadership Studies in Medical Laboratories

A search of the existing literature found only a few studies on the topic of leadership in the MLS field. For example, a study of clinical laboratory scientists (CLS) aimed to investigate charismatic leadership behaviour and employees' satisfaction levels (Castellanos 2018). The CLS participants (n=103) rated the charismatic behaviour of their leader utilising the Global Leadership and Organisational Behaviour Effectiveness (GLOBE) Phase 3 Survey B (House et al. 2014) and their own levels of satisfaction using the Abridged Job Descriptive Index Survey (Bowling Green State University 2009). The outcomes revealed that charismatic (or value-based) leadership accounted for a substantial proportion of the employee satisfaction. Considering the findings of this study, CLS leaders could use a charismatic leadership style as a possible method to increase employee's satisfaction level with duties, promotions, management, and the overall job focus. This is the first known paper to specifically research the impacts of charismatic (or value-based) leadership behaviour of CLS leaders and the satisfaction levels of employees (Castellanos 2018). This study also suggests that there has been minimal research performed in the field that

measured the leadership and its association with other factors that impact employees, such as job satisfaction.

However, one study was carried out that investigated medical employees and their roles in the laboratory and blood bank department in SA (Albeladi and Elrayah 2018). The purpose of the study was to examine the correlations between the transformational leaders' behaviour and medical employees' level of satisfaction in the Eastern region of SA. The participants were given a survey questionnaire comprised of forty-five questions adopted from the Multi-Factor Leadership Questionnaire (MLQ) (short-form5X) and Minnesota Satisfaction Questionnaire (short-form). In total, thirty-six responses (32% response rate) were deemed to be valid for analysis. In terms of the leadership behaviour, the study established that, in general, the behaviour expected of transformational leaders was absent. Furthermore, the study identified a positive correlation between transformational leaders' behaviour and the job satisfaction of medical employees. As far as this researcher can ascertain, this was the sole study performed on MLS that investigated the connection with leadership behaviour.

Another study carried out recently on medical laboratories endeavoured to determine the dominant organisational culture in Metro Manila (Fajilan et al. 2021). Additionally, the study also aimed to identify how such culture impacts the engagement, leadership style, and work performance of the employees in terms of accomplishing the goals of the organisation. The study was comprised of an online survey, distributed to sixty-seven laboratory employees. It consisted of a self-made personal data sheet and the following four standardised assessment tools: Competing Values Framework (CVF)-Based Culture Instrument; Utrecht Work Engagement Scale (UWES); Multifactor Leadership Questionnaire (MLQ-5XShort) and Role-based Performance Scale (RBPS). The study found that the prevalent style was associated with transformational leadership.

2.5.6.2 Summary

The majority of studies investigating leadership in the field of MLS measured charismatic and transformational leadership. The transformational leadership style is the most prevalent form of leadership across diverse organisations (Bass and Avolio 1990, as cited in Suryanto et al., 2019). Moreover, the transformational leadership may be considered the

most suitable leadership type for a healthcare context, this is due to its focus on decision-making and fast adaptive reactions (Ahern and Loh 2020). It is worth mentioning that the study of (Albeladi and Elrayah 2018) found that transformational leadership was not evident, whereas research by Fajilan et al. (2021) found the opposite. This could explain that people-oriented styles are not prevalent in hospital laboratories of SA. However, an integrative review revealed that transformational leadership was adopted by nurse's leaders and managers in Saudi hospitals (Alilyyani et al. 2021).

2.5.7 Correlations between Leadership and Job Satisfaction

Of the factors associated with job satisfaction, leadership is deemed a key predictor and plays a key role in the satisfaction level of employees. The level of job amenities positively correlates to the level of employee satisfaction (Lévy-Garboua et al. 2007). The association between leadership and job satisfaction relates to the leader compensating staff with both financial and non-financial amenities, which will lead to improved workplace performance. Considering the focus of this study, leadership theories that are task-oriented typically enhance job satisfaction via rewards. Therefore, it is likely that the followers of an effective leader who adopts the task-oriented style are generally satisfied, as this kind of leader clearly states their expectations and defines the financial returns for employees.

Similarly, the relationship-oriented (or people-oriented) leadership style is also pivotal to improving employees' job satisfaction levels. People-oriented leaders motivate employees to achieve higher levels of human needs. Maslow's Hierarchy of Human Needs theory established that esteem and self-actualization are the two greatest human needs (Maslow 1943). This theory can be applied to research on leadership and job satisfaction of employees. Essentially, the concept is that employees can accomplish their own higher order needs by performing their job (An et al. 2019). Hence, effective leaders who adopt a relationship-oriented leadership style can enhance job satisfaction which may consequently improve the overall performance of the organisation overall.

Another study was carried out by Rad and Yarmohammadian (2006) in a healthcare environment. The study encompassed a range of medical practitioners and determined that there is a significant correlation between the relationship-oriented leadership style and the job satisfaction of employees (Rad and Yarmohammadian 2006). Furthermore, a

study performed recently (and as already mentioned above) in a Saudi hospital laboratory attempted to examine the association between the transformational leadership style and the job satisfaction of MLS (Al-Beladi and Elrayah 2018). The researchers identified a positive significant correlation between transformational leaders' behaviour and the job satisfaction of MLS. An important point of clarification is that there are many commonalities between transactional leadership and the task-oriented leadership style, and also between transformational leadership and the relationship-orientated style of leadership (McCleskey 2014), a position which has been applied in this study.

A search of the existent body of literature on healthcare that focuses on nursing professionals identified several studies on the topics of task-oriented and relationship-oriented leadership styles. One systematic review of nursing aimed to synthesise the existing evidence on nursing leadership styles, nurse satisfaction, and patient satisfaction (McCay et al. 2018). The findings indicated that the characteristics of relationship-oriented leadership are a primary driver of nurse satisfaction, while contrastingly, task-orientated leadership may actually reduce the level of satisfaction amongst nurses. There was little information found about the link between nursing leadership and patient satisfaction. The systemic review offers robust evidence regarding the significance of the relationship-oriented leadership approach (McCay et al. 2018). However, the researcher of this study contends that leaders should strike a balance between both relationship-oriented and task-oriented leadership (see 2.5.5).

2.5.8 Correlations between Leadership and Professional Identity

No studies were identified in the field of MLS that determined whether there is an association between leadership and professional identity. One phenomenological descriptive study was conducted by Wuerz (2017) in nursing. It was carried out in a bid to explore and understand the perspectives, beliefs, and opinions of nurses about leadership style and its impact on professional nursing behaviours in an inpatient care unit at a tertiary care centre (Wuerz 2017). Wuerz (2017) reported a lack of availability of both knowledge and literature on the effect of leadership styles on nursing professionalism. Furthermore, the findings showed that leaders who adopted a leadership style could substantially improve the professional identity of staff. This is particularly true of the styles that prioritise

staff care, such as the relationship-oriented or transformational style (Wuerz 2017). Hence, MLS leaders can also enhance the professional identity of their employees by influencing their perceptions, actions, behaviours, level of commitment to the job, and overall loyalty to the organisation. Therefore, relationship-oriented leaders can support MLS in areas associated with professional identity that require improvement, such as continuing medical education, professional development, autonomy, invisibility, and lack of recognition (Butina and Schell 2011; Schill 2017b; Camillo 2019; O'Connell-Spalla 2021).

Summary

Chapter two has reviewed the literature of the MLS which included studies that looked at the professional identity, job satisfaction and leadership behaviours of MLS. The definition of MLS's professional identity remains largely ambiguous. The literature identified the profession struggled to establish a definitive identity. Job satisfaction's literature review determined some issues such as salaries, workload, management support and others. One study on MLS explores the correlation between job satisfaction and professional identity that identified a gap and the need for more studies. Three studies were explored the leadership behaviours of leader who are working in laboratory hospitals. The literature revealed positive correlations between leadership, job satisfaction and professional identity. Finally, there no studies conducted in SA to explore the professional identity of MLS. One study has been conducted to investigate the correlation between behaviours of transformational leader and satisfaction in the eastern region of SA. This represents the significance of the current study as it will fill a gap in the literature review of MLS in SA.

The next chapter will discuss the methodology that was used to explore the professional identities and job satisfaction of MLS in SA together with the leadership behaviour of their medical laboratory leaders.

CHAPTER THREE- Methodology

3.1 Introduction:

This chapter discusses the use of a two phased mixed-methods, sequential explanatory study design (Creswell and Plano Clark 2017). This method was chosen as it provided an understanding of professional identity as well as the role of job satisfaction amongst MLS (medical lab staff) and the possible relationship with professional identity, job satisfaction and leadership behaviour of their leaders. In addition, it generated a holistic description of current practices and contextual features that shaped the nature of leadership in SA laboratory services. This chapter presents the aims, research questions of the research, and it also provides a description of the process of selection and development of the conceptual framework which underpins the study. Then research design and the underlying philosophical perspective are presented, and this is followed by an explanation of the research rationale and adoption of a mixed-methods, sequential explanatory study design. A discussion of the study including phase one (quantitative) and phase two (qualitative) is included, this also touches upon the employed techniques of design, data collection, and data analysis. The standards complied with in order to guarantee research rigour and quality are also outlined. Finally, reflexivity and the procedure for obtaining ethical approval and the matters of ethics, confidentiality, and informed consent are described.

3.2 Research aim

The aim of this study was to use a descriptive exploratory approach to examine the professional identities and job satisfaction of MLS in SA together with the leadership behaviour of their medical laboratory leaders. In addition, it generates a holistic description of the current practices and contextual features which have helped shaped the nature of leadership in SA laboratory services. There is a dearth of research studies which have been undertaken in SA among MLS. As a result, there is a limited research background for such a study. Therefore, it was considered important to deploy an appropriate research paradigm, research design and methods in order to achieve the aims.

3.3 Research questions

1. How do MLS describe their professional identity?

2. What are the possible relationships between MLS' perceptions of professional identity and job satisfaction?
3. a) What is the leadership behaviour of medical laboratory directors, and b) how might this affect the professional identity and job satisfaction of MLS?

The research aims, questions and outcomes are shown in Table 9.

Table 9 Research aims, questions and outcomes

Research Questions	Question purpose	Data collection methods	Outcomes
1. How do MLS describe their professional identity and job satisfaction; and leadership behaviour of their leaders?	The purpose of this question is to detail these three factors through questionnaires that will provide general overviews. Further investigations and exploration of these concepts will be achieved through the observations and focus groups.	<ul style="list-style-type: none"> - Observations - Questionnaires - Focus groups - In-depth interviews 	To describe and investigate the role of professional identity, job satisfaction and leadership behaviour of MLS in SA.
2. What are the possible relationships between MLS' perceptions of professional identity and job satisfaction?	The relationship between these two concepts will be examined through statistical analysis.	<ul style="list-style-type: none"> - Questionnaires 	To examine the relationship between professional identity and job satisfaction of MLS in SA.
3. a) What is the leadership behaviour of medical laboratory directors and supervisors; and b) how might this affect the professional identity and job satisfaction of MLS?	<p>The leadership behaviour of medical laboratory directors will be described through observations and In-depth interviews.</p> <p>The relationship between these concepts will be examined through statistical analysis.</p>	<ul style="list-style-type: none"> - Observations - Questionnaires - In-depth interviews - Focus groups 	<p>To describe the role of leadership behaviour of hospital laboratory directors.</p> <p>To examine the relationship between the leadership behaviour of hospital laboratory directors and supervisors; and on the professional identity and job satisfaction of MLS.</p>

3.4 Conceptual framework

The theory or conceptual framework selected should have overall alignment with the research methodology, as it is a composite of concepts, assumptions, expectations, beliefs, and theories that support and inform the overall research and research questions (Maxwell 2004). The chosen conceptual framework is consistent with previous theories and the literature review, and with several factors positively affecting job satisfaction (see Figure 5).

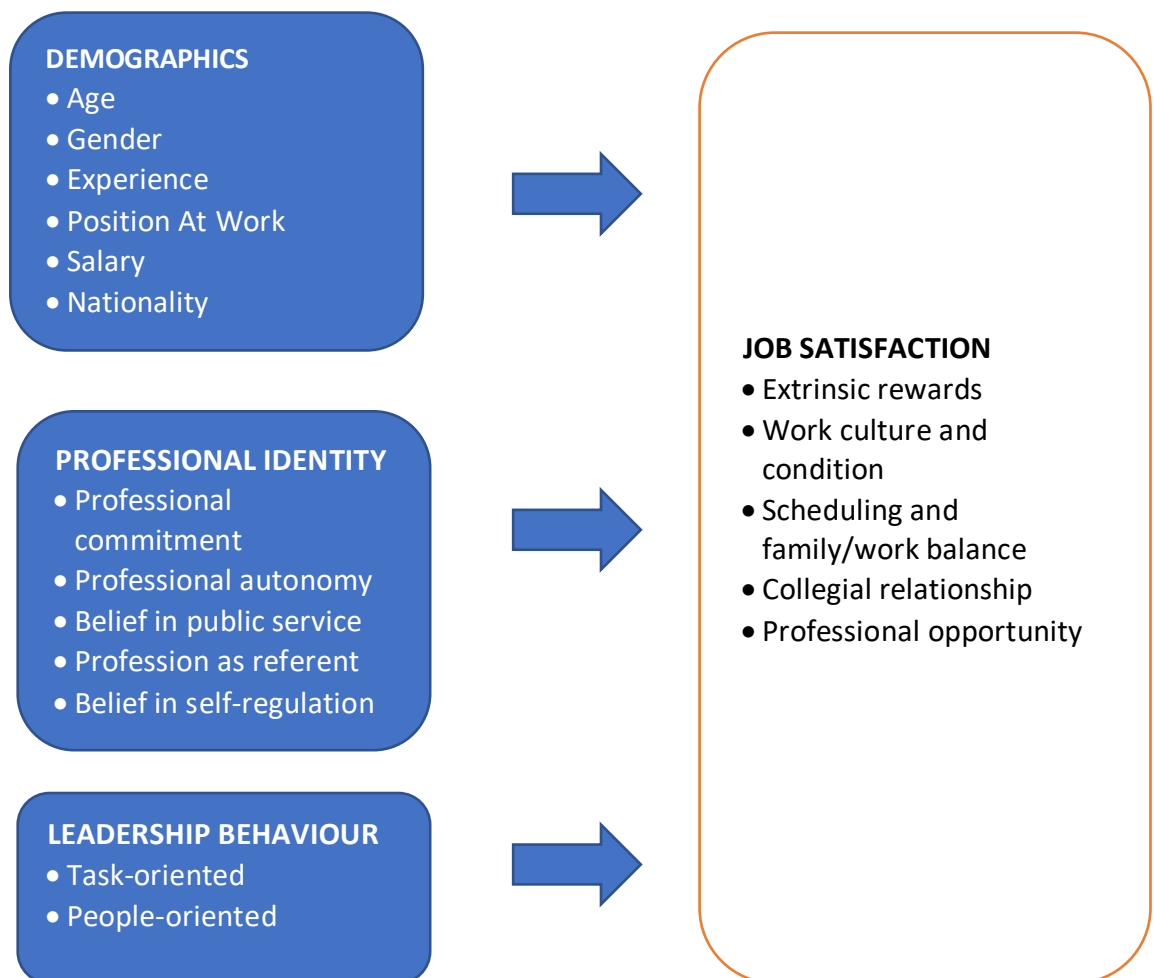
The concept of professional identity, which has a core meaning of 'occupational integration' is a person's perception of him/herself as a member of a profession (Deppoliti 2008). This concept was thought to be interwoven into employees' satisfaction levels because professional identity was shown to be one factor which could affect job satisfaction (Sabanciogullai and Dogan 2015; Kabeel and Eisa 2017). The literature further expressed the concept that job satisfaction contributed to employee performance and overall success (Alrawahi et al. 2018; Kenwright 2018; Chaava 2020). Studies which took place more than ten years apart (Beck and Doig 2005 2007; Alrawahi et al. 2019) highlighted the fact that the majority of MLS experienced poor job satisfaction. This was an important finding as job satisfaction has a pivotal role in the quality of healthcare services. According to Abel et al. (2021) and Marinucci et al. (2013), a high level of job satisfaction is considered to be a marker for the provision of high-quality healthcare. Furthermore, the literature also suggests that there is a relationship between effective leadership and employee job satisfaction (Rad and Yarmohammadian 2006; Specchia et al. 2021). Effective leadership includes those leadership styles which focus primarily on the relationship with followers (i.e. the leader-follower relationship), such as transformational leadership and authentic leadership styles.

This study is designed to examine the effect of leadership behaviour, this has two dimensions: people-oriented and task-oriented effects; and also the impact of professional identity on job satisfaction. It describes the attitudes, beliefs and perceptions of MLS, and hospital laboratory directors, with regard to professional identity, job satisfaction and leadership behaviour. These concepts and theories guided the researcher in the development of both the quantitative and qualitative phases of inquiry. In this mixed-methods study in order to answer the research questions and to examine the job

satisfaction level of MLS and the way in which this links with professional identity and leadership behaviour, this framework helped the researcher with the collection, analysis and interpretation of the data.

The core elements used in this framework are focused on the following: the concept of professional identity was defined by Hall's professionalism (1968) to encompass five core factors: (a) professional commitment; (b) professional autonomy; (c) belief in public service; (d) profession as referent; and (e) belief in self-regulation. Job satisfaction was defined by McCloskey and Mueller (1990) and refined by (Lee et al. 2016). This consists of five core factors: (a) work culture and condition; (b) scheduling and family/work balance; (c) collegial relationship; (d) extrinsic rewards; and (e) professional opportunity. The theory of leadership behaviour was classified into two core categories (a) task-oriented and (b) people-oriented approaches (Northouse 2016).

Figure 5 The conceptual framework of the study



3.5 Research design

3.5.1 Philosophical standpoint

All scientific research follows certain philosophical assumptions or ‘paradigms’ about the world. These paradigms (Kuhn 1970) or worldviews (Creswell and Plano Clark 2017) determine the shape of the research process and the conduct of empirical inquiry. According to Creswell and Plano Clark (2018), mixed methods research designs are usually dominated by four worldviews: postpositive, constructivist, transformative and pragmatist in order to attain information from a social scientific viewpoint (see Table 10).

Table 10 Four worldviews used in mixed methods, Source adapted from Creswell and Plano Clark (2017)

Philosophical question	Postpositive worldview	Constructivist worldview	Transformative worldview	Pragmatist worldview
Ontology	Singular reality	Multiple realities	Multifaceted and based on different social and culture positions	Singular and multiple realities
Epistemology	Distance & impartiality	Closeness	Collaboration	Practicability
Axiology	Unbiased	Biased	Biased & negotiated	Multiple stances
Methodology	Deductive	Inductive	Participatory	Combining
Methods	Quantitative	Qualitative	Usually qualitative	Quantitative and qualitative
Rhetoric	Formal	Informal	Advocacy & change	Formal or informal

These worldviews aim to make sense of the social world and the problems being examined. However, they are sometimes deemed irreconcilable with one another because of disagreement over truth claims and how knowledge is acquired about those truths (Cherryholmes 1992).

It is apparent that each worldview seems to be distinct; they should not be treated as inelastic categories. Boundaries between each worldview is blurred and debatable, depending on the context of contemporary research and the need to transfer between worldviews as needed to answer the research questions (Creswell 2014). Although the move between worldviews is available, present scholars often seem hesitant to do so. Instead of moving between many worldviews, they prefer to focus on one particular approach with more details on philosophical assumptions, principles and strategies. In this study, the worldview best suited to this mixed-methods approach is pragmatism.

3.5.2 Pragmatist worldview

The pragmatism worldview abandons the ontological and epistemological debate that is about what and how we can discern the social world (Morgan 2007). Instead of focusing on philosophical questions, a pragmatic approach lays emphasis on the research problem and inquiry and the use of all techniques to understand the problem (Creswell and Plano Clark 2017). In doing so, the pragmatic researcher recognises the value in using different strategies to gain complementary answers for their research inquiries. Tashakkori and Teddlie (2003, p:713) define methodological pragmatism as:

“A deconstructive paradigm that debunks concepts such as “truth” and “reality” and focuses instead on “what works” as the truth regarding the research questions under investigation. Pragmatism rejects the either/or choices associated with the paradigm wars, advocates for the use of mixed methods in research, and acknowledges that the values of the researcher play a large role in interpretation of results”.

Therefore, the pragmatic worldview is mounted out of actions, situations, and consequences rather than focusing on antecedent determination (as in postpositivism). This means that the pragmatic approach moves away from leaning on a certain theory as a

starting point. It instead endorses the use of pluralistic approaches to derive knowledge about the problem by using the most suitable methodologies 'what works best' for answering the research questions. The pragmatism worldview may use deductive (quantitative) and inductive (qualitative) thinking, these lead to holistic answers which are based on plurality of method (Creswell and Plano Clark 2017).

The rationale for using pragmatism as a research paradigm is that it provides flexibility in the selection of investigation techniques; methods can be chosen as appropriate depending on the research question to be addressed (Morgan 2007). The pragmatic paradigm utilised in this study offered a systematic application of appropriate methods, whether it be qualitative or quantitative, to address the aims of the study. In addition, the pragmatic paradigm benefited this study by using quantitative methods to inform the qualitative phase as a sequential explanatory design was being used. For instance, quantitative data can be made more meaningful by the inclusion of the qualitative method. Since the pragmatic worldview allows the researcher to use both quantitative and qualitative data they serve as a bi-focal lens, allowing the researcher to zoom into a very small detail or to zoom out to gain the whole field (Morgan 2007). Thus, it offers an opportunity for the researcher to integrate the macro and micro levels of a research problem. Finally, it is very clear that the pragmatic worldview allows the researcher to utilise mixed methodologies. This will be discussed next.

3.5.3 Mixed methods research design

Mixed methods research design has been defined as a research approach of inquiry combining qualitative and quantitative approaches and follows from the pragmatic research paradigm. Therefore, the extracted information may be mixed, and knowledge develops in a more meaningful way than by using each approach alone (Creswell and Plano Clark 2017). This method of inquiry was considered to be more suitable for addressing the research questions of this study for the following reasons. Firstly, there was limited evidence informing the measurement of job satisfaction and professional identity of MLS as well as the leadership behaviour of directors in SA. This supported the need for descriptive quantitative work which aimed to identify insights into levels of job satisfaction, professional identity and leadership behaviour of MLS. In addition, it was considered necessary to test the professional identity and leadership behaviour of laboratory leaders

in order to identify any significant relationships with job satisfaction. This may be useful in generating a framework for selecting appropriate leadership styles for effective laboratory operations as this is supported by the use of quantitative methods. Qualitative data enables the researcher to explore unknown phenomena, especially in unique contextual settings such as SA (Silverman 2010). Therefore, this mixed methods research design permitted a rich conceptualisation of job satisfaction, professional identity and leadership behaviour phenomena as well as testing for significant relationships between these variables within the laboratory context. Furthermore, the mixed research methods approach assisted in the study of human and social problems by combining both statistical trends and individual descriptive accounts (Creswell 2014).

3.5.4 Strengths and weaknesses of the research design

The general consensus is that the research design of mixed methods research is associated with a particular methodological philosophy (Creswell and Plano Clark 2017), techniques, and worldview (Tashakkori and Teddlie 2003). As noted by Bryman (2006), mixed methods designs are advantageous primarily because they enable research to be conducted more widely and in greater detail. Thus, a more broad and in-depth investigation of hospital laboratories, known as 'completeness', was achieved through the combined qualitative and quantitative phases (Bryman 2006).

The quantitative phase was intended to give a comprehensive overview of hospital laboratories, whilst the qualitative phase aimed to generate more in-depth and 'richer' information about professional identity, job satisfaction, and leadership behaviours than could be afforded in the quantitative phase. The use of one research approach to enhance, illustrate, explain, and strengthen the results of another approach is called 'complementarity' (Greene et al. 1989).

The limitations of the individual qualitative and quantitative methods can be overcome by conducting mixed methods studies which integrate the advantages of both methods (Creswell and Plano Clark 2017). Thus, the mixed methods design permitted the use of the phase-one, cross-sectional MLS survey to assess statistical data on professional identity, job satisfaction, and leadership behaviour. The data were then used for additional explanation and to explore the findings in greater depth (Bryman 2006). Therefore, the

credibility of the research results was improved through the implementation of both qualitative and quantitative methods (Bryman 2006).

According to Green et al. (1989), mixed methods designs may also have a disadvantage in that they may be construed to be a hybrid without association to any specific research paradigm. Indeed, it has been contended that the integration of quantitative and qualitative methods should be avoided as these methods are related to distinct and opposing paradigms (Creswell and Plano Clark 2017). Furthermore, mixed methods designs may present difficulties as they take longer to implement and necessitate enhanced abilities of data integration and presentation (Creswell and Plano Clark 2017).

3.5.5 Rationale for use of an explanatory sequential study design

An explanatory sequential mixed methods research design is comprised of a quantitative phase followed by a qualitative phase (Creswell and Plano Clark 2017). This sets the design apart from other forms of mixed methods designs, namely, convergent parallel, exploratory sequential, embedded, transformative, and multiphase designs (Creswell and Plano Clark 2017). In this case, the choice of an explanatory sequential design was justified because it helped delineate the patterns and correlations regarding MLS professional identity, job satisfaction, and leadership behaviour based on quantitative data. It was thus possible to detect the levels of MLS on the parameters and undertake comparative analysis with studies from around the world.

In phase one, surveys of professional identity, job satisfaction and leadership behaviour were undertaken to answer research questions 1, 2 and 3 (see Table 9). In phase two, an embedded case-study was conducted in two hospital laboratories, both funded and supervised by the MoH, to further answer research questions 1 and 3. The priority accorded to the quantitative and qualitative research phases was established from the start. As defined by Creswell and Plano Clark (2017), priority reflects the significance of the quantitative and qualitative approaches in a mixed-methods study. The qualitative phase provided a wealth of information and seemed more important than the quantitative in meeting the research aims and providing answers to the research questions. In addition, the qualitative phase enabled a more in-depth exploration of the information provided by

MLS in relation to their professional identity, job satisfaction and the behaviour of their leaders.

The adoption of an explanatory sequential study design was advantageous because it enabled collection of data in two separate phases at distinct times. Also, quantitative data from the first phase provided the foundation for further and more in-depth investigation when carrying out the qualitative phase (Tashakkori and Teddlie 2003; Creswell and Plano Clark 2017). The defining feature of a sequential mixed-methods study is that it is an iterative approach to collecting data; those data acquired in the first phase contributes to the data acquired in the subsequent phase (Driscoll et al. 2007). This allows the researcher the opportunity to ascertain whether more questions should be formulated based on the quantitative data that was collected. The quantitative data provided by the questionnaires was explained and made sense of through the qualitative data when exploring MLS' views on the measured variables (Ivankova et al. 2006). However, the design has limitations in that the implementation of two sequential phases may be time consuming.

3.5.6 Integration of quantitative and qualitative strands in mixed methods studies

As emphasised by Tashakkori and Teddlie (2003), mixed-methods studies involve merging qualitative and quantitative strategies throughout the research, rather than simply mixing the two methods. In this case, the integration of quantitative and qualitative methods was undertaken at the level of design, methods, data collection and interpretation and reporting stages of the research (Fetters et al. 2013; Creswell and Plano Clark 2017). Qualitative and quantitative mixing was accomplished by linking and employing the first phase as the basis for the second phase and by implementing the conceptual framework to combine datasets (Creswell and Plano Clark 2017). In the second phase a case study, interview data and observation data were collected.

3.5.7 Integration at the design and methods level

The integration of quantitative and qualitative methods in the present study was undertaken at the level of design and in the methods (Fetters et al. 2013; Creswell and Plano Clark 2017). An explanatory sequential design was selected in order to connect the quantitative approach in phase one and employ it as the foundation for the qualitative approach in phase two. Therefore, the data collection methods used in the phase two, the

qualitative case study, drew on the findings of the quantitative survey in phase one (Fetters et al. 2013) in order to formulate further interview questions.

3.5.8 Integration at the interpretation level

At the level of interpretation and reporting, data integration can take place concurrently or sequentially via the formulation of narrative reports, data comparison or transformation (Fetters et al. 2013; Creswell and Plano Clark 2017). In line with the explanatory, sequential design, and paradigms underlining the various research stages, both qualitative and quantitative methods were maintained independently of one another, with separate collection and analysis of the data (Creswell and Plano Clark 2017).

Interpretation was the final stage of the research process, and it was here that the combination of findings from the quantitative and qualitative methods was performed in order to synthesise the findings and answer the research questions within the context of the discussion and implications (Ivankova et al. 2006; Creswell and Plano Clark 2017).

3.6 Methods

Quantitative methods

3.6.1 Rationale for the use of a survey design

The choice of survey design was legitimised by the possibility of large-scale data collection from two SA laboratories (Bryman 2016). As explained by Sapsford (2007), the purpose of a survey is to collect quantified data in order to describe MLS and investigate inter-variable patterns and relationships. In this case, the survey facilitated evaluation of the similarities and differences between the two laboratories. This was the only research design suitable for accessing the MLS in question and investigating the selected variables. The systematic and standardised approach makes the survey research design particularly advantageous (Sapsford 2007).

3.6.2 A cross-sectional survey

A cross-sectional survey was conducted to explore MLS' views on professional identity, job satisfaction and their leaders' behaviour. Patterns of association were identified from the

cross-sectional survey through the gathering of quantitative data and a comparison of a minimum of two variables from a sample of cases at a single time point (Bryman 2016).

Cross-sectional survey is beneficial because it permits variation in a sizeable case sample to be investigated more quickly than using other approaches (Bryman 2016). The use of a cross-sectional survey enabled variation in MLS' levels of professional identity, job satisfaction and their views on leadership behaviour of their leaders across the two selected laboratories in this study. Cross-sectional survey is also advantageous because it facilitates the analysis of relationships between variables.

A weakness of cross-sectional surveys is that they do not always allow for measurement of change over time (Bowling 2014), where each participant was surveyed once. However, a strength is that no major changes were taking place in hospital laboratories at the time of the study, as these might have had an impact on the findings.

Qualitative methods

3.6.3 Definitions of a case-study

A case study is generally defined as “An empirical enquiry that investigates a phenomenon in depth within its real context, when the boundaries between phenomenon and context may not be clearly evident” (Yin 2009, p. 13). The present work applied the above definition since it clarified the intended goals pursued via a case-study design. It was necessary to gain insight into the professional identity and job satisfaction of MLS and to explore their leader's leadership style. Comparable definitions were provided by Yin (2009) and Robson (2002), with the former emphasising that it was important to undertake an in-depth exploration of the phenomenon in its specific context as well as the boundaries between the two, while the latter highlighted the fact that comprehension of a phenomenon in its real-life context required the use of more than one evidence source. Investigating the boundaries between professional identity and job satisfaction, and the ways in which MLS were affected by leadership, was especially pertinent in this work.

Compared to Stake (1995) and Merriam (1998), Yin (2009) defines the case study more clearly. Stake (1995) does not attribute much attention to the investigation of the case-context relationship, despite acknowledging the complex aspects of a case and the

significance of comprehending underlying matters. Meanwhile, a more elaborate definition has been provided by Merriam (1998), arguing that case studies are particularistic and heuristic in nature, the former signifying that the case study concentrates on a certain event, phenomenon or circumstance, while the latter signifies that the interpretation of a phenomenon in question is explicable by case studies. Yin (2009) also addresses these features in defining the case study.

3.6.4 Rationale for use of a case-study design

The reason for the selection of a case-study design was the unique capability of this design to explore the complexities of the phenomenon in question within a real-life setting (Scholz and Tietje 2002; Yin 2014). The phenomenon being studied was MLS' professional identity and job satisfaction and leadership behaviour of MLS leaders. The two hospital laboratories were each considered as case-study sites. Uncovering the contextual conditions and influences upon the professional identity and job satisfaction as well as the influence of leadership on MLS in these laboratories was considered of major importance. A case-study design was appropriate for providing answers to the 'how' explanatory questions: around how MLS describe their professional identity, job satisfaction and the leadership behaviour of leaders (Yin 2014). A thorough exploration of MLS' description of professional identity, job satisfaction and leadership behaviour within the context of hospital laboratories could not have been achieved using other research methods.

3.6.5 Sampling

Survey participation invitations were sent to 150 MLS from the two SA laboratories. To improve the generalisability of the results the entire population was targeted since this was feasible and manageable (Bryman 2016). A purposive sub-sample of interviewees was used for focus groups and in-depth interviews (Silverman 2010). Observation of work events carried out by MLS was also undertaken, this focused particularly on leadership issues. The number of staff involved varied and was dependent upon their availability.

The inclusion criteria comprised all MLS staff working in the two medical laboratories, supervisors of departments and laboratory directors, however, it excluded staff who had qualified with a Doctor of Medicine degree (MD), and who were working as pathologists. All medical laboratory staff, supervisors of departments and laboratory directors who met

the inclusion criteria were invited to participate in this study. This ensured that the sample provided valuable data, including a wide range of experiences and views.

Regarding the focus groups, the researcher aimed to recruit twelve MLS to take part in focus groups, six members from each laboratory (Krueger and Casey 2014). However, only five members from each laboratory actually contributed. The strategy for recruiting the participants was as follows; those who met the inclusion criteria described previously and who had completed the first stage of this study (the survey). The participants were then divided into two groups based on their experience, those with more than five years' experience and those with less.

The in-depth interviews included laboratory directors and supervisors of departments (two directors and three supervisors from each laboratory). Furthermore, the sample size for qualitative data is not always set in advance; the researcher simply needs to be able to justify their sample size (Marshall et al. 2013). The researcher had to increase the number of supervisors from three to four in order to achieve data saturation. In this study, the sample size for the qualitative data was limited by the number of laboratory directors who were willing to be participants in face-to-face in-depth interviews, and the number of MLS staff who were prepared to be participants in focus groups.

3.6.6 Recruitment

This study was carried out in the city of Makkah in SA, where the Directorate General of Health Affairs (DGHA) contains six government hospitals in Makkah city. The study included two hospitals. These hospitals are funded and overseen by the MoH through the DGHA. The researcher contacted the DGHA to obtain permission and to facilitate the coordination of hospital laboratories in Makkah city to carry out this study. In addition, the researcher contacted key people in each hospital laboratory to facilitate the conduct of this study. The remaining hospitals in Makkah city were excluded due to time constraints. Hospital lab B has been accredited by the Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) (CBAHI 2018) and the Joint Commission International (JCI) (JCI 2018). Lab A performs general laboratory tests and has recently been accredited by the CBAHI (CBAHI 2018).

3.6.7 Data Collection Tools

3.6.7.1 Questionnaires

Quantitative data was collected using a questionnaire which comprised four self-report scales, these were: Hall's professionalism scale (Hall 1968), Mueller and McCloskey's Job Satisfaction Survey (MMSS) (Mueller and McCloskey 1990) and the leadership behaviour questionnaire (LBQ) (Northouse 2016) and the demographic questionnaire (see Table 11, Appendix D). Mueller and McCloskey's Job Satisfaction Survey (MMSS) has been validated for use in SA by Al Asmri (2014). The current researcher justified the use of Hall's professionalism questionnaire (1968) because it has previously been used in the medical laboratory profession (Schill 2017) and updated by Swailes (2003). In addition, the use of LBQ (Northouse 2016) is also justified as it is a contemporary questionnaire which includes modern terminology and therefore fits the current decade.

Table 11 Information on the tools used in the current study

Tool	Number of dimensions and items	Reliability score (α Cronbach)
Hall's professionalism (Hall 1968) Updated by Swailes (2003)	Five factors, 21-items. 5-points Likert scale	$\alpha = 0.53 - 0.85$ (Swailes 2003)
Mueller and McCloskey's Job Satisfaction Survey (MMSS) (Mueller and McCloskey 1990) Updated by (Lee et al. 2016)	Five factors, 25-items, 5-points Likert scale	$\alpha = 0.71 - 0.87$ (Lee et al. 2016)
Leadership behaviour questionnaire (Northouse 2016)	Two dimensions, 20-items, 5-points Likert scale	$\alpha > .70$ (Mujtaba et al. 2009)
demographic questionnaire (see Appendix D)		

Hall's professionalism scale

Hall's professionalism scale was developed by Hall (1968) and shortened by Snizek (1972). In 2003, Swailes (2003) updated the terminology and shortened the questionnaire to 21-items. This scale is rated on a 5-point Likert scale. It has five sub-categories of the profession: professional organisations, service to society, self-regulation, calling to the field and autonomy (Snizek 1972). Although reliability ranges between 0.53 and 0.85, this scale

is widely used and statistically acceptable (Morrow and Goetz Jr 1988; Swailes 2003). Other professionalism scales used in the medical profession are more related to nursing and do not fit with this research. Hall's Professionalism Scale has been used to measure professional attitudes and behaviour in some careers, for instance, medicine, nursing, engineering (Hall 1968; Snizek 1972), education (Blezek 1987), occupational therapy (Breedon et al. 2000) and accounting (all cited in Schill 2017). According to Schill, this scale has not been used in the laboratory field since 1980 although it was used in a study conducted in (Schill 2017).

Mueller and McCloskey's Job Satisfaction Survey (MMSS)

The MMSS was developed by Mueller and McCloskey (1990) and shortened by Lee et al., (2016) to 25 items. Each item of this survey is rated on a 5-point scale. The MMSS evaluates five factors of job satisfaction: extrinsic rewards, work culture and conditions, scheduling and family/work balance, collegial relationships and professional opportunities. Misener et al. (1996) (cited in Al-Asmari 2014) stated that MMSS is a reliable job satisfaction indicator and that it could be utilised within various cultures. To justify using this survey in the current study, Al-Asmri (2014) had used it within a Saudi context to measure job satisfaction levels among primary healthcare staff with a reliability result between 0.52 and 0.84. Lee et al. (2016), who updated the MMSS, reported a higher reliability score of between 0.71 and 0.87. Furthermore, the MMSS was employed in a study conducted in the healthcare setting (Mueller and McCloskey 1990).

Leadership behaviour questionnaire (LBQ)

The LBQ was developed by Northouse (2016), the most recent version being published in 2016. This questionnaire consists of 20 items. Each item of the questionnaire comprises a statement with a 5-point Likert scale. It has two leadership behaviour dimensions. The first dimension is people-oriented, which can be explained as leaders' concern about and respect for their followers and appreciation of their work. The second dimension is task-oriented, this being a leader's ability to define tasks and expected outcomes using formal communication. The two dimensions are operationalised by the summation of the total item scores. This instrument has been used previously in a health setting (Fitzgerald 2009),

the reliability result was reported as 0.88 in a study (Mujtaba et al. 2009). Therefore, the LBQ was considered applicable for the current study.

Demographic questionnaire

This study used a demographic questionnaire developed by the researcher. Demographic data included the following: years of experience, income, age, gender, educational background, position at work (i.e. the classification provided is based on the Saudi healthcare system) (phlebotomist, medical technician, medical technologist, medical technologist I, and consultant) and nationality. The purpose of this questionnaire was to identify the association between the demographic data and other variables, for instance, professional identity, job satisfaction and leadership behaviour.

3.6.7.2 Using observation data

Observational data were collected during this study in order to gain an insight into the hospital laboratories in terms of leadership in action (Morgan et al. 2017). There is a lack of such studies in SA. Furthermore, hospital laboratories are complex, and they involve a range of medical practitioners from various backgrounds, for example, physicians and MLS. Medical practitioners who work in the laboratory communicate, interact, and collaborate with nurses and physicians from wards throughout the whole hospital, and with patients who have varying conditions. Therefore, the researcher felt it was essential to have an in-depth understanding of the way in which MLS construct their perceptions about professional identity, job satisfaction and leadership behaviour in everyday events. It was felt important to document details of the hospitals in which the study was conducted, their lives and the interaction between themselves and their leaders (Morgan et al. 2017).

Observation takes two forms, namely, participant and non-participant observation, which respectively include and exclude the observer (Hammersley and Atkinson 2007; Morgan et al. 2017). In this case non-participant observation was adopted, this prevented the researcher's involvement from affecting interactions or communication. The observation data in this study was descriptive in nature. Examples of the types of observation data collected can be seen in appendix (J). The observation data in this study were not used as a distinct method of data collection, instead they were used to enhance the understanding

of research context, to help reflect on the results and to assist in the interpretation of this study.

3.6.7.3 Using focus groups

The focus groups in the current study were used to gather a wealth of information on topics such as job satisfaction, professional identity and leadership behaviour within the hospital laboratory. According to Lederman (1990), using focus groups rather than individual interviews has many advantages in terms of gaining a richer understanding of MLS' ideas.

Focus groups were selected for this research study for the following reasons. Firstly, focus groups provided dynamic interactions within a group and this generated rich experiential data (Webb and Kevern 2001). Group members may share information and discuss issues within their workplaces, and they tend to be more open than if they were interviewed alone (Lederman 1990). Participants in focus groups have the opportunity to discuss and reflect on information shared within the group which provides them with an opportunity to refine what they want to say and to offer more 'honest' data (Osborne and Collins 2001). Furthermore, focus groups seem to be less threatening than individual interviews, members feel more comfortable and less inhibited as part of a group and this gives them support and security (Lederman 1990; Osborne and Cillins 2001). Focus groups also provided the opportunity to explore the topics concerned in more depth, thus more data was generated in a certain amount of time. This is important in a time limited study such as this (Lederman 1990).

3.6.7.4 Interviews

Interviews are one of the most important sources for qualitative data collection (Yin 2014). They provide flexibility which enables the researcher to add additional queries into the research subject in order to gain richer qualitative data. Interviews provided the researcher with access to personal experience, opinions and feelings about their roles (Miller and Glassner 2016; Spradley 2016).

Prompting questions were used in the interviews, and these worked as a guide in gathering comparable qualitative data (Flick 2002). This type of interview is considered to be a foundation for the semi-structured approach as it allows flexibility and creativity to make

sure that the views of respondents are gained (Knox and Burkard 2009). It is also important to consider the relationship between interviewer and participants. Building strong relationships with interviewees assists with the collection of data and strengthens its validity (Kvale 1996; Adler and Adler 2002).

Some techniques can help to maintain the interview relationship and can encourage further elaboration. For example, the interviewer can manage his/her reaction to interviewees' emotional distress and to respond positively to them (Knox and Burkard 2009). Therefore, interview training was required for some methods such as reviewing the research protocol, conducting pilot interviews while under supervision, practising the interview process through role-play, listening to recordings of more experienced interviewers, and debriefing after interviews (Knox and Burkard 2009).

3.6.7.5 Triangulation of methods

Combining different methods of data collection (i.e. surveys, observations, focus groups and interviews) ensures that findings are consistent and also enhances the credibility of the data (Patton 1999). The first stage of the current study was a quantitative approach to explore views of professional identity, job satisfaction and leadership behaviour. The second stage used focus groups and interviews that investigated and provided a deeper understanding of this leadership behaviour, job satisfaction and professional identity. Reconciling qualitative and quantitative data is a form of triangulation and this compares all data from a variety of methods (Patton 1999).

3.6.7.6 Pilot study

A pilot study was conducted prior to data collection. This allowed the researcher to ensure the feasibility of the proposed methods and to identify any difficulties with the questionnaires, observational data, focus groups and interview processes.

Some changes had been made to the questionnaires based on comments from the 14 piloted participants. The participants were school colleagues, some of whom were bilingual (i.e. Arabic and English or Nigerian and English speakers) and their feedback was very informative. For example, the format of the five-level Likert item of Hall's professionalism scale used poorly, poor, neutral, well and very well as options. These were replaced with

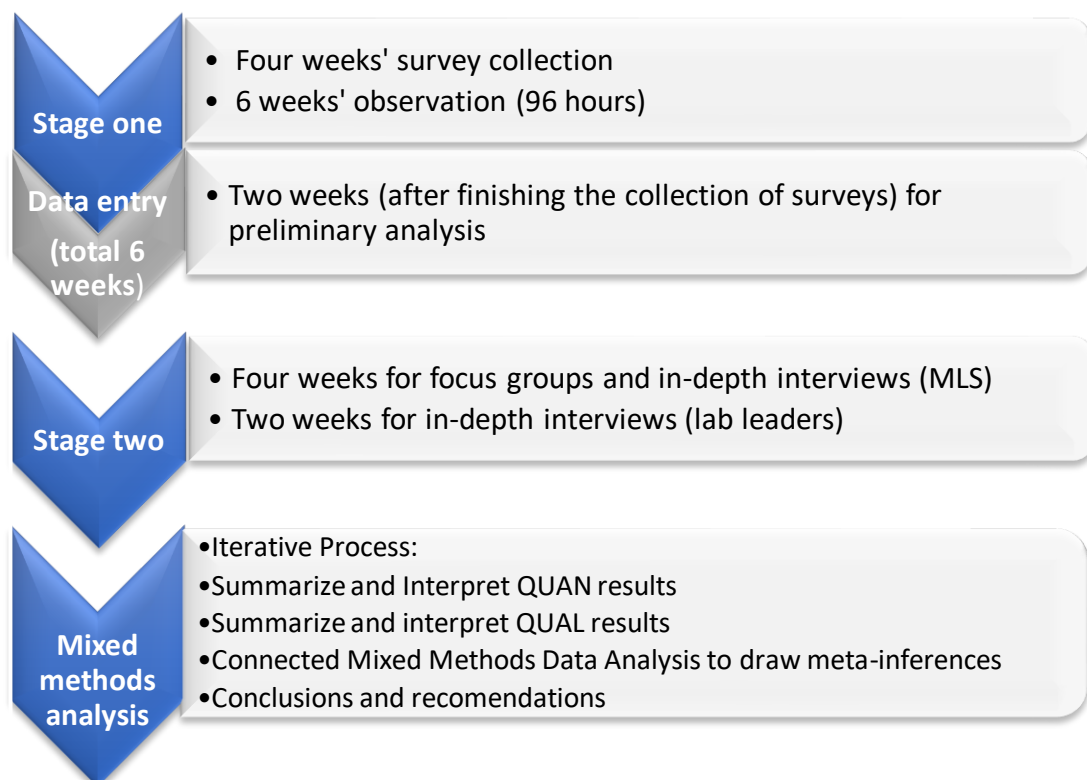
strongly disagree, disagree, neutral, agree and strongly agree. In addition, the participants of the pilot study experienced problems in using this scale due to missing topics. A lead topic was added to each scale in bold to ensure that it was visible. The arrangement of the scales in the questionnaire were also changed so that it commenced with a less sensitive scale, job satisfaction, professional identity and then leadership behaviour, respectively. As the majority of the participants were confused by the definition of professional identity, the researcher added the definition at the top of the scale in bold to ensure a more accurate response. Furthermore, some modifications were done to the job satisfaction scale, item 2 'vacation' was replaced by holidays as this term is more popular in SA. The item 11 'maternity leave' was replaced with special leave (e.g. maternity and paternity leave) to fit males and females and avoid the issues of sexism (Holdcroft 2007). In the same scale, item number 12 'your immediate supervisor' was replaced with 'your supervisors' to make it less sensitive. The last change was to item 14 'the delivery product/services method used your LAB (team functional)' this was replaced with 'the work practice' to ensure the use of simple terminology and a short sentence (Tsang et al. 2017).

The researcher visited a popular café in Cardiff to practise the observational data collection. The researcher visited the café at various times, such as early morning, afternoon, evening and late evening, to capture data under headings of place, actors and events following Spradley's methods (Spradley 1980). The customers' purpose for attending the place, staff and leaders were the actors, the place was a cafe and the events were what happened during the actual observation in terms of leadership. This experiment demonstrated that it was not easy to pick up leadership events and that more time was required in order to do so. Therefore, the researcher carefully planned and allowed sufficient time for carrying out the actual observation in SA. Some editing was necessary in relation to the arrangement of focus groups, and also the order of the interview questions so that they were more logical. Data from the pilot questionnaires, interviews, focus groups and observational data were excluded from the study, but it was a useful stage to undertake. The pilot study also gave the researcher an opportunity to practise their skills in relation to data collection techniques and also to test the questionnaires, interviews, focus group questions, recording equipment and observational data collection (Berg and Lune 2014).

3.7 Data collection procedure

The data collection proceeded in two stages (see Figure 6). The purpose of using a sequential approach was that the quantitative and observational data collected in the first stage which then led to additional questions being identified for focus groups and in-depth interviews in the second stage. This was appropriate because the questionnaires and observations offered a description of the current status of medical laboratory personnel (i.e. job satisfaction and professional identity) and the leadership behaviour of laboratory directors. The researcher began with the observations data at stage one, due to time constraints. This approach to data collection enabled a complete focus on each distinct phase as, while interrelated, the data are collected sequentially (Creswell and Plano Clark 2017). Having multiple phases increased the length of time needed for the study.

Figure 6 The diagram shows the explanatory sequential mixed methods design of data collection for this study in line with the research design.



3.7.1 Quantitative data collection (First stage):

The first stage was the collection of quantitative data. The researcher distributed 150 questionnaires which comprised four self-report scales and included professional identity, job satisfaction, leadership behaviour and demographics data (see Appendix D). An invitation letter, information sheet and consent form were also provided (see Appendix A, B and C). A total of 99 completed questionnaires were returned in stamped envelopes to the office of the laboratory director's secretary. The researcher used hard copy questionnaires rather than online surveys because it made it easier for participant follow up (Nulty 2008). The time for completing this questionnaire was four weeks, a reminder letter was sent to each participant after two weeks if they had not returned the questionnaire within the proposed time. The researcher then collected all the completed questionnaires. Although questionnaires are non-anonymised, the researcher maintained the confidentiality of the participants by converting all names to codes. The purpose of non-anonymity was to identify which participants had completed the questionnaires (first stage) and their eligibility for participating in the second stage (i.e. the focus group and in-depth interviews).

During the first stage, the researcher collected observational data on MLS (i.e. qualitative data). Observations included key events in hospital laboratories which were related to professional identity, job satisfaction and leadership behaviour. The data was collected in a number of different ways via attendance at staff meetings, new employment induction, staff presentations, volume of work discussions, concerns about the work environment, daily interactions with the MLS themselves and their leaders and any evidence of informal leadership of MLS. Thus, the approach of the observations that were utilised in this study was non-participatory. The researcher visited each hospital laboratory for two days a week, four hours at morning shift (day one) and four hours at afternoon shift (day two). This took place over a period of six weeks.

The researcher used the following process for recording each session. Notes were taken at each observation, either during or after the session, in a research notebook. If it was inappropriate to take notes in front of the participants, the researcher did so as soon as possible after the observation or used an audio recorder. Furthermore, the notes on each observation session were organised following this (e.g. day, date and topic). The data were

then transcribed in order to record the observations and using the categories of place, events, actors as proposed by Spradley (1980).

It was important that participant consent was given, and that confidentiality was maintained at all times. The researcher kept staff informed about the study and the dates and times of observational sessions during their attendance at staff meetings. The researcher also attached a timetable on the main advertisement board in the laboratory and placed a poster in front of the main gate of the laboratory informing staff that the observation session was running. None of the participants could be identified through the collection of observation data as names and place names were excluded. Finally, if the researcher had observed something which they regarded as dangerous or against the policy of the workplace then the researcher would have informed the management.

3.7.2 Qualitative data collection (Second stage):

3.7.2.1 Focus groups

The second stage involved the collection of qualitative data using focus groups. This study utilised a semi-structured approach (i.e. open-ended prompting questions), and also used visual advertisements; newspapers and photos of events that MLS participated in for conducting a series of focus groups with MLS using a face-to-face method and audio recorders. The focus groups questions were divided into three themes: professional identity, job satisfaction and leadership behaviour (see Appendix E). These questions were subjective and were amended based on the initial analysis of the first stage.

After identifying which participants met the sampling strategy, the researcher randomly selected six for each focus group session. The researcher then met the selected participants in the laboratory to set a mutually convenient time for group meetings, these were to be held in the conference room at the laboratory in order to maintain confidentiality.

The researcher discussed the prepared questions with the participants, the focus group was led by the researcher as he understood the topic and aims of each question. The time allocated for each session was generally around 60 minutes (Neuman 2014). A typical study employs four to six focus group sessions (Krueger and Casey 2014; Neuman 2014). However, due to time limits, this study included only two focus groups. Participants were

allowed to provide responses in their first language. Hence, the qualitative approach was challenging as it involved another language and required translation (i.e. from Arabic to English).

The participants were reminded that participation in the focus group was voluntary and that they would be asked to sign the consent form prior to attending the sessions (see Appendix C). In addition, the researcher informed the participants of the purpose and structure of the focus group and the way in which confidentiality would be maintained at all times and that their identity would be anonymised (i.e. before, during, after the meeting and in the reporting of the study). The researcher then asked each participant for his or her permission to audio record the entire meeting (see Appendix C).

3.7.2.2 Interviews

Face-to-face in-depth interviews were another method used for data collection. The semi-structured approach was followed (i.e. open-ended questions) for conducting the interviews with laboratory directors and supervisors. The researcher also used visual advertisements, newspapers and photos of events that MLS participated in to stimulate contributions from the participants. The question prompts were divided into three themes: professional identity, job satisfaction and leadership behaviour (see Appendix E). These questions were subjective and were edited as required based on the initial analysis of the first stage.

As this study aimed to explore the leadership of the hospital laboratory, the recruitment strategy was to select four participants from each site. These included a leader and four supervisors from each laboratory. The researcher contacted the laboratory directors and the supervisors, who had agreed to participate in this study, individually via telephone to set a time for the interviews. The purpose and procedures of the study were explained to the participants. The interviewees were reminded that their participation was voluntary and that they could withdraw at any time. Participants were informed that interviews would be recorded using a digital voice recorder and asked to sign the consent form prior to the interviews (see Appendix C). The researcher arranged to meet the participants in a conference room within each laboratory to maintain privacy. The confidentiality process

was explained, and they were informed that their names and location information would be anonymised.

For the qualitative stages: the participants preferred to provide their responses in the Arabic language. Thus, their transcribed texts were confidentially translated into the English language by a third-party certified translator (see Appendix I).

3.7.2.3 Recording, transcribing interviews and translation

This step is one of the most important parts when doing qualitative research (i.e. focus groups and in-depth interviews). Silverman (2010) suggested steps which could improve the quality of interview recording. Firstly, interviews were recorded with a high-quality digital recorder that enabled the researcher to file and retrieve the sound at a later date. In addition, this technology allowed the researcher to concentrate fully on the interview without the distraction of notetaking. Participants were allowed to provide their responses in their first language in interviews and focus group meetings. The researcher transcribed four recordings and the remainder were transcribed and translated by a certified professional (see Appendix I). However, some interviews were not transcribed during the data collection period, and for this reason the researcher reviewed and checked the accuracy of each interview and focus group by listening to the recordings again.

Finally, as the transcribed texts were in the Arabic language, they were translated into the English language by a third-party certified translator, all identifying information was removed and the transcripts were anonymised.

3.8 Data analysis

3.8.1 Quantitative data

Data analysis was undertaken in two phases within a mixed-methods, sequential explanatory design, with quantitative data being analysed first followed by the qualitative data (Creswell and Plano Clark 2017). The Statistical Package for the Social Sciences (SPSS) was employed to perform descriptive and inferential statistical analyses on the data from phase one. The purpose of descriptive statistical analyses was to describe, summarise, and identify patterns in the data (Dancey et al. 2012) related to the Saudi MLS professional identity and job satisfaction as well as the leadership behaviour of medical laboratory

directors. Meanwhile, inter-variable relationships were investigated, and the findings were generalised from the data to the general population through inferential statistical analysis (Dancey et al. 2012). Prior to the commencement of data analysis, the data was checked for completeness and accuracy, this was done through a process of preparing and screening it. The process involved coding and entering, some of the collected data was numerically coded to make it suitable for computer analysis (Pallant 2011). The completed questionnaires were coded and converted into a format suitable for computer analysis. The next step was to reduce potential errors which had occurred during data processing and to ensure that data from the questionnaires were accurate (Pallant 2011). The quantitative data was then entered, and the researcher checked for inconsistent responses. The last step was to identify coding errors and eliminate them. The researcher checked the data by listing values for all the variables in the dataset using a frequency table, this included categorical and descriptive continuous variables. The researcher used SPSS software to analyse the quantitative data.

3.8.1.1 Statistical analysis

A summary of data from the investigation of professional identity, job satisfaction and laboratory leaders' leadership was produced by calculating frequency distributions, measures of central tendency, and dispersion (Bryman 2016). A number of different statistical tests were used, these included: A two-tailed independent samples *t-test* and a Pearson correlation analysis, a Mann Whitney U test was also used due to the assumption that homogeneity of variance for the *t-test* was violated.

3.8.1.2 Measures of central tendency

Central Limit Theorem (CLT) was applied for the purpose of conducting parametric tests. The CLT states that when considering data which are normally distributed the sample size should be sufficiently large, this means more than 30, regardless of the population's shape of distribution. The sample size in this study is large ($n=99$), thus the sampling distribution tends to be normal justifying the use of the mean which is more reliable (Field 2013).

3.8.1.3 t-test

To establish whether the means of the two laboratory groups exhibited any significant differences which could be associated with certain features, the inferential statistic known as a t-test was applied (Kim 2015). This approach is commonly employed in circumstances where datasets have a normal distribution and potential variances that are not known. The t-test permits testing of an assumption that applies to a population, so it can serve as a hypothesis testing tool. However, no hypotheses were formulated in this work. Furthermore, the statistical significance is measured by the t-test based on the t-statistic, t-distribution values, and degrees of freedom. Analysis of variance is necessary when the test involves at least three means.

3.8.1.4 Mann Whitney U test

To determine whether the two laboratory groups had any statistical difference in collegial relationship, the Mann Whitney U test was conducted. In this test, the statistical differences amongst mean rank scores for two levels of a categorical variable on a continuous variable are calculated (Agresti 2007). A non-parametric Mann Whitney U test for two independent groups was adopted instead of a parametric t-test because the data related to the collegial relationship dimension associated with job satisfaction and homogeneity of variance was violated (Dancey et al. 2012).

3.8.1.5 Pearson correlation coefficient

The statistical relationship or association amongst two continuous variables was evaluated by the test statistic known as Pearson's correlation coefficient. Since it draws on the covariance technique, this approach is considered most suitable for determining the association between variables of interest. It provides insight into both the magnitude of the association or correlation and the direction of the relationship. The degree of correlation is categorised into four levels and a strong correlation is indicated by a coefficient value in the range from ± 0.50 to ± 1 . If the value lies between ± 0.30 and ± 0.49 , then it is said to be a medium correlation. If the value is below $+ .29$ it is classed as a small correlation and if the value is zero there is no correlation (Cohen 2013).

3.8.2 Qualitative data

3.8.2.1 Analysis of observation data

After each observation, the researcher recorded the data, this helped to narrow down the research investigations and generated further questions (Silverman, 2010). Following these steps helps the researcher to answer all queries related to the study, rather than leaving the analysis to the end. When analysis takes place at the end of the observation period it may result in questions which cannot be answered, as a consequence further observation may be necessary. The data were collected in the form of field notes or digital audio recordings (Spradley 1980). The researcher applied Spradley's framework (1980) which includes place, events and actors to help with analysis of the observation data.

Furthermore, these observational data were used to enhance the understanding of the research context and to reflect on the results and interpretation but were not analysed separately. In this study, observation data were used to inform the coding process and developing themes. The observation data also informed the analytic process of the way in which my thinking had been informed by immersion in the social context of MLS involved in this research.

Since the researcher is the instrument when undertaking qualitative inquiry, particularly in observation, the credibility of the researcher is a crucial concern. The credibility of the researcher can be strengthened by the following steps (Patton 1999); being well-trained in using this method; the fact that the researcher had a laboratory medicine background with one year's experience; the perspective that the study will follow an exploratory approach to understand certain phenomena (i.e. leadership behaviour, professional identity and job satisfaction); a personal connection - achieved because the researcher knew key people in each hospital laboratory, this facilitated the process of gaining access to the study site and the required permission (Patton 1999). Following the previous steps also helped in terms of credibility of the researcher and the findings.

3.8.2.2 Analysis of interview data

Thematic analysis

Thematic analysis was undertaken using Braun and Clarke's (2006) six step approach, which involves:

- 1) Familiarisation with data
- 2) Generating initial codes
- 3) Searching for themes
- 4) Reviewing themes
- 5) Defining and naming themes
- 6) Producing the report

Thematic analysis was managed methodically in this study, hence the reason for its selection. The explicit description of every stage enabled the researcher to guide a recursive process instead of a linear analytical one (Braun and Clarke 2006). The formulation of codes and themes is outlined through presentation of every stage of thematic analysis.

Phase 1 - Familiarisation with data

In phase one, every audio recording was listened to by the researcher post-interview and notes were taken. Initially, the researcher transcribed four interviews with different participants (e.g. laboratory leader, supervisors, and MLS). Subsequently, an experienced transcriber transcribed all interviews and translated them into English. Transcript accuracy was checked against the audio-recordings by the researcher, with rectifications made accordingly. The researcher became familiar with the data and detected potential codes in Microsoft Word by re-reading every interview transcript. To facilitate the managing of themes and codes, the interviews were then transferred to NVivo 12 Pro for Windows.

Phase 2 - Generating initial codes

In phase two, every transcript was methodically processed and coded using Nvivo. The reason for coding the extracts was to ensure comprehension of the context and avoid loss of meaning.

Initial codes were identified during first-order coding, then codes were revised on an ongoing basis against the original transcript and retained, refined or removed through the process of analysis during second-order coding (Saldaña 2013). This ensured that they were correctly allocated and that they accurately reflected the raw data (Fereday and Muir-Cochrane 2006), and these codes were then reviewed by the researcher's three supervisors. The coding of data did not present any problems. Moreover, discussions with the supervisors were held periodically regarding the coding and thematic analysis to guarantee a level of objectivity in the process of this research study.

Phase 3 - Searching for themes

This phase involved the use of thematic maps to investigate code similarities or patterns. Similar codes or patterns were used to cluster them into groups, which then generated wider themes. The codes were verified against the transcripts; this was done to ensure they were relevant to the main theme. The general meaning of the grouped codes was indicated by the category label. Subsequently, categories were grouped into sub-themes of broader themes and their fit was evaluated. Analysis of all themes was undertaken to confirm their relevance to the research questions (Yin 2014).

Phase 4 -Reviewing themes

The emerging sub-themes and themes were reviewed and refined. Furthermore, to ensure that they correctly denoted the underlying codes, certain sub-theme names were rectified. For instance, the sub-theme called 'the specialisation's title' was integrated into the sub-theme called 'MLS believe they play an important role'. Additionally, the existence of viable correlations between the sub-themes was ensured by reviewing them against the entire dataset (Braun and Clarke 2006).

Phase 5 - Defining and naming themes

An iterative process was applied to the themes, sub-themes, and codes, with repeated verification and revision. The titles of the themes and sub-themes were also revised one last time. Every theme then had a clear focus and boundaries related to their topic of concern so that the themes were distinct from one another (Braun and Clarke 2006).

3.9 Rigour and quality in mixed methods studies

This section addresses the rigour and quality of every phase of the present mixed-methods study. Veracity, consistency, applicability, and neutrality were the four parameters applied in order to assess those two properties (Curry and Nunez-Smith 2015).

3.9.1 Veracity

The 'truth' of research findings is denoted by veracity, this is associated with credibility and internal validity in qualitative and quantitative research respectively (Curry and Nunez-Smith 2015). Triangulation was performed to improve qualitative data credibility. Alongside construct validity, data credibility was further enhanced by employing more than one source of data and integrating various research directions (Yin 2014). Observation, focus groups, and interviews were among the major methods adopted.

Member checking was undertaken with two participants from each laboratory in order to enhance the credibility and dependability of the findings. During this process, the findings were reported to the participants so that they could confirm that their views and experiences were correctly represented (Lincoln and Guba 1985; Curry and Nunez-Smith 2015). The strategy applied to increase the credibility of qualitative findings, involved checking the extent to which findings were plausible compared to the entirety of data and searching for rival explanations that could elucidate the findings (Yin 2014). Divergent perspectives or findings were outlined.

Thematic analysis credibility was enhanced by involving three experienced researchers in the checking of theme coding and development (Nowell et al. 2017). Such a supervisory procedure enabled discussion of theme coding and development, whilst also making it possible to rationalise the decisions related to the analytical process.

The internal validity of the phase one surveys were assured by the use of valid survey tools. For example, the questionnaire of job satisfaction had been used previously in SA. The questionnaire on professional identity had also been previously used to measure MLS identity, and the leadership questionnaire had previously been used in the context of healthcare.

3.9.2. Consistency

Dependability and reliability are respectively reflected by the consistency in qualitative and quantitative research (Curry and Nunez-Smith 2015). In this case, each research phase was reviewed by three independent and experienced researchers to confirm dependability. Furthermore, the results were discussed and reviewed with research supervisors at each stage of both quantitative and qualitative data analysis. Qualitative data analysis involved ongoing refinement of codes, sub-themes, and themes according to the interview data and discussion with supervisors.

In the quantitative data, the internal consistency or reliability of each questionnaire used showed an acceptable level of a Cronbach's alpha-coefficient (see Table 11). Furthermore, prior to the phase-one survey data analysis, data cleaning was carried out in order to detect incorrect data entry or missing data that could have compromised the reliability of the findings (Curry and Nunez-Smith 2015).

A pilot of the phase one survey was conducted in the researchers' own university increasing the feasibility of an approach that is intended to ultimately be used in a larger scale study. A pilot observation, interview and focus group were conducted, using the interview guide designed for the study, with a small number of healthcare professionals from the study. These procedures were clearly documented and a qualitative database was set up in Nvivo.

3.9.3 Applicability

The degree to which findings are relevant to other populations or contexts reflects their applicability (Curry and Nunez-Smith 2015). In qualitative and quantitative research, applicability respectively refers to the transferability and generalisability or external validity of findings (Curry and Nunez-Smith 2015). In this case, each research location was described comprehensively to improve qualitative data transferability and this helped to

determine whether the findings were transferable to comparable situations. Furthermore, the protocols employed for the sampling method, participants, data collection procedures, and data analysis were also detailed (Curry and Nunez-Smith 2015). A standardised strategy was implemented when gathering data to enhance the external validity of the quantitative survey and the statistical methods were discussed in depth before being applied.

3.9.4 Neutrality

Neutrality is concerned with any a priori assumptions that the researcher may have, and which may bias the interpretation of the findings (Curry and Nunez-Smith 2015). It is known as objectivity in quantitative research and is considered a low-level threat (Curry and Nunez-Smith 2015). To improve objectivity, the major research process decisions were justified and outlined clearly. For example, critical decisions relating to design and analysis were documented to assist with comprehension and appraisal. Meanwhile, neutrality also refers to confirmability in qualitative research (Ritchie et al. 2014). In this case, confirmability was verified by subjecting the research process to independent review or external audit, as addressed in section 5.8.2 on dependability (Curry and Nunez-Smith 2015).

Reflexivity was proven by keeping a reflective diary throughout the research process.

3.9.5 Reflexivity

The ongoing self-evaluation and reflection process examines the potential impact of the researcher's stance and personal experiences on the research process and findings are known as reflexivity (Ben-Ari and Enosh 2010). This was achieved by recognising that the researcher's background as an educator in the area of leadership and management, and their previous role as an MLS with one year of experience. These might influence the research process.

Reflexivity is a defining feature of qualitative research, but in this case it had to be implemented for both qualitative and quantitative methods, given the mixed-methods nature of the adopted research design. However, due to the philosophical dichotomy dividing quantitative and qualitative research methods, reflexivity is not so common in quantitative research (Mauthner and Doucet 2003). Quantitative data collection is typically

construed as a formal, objective, and systematic approach for gaining information on a particular phenomenon from numerical data (Burns and Grove 2005). Furthermore, the setting of quantitative research is tightly controlled, and researchers usually attempt to be external, objective observers to reduce the likelihood of bias. Quantitative research does not take account of reflexivity because it is not thought to contribute to the collection of genuine quantitative data. In fact, a reflexive approach in quantitative research has been construed as a shortcoming because it can interfere with the control measures underlying the validity of quantitative research (Ryan and Golden 2006).

By contrast, reflexivity can generate fresh knowledge in qualitative research as it enables researchers to address discrepancies identified in the process of data collection (Ben-Ari and Enosh 2010). Furthermore, researchers can use reflexivity to deal with preconceived ideas by finding strategies for becoming involved in the research process (Ben-Ari and Enosh 2010). A reflexive approach permits researchers to demonstrate the manner of their involvement in the research process and their interaction with participants. Diary keeping throughout the research process is very useful for this reason (Ben-Ari and Enosh 2010). During this study, the researcher kept a diary from the start of data collection in October 2018. Amongst the aspects addressed in the diary were the time allocated to research areas, strategies for participant recruitment, and consideration of the impact of assumptions on the research.

3.10 Ethics, consent and confidentiality

Ethical approval

The research protocol was approved by the School of Healthcare Sciences, Research Review and Ethics Screening Committee, Cardiff University on the 14th August 2018. The School of Healthcare Sciences, Research Ethics Committee, Cardiff University gave ethical approval for the study on the 1st October 2018 (see Appendix F). The work was conducted in keeping with the research ethical frameworks (Economic and Social Research Council 2015).

Ethical permission to conduct the study was obtained from the committee of ethics in Saudi MoH as well. The MoH reviewed the study through the Institutional Review Board (IRB) at the health affairs of the city of Makkah and the committee of research and planning, to identify any ethical issues. The researcher was provided with permission to conduct this

study and to facilitate the contact with the selected laboratories (see Appendix G and H). The researcher followed the ethical and legal practice of Cardiff University in conducting this study.

Ethical issues

No major ethical issues were expected to emerge due to the research direction. There was no patient participation in the research. Investigating MLS professional identity and job satisfaction were not perceived to be highly sensitive areas. However, exploring leadership behaviour was a sensitive topic as MLS could be concerned that rating or describing their leaders might negatively affect them. This was minimised by providing the participants with anonymised returned sealed envelopes upon completion of the questionnaires. Names were removed and replaced with codes, participant information was anonymised and will be excluded from any publication or report arising from the study. All interviewers' names were allocated with numbers, so they were anonymised.

Informed Consent

The voluntary nature of involvement in the research was stressed in the case of every person invited to take part, participants were assured that their decision regarding study participation would be upheld and would have no implications for their MLS role. The role of the researcher as an MLS and a leadership and management lecturer was acknowledged and no health professionals known to the researcher were coerced to participate in the study (The Economic and Social Research Council 2015).

Observational Consent

These steps ensured that confidentiality was maintained, and that participant consent was given. The researcher informed staff about the study by attending staff meetings; dates and times of observational sessions were also provided. The researcher attached a timetable of his attendance on the main advertisement board in the laboratory. In addition, the researcher placed a poster in front of the main gate of the laboratory, this informed the staff that an observation session was running. No participant was identifiable through the collection of observation data, and no names, pseudonyms or place names have been

used. Finally, if the researcher observed something which he regarded as dangerous or against the policy of the workplace, management would be notified (ESRC 2015).

Consent for questionnaires

Information on the research aims and process were provided to the participants and the confidentiality of their survey answers was guaranteed. The questionnaires were non-anonymised, the researcher maintained the confidentiality of the participants by converting all names to codes. The purpose of non-anonymity was to enable the researcher to identify the participants, who had completed the questionnaires (first stage) and consequently their eligibility for participation in the second stage (i.e. the focus groups and interviews). This invitation was included with the request to complete the survey. Participant information sheets (see Appendix B) advised participants about the possible research benefits and risks as well as the sources of assistance available to them prior to, during and following the research (ESRC 2015). Furthermore, the participants were assured that the information they gave would not have an impact on their future employment. The participants who agreed to become involved in the research were required to sign a consent form (see Appendix C). Participants were informed that their participation was voluntary, and they could withdraw from the study at any time, without prejudice or consequences of any kind, but that the data they provided would not be removed.

Interview and focus groups consent

The participants were reminded that their participation was voluntary, and that they would have to sign the consent form prior to focus group sessions (see Appendix C). In addition, the researcher informed the participants of the purpose and structure of the focus groups and interviews and advised them that confidentiality would be maintained at all times and their identities would be anonymised (i.e. before, during, after the meeting and in the study) (ESRC 2015). The researcher asked each participant for his or her permission to audio record the entire meeting. The researcher reminded the interviewees that their participation was voluntary and that they could withdraw at any time from the study without prejudice or consequences but that their data would be used. Participants were informed that interviews would be audio recorded and they were asked to sign the consent

form prior to the interviews (see Appendix B and C). The researcher met the participants in a conference room and a private office within the laboratory to maintain privacy.

Confidentiality and anonymity

The rights, dignity and well-being of participants were protected by the coding of all data to ensure anonymity and confidentiality (ESRC 2015). Sites, organisations' names and individuals were not identified. To ensure additional security and confidentiality, the data gathered in SA, such as questionnaires and the researcher's notes, were kept in a locked cabinet in the researcher's office at Umm Al-Qura University or in a password protected computer file. After completing the data collection phase in SA, the collected data was stored in a secure locker in the school of healthcare sciences at Cardiff University. The researcher's computer was securely stored and protected by a password, only the research team were able to access the saved data. All interviews were recorded on a digital audio device and immediately uploaded to a secure encrypted server (OneDrive) provided by Cardiff University. The researcher then deleted the interviews from the audio device in order to maintain the confidentiality of participants. The notebook used for recording the observation data was destroyed after transcribing, using the confidential waste service provided by Cardiff University.

Summary

Chapter three has discussed the research methodology and how the researcher has undertaken data analysis. The rationale for conducting a mixed-methods approach has been presented as it was the most suitable approach to answer the research questions and reach study's goals. Various tools were employed to collect the data of the study, such as questionnaires, observations, interviews and focus groups. Rigour and quality of the collected data were discussed with supervisors to ensure the credibility of results. These processes were all informed by maintaining ethics principles and research integrity.

The next chapter will present the demographic data and insights into the professional identity of these MLS.

CHAPTER FOUR - Demographic characteristics and professional identity

4.1 Introduction:

This study's purpose is to explore the professional identities and job satisfaction of MLS in two hospitals in SA, together with an assessment of the leadership behaviour styles of their medical laboratory directors. The data in this chapter provides answers in relation to the professional identity of these MLS. This study's current findings will be presented in three separate chapters. Chapter Four presents the results for professional identity; Chapter Five presents the results for leadership behaviour and Chapter Six presents the results for job satisfaction. The MLS participants' demographic characteristics are described in the current chapter. Each chapter contains three parts: Part I offers the statistical evidence that addresses the research questions. Part II provides the results of the qualitative analysis of the data collected during the interviews and observational data. Part III presents the chapter's conclusion and mixed-method inferences.

4.2 Demographic characteristics

Demographic characteristics of 99 MLS, working in two hospitals at a Saudi hospital's medical laboratory in the Makkah region, were measured and the results are outlined in Table 12. A summary of the data, frequency and percentages for the participants' characteristics are also provided. The MLS's experience ranged from 1 to 15 years, those with 1-5 years' experience accounted for 34.3% (n=34), 6-10 years 33.3% (n=33), 11-15 years 23.2% (n=23). Only a small number of participants had in excess of 15 years' experience in the laboratory (9%, n=9).

The participants' ages ranged from 21 to 50 years, with the largest group being between 26 and 30 years of age (42.4%, n=42). The next group comprised those aged between 31 and 35 years (31.3%, n=31), with the smallest group being those under 25 years of age (1%, n=1). Finally, those participants aged above 40 years represented 9.1% (n=9).

The proportions of males (48.5%) and females (51.5%, n=51) were approximately equal. Most participants were medical technologists (68.7%, n=68), followed by medical

technicians (24.2%, n=24), and medical technologists (7.1%, n=7). Table 13 demonstrates the differences between the three disciplines within the MLS.

Two thirds of the participants had a bachelor's degree 66.7% (n=66), the remainder either had a health science diploma 19.2% (n=19) or a master's degree 14.1% (n=14). The number of participants who had been working as regular members of staff accounted for 71.7% (n=71), senior staff accounted for 10.1% (n=10) and supervisors 18.2% (n=18). The participants' salaries ranged from 3000 SAR (£600) to 23000 SAR (£4600). The largest group (62.6%, n=62) received a salary of between 8001 SAR (£1600) and 13000 SAR (£2600), followed by 25.3% (n=25) of participants who had a salary of between 13001 SAR (£2600) and 18000 SAR (£3600). The majority of the participants were Saudi nationals 97% (n=97), whilst the remainder 3% (n=3) were non-Saudis (see Table 12).

Table 12 Demographic Characteristics of the MLS (N = 99) from two sites

Characteristic	Category	Frequency	Percent
Years of experience	1-5 years	34	34.3%
	6-10 years	33	33.3%
	11-15 years	23	23.2%
	16-20 years	3	3.0%
	21-25 years	3	3.0%
	26 years or above	3	3.0%
Age	21-25	1	1.0%
	26-30	42	42.4%
	31-35	31	31.3%
	36-40	16	16.2%
	41-45	7	7.1%
	46-50	2	2.0%
	51 or above	0	0.0%
Gender	Male	48	48.5%
	Female	51	51.5%
Profession	Phlebotomist	0	0.0%
	Medical technician	24	24.2%
	Medical technologist	68	68.7%
	Medical technologist I	7	7.1%
	Pathologist with medical laboratory degree	0	0.0%
	Others	0	0.0%
Educational Background	Health science diploma	0	0.0%
	Higher health science diploma	19	19.2%
	Bachelor's degree	66	66.7%
	Master's degree	14	14.1%
	Pathologist with medical laboratory degree	0	0.0%
	Pathologist with Doctor of Medicine degree	0	0.0%
Position at work	Normal staff	71	71.7%
	Senior staff	10	10.1%
	Supervisor	18	18.2%
	Lab director	0	0.0%
Salary	3000-8000 SAR	7	7.1%
	8001-13000 SAR	62	62.6%
	13001-18000 SAR	25	25.3%
	18001-23000 SAR	4	4.0%
	above 23000 SAR	1	1.0%

Nationality	Saudi	96	97.0%
	Non-Saudi	3	3%

Table 13 Educational levels, positions and responsibilities of MLS

Education level	Position	Responsibility
Two-Year College Degree	Medical Laboratory Technician	Performs clinical laboratory testing under supervision and with a limited exercise of independent judgment. This can vary from the operation of highly-automated equipment to bench testing with manual preparation of solutions.
Four-Year College Degree	Medical Laboratory Technologist (or scientist)	Performs clinical laboratory testing exercising independent judgment and responsibility. This can vary from the operation of highly-automated equipment to bench testing with manual preparation of solutions and analysis of results.
Medical Degree (M.D.) and Residency Training Or PhD with the appropriate experience	Pathologist	Evaluates blood, urine, and other non-tissue specimens. Includes related activities such as setting guidelines for blood transfusion practice.

Source: Adapted from: The American Society for Clinical Laboratory Science (2012); Ministry of Health (2018), Saudi Arabia

4.3 Part I - Quantitative data

4.3.1 Research question (1): How do MLS describe their professional identity?

The professional identity scores provide answers for the first research question in the study and were rated using the Hall's Professionalism Scale (1968), this was subsequently updated by Swailes (2003). The professional identity findings were drawn from a scale of 5 points on a Likert scale, 1 being the lowest score and 5 the highest. The total number of participants in this study was 150 MLS, 99 questionnaires were returned resulting in a response rate of 66%. Table 14 describes the highest and the lowest MLS answer frequencies for each item in the questionnaire. For the purpose of the analysis, some item scores were reversed following the scoring sheet guidelines (Swailes 2003).

On the whole, participants held strong opinions regarding their commitment to the profession (see Table 14). However, the majority of the other professional identity items were located around the average showing that the participants did not have strong opinions in relation to the items they had scored. The selection of a midpoint may also indicate that participants are undecided or have no strong opinion, therefore caution should be exercised when it comes to interpretation (Weems and Onwuegbuzie 2001). However, the qualitative data in this study offers additional insight and further understanding of the average scores achieved in relation to MLS' professional identity.

Table 14 MLS answer frequencies (green colour refers to the highest score)

	Items	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Professional commitment	1. If I could go into a profession other than the one I am in, and which paid the same, I probably would. (R)	34	10	13	17	25
	2. I definitely want to make a career in the profession I am in.	6	12	26	20	35
	3. If I could do it all over again, I would not choose the same profession. (R)	24	8	17	24	26
	4. I like this profession too well to give it up.	12	21	23	14	29
	5. I am disappointed that I ever entered my profession. (R)	40	15	22	14	8
Autonomy	6. I make my own decisions regarding what is to be done in my work.	1	12	33	23	29
	7. My own decisions are subject to review. (R)	9	11	35	26	18
	8. I am my own boss in almost every work-related question.	25	21	22	13	18
	9. Most of my decisions are reviewed by other people. (R)	21	22	24	20	12
Belief in public service	10. Other professionals are more vital to society than mine. (R)	22	21	26	19	11
	11. I think that my profession, more than any other, is essential for society.	6	15	32	28	18
	12. Some other occupations are actually more important to society than mine. (R)	11	22	33	21	12
	13. If ever an occupation is indispensable it is this one.	14	19	22	22	21
Profession as referent	14. I systematically read professional journals.	17	23	39	9	11
	15. I regularly attend local professional meetings.	13	24	36	18	8
	16. Professional bodies do little for the average member. (R)	7	9	31	30	22
	17. Although I would like to, I don't read professional journals too often. (R)	11	14	37	25	12
Belief in self-regulation	18. My fellow professionals have a pretty good idea about each other's competence.	12	19	38	20	10
	19. A problem in this profession is that no-one knows what colleagues in other organisations are doing to improve standards. (R)	11	11	28	26	22
	20. We really have no way of judging each other's competence. (R)	9	16	28	26	20
	21. There is not much opportunity to judge how another professional does his/her work. (R)	7	8	45	21	18

*R: reversed scores

4.3.2 Descriptive statistics of professional identity's variables

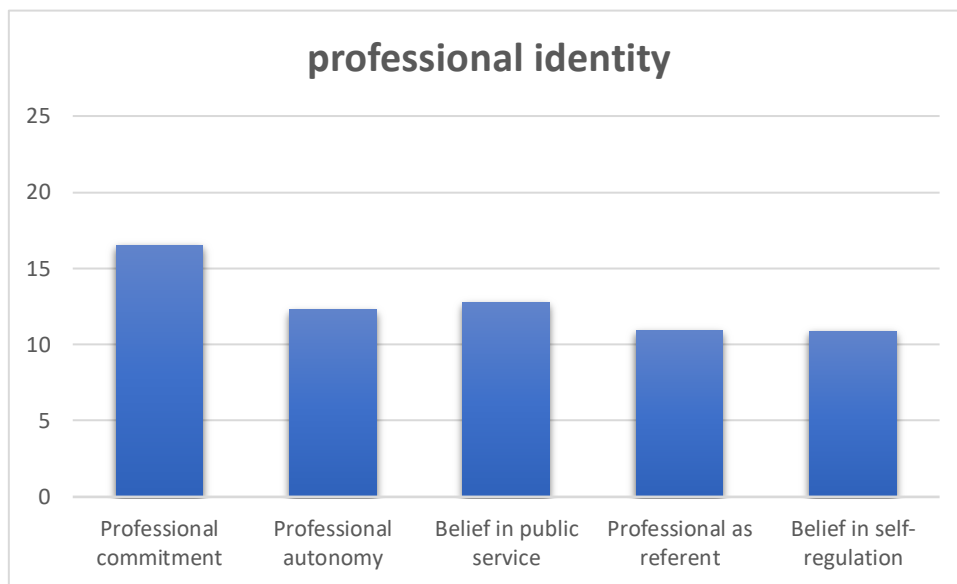
Table 15 shows the professional identity scores as means for MLS who were working in both hospital laboratories. Overall, MLS presented scores that indicated moderately high levels of 'professional commitment' with an average of 16.15 out of 25 (see Figure 7). Whilst 'professional autonomy' and 'belief in public service' both scored above the midpoint, with an average of 12.29 and 12.75 out of 20, respectively. The other two variables had mean scores which were almost on the midpoint of 10 out of 20, ranging from 10.93 for 'profession as referent' to 10.89 for 'belief in self-regulation' (see Table 15).

Further analysis has been undertaken to check data distribution and to identify whether the differences between lab A and lab B are significant.

Table 15 Summary statistics for MLS in both laboratories

Variable	<i>M</i>	<i>SD</i>	<i>N</i>	<i>SE_M</i>	Min	Max	Skewness	Kurtosis
Professional commitment	16.51	5.315	99	.534	6	25	.124	-1.031
Professional autonomy	12.29	2.715	99	.273	7	19	.011	-.367
Belief in public service	12.75	3.001	99	.302	4	20	.138	.250
Profession as referent	10.93	2.331	99	.234	4	19	.210	1.324
Belief in self-regulation	10.89	2.976	99	.299	4	18	.084	-.488

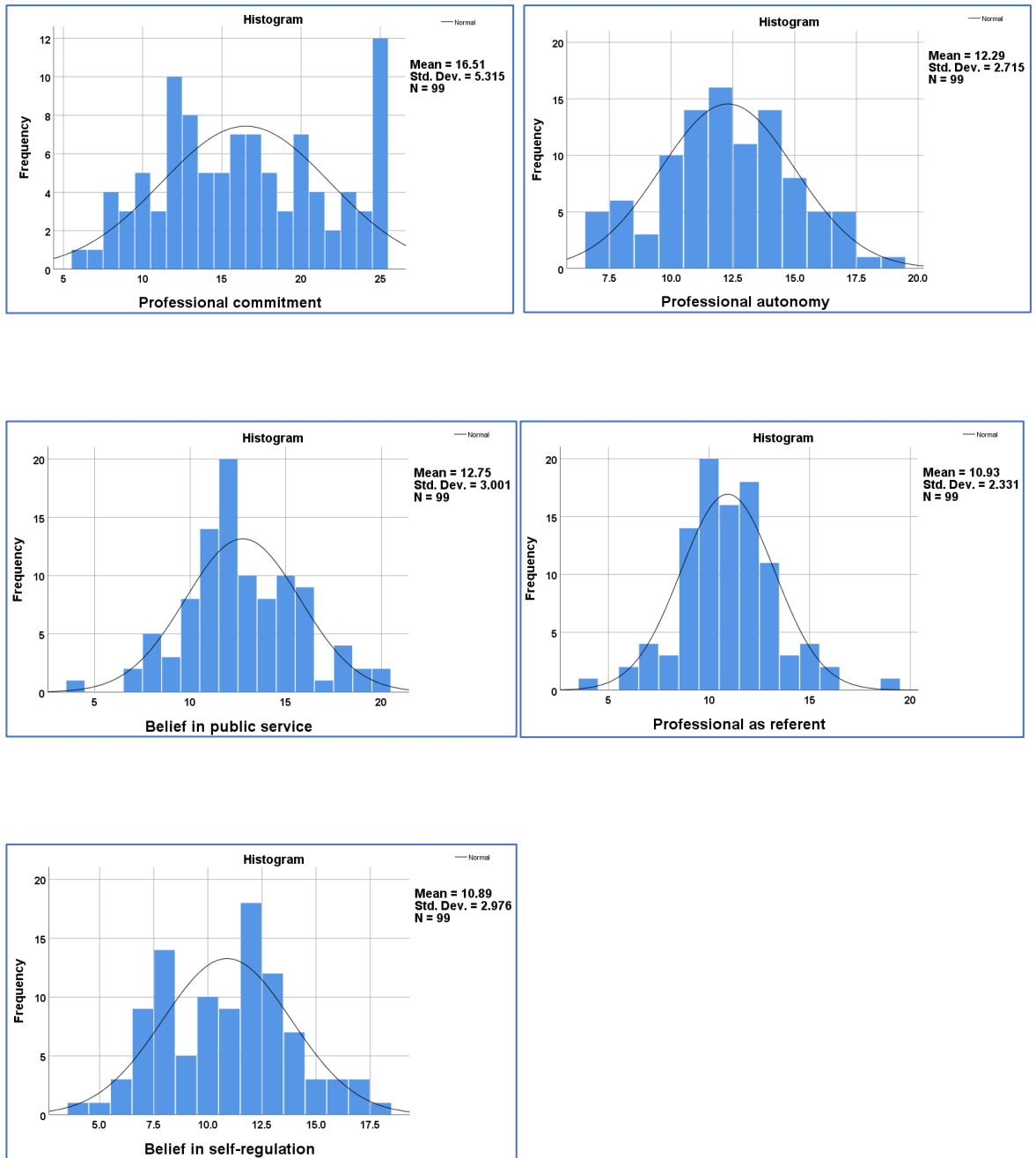
Figure 7 Mean scores of professional identity for MLS in both laboratories



4.3.3 Normality testing

Central Limit Theorem (CLT) was applied for the purpose of conducting parametric tests. The CLT states that for the purpose of considering data which are normally distributed, the sample should be sufficiently large, usually more than 30, regardless of the population's shape of distribution. The sample size for this study was large (n=99), this means that the sampling distribution can be considered as normal (Field 2013) (see Figure 8).

Figure 8 Histograms of data distribution of professional identity



4.3.4 Means Comparison of means

The differences in the professional identity scores between lab A and lab B (see Figure 9) were tested using a two-tailed independent sample *t*-test to examine whether the means of professional identity variables are significantly different. The variances were consistently homogeneous for all five variables, these were ‘professional commitment’, ‘professional

autonomy', 'belief in public service', 'profession as referent' and 'belief in self-regulation', indicated by $p > .05$ for Levene's test.

The results of the two-tailed independent samples t-test were not significant for 'professional commitment', $t(97) = -1.019, p = .311$, 'professional autonomy', $t(97) = -.010, p = .992$, 'belief in public service', $t(97) = .315, p = .753$, 'profession as referent', $t(97) = .680, p = .498$, and 'belief in self-regulation', $t(97) = -1.594, p = .114$. The findings suggest that the means for all variables were not significantly different between lab A and lab B. The results are presented in Table 16.

Figure 9 Professional identity mean scores in lab B and lab A

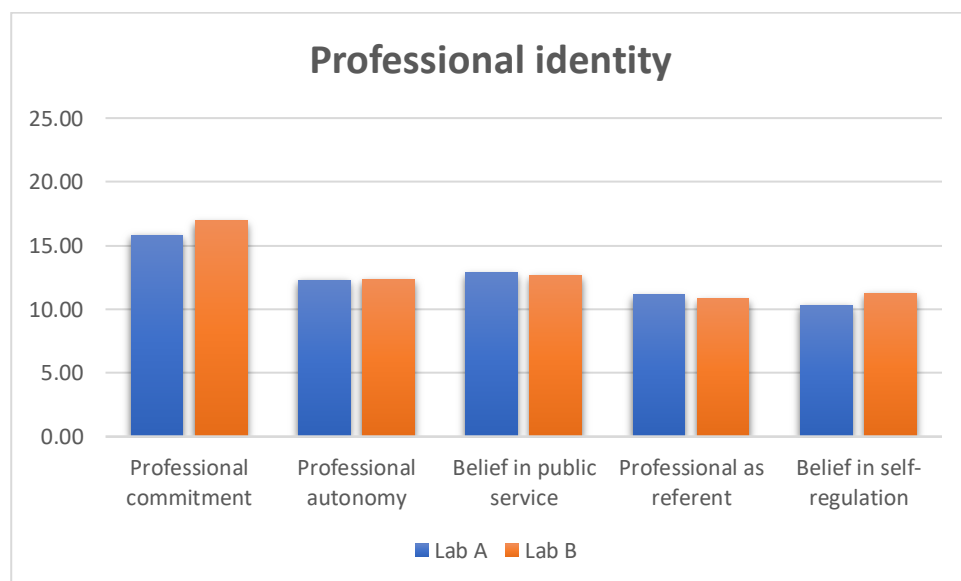


Table 16 Two-Tailed Independent Samples t-Test for professional identity variables

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Professional commitment	Equal variances assumed	.121	.728	-1.019	97	.311	-1.119	1.098	-3.298	1.061
	Equal variances not assumed			-1.019	78.788	.311	-1.119	1.098	-3.303	1.066
Professional autonomy	Equal variances assumed	2.173	.144	-.010	97	.992	-.006	.564	-1.125	1.114
	Equal variances not assumed			-.009	65.176	.993	-.006	.596	-1.195	1.184
Belief in public service	Equal variances assumed	.133	.716	.315	97	.753	.196	.623	-1.040	1.433
	Equal variances not assumed			.304	69.377	.762	.196	.647	-1.093	1.486
Profession as referent	Equal variances assumed	.010	.922	.680	97	.498	.328	.483	-.630	1.287
	Equal variances not assumed			.670	74.826	.505	.328	.490	-.649	1.305
Belief in self-regulation	Equal variances assumed	.027	.871	-1.594	97	.114	-.973	.610	-2.184	.238
	Equal variances not assumed			-1.624	83.309	.108	-.973	.599	-2.164	.219

Summary

The quantitative data from this phase of the study indicates that participants held strong opinions regarding their professional commitment. However, the participants' answers were seen to cluster around the average for the remainder of the variables, this indicates that the MLS did not hold very strong opinions on other professional identity variables. Further investigations are required to identify and understand the reasons why MLS selected midpoint scores. The differences in the professional identity scores between lab A and lab B were examined using the two-tailed independent samples t-test, this revealed that there were no statistically significant results. This could suggest that neither hospital is doing better than the other in term of professional identity development. The researcher also conducted non-parametric tests, such as Mann-Whitney U test, these produced the same results as the parametric tests. The qualitative data in the next section provides further explanation and complements the quantitative data.

4.4 Part II - Qualitative data:

The data in this section is derived from both semi-structured interviews, focus groups (FG) and the observational data. Qualitative interviews were conducted with 17 participants, this was the case for both hospitals. Eight held supervisors' positions and seven were technologists and technicians, the remainder were laboratory leaders. The total number of participants involved in focus groups was 10 in total, these took place in both hospitals. The total time spent gathering observational data was 96 hours.

Extracts from the interviews are presented in italics, these provide evidence for the subsequent identification of the main qualitative findings. Three main themes were identified from the thematic analysis of interviews and observation data (Braun and Clarke 2006). These themes were: 'belief in the job's importance'; 'professional recognition and lack of role clarity'; and 'feeling valued'. These themes were identified throughout the data collection and analytic processes as outlined in Chapter 3. Some changes were made to the interview transcripts, excessive information was deleted and replaced by '...', and the participant's identities were always protected by removing names and locations. The themes were then classified into sub-themes using participants' responses to identify emerging patterns in the data.

The quantitative data provided rich description with regard to the MLS' views of professional identity, and this was the case for both laboratories. The survey results were considered alongside the qualitative phase to investigate the issue further as additional data were gathered, this enabled discrepancies to be identified and further explanation to be provided. The themes presented below include results from the interviews, focus groups and the observational data.

4.4.1 Theme 1 - Belief in the job's importance

The first theme of this study focuses on the way in which MLS' perceived themselves within their profession and also how society and the medical community perceived the MLS profession. Theme 1 explores the belief in the job's importance and is derived from the data relating to this overarching belief, this information is presented in the figure below and is comprised of three sub-themes (see Figure 10).

Figure 10 Theme 1 - The belief in the job's importance



Sub-theme 1 - Choosing the profession

MLS' expressed a number of reasons for choosing their profession. Some participants had made their choice based on an internal desire, while the remainder chose it as a result of family influence or even pressure. For others it was the best option available to them at the time or was the only one that had university places available. Participants' opinions and responses varied widely in this part of the interview. For example, Participant P6 stated that they chose the profession because their father wanted them to work in the medical field:

(P6): *“I really did not want the laboratories major, as I was hoping to work in the media. However, my father wanted me to be in the medical field, the same as my brothers and sisters, so he helped me to get into this field, and thank God, in the end, I am satisfied.” [Participant MLS (6)]*

Participant P3 really wanted to study medicine as her major. However, there were no places available:

(P3): *“It was not my first choice; I chose the medicine speciality, but the seats were all taken and they would not even accept me in a pharmacy speciality or any other speciality. I do not know what the reason was for choosing the medical laboratory. In the first year, I was not convinced, in the second year I was a little bit convinced and, in the third year, I felt that I wanted to be in this department. I wanted to complete my studies in this department.” [Participant MLS (3)]*

Participant P13 shared his experience when choosing this profession, he was only aware of two medical majors available for study:

(P13): *“I only knew about the faculties of medicine and pharmacy. One day I was talking to my uncle about medical specialities, because my uncle is in the field of surgery. He told me that there was a major called medical laboratories. I was so excited and enthusiastic when he told me because I loved these things. I wanted to discover the world.” [Participant MLS (13)]*

Participant P5 was extremely optimistic and ambitious; however, the laboratory workplace does not provide the opportunities he seeks. The participant chose the profession based on his desire to serve patients. Participant P5's response was: *“I chose this career because I love it”*. This strong motivation for choosing the profession may have resulted from his previous positive perception of it.

Summary

The participants' responses suggest that, for some at least, their selection of this profession was something that they had 'settled for'. The participants' justification for choosing this career included factors such as family pressure or their desire to study medicine but no places being available. Therefore, the medical laboratory speciality was the only option

available to them within the medical field. Only two participants had actively chosen the profession as their preferred option, one participant had prior knowledge of the career whilst the other one did not. The differing responses from the MLS in this sub-theme could explain the average scores around professional commitment in the quantitative section and demonstrate that there is a lack of promoting or advertising this as a career option. This prompted the researcher to probe deeper to understand the MLS' beliefs in relation to their role in healthcare provision.

Sub-theme 2 - MLS believe they play an important role

Data from these participants suggest that they perceive themselves as playing an important role in healthcare provision. They can perform medical tests to detect diseases and to assist with the treatment of patients. However, the participants also revealed that at times they felt their roles were marginalised and worthless. Furthermore, some participants believe that the title of their specialisation has had an impact, they feel there is a lack of awareness of their role within healthcare provision. For example, the MoH referred to the profession as Allied Health Services. In addition, the data indicated that society used words such as 'disgusting' to describe the profession because MLS deal with stools and urine. This theme will cover two points. Firstly, it includes perceptions of the MLS role itself and secondly its lack of importance based on the way the specialisation is perceived according to the Saudi MoH.

The lack of importance of the MLS role is summarised by participant P13 who spent some time studying and working in medical laboratories overseas. P13 stated that the MLS role was not well known, even amongst doctors, in SA. In addition, the health system in SA has not given enough authority and independence to MLS to enable them to diagnose and treat patients. This could have a negative impact on their professional identity and may result in MLS' feeling that their roles are not worthwhile. Participant P13 believes the MLS role has greater importance than other roles within the healthcare system:

(P13): *"A doctor cannot determine the type of bacteria or microbes. A doctor cannot prescribe anything before going back to the laboratory. I feel that we are more important than doctors. Our role is really important. If we were like the foreign country I was in, they have a classification for a Laboratory Doctor. When I was*

there, they called laboratory specialists ‘Doctors’. They consider you to be a doctor.”
[Participant MLS (13)]

The researcher argues that doctors sometimes prescribe treatments for patients. However, they must use a laboratory result to confirm that treatment is a good choice, particularly if patients have no critical medical history.

In contrast, Participant P17 acknowledged that every speciality in the hospital, including doctors, plays a fundamental role in healthcare provision. The participant added that society does not have a full understanding of a hospital laboratory’s function; this is also the case for some medical departments within the hospital. According to her:

(P17): “My father and mother say that “my daughter is a doctor and, therefore, she is the most important of all”. You see how the community's view will not be changed. A doctor is a doctor, but they do not see that we are important”. [Participant MLS (17)]

Another participant, P10, described the hospital as being like a table that has four legs, with one of these legs being the laboratory. Therefore, the absence of one leg, the laboratory, would impact upon the hospital’s workflow. The MLS profession has unique merit that is not present in other professions:

(P10): “I think that the hospital would not stand without its laboratory, if we consider the hospital as a table. A table will not stand without legs; therefore, the laboratory represents the legs of this table. The laboratory is just like the other departments, but it needs to be presented to everyone.” [Participant MLS (10)]

According to the MoH, the title of the specialisation is “Allied Health Services”. However, MLS consider that they have a more vital role, this was supported by the following statement:

(P10): “I think that we are the fundamental services, but we are not Allied Health Services.”
[Participant MLS (10)]

The reason society sometimes uses the term ‘disgusting’ when referring to the profession is because MLS are required to handle urine and stool samples. The nature of their work requires MLS to conduct these types of analyses, this point seems to have a powerful impact on the professional identity of MLS. Participant P9 supports this claim:

(P9): *“The view of society is still not good. They say: “stools and urine” but this is the view of stupid people, especially girls, who say it is disgusting ...We are a big department with a million aspects, not just these two things”. [Participant MLS (9)]*

Participant P13 added:

(P13): *“They treat you as something disgusting because they do not know that this is a science, microbiology, genetics, etc...”[Participant MLS (13)]*

Summary

The participants considered the MLS role to be vital in the care of patients, medical laboratories play a role in detecting diseases and offering treatment plans. However, society, and even medical colleagues, is not fully aware of the laboratory’s role. Two names are given to the MLS profession - Allied Health Services and ‘disgusting’, this is because MLS deal with stools and urine. Participants believe that this is a consequence of the lack of awareness and understanding. This sub-theme reflects on the average level of belief in public services using quantitative data. MLS believe in the fundamental importance of their work and, therefore, a question could be asked about the feeling of pride they experience when carrying out their work.

Sub-theme 3 - Pride in the role

MLS seemed proud of the role they play in healthcare provision as they are involved in diagnosis, treatment and saving lives, as well as assisting doctors with decisions regarding critical clinical cases. Doctors are unlikely to perform surgical operations or prescribe treatment without first referring to laboratories. For example, a participant who works in a blood bank department described the importance of the role they played in saving people’s lives and controlling infectious diseases, particularly during emergencies:

(P17): *“I feel that we are very important in the blood bank department because we give blood and save people's lives. We are distinguished among all departments. I am not saying that we are the best but we are important, especially at times of crisis and pilgrimage...” [Participant MLS (17)]*

Participant P17 also added:

(P17): "We discover many people infected with Hep B, C or HIV and it is necessary for us to send their papers to Infection Control and then to Health Affairs to limit the spread of this infection in people's families and such information is needed in the Kingdom in order to identify the growing number of people who have cases of disease or viruses." [Participant MLS (17)]

In addition, P16 feels proud of her work within the field because she has an important role in detecting diseases and that no one else can do what she does:

(P16): "We are very important. For example, if there are diseases, how can anyone know if there is no expert person who has studied them in medical laboratories. No one will know! Nurses cannot know the types of samples." [Participant MLS (16)]

Supporting the previous advocate, Participant P11 gave an example of feeling pride in her job. She remarked that doctors cannot know whether or not a patient has a bacterial infection, the laboratory results provide the name of the bacteria and indicate which is the most efficacious antibiotic for treating it.

(P11): "We help the doctors to see the results. The results are extracted and the doctor has to wait for such results to proceed. I am talking about the department I am in. Samples come to me and then I tell the doctor the name of the bacteria and sensitivity test results and, on this basis, the doctor knows which antibiotic fits. This is important. How do you know that this patient has bacteria? Everyone has a role in this hospital and I think we have a part to play." [Participant MLS (11)]

This is also supported by participant P26, this participant also felt proud to be working in the field:

(P26): "I can participate in any medical discussion. My specialization gives me information about diseases and medical diagnosis. Laboratory department can diagnose all diseases and describe medicines. Physiotherapy department has to refer to laboratory department regarding some analyses. 80% of patients have to have the necessary medical analyses" [Participant MLS (26) FG.2]

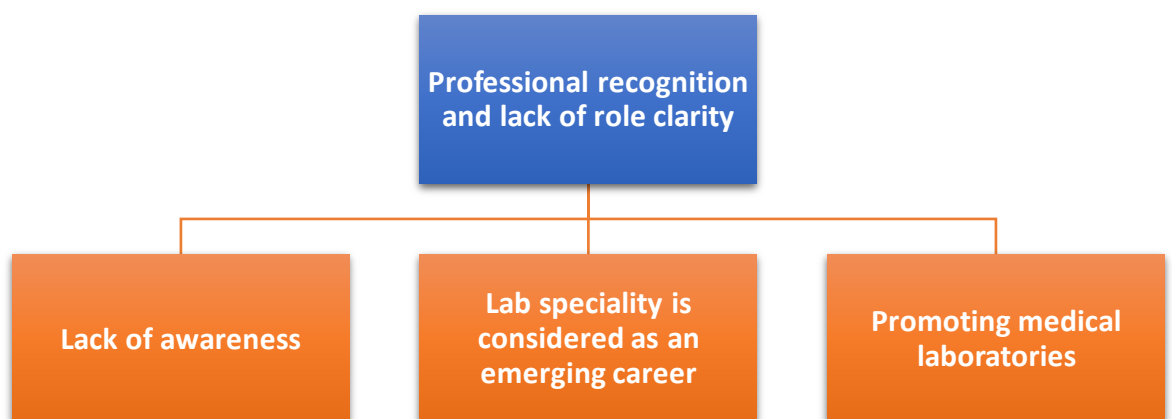
Summary

This theme confirms that most MLS do feel pride because they play a direct role in saving people's lives. In addition, they have a significant responsibility in detecting diseases, offering the correct treatment and assisting in medical decisions related to patients. It is important to ascertain the way in which this profession is perceived in society and also by the medical community as some MLS do feel pride in their role. This could provide further understanding of the reason why MLS do not express strong opinions about this issue, and also why it is not reflected in the quantitative data.

4.4.2 Theme 2 - Professional recognition and lack of role clarity

Professional recognition is another concern affecting the MLS role in healthcare provision. Lack of awareness about the MLS role in Saudi society, and the medical community more specifically, could be key issues, as expressed by these participants. This low profile resulted in laboratory roles being hidden and other medical professionals not having a full understanding of the MLS role. This theme presents three subthemes: lack of awareness, the laboratory speciality being considered as an emerging career and better promotion of medical laboratories (see Figure 11).

Figure 11 Theme 2 - Professional recognition and lack of role clarity



Sub-theme 1 - Lack of awareness

The qualitative data suggest that participants perceived the MLS role as being hidden, this could in turn impact on their professional identity. This profession does not appear to be well-recognised by society or the medical community, therefore MLS roles are not clear to most individuals. The poor professional recognition by the medical community and society, as perceived by the MLS, provides further understanding of the average response to professional commitment questions in the quantitative data. Sub-theme 1 covers two points, the general lack of awareness by society and being misunderstood by the medical community. Participant P10 claims that society in general has insufficient knowledge of the medical laboratory role:

(P20): "Society still has not any awareness about laboratories profession and do not have any idea about its role" [Participant MLS (20) FG. 1]

If these roles are ambiguous, this could have an impact on job status or prestige. This point is discussed in the present chapter as part of Theme 3. Another participant expressed a different point of view, suggesting that some individuals in society were aware of the scope of the MLS' role:

(P6): "They appreciate you and your work, so they feel that you offer them something wonderful. We give them the result of their analysis as we welcome them. Society's view of us is great, but not everyone understands the work of the laboratory." [Participant MLS (6)]

However, another participant felt that society, including some medical community professionals, lacked understanding of the MLS' role:

(P3): "Most of the outside people say that we don't do anything (MLS) and they think that the doctor is above everything, although most doctors do not understand our work." [Participant MLS (3)]

The claim that they are misunderstood by the medical community, including some doctors and nurses, seems to concentrate on those who do not fully understand the laboratory's work or processes. In fact, doctors do not explain the laboratory's functions or the MLS' role to patients because they do not fully understand it themselves:

(P1): *"I do not blame society because the doctors do not realise the truth about our role and work."* [Participant MLS (1)]

And,

(P26): *"Doctors ignorant with some blood analyses. Last week, a doctor was impolite with me, I asked him to speak more politely, he thinks that I'm inferior to him, when he discovered that he was wrong, he left without apologizing. Ethics should be available within all professions"* [Participant MLS (26) FG.2]

Another source of qualitative data, drawn from the observations collected by the researcher, provides evidence for sub-theme 1 (lack of awareness). A patient's relative came to the reception window of the laboratory and shouted at the lady working there. The man was frustrated by the delay in results.

The following observations were made from lab B.

Place: The reception of the lab B, **Actor:** staff (bachelor's degree, more than four years' experience), **Time:** afternoon session 3.50 pm,

Event: I was preparing to leave the laboratory at 3.50 pm, but I realised there was a dispute involving a lot of screaming and shouting between a staff member and a patient's relative who was asking about a sample which had been sent 3 hours earlier from the ED. The result was not yet available to the physician on the system. It took a long time to explain this to the patient's relative, but the relative failed to understand and left disappointed.

Interpretation: the perception of the efficiency of MLS staff was being affected by incorrect labelling of samples in ED. This may affect the way MLS professionals are viewed by hospital staff and members of the public. Physicians and patients need to be aware of the nature of the work in the laboratory, the types of test that can be performed and the time they take in order to improve the overall professional identity of MLS.

In addition, some doctors seem to believe that MLS staff are inferior and less well educated, or that they do not fully understand the purpose of each test in the laboratory. This could hugely impact upon the image the MLS have of themselves:

(P11): *“Honestly, we are working, but our roles are not clear even when a doctor deals with us (MLS). The doctor says, “You do not understand what I want” He thinks that I do not understand.” [Participant MLS (11)]*

Some doctors blame the laboratory if results are delayed or when another sample is requested in order to do a retest. Most of these issues are the result of doctors and nurses not having a full understanding of the way in which the laboratory functions:

(P8): *“Most of the doctors here distort our reputation. They say that the laboratory is the problem. They send the patients to us in reception and the patients are bored because of the delays in the doctors' procedures.” [Participant MLS (8)]*

Another negative reaction shared by the participants involved a doctor visiting the laboratory and claiming that MLS do not understand clinical urgency:

(P1): *“Regarding the doctors' view of the laboratory, we regret that they view that the MLS are a lower class than the doctor... We have had some problems at times that a Dr. X came down to the laboratory angry, especially during the night. We deal with these incidents and we do not let them pass without taking action ... For example, some doctors give us a call ordering a test in a certain way and we tell them that it could not work in this way. The doctors' response was: You teach me!!.” [Participant, MLS (1)]*

Summary:

These quotes provide evidence of an overall lack of awareness regarding the nature of the work carried out in the medical laboratory field. The qualitative evidence revealed that some individuals in society, as well as some medical professionals, do not fully understand the MLS' role. This poor perception, by society and some medical professionals, could offer an explanation for some of the average scores in relation to professional identity. The qualitative data presents the participants' responses to illustrate the general lack of awareness with regard to the MLS role and function. The findings confirm that a laboratory career is considered to be an emerging one, particularly in SA. This finding is discussed further in the next sub-theme.

Sub-theme 2 - A laboratory speciality as an emerging career choice.

The existence of diverse qualified professionals, such as graduates of applied science colleges and medical applied sciences, working in the laboratory could impact on the developing professional identity of the current MLS. Referring to the quantitative data, the emergence of this as a career choice could support the average professional identity scores of MLS in both participating laboratories. This subtheme discusses the emergence of this career choice and clarifies the roles of the multiplicity of qualified medical laboratory professionals.

The emergence of this as a career choice was supported by Participant P1 who explained that the profession was initially run by graduates of science colleges:

(P1): "All the graduates of sciences colleges, who are now working for the Ministry of Health, are mostly old graduates. They have gained experience with time and we have found that their level of experience has become close to the level of graduates of the faculties of applied medical sciences". [Participant MLS (1)]

Those older graduates may have the same experience in terms of using machines 'technique', but they may not have the medical background as the more recent graduates of applied medical sciences.

Similarly, another participant attributed the low standing of the career to the fact that it is still relatively new, and as a result few people are aware of it. Participant P16 shared their experience of attending a laboratory open day event that aimed to raise awareness of MLS as a career choice:

(P16): "The evidence was that all laboratory staff were chemistry and biology graduates but now they have stopped this system. The laboratory specialist is considered a new speciality and so far people do not know exactly what the laboratory is doing. When we started to do a laboratory day event, people began to understand what the laboratory is doing." [Participant MLS (16)]

Participant P9 also described the impact of having no clear job specification, technologists and technicians may practise the same tasks in both laboratories. As a result, the technologists felt they were underappreciated and that their professional identities were

threatened. The reason for this is that some consultants (laboratory doctors) and other medical staff think that MLS are not as well educated as they are. In fact, technicians may not have as much in-depth knowledge as technologists and the length of their studies can vary. Technologists can read and interpret the results (performing validation) as well as the consultants in the laboratory department. This point will be more thoroughly discussed in the autonomy section:

(P9): "There is no difference between us (technologists and technicians), and this is wrong. Each one has a role in the laboratory, but technologists work on devices as technicians and they leave the validation of the results to the consultants to do in the morning shifts." [Participant MLS (9)]

As technologists and technicians normally perform the same tasks and have the same level of responsibility, this lack of clarity is one of the key challenges for managers in medical laboratories. This point will be discussed in the leadership chapter but is supported here by Participant P1:

(P1): "In our laboratories in government hospitals, we have workers who come from different backgrounds. They come from the faculties of science (specialities: chemistry and biology), there are graduates of medical institutes and, finally, there are graduates of the faculties of applied medical sciences from Saudi universities. There is a challenge of how to create a suitable atmosphere in which all three categories mentioned above can work together." [Participant MLS (1)]

Summary:

It is apparent that the professional identity of this career is adversely affected by the presence of variously qualified MLS professionals. The identity of this speciality as a career has emerged gradually and in such a way that society and medical professionals have tended to ignore it or have failed to recognise its importance. In addition, it is clear the systems within medical laboratories may not set clear boundaries between the role of medical technologists and technicians, as has been stated by participants from both laboratories. This results in the role of MLS being unclear even to the staff themselves, this is reflected in their opinions which cluster around the mean in the quantitative section. Therefore, greater awareness is essential, in society at large, and for medical professionals

in particular, who need to be more aware of the role of medical laboratories in the healthcare system. Sub-theme 3 will discuss these points in more depth.

Sub-theme 3 – Promoting (or recognising) the contribution of medical laboratories.

Gaining recognition and being regarded as an important part of the healthcare system should perhaps begin with education of those who are closest to the MLS, their family and relatives who are part of wider Saudi society. Medical professionals working within hospitals in this country should also be included. Participant P17 shared an example of seeking to educate her own family about the MLS role:

(P17): "It starts with us (MLS). I mean, if someone talks to us, we should explain to him/her and show them our role and then, from one person to another, this message will spread and the culture will begin to change as well. For example, when my parents said that a physician is more important than a laboratory specialist, I had to sit with them and explain to them how doctors know if there is diabetes and how they discover that I am a diabetic." [Participant MLS (17)]

In addition, participants suggested the promotion of the MLS role through health awareness campaigns that aim to educate society about diseases more broadly. The researcher in this study recognised that both laboratories were actively participating in such campaigns. Participant P13, for example, shared the pleasure they felt at helping out and also educating society:

(P13): "We are here to help society. One day I stayed at work late, until 9 pm because we offer a service called a voluntary service, the goal of which is to help society. If I do health awareness sessions, many members of the family will benefit. For example, the awareness message from me will be conveyed to a patient, they will deliver it to family members and those members will learn and spread this message to the other society members, like kids to their friends at school.etc. We feel happy because it is like we are being given a reward from God." [Participant MLS (13)]

Participant P16 stressed that hospitals, which are mainly run by doctors, also have a role to play in educating society as hospitals are often involved in the promotion of their departments:

(P16): "The community's view should be changed, starting from hospitals and health affairs. The laboratories could possibly try to promote themselves but, in the end, a laboratory is under the hospital. As the hospital promotes Intensive Care Units and other departments, so they should do the same for the laboratory." [Participant MLS (16)]

However, laboratory department managers can also contribute to promoting the role of MLS through regular communication with those outside the department. This point is supported by Participant P1:

(P1): "This view needs years to change through constant communication with the leader or even with the Ministry. It must be strong and effective. In the hospitals' medical councils, the leader of the laboratories must communicate with doctors and correct their bad perceptions about the laboratories. In health affairs meetings and ministry meetings, the general director of regional laboratories must correct their perceptions and make them aware. There must be communication." [Participant MLS (1)]

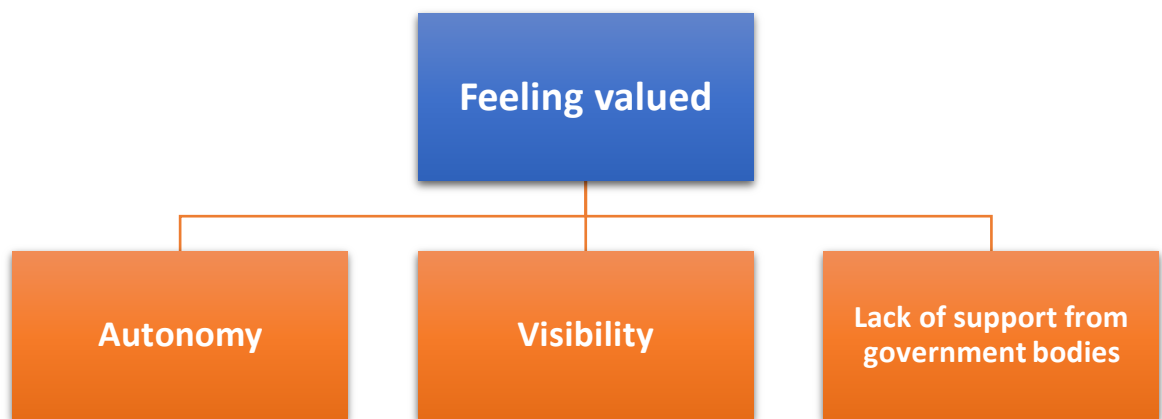
Summary:

It can be concluded from these data that increased awareness of laboratory careers might result in enhanced levels of professional identity. Lack of awareness has been identified as having a negative impact on the professional identity of the MLS, this could be due to the MLS speciality being considered currently as an emerging career choice. Thus, MLS are themselves working on promoting the medical laboratory career, a lack of awareness could lead to a further distortion of the image of MLS, particularly by doctors, as they deal directly with patients and thus society in general. The poor perception, that these participants said society and medical professionals already have, could explain the average scores obtained in the quantitative data in relation to professional identity. Therefore, the next theme provides data around the question of feeling valued, as the MLS may be lacking in this respect.

4.4.3 Theme 3 - Feeling valued

The concept of feeling valued has been defined as a “positive response arising from confirmation of an individual's possession of qualities on which worth or desirability depends” (White and Mackenzie-Davey 2003, p. 228). The participants in this study emphasised that their role is not well recognised by other professionals, such as doctors, nor by society in general. This theme will be explored using three sub-themes which present data on ways in which this situation could impact upon how valued the participants feel (see Figure 12).

Figure 12 Theme 3 - Feeling valued



Sub-theme 1 - Autonomy

Participants in this study were concerned that the system did not enable them to use their training and experience fully. It has previously been mentioned that the data suggests a lack of clarity in the MLS role and this point will be elaborated further in the sub-theme. Participant P9 clarified the present situation in the laboratory:

(P9): “Each one has a role in the laboratory, but specialists work on devices as technicians and they leave the validation of the results to the consultant to do in the morning shift.” [Participant MLS (9)]

It is clear that laboratory consultants are the ones that take the final steps and release the results to clinical colleagues. This leaves the analysis and laboratory machine work to be

undertaken by MLS even though they have been trained to interpret and validate results themselves. Participant P6 confirmed that MLS can actually deal with result validation:

(P6): "Can you imagine that we came here, and we did not apply what we studied in university? Do you know what I mean? We know how to read and extract the results. We learned well and we studied with Dr. XX in chemistry and Dr. XZ in haematology. They taught us many things but, in the end, we did not care about such things because it was not our major job." [Participant MLS (6)]

And,

(P22): "There was a case which has blood toxicity due to high doses of vitamin D, the consultant of the laboratory accepted the results without notifying the medical department, which was the ICU. The consultant of the laboratory is not qualified and competent. My role as a technologist I notified the department since the result released" [Participant MLS (22) FG.1]

The previous quote showed that the MLS are qualified to practise and judge the standard of their work without the involvement of the laboratory consultants. However, there is a possibility that the consultant may forget or get confused due to the huge volume of samples. It seems that the role of each professional in the hospital laboratory is to complement others to reach a high level of expertise.

This issue seems to be related to laboratory policies and it is not supportive of the role of MLS. Another participant also discussed the impact of lack of such autonomy on MLS, such as failing to remember some of the skills they had been taught:

(P15): "The current policy is that you are not authorised to check the slides or to extract the results. You are not authorised to see the results or to read the plates. We have a doctor (a laboratory consultant) in each department who writes the result and presses F7 and F8 to release results on the system! While there are specialists who can do this job, I wonder why a doctor (a laboratory consultant) interferes with the results. The specialists have become closed minded because they are not practising their jobs! They have reached the stage where they have stopped thinking." [Participant MLS (15)]

Another factor which could be threatening the autonomy of the MLS is that the main laboratory machines are fully automated, they do not require a professional to interpret the results so they can be sent directly to doctors:

The following observations were made from lab B.

Place: At lab B, **Actor:** member of staff (bachelor degree, more than four years' experience),
time: morning session from 8 am to 12 pm

Event: Informal interview with three MLS: about the future of the laboratory

Three MLS were talking about the future of the medical laboratories. They said now there is a movement towards robotic laboratories. Many medical companies, e.g. Siemens, Abbott and Roche, are working on developing fully automatic machines that reduce the interventions of MLS or make our roles functionless ... Furthermore, here in the lab physicians do not believe in our role as MLS. You remember that when we graduated from the School of Applied Medical Science with a difference in the year of graduation, we had studied many subjects that gave us a good background in our role as MLS. But, when we were confronted with reality, physicians did not pay enough attention to us and our opinions were always ignored. Physicians believe in the machines more than our physical examinations.

Summary:

Lack of autonomy in practising the role has a negative impact on MLS in terms of failing to remember skills and knowledge gained. As a result, MLS may appear to lack competence and this can prejudice doctors' opinions of the profession. Participants identified that the laboratory policy of consultants releasing results impacts on the MLS general sense of autonomy. The advanced technology of medical laboratory machines has been identified as another possible factor impacting on the autonomy of MLS. This is because there is no need for the interpretation skills of MLS to be questioned as the results can be sent directly to doctors. Furthermore, the average score for professional autonomy in the quantitative data may have been affected by this situation. This also results in MLS being less visible due to the factors mentioned above.

Sub-theme 2 - Visibility

This sub-theme provides further evidence that the MLS role is not well perceived by society and the medical community generally. It is made up of three patterns that describe the way in which people regard MLS, these include issues of invisibility, the use of blue lab coats and the lack of prestige.

Invisibility means that the MLS feel that no one can really see them - neither society nor the medical community. As mentioned previously the MLS role is not well understood, and their significance has not been recognised. According to Participant P9:

(P9): "We are invisible we are important for doctors and the nurses, but they think we are nothing". [Participant MLS (9)]

Participant P5 discussed the same point but gave a further important reason for the apparent transparency of MLS, stating that most doctors think that laboratory practitioners are simply biology or chemistry graduates rather than having graduated from medical colleges:

(P5): "Doctors see us as nothing because we have a bachelor's in biology or chemistry and they do not even know that there is a faculty of medical applied science." [Participant MLS (5)]

This issue further confirms the lack of awareness of the MLS role in the hospital. This could be because nurses and doctors are more visible to patients and other medical departments in the hospital, whereas the MLS staff are working behind the scenes.

Dress code is another issue impacting the professional identity of MLS. It is well-known in SA hospitals that blue lab coats are assigned to hospital cleaners. If the MLS are also wearing blue lab coats, they might be mistaken for cleaners and asked by a member of the public or the medical community to clean something:

(P11): "When we face people treating us as cleaners, even doctors, they do this because we wear blue lab coats." [Participant MLS (11)]

The effect of wearing blue lab coats is not limited to an impact on the professional identity of MLS. It also seems to have an impact on them psychologically, they feel inferior to other

medical practitioners in the hospital. Although MLS and other medical practitioners all work in the same hospital, the MLS speciality is perceived as of lower class due to the practice of wearing blue lab coats:

(P9): "I am a senior specialist, I am like a doctor, so why do they have this lower-class view? Why do I have to wear blue? It is a big problem. I am disturbed psychologically if I see myself in the mirror wearing blue clothes, I do not care about people's view if they see me as a cleaner, all I care about is my look for myself, but why should I wear blue? Its name is lab coat, it means special for us." [Participant MLS (9)]

Conversely, another participant did not care about the colour of the lab coat. As it is the legal colour, the participant thought it was important to follow the rules:

(P8): "Researcher: Why do you wear a blue coat?"

Participant: This is the legal colour.

Researcher: There are people who are annoyed by this. Through my previous discussions, it was a problem for others in the lab.

Participant: Yes, but it is ok for me. I don't care." [Participant MLS (8)]

It is important to clarify that the issue of blue lab coats has been raised by some females but has been largely ignored by most male participants. This is because females wear these lab coats all the time whilst they are working in the hospital or outside instead of wearing 'Abaya' for cultural reasons. Wearing blue lab coats, however, could be one of the significant issues affecting the prestige of MLS.

It seems that this sub-theme is interwoven with other themes and sub-themes in this chapter as participants have discussed the range of issues that could have an impact on their job prestige. Therefore, the researcher has included this sub-theme to help clarify the views of MLS and to prompt suggestions for resolving the problem. This has been identified by employees in laboratories, for instance:

(P1): "Regarding the doctors' view of the laboratory, we still regret that they see that the laboratory specialism is lower class than the doctor." [Participant MLS (1)]

This view was expressed by another MLS participant who stated that a laboratory career is not seen as being as prestigious as other medical careers:

(P9): *“But from a prestige view, the laboratory does not have this view.” [Participant MLS (3)]*

Participant P5 also attributed the issue of the poor prestige of a laboratory profession to the weak administration of laboratory services:

(P5): *“The problem is the thing that makes the doctors not care about the laboratory is its weak administration of the laboratory in most hospitals, even in the rest of the regions”. [Participant MLS (5)]*

This point was clarified by Participant P14, the heads of laboratories are the only representatives of the laboratories involved in the medical councils of hospitals. Therefore, it is claimed that it is up to them to clarify the role of MLS and their educational levels:

(P14): *“I think and feel that we should increase the prestige of the laboratory, especially when doctors meet in the hospital’s medical council. So, doctors see us as nothing because we have a bachelor’s in biology or chemistry, and they do not even know that there is a faculty of medical applied science. And they think we don’t have high qualifications, such as master’s degrees.” [Participant MLS (14)]*

The previous points were confirmed by the response of Participant P1 who said that a laboratory career was considered to be a low-class job. However, Participant P1 also suggested that stronger and more effective communication with other medical departments of hospitals could help to enhance the laboratory’s image as well as the professional identity of MLS:

(P1): *“Regarding the doctors' view of the laboratory, we still regret that they see that the laboratory is a lower class than the doctor ... I think their view of the laboratory staff is changed and it is now very respectful, particularly in the recent period, in the last 3 years, because most of the feedback that comes from other medical departments is very positive and encouraging after we have strong communication between us and the hospital medical departments, this has led to an understanding of the role of the laboratory”. [Participant MLS (1)]*

Participant P1's response suggests that the way in which the MLS role is perceived has only been relatively enhanced up until the present, this could provide an explanation for the quantitative data which showed average responses to this question.

Summary:

This sub-theme presented data on three issues which could impact upon the visibility of MLS, these include invisibility, the wearing of blue lab coats and job prestige. MLS normally work behind the scenes in the hospital. Thus, they are not as visible as nurses and doctors who can be seen by patients and other medical professionals every day. The colour of the lab coat is a system issue, but it further decreases the prestige level of this job. The poor visibility of this profession could be a reason for the low level of professional identity. The MoH, other governmental bodies and society need to recognise the importance of the role, this would in turn enhance the professional identity of the MLS.

Sub-theme 3 - Insufficient support from governmental bodies

It is clear that factors previously discussed in this chapter could affect the professional identity of MLS. In this sub-theme, the researcher reports data aimed at answering the question "What does the Saudi Commission for Health Specialties (SCHS) do for MLS?", the researcher noted that many participants seemed disappointed in the Commission. All participants agreed that SCHS does not currently offer MLS anything useful. According to Participant P7, SCHS is only responsible for the issuing and renewing of licenses. The participant also added that SCHS make things complicated, and it seems that SCHS have failed to publicise their functions:

(P7): "The SCHS has made things difficult and has not done anything. It has made job titles more complicated. So, these are the problems they have caused, but what is their work? I do not know if they have modified things in the profession. I do not know as I have no background and I have no idea about the role of the Saudi Commission for Health Specialties." [Participant MLS (7)]

Participant 16 felt that the SCHS had limited programmes and activities for MLS compared with physicians who have a variety of board programmes available to enrol in:

(P16): "I did not see anything. I only see that it is like a renewal card. I heard that they have conferences and programmes. Most of them are for doctors, only some programmes for microbiology and chemistry are available for laboratories."
[Participant MLS (16)]

Another participant commented that SCHS had disadvantaged MLS by failing to recognise specialisation in their job title. For example, the microbiology speciality has three subspecialties such as bacteriology, virology and parasitology. MLS usually graduate with general medical laboratory degrees. When they are awarded masters' degrees in specific areas, such as virology, their job title should be modified by SCHS according to their acquired degree. However, the SCHS continues to regard them as general MLS and their job title remains the same. As a result, they do not receive the extra allowances associated with some minor specialisation in the laboratory:

(P11): "It does not offer anything, on the contrary, the Commission for Health Specialties harms us. It just takes and does not give. For example, in classification, when I wanted to renew the classification certificate, the Commission for Health Specialties had changed the names according to their own opinion. This was harmful to the staff because they lost financial allowances...The Commission does not care about MLS". [Participant MLS (11)]

Summary:

This sub-theme has examined the impact of government bodies on the professional identity of MLS. As described by participants, the main function of SCHS is to renew health professional's licenses and to classify healthcare practitioners according to their medical qualifications. However, SCHS provides additional courses for many specialities, this could result in MLS feeling their specialism is less important. Attending regular meetings, conferences and courses organised by SCHS could enhance the professional identity of MLS who feel that SCHS is a major referent.

4.5 Part III: Conclusion and mixed-method inferences

This chapter provides a rich description of the MLS' professional identity. The participants' responses to the study's first research question, which is focused on describing MLS'

professional identity, provided a broad range of information. Statistical analysis firstly offers evidence that there are no statistically significant differences between the two laboratories in terms of the professional identity scores. This evidence was established by conducting t-test for parametric data. As a result, both laboratories could be treated broadly in the same way in terms of conducting further qualitative investigations. Five dimensions of professional identity were measured using a reliable and valid questionnaire, this was completed by 99 participants. The scores on the professional identities scale ranged from 10.89 (equivalent to 2.75 on Likert scale) to 16.51 (equivalent to 3.4 on Likert scale). Therefore, the level of MLS professional identity, appears to be average. The qualitative data was analysed to gain a better understanding of the reasons for the average scores.is

The qualitative data's purpose was to explain and investigate the issues around the MLS' professional identity. The interview transcripts and observational data revealed three primary themes: (a) their belief in the job's importance, the MLS shared their reasons for choosing this profession and described their role and their pride in it. The previous theme's average result leads to impact (b) professional recognition and related issues such as lack of role clarity. This theme shed light on issues such as society having insufficient knowledge of the MLS' role and it being misunderstood by other medical professionals. This could be due to the profession being regarded as an emerging career choice and a lack of role clarity in relation to MLS duties. Specifically, the way the similarity between the technologist and technician role has impacted on professional identity. As a result, the current MLS are promoting the profession in order to enhance their professional identity. Finally, the issue of (c) feeling valued from working in this profession also seems to be poor. Many of the issues highlighted by the participants could explain this, such as poor autonomy, lack of visibility, the unfavourable names this profession is given by the MoH, the wearing of colours also worn by hospital cleaning staff, and the general lack of support by government bodies.

In conclusion, the results in this chapter have indicated that the MLS participants display only an average level of professional identity at present. Three elements were identified to explain this situation, these included the role being poorly understood in society, by medical professionals and by governmental bodies; all of which should play a key role in

enhancing the profession's professional identity. Other factors, such as leadership behaviour and job satisfaction, should also be considered as they have a direct or indirect impact on any profession. These two points will be discussed in the following two results chapters.

CHAPTER FIVE - Leadership behaviour

5.1 Introduction

This chapter provides answers to the third question in the study, the perceived leadership behaviour of MLS leaders. It commences with a description of leadership styles within both hospital laboratories and examines whether one was more effective in terms of leadership style for MLS. The challenges facing leaders and supervisors will be explored and the effect of leadership on professional identity will be examined. This study's findings are presented in three parts: Part I offers the statistical evidence that addressed the research questions and informed the qualitative data. Part II provides the results of the qualitative analysis of the data collected during the interviews and also observational data. Part III presents the chapter's conclusion.

5.2 Quantitative data

The responses to leadership behaviour were scored using the leadership style questionnaire to measure task-oriented leadership and people-oriented leadership (Northouse 2016). The leadership behaviour results were drawn from a scale of 5 points on a Likert scale, (1 = never to 5 = always). The number of participants in this study was 150 MLS, 99 questionnaires were returned resulting in an overall response rate of 66%. The frequencies for each item in the questionnaire can be seen in Table 17.

The most notable result in Table 17 was the score for statement 2, "Acts friendly with members of the group" – this represents one example of people-oriented leadership scores. However, the qualitative data gave a slightly different impression, as it indicated that the leader of lab A did not demonstrate a high level of leadership behaviour, and for this reason further investigation was undertaken. Each statement of the leadership questionnaire has therefore been displayed using histograms/boxplots to identify the difference between the answers for the two laboratories (see Figure 16). In addition, a two-tailed independent samples t-test was conducted, this indicated that there were significant differences between the two groups (see Table 19). The highest score for statement 2 of the questionnaire referred to answers given by lab B, interestingly this is consistent with the qualitative data.

Table 17 MLS answer frequencies (green colour refers to the highest scores)

Items	Never	Seldom	Occasionally	Often	Always
1. Tells group members what they are supposed to do.	6	14	30	18	31
2. Acts friendly with members of the group.	5	10	23	22	38
3. Sets standards of performance for group members.	13	13	20	23	30
4. Helps others feel comfortable in the group.	13	20	19	16	31
5. Makes suggestions about how to solve problems.	11	22	22	22	22
6. Responds favourably to suggestions made by others.	20	14	15	20	30
7. Makes his or her perspective clear to others.	14	27	15	15	28
8. Treats others fairly.	23	16	18	17	24
9. Develops a plan of action for the group.	13	18	22	20	26
10. Behaves in a predictable manner toward group members.	15	17	23	24	20
11. Defines role responsibilities for each group member.	10	15	21	28	25
12. Communicates actively with group members.	13	19	23	17	27
13. Clarifies his or her own role within the group.	14	20	15	21	29
14. Shows concern for the personal well-being of others.	23	16	21	16	23
15. Provides a plan for how the work is to be done.	8	26	17	22	26
16. Shows flexibility in making decisions.	16	18	19	21	25
17. Provides criteria for what is expected of the group.	14	20	20	24	20
18. Discloses thoughts and feelings to group members.	17	14	27	21	20
19. Encourages group members to do quality work.	11	17	19	23	29
20. Helps group members get along.	14	18	21	17	29

Statements with odd numbers represent task scores, even-numbers represent relationship scores

5.2.1 Descriptive statistics of leadership behaviour's variables

Table 18 shows leadership behaviour mean scores for both laboratories. The scores for task-oriented leadership and relationship-oriented leadership were almost identical. They fell in the range of 'moderately high' according to Northouse's (2016) scoring guidelines (see Table 18). However, further analysis was required to check data distribution and to identify whether there are significant differences between labs A and B.

Table 18 Shows summary statistics for MLS in both laboratories

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	<i>SE_M</i>	Min	Max	Skewness	Kurtosis
Task-oriented leadership	33.28	12.01	99	1.208	10	50	-.129	-1.313
Relationship-oriented leadership	32.41	12.58	99	1.265	10	50	-.154	-1.264

Figure 13 Mean scores of leadership behaviour for MLS in both laboratories

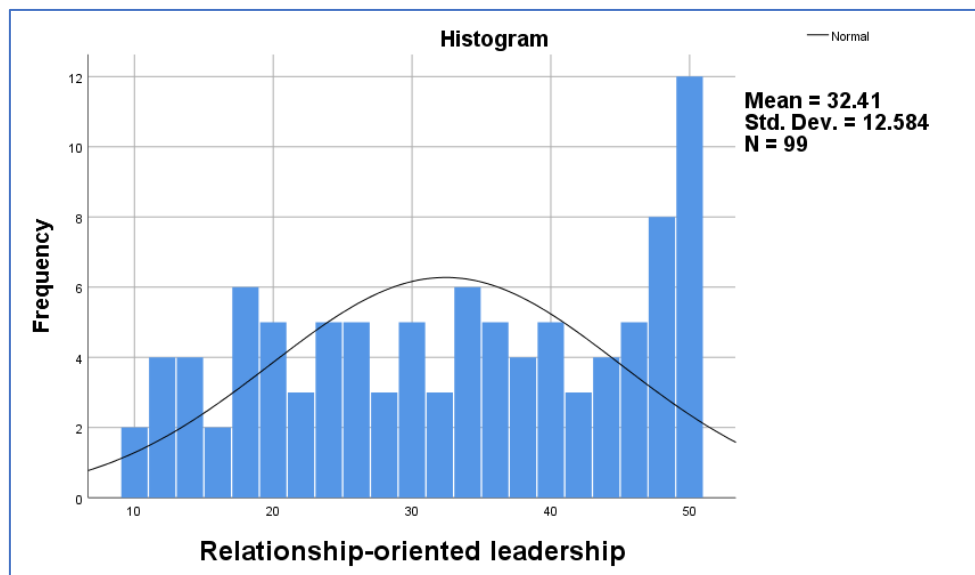
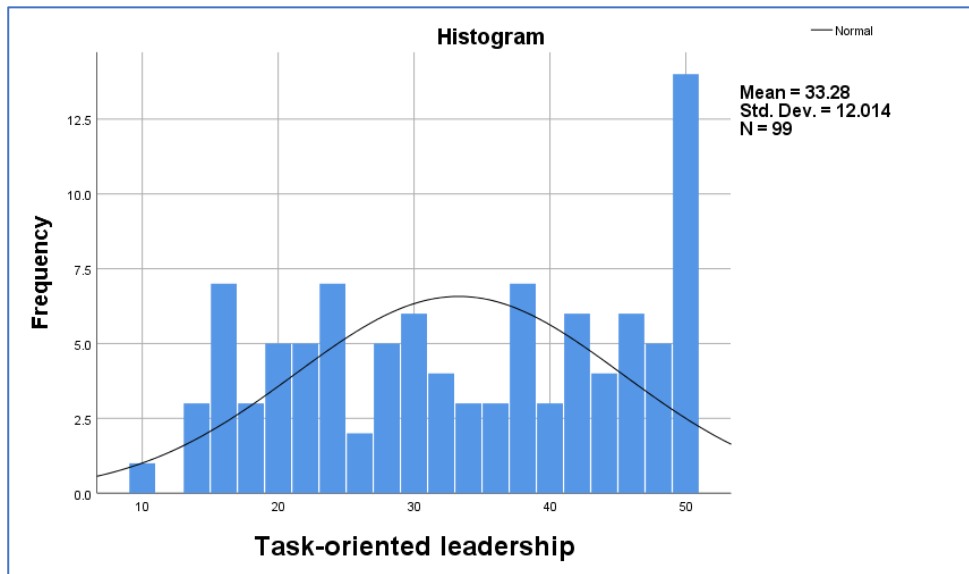


5.3 Normality testing

CLT was applied for the purpose of conducting parametric tests. The CLT states that when considering normally distributed data the sample should be sufficiently large, this means more than 30, regardless of the shape of the distribution. The sample size of this study was

large (n=99), meaning then that the sampling distribution can be considered normal (Field 2013) (see Figure 14).

Figure 14 Histograms of data distribution of leadership behaviours



5.3.1 *Research question (3): a) What is the leadership behaviour of medical laboratory leaders?*

5.3.2 Means comparison

For lab A, the mean of relationship-oriented leadership score was 25.08 ($SD = 13.06$), while for lab B the mean relationship-oriented leadership score was 36.98 ($SD = 9.91$). For lab A, the mean task-oriented leadership score was 26.53 ($SD = 12.16$), while for lab B, the mean task-oriented leadership score was 37.49 ($SD = 9.88$) (see Figure 15, Table 18). It is apparent that the leader in lab B scored higher than the leader of lab A. Interestingly, both leaders showed the same level of relationship-oriented leadership and task-oriented leadership regardless of whether the score was low or high.

A two-tailed independent samples t -test was conducted to examine whether the means of task-oriented leadership or relationship-oriented leadership were significantly different between lab A and lab B. The variances were consistently homogeneous, indicated by $p > .05$ for Levene's test. The result of t -test for task-oriented leadership was significant, $t(97) = -4.91$, $p < .001$. This finding suggests the mean of task-oriented leadership was significantly different between lab A and lab B.

In addition, the result of t -test for relationship-oriented leadership was also significant, $t(97) = -5.14$, $p < .001$. This finding suggests the mean of relationship-oriented leadership was significantly different between the two laboratories (see Table 19).

Figure 15 Mean scores of leadership behaviour for MLS in both laboratories

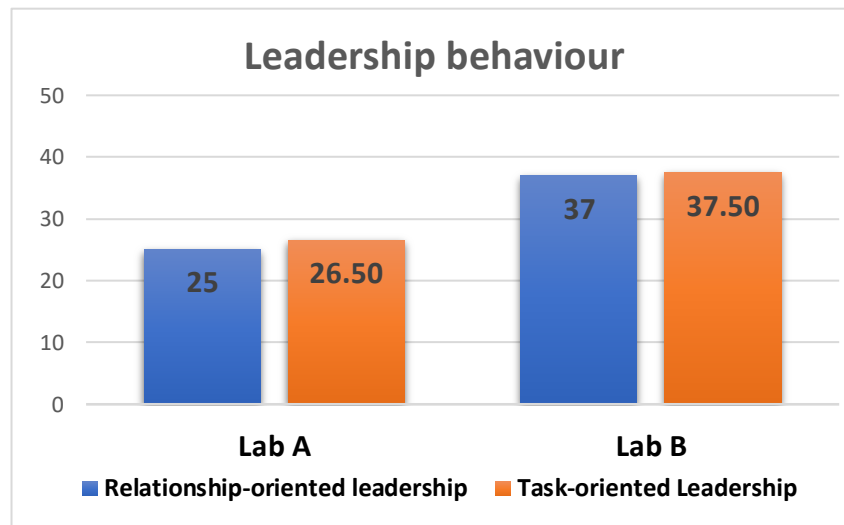


Table 19 Two-Tailed Independent Samples t-Test for leadership behaviour dimensions by hospitals

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Task-oriented leadership	Equal variances assumed	2.496	.117	-4.90	97	.000	-10.965	2.234	-15.399	-6.532
	Equal variances not assumed			-4.67	66.75	.000	-10.965	2.343	-15.643	-6.288
Relationship-oriented leadership	Equal variances assumed	3.889	.051	-5.13	97	.000	-11.905	2.318	-16.505	-7.304
	Equal variances not assumed			-4.82	63.29	.000	-11.905	2.469	-16.839	-6.971

There are significant differences between the two laboratories in terms of leadership styles. Box and whisker plots are very useful when there are a significant number of observations and when two or more data sets are being compared. A box and whisker plot is a method of summarising a set of data measured on an interval scale. Box and whisker plots are ideal for comparing distributions because the centre, spread and overall range are immediately apparent. Boxplots enable the researcher to see whether the answers of participants cluster round the middle or to one end or are polarized between the two ends of the scale (see Figure 16).

From the boxplots, it is apparent that the answers of lab B were negatively skewed while lab A were positively skewed. The interquartile ranges, that is the box lengths of each leadership statement, were compared in order to examine the way in which the data is dispersed. The boxes were mainly long, this meant the data were scattered, these boxes represented the results of lab A. The results for lab B represented smaller and less dispersed data. It was clear that the answers for Lab B were more similar, and the participants held strong opinions regarding the behaviour of the leader. So, the leader of lab B was stronger as perceived by the staff (see Figure 16).

Figure 16 Boxplots of MLS' answers for both rating laboratories leaders

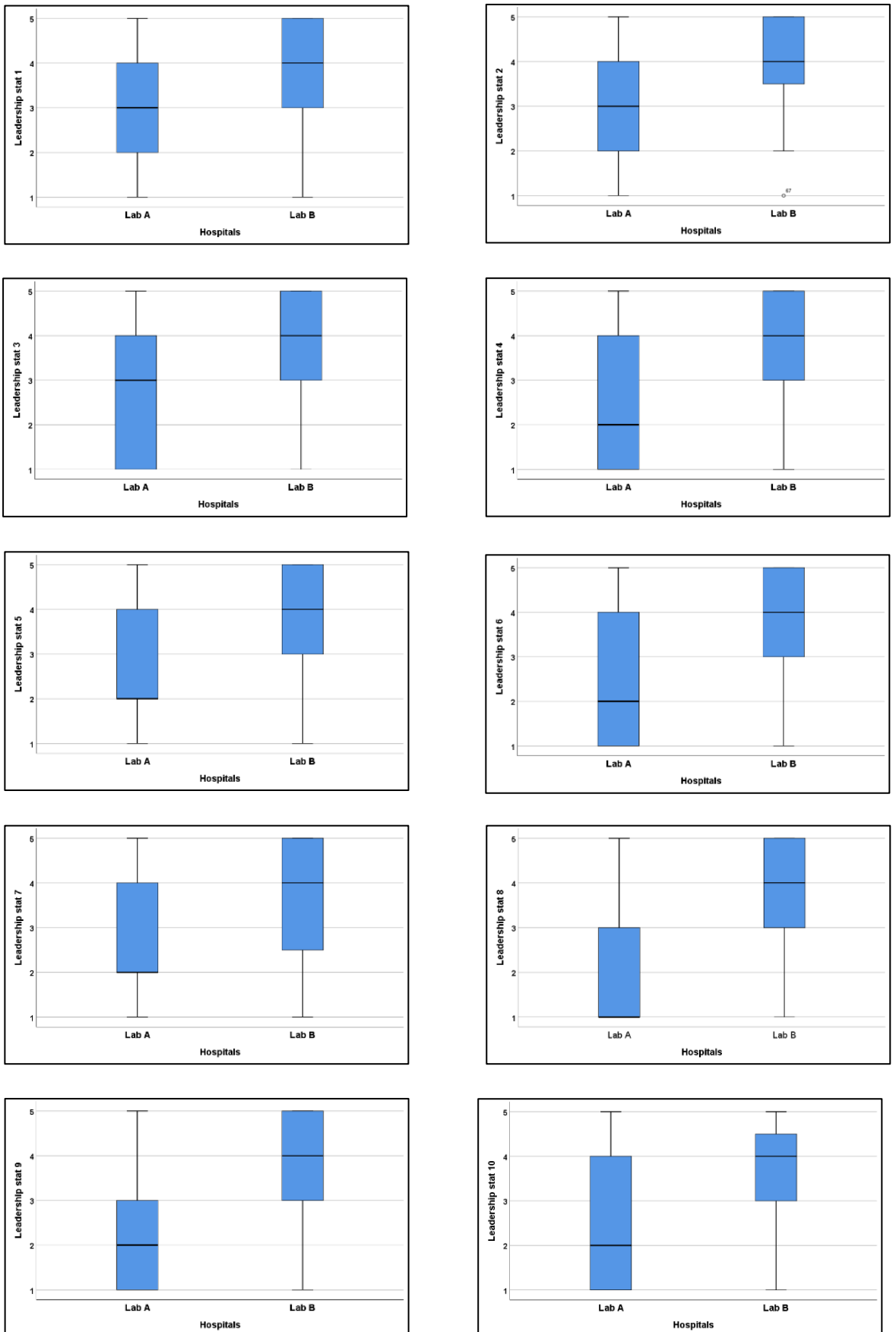
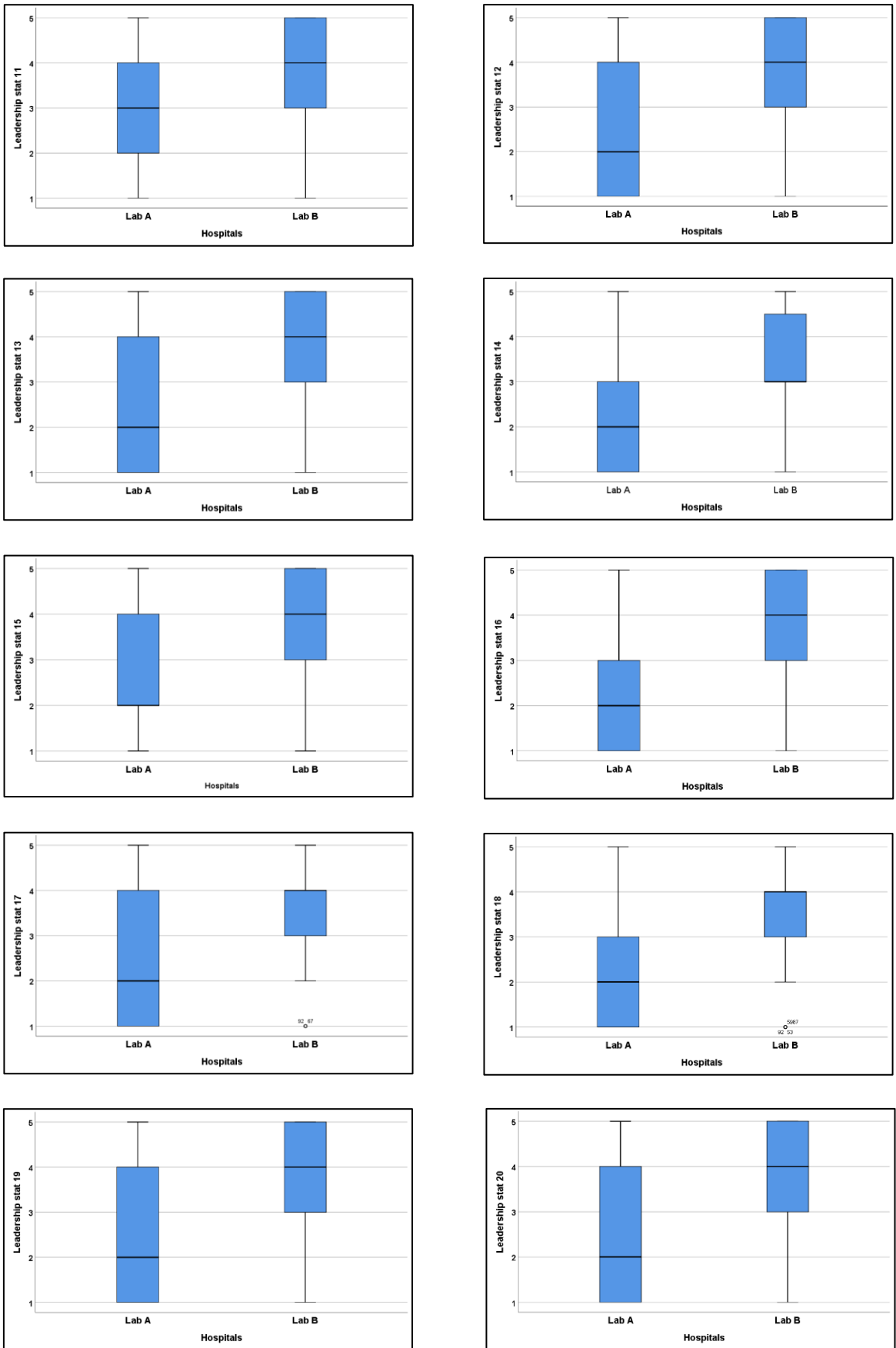


Figure 16 Boxplots of MLS' answers for both rating laboratories leaders



Summary

It appears that MLS in lab A rated leadership behaviour as 'poor' compared with lab B who rated leadership behaviour as 'moderately high'. The results for lab A indicated that leadership behaviour was weak in this dynamic workplace. The differences in the mean score between the two laboratories were significant. More investigation was therefore required in order to explore and describe the quality of leadership in the two laboratories. The qualitative data in part two provides comprehensive answers and helps to reveal the impact of each leadership dimension on MLS staff.

5.3.3 Research question (3): b) How might leadership behaviour affect professional identity?

Measuring the strength of the relationship between two independents variables.

A Pearson correlation analysis was conducted to measure the strength of the relationship between the two dimensions of leadership behaviours and the five dimensions of professional identity. A significant positive correlation was observed between task-oriented leadership and professional commitment ($r_s = 0.21, p = .034, 95\% \text{ CI } [0.02, 0.39]$). The correlation coefficient between professional commitment and task-oriented leadership was 0.21, indicating a small effect size (Mukaka 2012). This correlation indicates that as professional commitment increases, task-oriented leadership will increase. No other significant correlations were found (see Table 20).

Table 20 Correlations between leadership behaviours and professional identity

		Professional commitment	Professional autonomy	Belief in public service	Profession as referent	Belief in self-regulation
Task-oriented leadership	Correlation Coefficient	.213	-.079	.175	-.027	.063
	Sig. (2-tailed)	.034	.438	.083	.788	.533
	N	99	99	99	99	99
Relationship oriented leadership	Correlation Coefficient	.173	-.070	.161	-.017	.101
	Sig. (2-tailed)	.088	.494	.112	.864	.319
	N	99	99	99	99	99

Correlation is significant at the 0.01 level (2-tailed).

Correlation is significant at the 0.05 level (2-tailed).

Light green: indicates the weak relationship

Moderate green: indicates the moderate relationship

Summary

The two dimensions of leadership behaviour and five dimensions of professional identity were tested to identify significant relationships. There was only a weak significant positive relationship between task-oriented leadership and professional commitment. The researcher also conducted non-parametric tests, such as Mann-Whitney U test and Spearman's correlation, these provided the same results as the parametric tests. Further investigation was undertaken using the results in the qualitative findings.

5.4 Part II Qualitative data

The data was derived from semi-structured interviews, focus groups (FG) and observational data, these totalled 96 hours. The total number of participants interviewed was 17. The participants were comprised of the following, 8 MLS held supervisors' positions, 7 were technologists and technicians and two were laboratory leaders. The total number of participants taking part in FG was 10 in total. Extracts from the interviews are shown using italics, these provide evidence for the main themes being described. Three main themes emerged from the thematic analysis of interviews and observation data, these were: (a) effective leadership; (b) ineffective leadership; and (c) leadership challenges in medical laboratories services. The three themes were identified during qualitative data collection and analytic processes as outlined in Chapter 3. Thematic analysis methodology was used

to analyse the qualitative data and identify codes and themes (Braun and Clarke 2006). Changes were made to the extracts from interview transcripts, for example, excessive information was deleted and replaced by ellipses. Identities were protected by anonymising personal information such as names and locations. Sub-themes were created using the participant responses as evidence. The interview transcripts and findings are presented below, and these are followed by extracts from observational notes.

The quantitative data provided rich description with regard to the MLS' views of leadership behaviour of the laboratory leader, and this was the case for both laboratories. The survey results were considered alongside the qualitative phase to investigate the issue further as additional data were gathered, this enabled discrepancies to be identified and further explanation to be provided. The themes presented below include results from both the interview and the observational data.

5.4.1 Theme 1: Effective leadership

This theme explores the most important leadership qualities practised by leaders in these two hospital laboratories services in SA. The participant responses have been classified into three sub-themes. These sub-themes are interpersonal relationships, involving staff in decision making and building an effective team (see Figure 17).

Figure 17 Theme 1 - Effective leadership



Sub-theme 1: Interpersonal relationships

This sub-theme examines the interpersonal relationships which exist between leaders of laboratories and MLS. Interpersonal relationships play a critical role in the MLS workplace, this was apparent in participants' responses during interviews, focus groups (FG) and observational data. Evidence substantiating this was also found in the quantitative data. This sub-theme explains the variation in people-oriented dimension scores for leadership behaviour and covers a range of relationships existing in the laboratories. The following participant provided examples for the role of active listening that the leader is following:

(P14): "Researcher: What do you think of the leader here?"

Participant: I see that he is close to us and humble, he opens his channels and doors to us. He has open channels, there are debate and discussion areas and open doors there is no room to rebel." [Participant MLS (14)]

This was reinforced with observation data. The following observations were made from lab B.

Place: At Lab B, **Actor:** head of the laboratory (Assistant professor, head of lab for more than 4 years, working part-time in the hospital). **Time:** 5 weeks

Event: Leadership observation.

I could see his door was always open; staff could access his office without asking the secretary's permission. I noticed he showed a professional manner in negotiations. At the same time, there was a friendly conversation; members of staff were laughing with him. I could sense there was no great barrier between the head of department and MLS or between the MLS and the head technician.

Conversely, participant P4 described the behaviour of the leader in lab A as less approachable and someone that needed to be avoided:

(P4): "We did not come here to avoid our head of department ... When I suggested a proposal to the head of department, I was totally frustrated because anyone wanted to talk to the head of department would not listen. I was frustrated with respect to that person." [Participant MLS (4)]

This was corroborated by observation data. The following observations were made from lab A.

Place: At Lab A, **Actor:** Head of the laboratory (bachelor's degree in medical laboratory, with more than 4 years' experience in this position). **Time:** 5 weeks

Event: leadership observation.

I could see his door was always open, but no one came to his office for daily conversation or even just to say hello.

This suggests that the leader of lab A appeared less approachable and may not have known about listening skills. The previous two participants' comments could help explain some of the scoring differences for leadership behaviour between lab A and lab B.

It was evident that laboratory leaders and supervisors in lab B showed appreciation for their employees and acknowledged their efforts, participant P15 said: *"We always say thank you, good job, you are the best, we cannot succeed without you ..."* [Participant MLS (15)]. Professional appreciation and recognition are a part of professional identity, providing staff with these qualities could enhance MLS professional identity.

The following was extracted from lab B, as the leader seems to demonstrate working on maintaining good relationships between leaders, supervisors and employees:

(P14): Participant: "I only have one resistant, I left her because I do not want to lose her.

There was a relationship between us, but when it comes to work, I do not care, and work must run. So, I asked her line manager to deliver my message to him.

Researcher: Good, you found another one to talk to her.

Participant: Yes, I found someone else because there is no benefit to clashing with her." [Participant MLS (14)]

However, the participants of focus group two from lab A also made comments which were contrary to the previous quote, saying that they felt that this leader had put relationships at risk:

(P25): "Sometimes, the leader causes clashes between the employees. This is obvious when an employee is transferred from one department to another, some clashes take place when he knows that there are two employees with different orientations or views" [Participant MLS (25) FG.2]

This could be the result of staff rotation between departments. The quote is acceptable as none of the participants in the FG disagreed with it. However, conflicts did seem to affect the employee's work in lab A. The leader should work on fixing relationships between employees, building teamwork and avoid making relationships worse.

Summary

The ability to build good interpersonal relationships is critical to the success of a leader, this was evident in these data. A good relationship between leaders and MLS can influence the workplace culture and cohesiveness of hospital laboratories and improve commitment to both the leaders and the organisation. This relationship can be enhanced when leaders are approachable and take into account the employees' needs and expectations. It is important that employees feel appreciated, this was demonstrated particularly by the participant responses for lab B. Appreciation and recognition play a key role in developing the professional identity of MLS and consequently job satisfaction. Improving relationships between leaders, supervisors and employees is evidence of leaders who possess people-oriented behaviours. This could explain the differences between lab A and lab B in terms of people-oriented leadership scores.

Sub-theme 2 Involving staff in decision making

This sub-theme addresses the issue of staff involvement in decision making, participants described their negative experiences. Making decisions without the involvement of MLS could threaten the relationship between employees and leaders. This could also explain the low scores for relationship-oriented leadership, especially as the leader did not consider employees to be important and they were not encouraged to speak out or to share concerns.

The following quote shows that there were conflicts between the laboratory leader and MLS in lab A due to employees not being involved in decision making:

(P4): *“We should not fight him because of his decision, we should not make it serious confrontation full of hate. Unfortunately, this is what happens in our laboratory. If a manager decides something so, “it is what it is” why do not we support him. It could be a good decision who knows? ... Unfortunately, they consider an employee as nothing or of no importance, they say if we put you here you must work regardless of your talents or desires. This is a big mistake to annoy your employees based on your decision. There are many unbelievable stories here!” [Participant MLS (4)]*

Participant P5 from lab A discussed the consequence of not involving MLS in decision making, it resulted in a lack of cooperation between the leaders and employees:

(P5): *“the reason for the lack of cooperation and enthusiasm is the leader. The leader takes decisions without asking the staff. For example, in the public holidays, those who work shifts are supposed to take days off but the leader gave money to everyone ... This incident caused conflict between the staff and the leader, and the complaint was escalated to the Ministry of Health.” [Participant MLS (5)]*

This was reinforced with observation data. The following observations were made from lab A.

Place: At Lab A, **Actor:** MLS, **time:** afternoon session 1-4 pm

Event: MLS were disappointed that the head of the laboratory had made a decision to offer financial compensation rather than time in lieu when staff worked a public holiday. The head of the laboratory justified this decision by saying that if everyone chose a day off, no one would be available to work in the laboratory. Interpretation: Anyone who works on public holidays will be compensated for this. The form of compensation might be a day off or a financial reward. This event illustrates the type of autocratic leadership style demonstrated by the head of laboratory, sharing decision making could have a positive impact on employees' job satisfaction.

In addition, the leader of lab A showed a lack of flexibility in his decision making, this comment was made by participant P11: *“if he decides to do something, he says this is my word”.* [Participant MLS (11)]

However, the previous quote shows that MLS in lab A were unhappy with the leader because they regarded him as inflexible. MLS in lab B were also not always happy with their leader because they felt the leader showed too much flexibility in decision making:

(P21): *“Participant: Yes, in our laboratory whenever a decision is made, some people are able to influence the manager which leads him to change his decision, he is too easily influenced.*

Researcher: Do you consider it as courage if someone changes their decision?

Participant: No, it is a random decision, if all aspects of the decision are taken into consideration, it does not need to be changed.” [Participant MLS (21) FG.2]

Another example of poor decision making was given, this related to moving a staff member to a department in which the employee has no experience:

(P4): *“I am now in the blood bank though I am not an expert at it. My speciality is in microbiology and my experience as well ... you must work regardless of your talents or desires. It is a big mistake to make decisions which annoy your employees. There are many unbelievable stories here!” [Participant MLS (4)]*

In fact, the hospital laboratory system in SA does not classify MLS or give them opportunities to specialise, MLS could actually work in any department within the hospital laboratories. This is an area for improvement and is explored in the discussion chapter.

Another topic that relates to this sub-theme is the lack of consultation with MLS, they are not involved in the decision-making process at all:

(P9): *“At work, I cannot tell the head of laboratory that he doesn't know how to make decisions, because he may inform me that I have no right to say that. In the end, you do not want to fire from your work because of this. I feel that it is difficult.” [Participant MLS (9)]*

Summary

Participants considered that consultation during decision making was an example of good leadership behaviour. By demonstrating such a quality, the relationship between leaders and MLS could be strengthened. The qualitative data indicated that whilst the leader of lab

A believed he was making decisions for the benefit of the group, the employees did not feel that was the case. As a consequence, this has led to continuous discord between the MLS and the laboratory leader. This could explain the low scores for people-oriented leadership in lab A. In lab B, this was not the case, but their approach was also not perfect as some concerns existed about the leader being indecisive at times.

Sub-theme 3 Building an effective team

This sub-theme discusses the importance of teamwork in medical laboratories. Successful leadership can build excellent teamwork. Thus, leaders play a critical role in creating a harmonious team. Participants in this study identified aspects of effective team building in the workplace, such as leaders clarifying the roles of staff, distributing tasks and taking corrective action. The following comment was made by a member of an administration team:

(P1): "I think the most beneficial aspect of leadership is to develop good teamwork, if you build a harmonious and homogeneous team and distribute tasks and functions as required, I think success will follow. One of the things that I wanted was to create a feeling of team spirit in the laboratory, thank god we achieved that and made all the departments feel as one department..."

Researcher: How did you reach that?

Participant: I think it is trust. I trusted them and then they trusted me, and this resulted in loyalty to the laboratory ... the employees understood that the work within the laboratory should be a collective one, not as it was once an individual. Laboratory staff understood that everyone must be as one heart ... Everyone understood what was going on in the laboratory." [Participant MLS (1)]

And,

(P19): "Creating bonding and brotherhood between staff. If the laboratory was a multi-party system and groups, I'm against this, it will not develop as long as people are incompatible. So, connecting work with interpersonal relationships, for example, perhaps in terms of work we agree but on a personal level we do not. Maybe I'm personally in accord with you but in terms of work I disagree, we should be related

anyway. When the team is connected, the work will be done. Brotherhood improves working relationships and is important for the cohesion of the workplace, it results in effective teamwork.” [Participant MLS (19) FG.1]

Transparency and sacrifice are also factors which contribute to building effective teams. Participants mentioned the existence of selfish behaviour in the laboratory, this can threaten the harmony of teams. Leaders and supervisors should take corrective action both to maintain the relationships within the group themselves and to encourage a selfish member of staff to become a team player:

(P14): “As I told you there must be transparency and selfishness must be taken away. There must be a kind of sacrifice if someone takes initiatives and makes sacrifices the other ones in the group will feel shy to be lazy or be careless. But if selfishness exists, or a selfish employee is present, you should talk to him/her whether to be a good one or to tell him/her that you will be transferred to another department. The leader must find a solution to the problem, we should make a remedy plan for the employee, so you do your best to work and stay with your group.”
[Participant MLS (14)]

Providing staff with a sense of security also improves teamworking. The following quote was taken from an interview with a member of lab B:

(P16): “One staff member feels afraid and insecure, he needs reassurance ... You have to tell him that I am always with you. But some employees think that a manager is someone to fear and that they pose a threat. Therefore, you have to make them feel that we are working together step by step to achieve our goals, you have to be understanding and direct that person.” [Participant MLS (16)]

Participant P15 mentioned some cases of good teamwork and described the development of good working relationships between group members:

(P15): “We joke and laugh away from work, we sometimes talk about work in our group but most of the time we like joking and laughing and passing our regards to each other's family and this is what it is supposed to be like. There must be a sense of

trust, that is what we have in the X department, and I am aiming to spread this to other departments.” [Participant MLS (15)]

This was corroborated by observation data. The following observations were made from lab B.

Place: At Lab B, **Actor:** MLS, **Time:** morning session 8 am – 12 pm

Event: social events

I could see people in this department were more sociable and were arranging events (celebrations) when someone had surgery or was awarded a new qualification. This suggests that the relationships were good, people were prepared to make arrangements and spend money organising events.

In contrast, the following participant from lab A, P5, provided an example of poor teamwork and relationships between staff members:

(P5): “There is a negative atmosphere in our laboratory. For example, I always hear that an employee at the end of the working day if you ask him/her can you return to ER to run an ER sample? they refuse. They are not willing to do extra tasks after working hours because of the negative atmosphere that exists, this is a dangerous indicator. The atmosphere is full of problems between staff.” [Participant MLS (5)]

This was supported by observation data. The following observations were made from lab A.

Place: At lab A, **time:** 1 – 6 weeks

Event: Fieldwork observation – teamwork observation

I could not write a holistic overview of lab A for a number of reasons. Firstly, the departments are linked to the head of the laboratory and the staff members are not fixed in their departments. Secondly, the staff divide their working hours during a shift. For example, if there are 6 staff members working in a department, they divide the hours between them to cover the work, so each pair has to cover 2 hours and the rest take a break in the relaxation area. Therefore, the laboratory is always empty.

One of the aspects of building effective teamwork is the training and coaching of MLS. The following quote was taken from lab B, a member of the administration team:

(P1): *“I also instilled in them the spirit of continuous education and self-development, at the same time we did not focus on certain employees and leave others out. Some staff come to my office and express their desire to attend certain courses at their own expense. I make it easier for them and encourage them and sometimes I try to help them through the laboratory”.* [Participant MLS (1)]

In contrast, a participant from lab A identified poor leadership in relation to team building, leaders failed to develop staff so that they could meet work standards:

(P4): *“The problem is not related to competencies, there are good people, and the government spends a lot of money here on staff, this means such good support ... But, when it comes to this laboratory there are no opportunities for development, no one provides opportunities [the leader] for them [staff] to take courses or improve themselves. If you ask anyone [staff] a deep question about laboratory tests, you will be surprised because no one will answer you. No development!”*
[Participant MLS (4)]

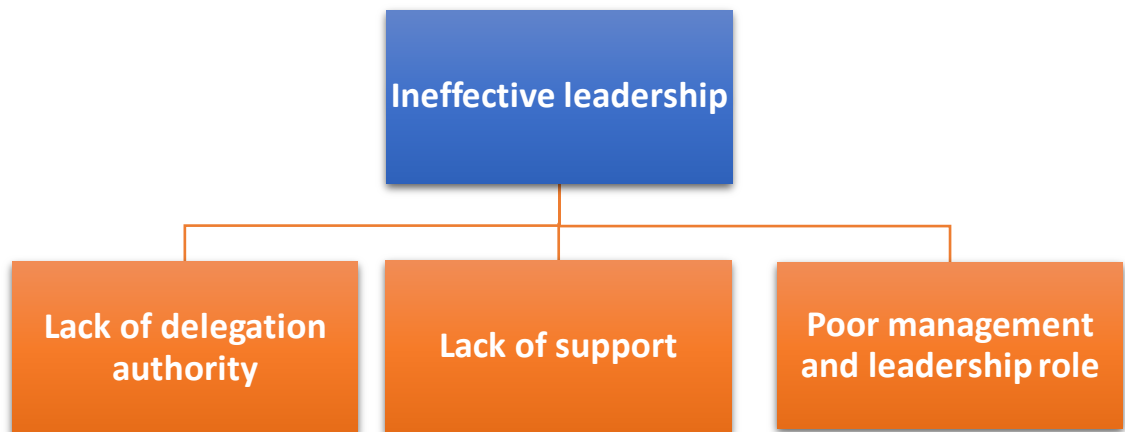
Summary

Leaders' behaviour plays a key role in building effective teamwork. Some factors such as trust, transparency, sacrifice, and sense of security were identified by participants, and these could help with effective team building. Providing staff with development opportunities and making attempts to meet their expectations are factors which can help to build an effective team. This could explain the reason for the high scores for lab B in terms of people-oriented leadership.

5.4.2 Theme 2: Ineffective leadership

This theme explores the ineffective leadership qualities that may be prevalent in the hospital laboratories service in SA. Participants' responses have been classified into three sub-themes. Research question (3): a) What is the leadership behaviour of medical laboratory directors? These sub-themes are: lack of delegation authority, lack of support and poor management and leadership role (see Figure 18).

Figure 18 Theme 2 - Ineffective leadership



Sub-theme 1 Lack of delegation authority

This sub-theme illustrates the difference in the leadership styles demonstrated by the leaders of the two laboratories. The first quote was taken from an interview with a member of the administration team from lab B. The participant P1 advocated for delegation authority with proper follow up:

(P1): "The centralisation of the administration is not good at all or the lack of delegation of authority, I see this as a very negative point. The delegation of power with adequate follow-up and supervision will lead to the production of great work." [Participant MLS (1)]

Another quote provided an example of the delegation of authority. The supervisor dealt with everything and finally met the leader to seek agreement:

(P15): "I wrote all the things that we need like the ideas and organization chart and the responsibilities and everything. I talked to my staff and they gave me their ideas. Finally, everyone was in agreement with the ideas. I then went to the doctor XXX (head of the laboratory) and said what do you think if we do this and this, then he said I agree." [Participant MLS (15)]

This was corroborated by observation data. The following observations were made in lab B.

Place: At Lab B, **Actor:** head of the laboratory. **Time:** 5 weeks

Event: Leadership observation.

The head of the laboratory's role is planning, improving, supporting, developing, assigning, listening and supervising. He was planning to develop a certified training centre in the laboratory. In addition, the laboratory had gained two quality accreditations during his time as the head of the laboratory. Many workshops had been provided and applied in the laboratory, such as lean rethinking and six sigma. So, this was the vision of this leader. I felt that the education level of this leader had a significant impact on the MLS and the workplace.

I observed the head of the laboratory doing his rounds, he was supervising the installation of a new system to convert it to a fully automated (core) laboratory. This would result in 5 departments working together in one area within an open-plan space. The existing machines would be reduced to standby if this core laboratory (automated laboratory) malfunctioned. A lecture had been provided for the staff in the five departments, this would facilitate their integration under a new supervisor. The head of the laboratory assigned a female with a master's degree to supervise and integrate the five departments.

The head of the laboratory delegated authority to the **head of the technicians**. The head of the technicians also has full authority and has managerial experience. His role is to supervise the laboratory, including staff and supervisors, confirm their vacations, and to deal with technical issues, such as air conditioning and maintenance of machines. In general, he will be responsible for anything relating to the staff and the laboratory. He also works as a link between the hospital's departments and the staff in the laboratory. I observed that his office was often busy with staff seeking advice, daily conversation or to socialise during break time.

The head of the laboratory delegated authority to the **department supervisors** who dealt with and interacted with their staff. Thus, the supervisors had full authority in terms of granting permission for holidays, conference attendance, timetables and dealing with internal problems within their departments. If an issue could not be resolved then the head

technician and the head of the laboratory will be informed in an orderly manner. It was clear that the system in this laboratory was more complex and hierarchical.

In contrast, the lack of delegation authority was a major problem in lab A:

(P13): *“If every department in the laboratory was given the authority to run itself, there would not be a problem because they would run independently. We are not allowed to submit our annual leave at any time. For example. school holidays will start shortly, we do not know in advance who is going to be on leave and who is not? Sometimes you are surprised because everyone submits their leave at the same time! What the leader does in this case is he ask some employees to defer their leave and give extra days off instead? But Why?”* [Participant MLS (13)]

The next quote confirms that the lack of authority to delegate is one of the issues in lab A:

(P11): *“Researcher: How can we make leadership more effective?
Participant: Give me authority, when there is a problem for me to deal with I cannot do so without discussing it with the leader and obtaining his approval. I have to have permission to implement any changes and need his support to do so. Sometimes he says no.”* [Participant MLS (11)]

The lack of delegation authority means that supervisors and seniors within departments have limited power:

(P4): *“The distribution of power is unbelievable in our laboratory; the whole laboratory is controlled by one person. This means our supervisors and senior managers have limited powers within the laboratory.”* [Participant MLS (4)]

This was corroborated by observation data. The following observations were made in Lab A.

Place: At Lab A, **Actor:** head of the laboratory (bachelor’s degree in medical laboratory, with more than 4 years’ experience in this position). **Time:** 1-5 weeks

Event: Leadership observation.

The head of the laboratory did not delegate authority to the **head of the technicians**. The head of the technicians was responsible for setting the staff timetable and then it was reviewed by the head of the laboratory.

The head of the laboratory did not delegate authority to the **department supervisors**. Their role was to set their timetables based on the timetable provided by the manager. They had to make sure their machines worked perfectly and to order reagents.

Summary

These data indicated that the lack of authority to delegate was a major concern in lab A. It seems that the leader here adopted an autocratic leadership style. As a consequence, the leader of lab A predominantly dealt with day to day problems and routine paperwork such as dealing with annual leave requests. The laboratory leader could perhaps be using his time to plan and develop the workplace. The leader from the other laboratory followed a more transformational leadership or people-oriented style. The lack of authority in lab A meant that supervisors and senior members of departments are without power, this could also have a negative impact on their creativity and management style. This was mainly presented in lab A and was less apparent in lab B.

Sub-theme 2 Lack of support

This sub-theme describes the differences between the leaders of the two laboratories in term of their support for MLS. This sub-theme provides examples of the way in which leaders support MLS when required to do so. The following quotes demonstrate that participant P5 felt isolated when he faced a problem:

(P5): "That means if someone complains from any department in the hospital or any doctor, the laboratories' management does not defend me or stand with me or with us". [Participant MLS (5)]

This was corroborated by observation data. The following observations were made from lab A.

Place: At lab A, **Actor:** senior manager, **time:** afternoon session 1-4 pm

Event: A senior had refused blood samples which were 7 hours old when they arrived at the laboratory because they had not been stored in the right way. A physician called the laboratory, expressed his/her anger, and asked to analyse these samples. However, the senior manager refused and reported this, in writing, to the head of the laboratory. The head of the laboratory asked the senior to run these samples again or he would report him. The senior stuck to his decision and used The Saudi Central Board for Accreditation of Healthcare Institutes (CBAHI) standards to defend his action. Feelings and interpretation: an issue like this indicates that the head of the laboratory was not supportive of his staff member or the policy and standards of the laboratory. This might lead to a decrease in job satisfaction levels amongst the MLS in the laboratory. Moreover, the power that physicians use to put pressure on MLS and the heads of laboratories should be limited through the use of stronger policies. The power that physicians use could negatively impact on the professional identity of MLS.

In addition, supervisors of the laboratory department do not support staff when they make a complaint, this shows duplicity in leadership:

(P13): "It hurts when the head of department does not support me and help employee, who made mistakes, against me!" [Participant MLS (13)]

In contrast, the leader of lab B followed a different approach in terms of supporting MLS. The following quote was taken from a member of the administration team:

(P17): "The leader gave me the green light, he said you are good, and you are an excellent person and we will support you and we are all cooperative. Even if I hear something negative about you, I will support you in making any changes required. This is the most important part, if we are all supporting each other we will be able to succeed." [Participant MLS (17)]

The action taken by the leader of lab B could have a positive impact on the professional identity of MLS.

Summary

Participants revealed the importance of leadership support whether for supervisors or regular members of staff. Participants in lab A seemed to lack the appropriate support from their leaders. In contrast, the leader of lab B took a different approach in terms of providing staff and supervisors with appropriate support. Supportive leaders can have a positive influence on the professional identity of MLS. This could explain the difference in the scores for people-oriented behaviour between lab A and lab B.

Sub-theme 3 Poor management and leadership role

This sub-theme highlights issues in the management and leadership styles of leaders of both laboratories. Participants drew attention to the preferential treatment of some staff members over others, importantly favouritism is associated with unethical leadership when one group of people is treated better than another. Also, there was a poor understanding of the leadership role. The gap between leaders and employees and the lack of problem-solving skills were also key issues. The following are typical quotes taken from participants regarding the issue of favouritism:

(P11): "I am one of the people who faced problems as a result of favouritism. If you make a mistake, we will report that, but what if X person makes that mistake? Why should there not be equality?" [Participant MLS (11)]

And,

(P4): "One of the negatives that I have seen is favouritism. He says this works with me and this is my friend etc.... What is happening is that the development of certain people is not for the sake of the work but the sake of personal interest."
[Participant MLS (14)]

Favouritism could be linked with inequality and the risk of losing valued members of staff, this was explained by participant P13:

(P13): "A leader deals with elders unfairly, some of them are forced to work hard while others are not." [Participant MLS (13)]

The previous quote is supported by participant P12: *“The thing that we do not have is justice. It is not there...”*[Participant MLS (12)]

The following quote identified some issues related to favouritism, such as losing hard-working employees:

(P11): “Frankly it affects them because of the favouritism ... A highly motivated employee may come to work, but he gets frustrated and crashes. This, unfortunately, happened to us. Half of the staff were affected.” [Participant MLS (11)]

Another issue in this sub-theme is the poor understanding of the leadership role. It is clear that the managers have different roles to the leaders. Participant P13 gave a detailed explanation of the laboratory leader’s situation:

(P13): “Leadership does not mean that a leader listens and does what top managers of the hospital order him to do, no. A leader is the one who is really creative, discusses everything before he/she turns back to his/her staff. A leader should listen from the top, understand what they really want and at the same time think deeply for the sake of staff. Is this order for or against my staff? Is this going to create a good environment or not? This is the role of the leader. But leadership now is not like that ... Because you have to ask permission from the leader! Sometimes he says we cannot allow you to take leave at this time, so if you defer your leave I will give you three extra days off! Why does this matter escalate? Why does the issue reach this stage? This is the reason that the manager is kept busy, should he stand up for my rights or ignore me! ... This method of centralisation is not good.” [Participant MLS (13)]

In contrast, the situation is different in lab B, it can be clearly shown that the role of a leader is as a planner, a supervisor, and a guide. The following quote was taken from a member of the administration team:

(P1): “Everybody knows what s/he should do, and my role is limited only to guidance, support and general supervision. There is a team spirit in the workplace and because of this I am confident that we will succeed, and I am sure that we have

reached the level of success thanks to God. To summarise, we released the giant inside you or the giants inside [Awaken the Giant Within].” [Participant MLS (1)]

The leader of lab B had set goals and a clear vision as described by the participants; this was not the case in lab A however. The following quotes were taken from participants of lab B, these were typical responses:

(P16): “We look forward to becoming the best at lab B hospital and being the hospital laboratory of the best laboratories in the western region and at the Kingdom level.” [Participant MLS (16)]

And,

(P15): “I want the whole laboratory to be aware and the quality should be so good. I want people to get involved. I want our laboratory level to be like the level of the national guard hospital which is highly ranked.” [Participant MLS (15)]

In contrast, it is shown that there was no clear plan for staff to work towards and that uncertainty is predominant:

(P4): “If the work is done according to a person’s whims or based on yesterday’s late-night talk! [ask for consultation from non experts]. Then, we will not progress, people become frustrated, and we cannot produce at this situation. I regret this, what is happening? There is unusual confusion.” [Participant MLS (4)]

The gaps between leaders and employees were shown. This could lead to poor understanding of workplace practices, participant P2 from the administration team added:

(P2): “I admit that there is a gap between myself and some staff. Because of the problems between us...” [Participant MLS (2)]

Another important quality for good leadership is the ability to solve problems, this enables a leader to diffuse workplace conflicts and prevent them from escalating. It also enables them to resolve any problems that may occur. However, participant P13 from the administration identified the opposite:

(P13): “If I complain to my manager, he should not tell me to write Occurrence/Variance Report (OVR), but in reality, he does nothing. He should not go to that employee

and inform him/her that I (the supervisor) has complained about them ... The manager should resolve the problem in a way that does not affect my relationship with my staff rather than create issues between us by discussing what I have said.” [Participant MLS (13)]

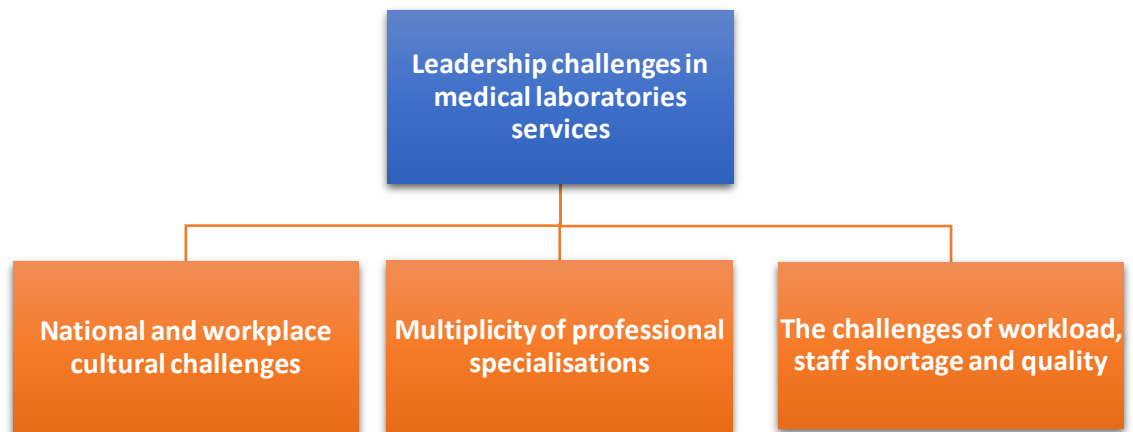
Summary

Participants asserted that leadership and management roles had impacted on the success of the workplace. Favouritism is an unethical leadership practice, all staff should be treated equally. This practice was a major concern to the participants of both laboratories, however, it appeared to be more widespread and affected a larger number of participants from lab A than from lab B. Favouritism can inhibit staff development since the affected members of staff may not receive the support they require. This could explain the low scores, as shown in the quantitative data, for people-oriented leadership in lab A. Also, the quantitative data revealed that both dimensions of leadership behaviour were low in lab A. Participants of lab A attempted to explain the low scores, they identified that the leader of the laboratory was confusing the concept and role of management with that of leadership. As a result, lab A was not following a clear plan and vision in the way that lab B was. Furthermore, the qualitative data revealed that there were gaps between leaders and employees. This could result in a poor understanding of workplace practices, particularly if leaders make decisions without staff involvement. The lack of problem-solving skills was considered to be another issue within lab A, this could explain the low score for leadership behaviour. It is clear that the hospital laboratory presents many challenges, the next theme will provide more details of the challenges facing leaders.

5.4.3 Theme 3 Leadership challenges in medical laboratories services

This theme highlights the challenges facing leaders and supervisors serving in this profession. Three sub-themes were identified as being the most challenging, these are cultural challenges (workplace and national), multiplicity of professional specialisations and the challenges of workload, staff shortage and quality (see Figure 19).

Figure 19 Theme 3 - Leadership challenges in medical laboratories services



Sub-theme 1 National and workplace cultural challenges

This sub-theme explores the challenges linked with culture, this is the case whether it is related to the workplace itself or to national culture. This is due to the culture of SA which is unique and totally different from Western culture. This sub-theme could partially reflect on the differences between scores of two dimensions of leadership behaviour in the quantitative data. However, this is an exploratory study, and this theme could provide a more in-depth understanding of professional identity and job satisfaction issues. Three topics will be discussed under these sub-themes: mixed genders, women in management and toxic workplace cultures.

Mixed-gender issues were evident during the interviews and in the observational data. Gender and shift issues are common challenges facing leaders and supervisors. Women are generally not refused to work at night because it is a mixed workplace environment. The following quote was taken from a member of the administration team:

(P1): "One of the most important challenges we face is the requirements of the employees themselves, for example, the requirements of the gender, whether men or women. But the majority of challenges are linked to women due to their medical conditions, such as pregnancy and childbirth, or problems of marriage or working in the evening. But to solve such a problem, we have followed a system where men and women are equal, and everyone must perform the same tasks, this is based on employment contracts." [Participant MLS (1)]

However, the previous participant acknowledged this issue as a part of the reality and identified that there is no effective solution:

(P1): *“But women come back to us again and complain that these times are not suitable for them, this is a reality for us we cannot change it because there is a higher proportion of women (65%) than men and it is, therefore, necessary for them to work at night. There are no solutions, but we always try to rotate each woman for a certain period of time to work.”* [Participant MLS (1)]

As can be seen from the above quote, women would prefer not to work at night. The main reasons given were family commitments and that the night shifts were mixed gender:

(P10): *“I feel that the work is very long ... If one has a family and a commitment, it is difficult to have a night shift for us as women. There are women who are not bothered, such as single girls. But the problem is for a mom, especially if she has children or family ... In addition, it is hard to go to work and sit in a place after midnight where all of the staff are male. I know that it is in a mixed-gender environment, but I want flexibility.”* [Participant MLS (10)]

This refusal by female members of staff to work with the opposite gender was endorsed by the previous head of department. The culture presented in the workplace has had a significant impact on leaders' decisions. The following interview was taken from a member of the administration team:

(P15): *“The previous head of department refused to let the females and males work together at night, but why? as long as we work together during morning time, what is different from work at night?”* [Participant MLS (15)]

In addition, there were some men who refused to work with women for cultural reasons. This presents a challenge for women in supervisory positions:

(P4): *“There are men who still look at a woman as a shame ... there is no acceptance of women, but they are surprised that the whole place becomes women, but honestly, a woman is better than a man in the laboratory's work.”* [Participant MLS (4)]

Furthermore, women identified communication with the opposite gender as a major challenge because men refused to speak with them face to face. Women, therefore, have to find alternative ways to communicate with men. This added to the burden for one female from the administration team:

(P11): "But there other are people did not want to communicate with me verbally because I am a woman, I tried to make WhatsApp groups and Telegrams, but above all of these, some of them still did not want to communicate." [Participant MLS (11)]

Other possible reasons for accepting women in the workplace were identified. For example, women hold high qualifications, high competence and have different perceptions (International Experience). The following interview was held with a member of the administration team:

(P2): "All the people who worked to get CBAHI accreditation were females ... I assigned a female to be a supervisor, she was very active. In three years, she made a significant difference. In the xx department, I assigned a competent female who had a master's degree in chemistry because the male supervisor did not want to be a supervisor anymore. In the xx department, everyone was a technician, so I assigned a female who was excellent, she returned from a scholarship abroad. The nature of women is such that if you give them responsibility, they will rise above your expectations." [Participant MLS (2)]

The last topic in this sub-theme is the toxic workplace culture which can exist in the workplace and was resulting in staff resistance. Some of the corrupt and dishonest behaviour demonstrated in the workplace of lab A that had been adopted by younger staff, for example, covering for each other, in order to leave the workplace during working hours:

(P2): "There is no harmony between the team, but they are in harmony in one thing which is covering each other. Meaning someone works for someone for two or three hours." [Participant MLS (2)]

This was reinforced with observation data. The following observations were made from lab A.

Place: At Lab A, **time:** 5 weeks

Event: Fieldwork observation on the work culture of many departments in the laboratory

The staff divide their work hours during a shift. For example, if there are 6 staff members working in a department, they divide the hours between them to cover the work, so each pair has to cover 2 hours and the rest take a break in the relaxation area. Therefore, the laboratory is always empty. Two or three MLS work in each department, so is it a negative culture.

In relation to the previous quote, participant P4:

(P4): *“There was a British visitor working in CBAHI committee, he said that this building is wonderful, but the culture is not good.”* [Participant MLS (4)]

The influence of a toxic culture was not only creating an unhealthy environment in which to work, it was also affecting the productivity of laboratory staff. No action had been taken to address the problems before they escalated. The following quote was taken from a member of the administration team:

(P2): *“They are 4 people ... I have tried to solve the problems, but if you have a rotten apple inside the box you have to get it out to save others. But I can't get them out of the box because of the working system.”* [Participant MLS (2)]

It was apparent that the leadership of lab A had spent a considerable amount of time trying to address the problems caused by toxic employees. It was clear that the employees concerned were negatively affecting the younger members of staff who were then resistant to workplace change:

(P4): *“Unfortunately, some of the new ones are affected by the old ones, they started to imitate them so, they are 100% like them.”* [Participant MLS (4)]

And,

(P12): "Researcher: What are their effects?"

Participant: They affected a lot. They did not accept development. We have certain policies, such as CBAHI and JCI, they do not accept these policies".

[Participant MLS (12)]

Staff resistance is another issue facing leadership in medical laboratories:

(P11): Researcher: What are the most important characteristics of the staff?

Participant: Resistance, I mean, some of the staff say that no one can change our system ... These are old people who were old employees. They had a certain idea that is "they do not like change!". They say you are not the one who teaches us! You learned recently and you come to teach me now!" [Participant MLS (11)]

It seemed that the leader of lab A allowed bad practices to continue without challenging them. Consequently, the culture of the workplace became toxic, and many young staff copied the bad practices. Whilst in lab B, the leader faced them from the start and the culture was not allowed to continue. Participant P1 from the administration team:

(P1): "Researcher: How did you overcome the difference in age groups in the laboratory?"

Participant: This problem was very simple, in general, it was a problem of experiences and minds. We were able to overcome these problems, for example, the larger more experienced age groups were being given certain opportunities which we knew they would not be able to accomplish or continue for long. Therefore we explained that you are not able to do what was requested and they responded to the changes without opposition..."[Participant MLS (1)]

Whereas the delay or the failure to make a decision regarding the problem of toxic employees has led to many negative results:

(P2): Researcher: What are the powers granted to you? I don't know them. Since you're a laboratory leader, why don't you put them elsewhere?

Participant: It is possible. But it will affect them financially, financial allowances will decrease. I try to fix the problems and I don't want to hurt the employee. I do not want the rate of hatred increased, if they have 90%, I do not want it to be

100%. I'm sure one day he will be right after three or five years.” [Participant MLS (2)]

Poor commitment and production levels in the workplace was linked with males who were adversely affecting the culture of the workplace. Most of the older employees were male and they identified with the younger male employees rather than women, this is due to cultural barriers. The following quote was taken from a member of the administration team:

(P2): “Because the age group of the female is close or they are of the same age, there is no impact on them. The tendency is affected by older male groups. Older staff members influence the new staff. You cannot reject them or ignore them. If you do this, you are a failed leader. These problems must be overcome. The old generation is afraid that the new generation will be better than them.” [Participant MLS (2)]

Summary

The responses collected from participants revealed that both hospital laboratories are affected strongly by SA cultural values. Mixed-gender environments seem to be a common concern for women because they prefer not to work at night in SA. The main reasons given were family commitment and refusing to work with men due to cultural values. These have been identified as challenges for leadership in the hospital laboratory. Since the number of women workers in hospital laboratories is comparatively high, this serves to exacerbate the situation. Thus, it is very difficult to assign night shifts to men. In addition, some men refuse to deal with and communicate with women. Therefore, women managing and communicating with men is contrary to the norm and considered as a challenge. Another point discussed under this sub-theme and related to the culture of the workplace was the presence of toxic employees. The existence of this type of employee has been identified as a factor which can lead to staff resistance, poor commitment and production.

Sub-theme 2 Multiplicity of professional specialisations

This sub-theme illustrates that another challenge facing leaders and supervisors in SA was the multiplicity of professional specialisation in medical laboratory services. This multiplicity of specialisation means that employees working in medical laboratories can

have any one of a number of different qualifications related to the field. Some of them do not have a medical background, such as the graduates of chemistry and biology departments. Therefore, the existence of a multiplicity of professional specialisations could result in a lack of role clarity, roles of technologists and technicians are almost identical at the laboratories included in this study.

The following quote explains the issue of poor clarity among MLS in medical laboratories. Participant P1 is a member of the administration team, P1 explained the challenges linked with the multiplicity of professional specialities:

(P1): “The main challenge facing any leader in a laboratory of the Ministry of Health is the multiplicity of professional specialities ... We have workers who come from different backgrounds. They come from the faculties of sciences [specialities: chemistry and biology], graduates of medical institutes and finally graduates of the faculties of applied medical sciences ... The challenge is how to create a suitable atmosphere in which all three categories mentioned above fit. How to employ each person in the right place? How to meet their aspirations and needs? how to get a benefit from all of them? Whether graduated institutes or colleges of science or applied medical sciences.

The difference is that the health institutes used to run courses for two years ... so the tasks distributed to them are simple, such as taking blood or receiving internal or external laboratory tests. Graduates of the faculties of sciences are mostly older graduates, who have gained experience with time ... their level has become close to the level of graduates of the faculties of applied medical sciences. The graduates of faculties of medical applied sciences, however, are ready to work immediately because they are trained for a full year...”[Participant MLS (1)]

In the same way that the multiplicity of professional specialities presented a challenge for leaders, it has also been of major concern for MLS who lost their professional identity, particularly autonomy, when they did not fully practise their profession. Despite the fact that graduates from the faculties of medical applied sciences are qualified for work immediately, as mentioned in the previous quote, they have been assigned to work as technicians. Participant P9 supported this:

(P9): *“Everyone one has a role in the laboratory, but technologists work on devices as technicians and they leave the validation of results to the consultants who do this during the morning shift.*

Researcher: Is this a validation problem?

Participant: Yes, as a technologist, this is my role, there has to be a difference between myself and the technician.” [Participant MLS (9)]

Summary

The multiplicity of professional specialisation has been identified as a challenge for laboratory leaders. This challenge is linked with poor role clarity as identified by participants of lab A. Role clarity is connected with task-oriented leadership, and this was rated very low by participants in lab A. The qualitative data under this sub-theme revealed that MLS, in both laboratories, had lost their autonomy which affected their sense of professional identity, this was due to the multiplicity of professional specialisation. In relation to this, the quantitative data have not shown significant correlations with the dimensions of leadership behaviours and professional autonomy.

Sub-theme 3 the challenges of workload, staff shortage and quality

This sub-theme revealed that the demand for medical laboratory tests is high, resulting in increases in workload is a challenge for leaders especially during the holiday season, Hajj and Ramadan as more visitors arrive in the city. This is supported by participant P1 from the administration team:

(P1): *“Also, one of the challenges in the hospital here is that the workload always increases. This means that it is necessary to keep up with the increasing workload ... the pressure of work increases during holidays or seasons such as Hajj and Ramadan.” [Participant MLS (1)]*

The reasons for staff shortages have been identified under this sub-theme. The first reason is age, older employees do not tend to be as hard working as younger colleagues. This is supported by participant P13:

(P13): "Participant: We have a shortage of staff numbers, shortage! But not really a shortage!"

Researcher: What do you mean?"

Participant: There is a group of elders who do not work hard.

Participant: This is a management problem. They should have told them that if they are not able to work as hard then they should leave the job because it results in a shortage of staff. It also causes stress to the rest of the staff." [Participant MLS (13)]

The second reason identified as a cause of staff shortage is women's medical conditions. The quantitative data reported that approximately 50% of the workers in the laboratory were females:

(P2): "Have you looked at the gender groups "Male and Female"? ... The females have maternity leave, and they have women related health issues ... Older employees are used in simple administrative settings because they cannot work as younger employees do, for example, they can work as a medical secretary. So, all these issues impact on the quality and provision of laboratory services." [Participant MLS (2)]

The third reason for staff shortage is the lack of phlebotomy teams to draw blood from in-patients and out-patients:

(P2): "There is no phlebotomist and people who adopted the job description of MLS did not include taking blood in the job description of the laboratory technicians. This means drawing blood is a nursing task, but it is not found in their job description, and this is a problem" [Participant MLS (2)]

The quality assurance of medical laboratories is affected by staff shortages. For instance, the following example is a consequence of not having a phlebotomy team. Many machine errors occurred daily because laboratory guidelines had not been followed when blood samples were collected from patients:

(P2): *“There is a problem with the volume of blood collection tubes, it is supposed to fill the tube with a volume of blood, but tubes arrived with less than the required amount of blood. This problem may not significantly affect the results but will affect the safety of the device ... we have a machine service that is fast and there is no room for error ... there will be delays in the analysis ...”* [Participant MLS (2)]

Another challenge facing laboratory leaders arises from the fact that quality assurance tasks are not included in their job descriptions. The application of quality assurance is mandatory, each laboratory has to be certified by accreditation bodies such as the CBAHI. Lab A seemed to have an issue with staff as they claimed that quality was not part of their workload, they considered it as extra work:

(P2): *“Participant: the tasks of quality do not exist in the job description of the ministry.*

Researcher: does the laboratory manager have the authority to add policies he thinks appropriate?

Participant: we are working on it now.” [Participant MLS (2)]

This was substantiated by observation data. The following observations were made from lab A.

Place: At lab A, **Actor:** a conversation between a member of staff and a supervisor (diploma degrees, more than 20 years' experience), **time:** after session, from 1 pm to 4 pm

Event: A dispute between a member of staff and a quality coordination supervisor

I was in the quality control office when a member of staff came in with a bag of blood samples that had been rejected. The staff member asked the quality coordinator to write a report and said, in an unprofessional way: “These are your rules, do it,” and he left the office. The supervisor followed him with the bag, but I did not go with him, as the situation was very difficult. **Interpretation:** I think the member of staff had refused to follow the quality standards or had not been aware of the importance of reporting rejected samples, so he refused to do it and regarded it as an extra job. This laboratory had recently been granted a quality accreditation certificate, but the staff member seemed to reject the new quality programme requirement. The supervisor had been spoken to disrespectfully and this might make other colleagues think it is acceptable behaviour. There are two other

factors which could have led to this: the fact it was at the end of the shift or the age of the member of staff.

MLS in lab B were prepared to take the necessary action to ensure they met the requirement of accreditation bodies, for example, asking staff to attend courses in order to gain the required knowledge and experience. Since the scores for people-oriented leadership were high, it is apparent MLS are performing above expectations:

(P1): "JCI, CBAHI and CAP are accreditation bodies they make enquiries regarding each person's position, certificate, and experience. When we put MLS in these positions we have to provide them with courses in the same field, such as infection control courses and safety. Thus, each person in his/her place has the experience and knowledge for their role. This has led to the success of the laboratory as MLS occupying these positions have the qualifications and experience to carry out their role." [Participant MLS (1)]

The MLS participants in lab B gave their comments regarding laboratory quality assurance:

(P16): "We look forward to becoming the best at lab B hospital and being the hospital laboratory of the best laboratories in the western region and at the Kingdom level." [Participant MLS (16)]

And,

(P15): "I want the whole laboratory to be aware and the quality should be so good. I want people to get involved. I want our laboratory level to be at the same level as the national guard hospital which is highly ranked." [Participant MLS (15)]

Summary

This sub-theme covered many of the challenges facing leaders in hospital laboratories. The first challenge mentioned was an increase in the demand for blood tests. This was associated with staff shortages which made the situation more difficult for laboratory leaders. Reasons for the shortages were identified as follows, ageing employees, women's medical conditions and a shortage of phlebotomy teams. These factors could threaten the quality assurance standards of hospital laboratories. It is important to mention that the qualitative data revealed that these challenges were present in both laboratories. In

addition, MLS in lab A saw quality requirements as extra tasks rather than being part of their normal workload. In contrast, MLS at lab B were very keen to fulfil their quality assurance requirements. Despite these challenges, it is apparent that lab B is outperforming lab A. This is in accord with the quantitative data as the scores for leadership behaviour in lab B are higher than in lab A.

5.5 Part III: Conclusion and mixed-method inferences

This chapter provided answers with regard to the leadership behaviour of hospital laboratory leaders, the participant responses then prompted two further questions *a) What is the leadership behaviour of medical laboratory directors?* and *b) How might leadership behaviour affect professional identity?*

Results from the quantitative data revealed that leadership behaviour mean scores in lab B were higher than in lab A. Two dimensions of leadership were examined using independent t-tests, these showed significant differences between the two laboratories. There was a weak significant correlation between the task-oriented dimension of leadership behaviour and the professional commitment dimension of professional identity. No other significant correlations were found. The qualitative data provided more detailed responses which enabled the researcher to gain a greater understanding of the discrepancies between the two laboratories.

The purpose of qualitative data was to explain and investigate the MLS' leadership behaviours in more depth. The interview, focus groups transcripts and observational data revealed three primary themes, the first theme being effective leadership. The MLS commenced the interviews by sharing their experiences of good qualities demonstrated by their leaders. The positive qualities shown were: inducing interpersonal relationships among staff, involving staff in decision making and building an effective team. The second theme was ineffective leadership, such as lack of delegation authority, lack of support and poor management and leadership. This theme shed light on issues of centralised management in which a leader deals with everything and neglects the main tasks of leadership. This revealed a poor understanding of the differences between leadership and management. The third and final theme was leadership challenges in relation to hospital laboratory services. It has been identified that the culture of the workplace, and the local

culture of SA, has affected the profession of MLS. These challenges were linked with issues of mixed gender and the effect of toxic employees on the workplace. In addition, the multiplicity of professional specialisations, the challenges of workload, staff shortage and quality were identified as additional challenges.

In conclusion, the results from the current study do indicate that leadership styles play a significant role in the developing culture of MLS workplaces. Lab B was identified as performing better than lab A in terms of planning, quality assurance and accreditation, and with fewer problematic staff issues. The quantitative and qualitative data were used to explain these findings, but no discrepancies were identified in terms of arriving at major conclusions or ways to explain these differences, although differences in leadership scores appear to be noteworthy. In the next chapter, the effect of leadership on job satisfaction will be explored and also the MLS's level of job satisfaction.

CHAPTER SIX - Job Satisfaction

6.1 Introduction

This chapter provides answers in relation to the job satisfaction of MLS in two hospitals. A detailed description of MLS' job satisfaction is presented. Then, this is followed by an examination of the association between MLS job satisfaction and professional identity and association job satisfaction and leadership behaviour to answer the second and the third question the study, respectively. The findings will be presented in three parts: Part I offers the statistical evidence that addresses the research questions, and which informs the qualitative data. Part II provides the results of the qualitative analysis of the data collected during the interviews and observational data. Part III presents the chapter's conclusion and mixed-method inferences.

6.2 Part 1: Quantitative data

Respondents rated their job satisfaction using Mueller and McCloskey's Job Satisfaction Survey (MMSS) (Mueller and McCloskey 1990), updated by Lee et al. (2016). The MMSS evaluates five factors of job satisfaction: extrinsic rewards, work culture and conditions, scheduling family/work balance, collegial relationships and professional opportunities. The job satisfaction results were drawn from a scale of 5 points on the Likert scale, where 1 is the lowest score and 5 is the highest score (Lee et al. 2016). The total number of participants in this study was 150 MLS, 99 questionnaires were returned giving an overall response rate of 66%. Table 21 displays MLS answer frequencies for each item in the questionnaire.

Two items included in 'scheduling and family/work balance' showed notable results (Table 21). The result for the first item, 'working hours', shows that 40% of MLS selected a neutral answer. It would appear that participants did not have a strong opinion on working hours. However, around 48% of the participants were very dissatisfied with 'part-time work'. The majority were therefore very dissatisfied, this may reflect the fact that a part-time job is not available, therefore is not popular and this is not really having an impact on their job satisfaction.

Working culture and conditions included a negative response under the headings 'Your participation in decision making', the majority were shown no strong opinion (neutral) or very dissatisfied. Whereas a positive response under the same factor, the heading 'recognition for your work from peers', the majority were moderately or very satisfied. This was not unexpected since MLS have excellent working relationships as demonstrated in the next dimension of collegial relationships.

Two items included in the factor 'collegial relationships' presented interesting results. The first item was 'the other professionals you work with'. The response to this item demonstrated that ten per cent of participants were dissatisfied, specifically two percent were very dissatisfied, and eight percent were moderately dissatisfied. The second item was 'opportunity for social contact with your peers at work', this response indicated that none (0%) of the participants were dissatisfied and that only seven percent were moderately dissatisfied. This indicates that MLS generally have a good relationship with colleagues and other departments in the laboratory.

Furthermore, two items included in the factor 'professional opportunities' showed interesting results, these were 'opportunities to participate in research' and 'opportunities to write and publish'. In both cases 37% of MLS were very dissatisfied, this could be the reason why MLS express an interest in undertaking and publishing research. Qualitative data provided further information in relation to participant's perceptions and needs.

Table 21 MLS answer frequencies (green colour refers to the highest score)

Factors	Items	very dissatisfied	Moderately dissatisfied	Neutral	Moderately satisfied	Very satisfied
Extrinsic rewards	1. Salary	8	16	26	23	26
	2. Holidays	7	18	32	20	22
	3. Other allowance (e.g., study leave)	26	24	32	8	9
Scheduling and family/work balance	4. Working hours	12	19	39	19	9
	5. Flexibility in Scheduling hours	6	24	29	19	20
	6. Working straight days	21	17	30	15	15
	7. Part-time work	47	16	16	11	8
	8. Weekends off/month	9	15	24	24	27
	9. Flexibility in Scheduling weekends off	9	13	26	25	25
	10. Compensation for working weekends	12	19	21	21	26
Collegial relationships	11. Special leave (e.g., maternity and paternity)	16	17	24	19	23
	12. The other professionals you work with	2	8	30	26	33
	13. The work practice	3	19	30	29	18
	14. Opportunity for social contact with your peers at work	0	7	26	32	34
	15. Opportunities for social contact with colleagues after work	1	14	28	28	27
Work culture and condition	16. Opportunities to interact professionally with other disciplines	5	18	29	27	19
	17. Your supervisor	11	12	26	25	24
	18. Control over what goes on in your work setting	7	18	32	24	18
	19. Recognition for your work from supervisors	13	18	13	32	23
	20. Recognition for your work from peers	5	9	22	35	28
	21. Amount of encouragement and positive feedback	13	15	24	24	23
	22. Your control over work conditions	23	27	26	10	12
Professional opportunities	23. Your participation in decision making	30	18	24	18	9
	24. Opportunities to participate in research	37	21	20	12	9
	25. Opportunities to write and publish	37	20	24	9	9

6.2.1 Descriptive statistics of job satisfaction's variables

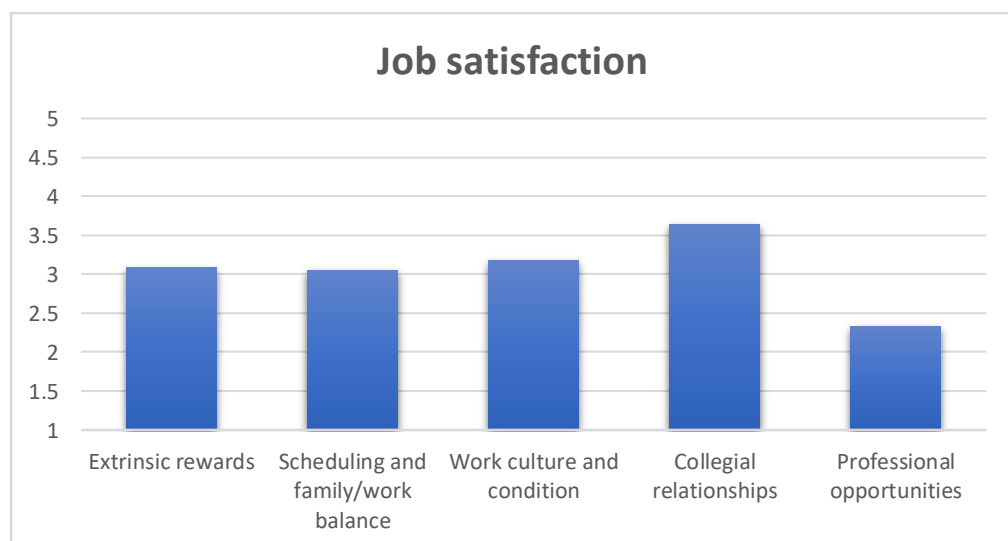
Table 22 includes job satisfaction average mean scores for MLS working in both hospital laboratories (n=99). Overall, they revealed that MLS professionals were not satisfied with the 'professional opportunities' currently open to them as they scored an average of 2.33; this score is below the midpoint or neutral on the 5-point Likert scale. The other variables scored above the midpoint of 3, ranging from 3.05 to 3.64. The MLS professionals had a high level of satisfaction, in particular, 'collegial relationship' scores resulted in an average of 3.64 (see Figure 20).

Further analysis of data distribution is required in order to identify whether the differences between lab A and lab B are correct.

Table 22 Summary statistics for MLS in both laboratories

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	<i>SE_M</i>	Min	Max	Skewness	Kurtosis
Extrinsic rewards	3.08	0.93	99	0.09	1.00	5.00	0.25	-0.35
Scheduling and family work balance	3.05	0.89	99	0.09	1.00	5.00	0.13	-0.47
Work culture and condition	3.17	0.99	99	0.10	1.00	5.00	-0.11	-0.79
Collegial relationship	3.64	0.82	99	0.08	1.60	5.00	-0.06	-0.69
Professional opportunities	2.33	1.27	99	0.13	1.00	5.00	0.59	-0.74
Overall	3.05							

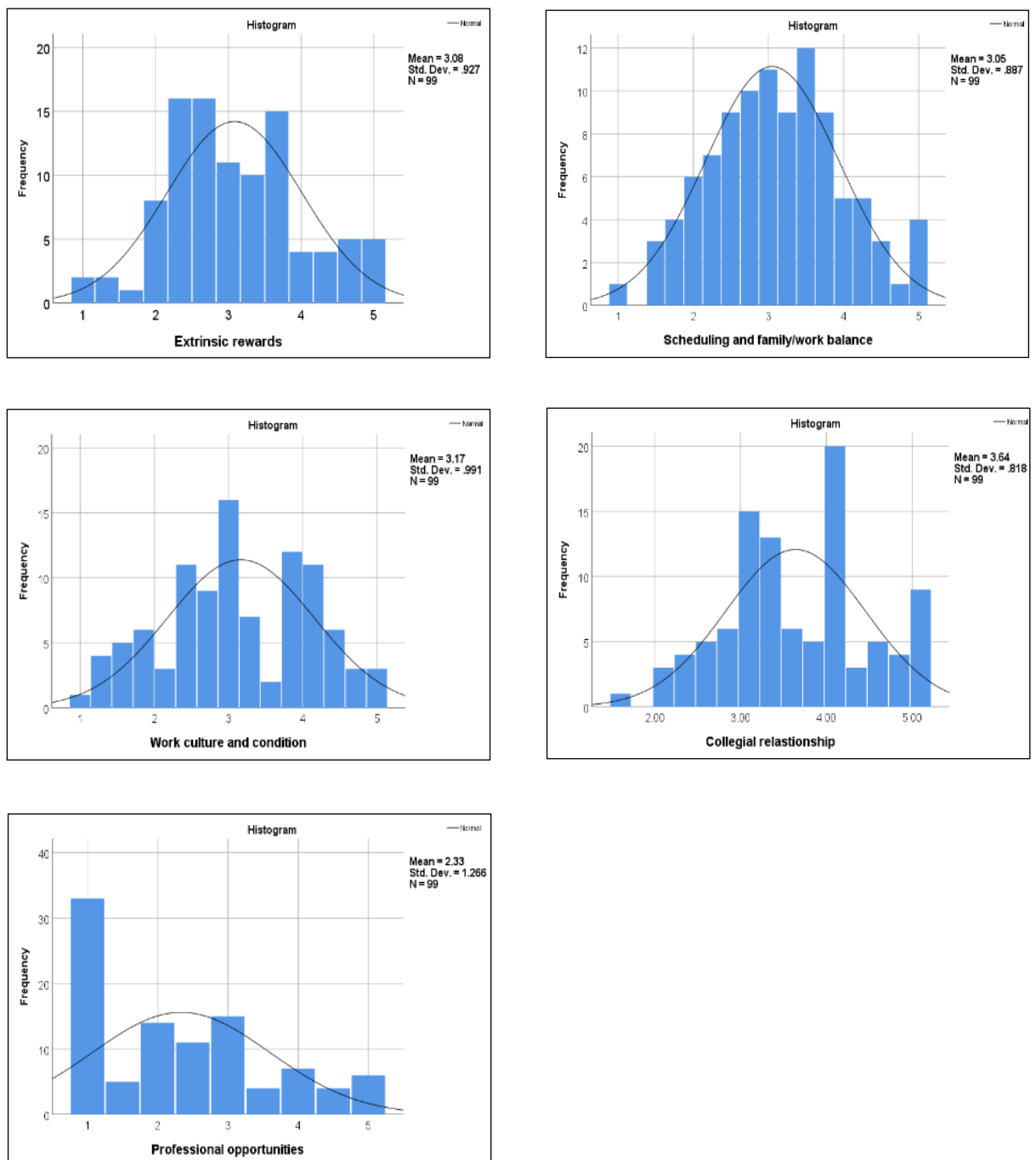
Figure 20 Average mean scores for MLS on both laboratories



6.2.2 Normality testing

CLT was applied for the purpose of conducting parametric tests. The CLT states that when considering data which is normally distributed, the sample size must be sufficiently large, more than 30, regardless of the population's shape of distribution. The sample size for this study is large ($n=99$), meaning then that the sampling distribution can be considered normal (Field 2013) (see Figure 21).

Figure 21 Histograms of data distribution of job satisfaction



6.2.3 Mean comparison

A two-tailed independent samples *t*-test was conducted to examine whether there was a significant difference in the mean scores for the two laboratories (A and B) in terms of job satisfaction variables (see Figure 22), these included 'extrinsic rewards', 'scheduling and family work balance', 'work culture and conditions', 'collegial relationship' and professional opportunities. The variances were only consistently homogeneous for four variables: 'extrinsic rewards', 'scheduling and family work balance', 'work culture and condition' and 'professional opportunities' indicated by $p > 0.05$ for Levene's test.

The results of the two-tailed independent samples *t*-test were not significant for extrinsic rewards, $t(97) = -0.12$, $p = .906$, scheduling and family work balance, $t(97) = -1.81$, $p = .074$, work culture and condition, $t(97) = -1.23$, $p = .222$, and professional opportunities, $t(97) = -0.43$, $p = .666$. These findings indicate that the means for variables were not significantly different between lab A and lab B. The results are presented in Table 23.

Figure 22 Job satisfaction mean scores in lab B and lab A

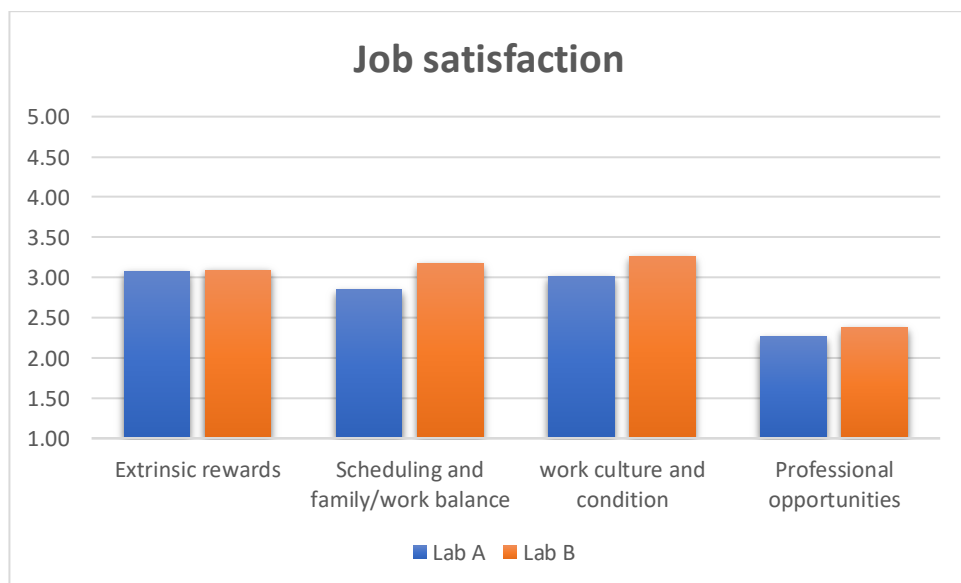


Table 23 Two-Tailed Independent Samples t-Test for job satisfaction variables

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Extrinsic reward	Equal variances assumed	.170	.681	-.118	97	.906	-.023	.193	-.405	.360
	Equal variances not assumed			-.115	72.63	.909	-.023	.197	-.416	.370
Scheduling and family work balance	Equal variances assumed	2.219	.140	-1.80	97	.074	-.328	.181	-.687	.032
	Equal variances not assumed			-1.72	66.26	.090	-.328	.190	-.708	.053
Collegial relationship	Equal variances assumed	4.017	.048	-.215	97	.830	-.036	.169	-.3735	.300
	Equal variances not assumed			-.205	67.32	.838	-.036	.177	-.3912	.318
Work culture and condition	Equal variances assumed	1.126	.291	-1.22	97	.222	-.251	.204	-.656	.154
	Equal variances not assumed			-1.19	70.52	.238	-.251	.211	-.672	.170
Professional opportunities	Equal variances assumed	2.999	.087	-.434	97	.666	-.114	.263	-.635	.407
	Equal variances not assumed			-.416	68.31	.679	-.114	.274	-.660	.432

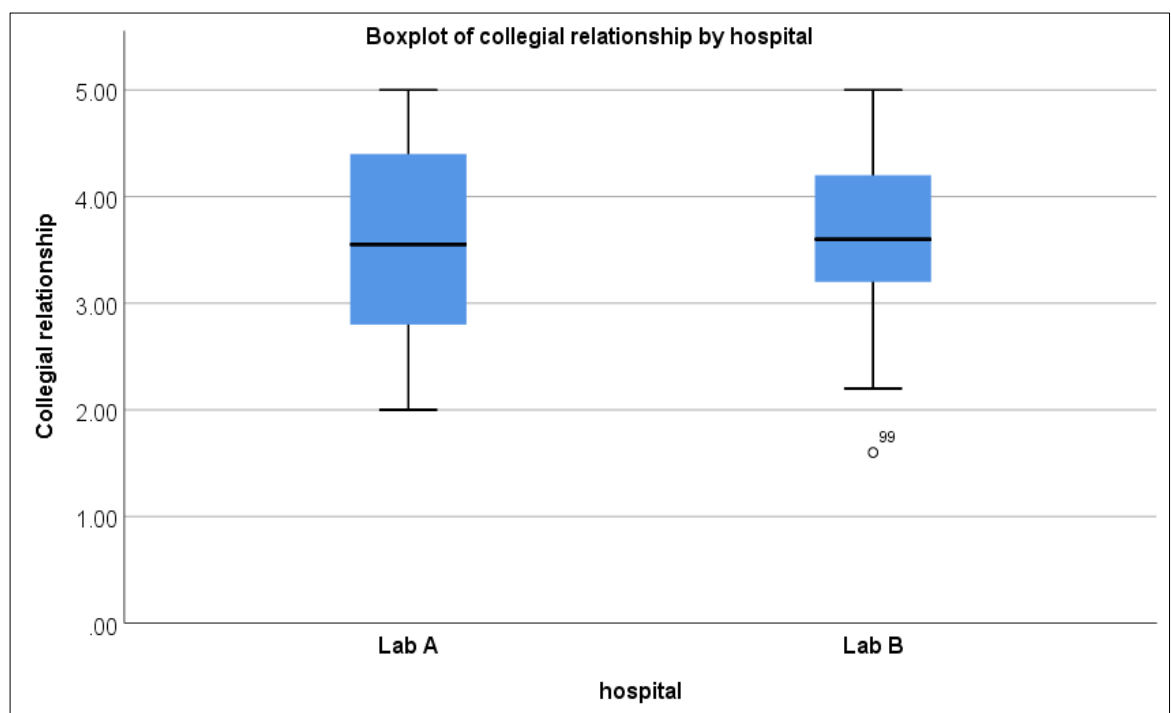
A two-tailed Mann-Whitney two-sample rank-sum test was conducted to examine whether there were significant differences in the collegial relationship between the MLS of the two laboratories.

The result of the two-tailed Mann-Whitney U test was not significant, $U = 1119$, $z = -0.29$, $p = .773$. The mean rank for group lab A was 48.95 and the mean rank for group lab B was 50.66. This suggests that the distribution of collegial relationships for group lab A ($Mdn = 3.55$) was not significantly different from the distribution of collegial relationship for lab B ($Mdn = 3.60$). Table 24 presents the result of the two-tailed Mann-Whitney U test. Figure 23 presents a boxplot of the ranks of collegial relationship.

Table 24 Two-Tailed Mann-Whitney Test for collegial relationship by hospital

Variable	Mean Rank		U	Z	p
	Lab A	Lab B			
Collegial relationship	48.95	50.66	1119.00	-0.29	.773

Figure 23 Boxplots of Collegial relationship by hospital



Summary

It appears that the job satisfaction scores for MLS in lab B were higher when compared with lab A. The difference in the means scores between the two laboratories, however, were not statistically significant. This indicates that no one group was doing better than another. Thus, more investigations were required to explore the job satisfaction of MLS in both laboratories. The qualitative data provided more comprehensive answers and offered further explanations for these job satisfaction scores.

6.2.4 Research question 2) What are the possible relationships between MLS' perceptions of professional identity and job satisfaction?

Measuring the strength of the relationship between these two variables.

A Pearson correlation analysis was conducted to measure the strength of the relationships between the five dimensions of job satisfaction and the five dimensions of professional identity. A moderately significant positive correlation was observed between three dimensions of job satisfaction and a professional commitment dimension of professional identity. The results were 'extrinsic rewards', $r = 0.31, p = .002$, 'scheduling and family/work balance', $r = 0.31, p = .002$, and 'work culture and condition', $r = 0.35, p < .001$. These correlations indicate that as 'extrinsic reward', 'scheduling and family/work balance' and 'work culture and condition' increase, 'professional commitment' also tends to increase. Some weak significant correlations coefficient values below 0.3 have been identified in Table 25.

Table 25 Correlations between job satisfaction and professional identity

		Professional commitment	Professional autonomy	Belief in public service	Profession as Referent	Belief in self-regulation
Extrinsic rewards	Pearson Correlation	.312**	.078	.204*	.207*	.138
	Sig. (2-tailed)	.002	.443	.042	.040	.174
	N	99	99	99	99	99
Scheduling and family/work balance	Pearson Correlation	.310**	.041	.211*	.273**	.066
	Sig. (2-tailed)	.002	.687	.036	.006	.517
	N	99	99	99	99	99
Work culture and condition	Pearson Correlation	.349**	.124	.189	.219*	.111
	Sig. (2-tailed)	.000	.222	.061	.029	.273
	N	99	99	99	99	99
Collegial relationship	Pearson Correlation	.186	.263**	.162	.137	.133
	Sig. (2-tailed)	.065	.008	.110	.176	.190
	N	99	99	99	99	99
Professional opportunities	Pearson Correlation	.201*	-.006	.108	.226*	-.042
	Sig. (2-tailed)	.046	.950	.286	.025	.683
	N	99	99	99	99	99

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Light green: indicates the weak relationship

Moderate green: indicates the moderate relationship

6.2.5 Research question (3): b) how might leadership behaviour affect job satisfaction?

Measuring the strength of the relationship between two independent variables.

A Pearson correlation analysis was conducted to measure the strength of the relationship between the five dimensions of job satisfaction and the two dimensions of leadership behaviour. A moderate significant positive correlation was observed between four dimensions of job satisfaction, these were ‘Scheduling and family/work balance’, ‘Work culture and condition’, ‘Collegial relationship and Professional opportunities, and all dimensions of leadership behaviour (see Table 26). These correlations indicate that as ‘leadership task-oriented’ and ‘leadership relationship-oriented’ increase; ‘Scheduling and

family/work balance’, ‘Work culture and condition’, ‘Collegial relationship and ‘Professional opportunities’ also increases. A weak significant correlation was observed between ‘leadership relationship-oriented’ and ‘Extrinsic rewards’ indicating a small effect as the value of the correlation coefficient is below 0.3 (see Table 26).

Table 26 Correlations between job satisfaction and professional identity

		Extrinsic rewards	Scheduling and family/work balance	Work culture and condition	Collegial relationship	Professional opportunities
Leadership task-oriented	Pearson Correlation	.197	.385**	.516**	.458**	.334**
	Sig. (2-tailed)	.051	.000	.000	.000	.001
	N	99	99	99	99	99
Leadership relationship-oriented	Pearson Correlation	.200*	.377**	.528**	.454**	.334**
	Sig. (2-tailed)	.047	.000	.000	.000	.001
	N	99	99	99	99	99

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Light green: indicates the weak relationship

Moderate green: indicates the moderate relationship

Summary

The five dimensions of job satisfaction and the five dimensions of professional identity were tested to identify significant relationships. There were three moderately significant positive relationships between 'extrinsic rewards', 'scheduling and family/work balance', 'work culture and condition' and 'professional commitment'.

The two dimensions of leadership behaviour and five dimensions of job satisfaction were tested to identify significant relationships. Moderate significant positive correlations were observed between four dimensions of job satisfaction, these were 'Scheduling and family/work balance', 'Work culture and condition', 'Collegial relationship and Professional opportunities, and all dimensions of leadership behaviour. The results of the correlations were explored further by the qualitative data.

6.3 Part II Qualitative data

The data was derived from the semi-structured interviews, focus groups (FG) and observations with a total of 96 hours. The total number of participants interviewed was 17. Eight MLS held supervisors' positions, seven were technologists and technicians and two were leaders. The total number of participants taking part in FG was 10 in total. Extracts from the interviews and FG are shown in italics and provide evidence for main themes. Three main themes emerged from the thematic analysis of interviews and observation data gathered from the participants. The themes were: job factors, disadvantages of this career and supervisory style and workplace environment. The three themes were identified throughout data collection and analytic processes (Braun and Clarke 2006). Changes were made to the extracts from interview transcripts, such as deleting excessive information, which was replaced by ellipses. Identities were protected by anonymising personal information such as names and locations. The themes were classified into sub-themes using evidence provided by the participants during the interviews. The findings are presented with the interview transcripts followed by extracts from observational notes.

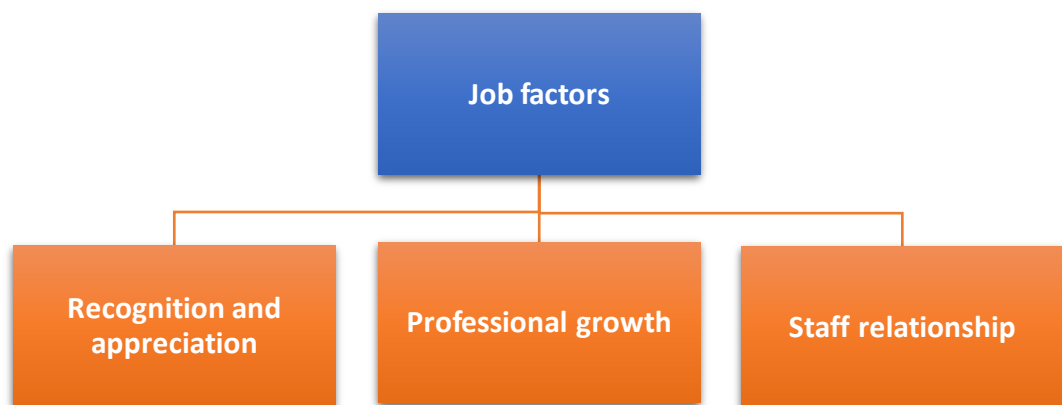
The quantitative data provided rich description with regard to the MLS' views of job satisfaction, and this was the case for both laboratories. The survey results were considered alongside the qualitative phase to investigate the issue further as additional data were gathered, this enabled discrepancies to be identified and further explanation to be

provided. The themes presented below include results from both the interview and the observational data.

6.3.1 Theme 1: job factors

This theme explores the most important job factors reported by MLS. Participants described the factors contributing to their job satisfaction, these responses were classified into three sub-themes. These sub-themes are recognition and appreciation, professional growth and staff relationships (see Figure 24).

Figure 24 Theme 1 - Job factors



Sub-theme 1: Recognition and appreciation

This sub-theme illustrates the fact that there is a lack of recognition and appreciation afforded to the MLS profession by both the healthcare professionals in the hospital and the wider community. It is important to clarify that recognition and appreciation are core elements of professional identity. The medical community, particularly some doctors, may regard the MLS profession as inferior due to lower educational requirements. Leaders and supervisors of the laboratories could pay more attention to the recognition and appreciation of the work of MLS.

The following quote was provided by participant P5:

(P5): "The medical community regard us as inferior ... especially from the group of doctors. Not all of them but most of them do not see the laboratory as an important thing ... doctors see us as nothing because we have a bachelor's in

biology or chemistry [facilities of applied sciences] and they do not even know there is a faculty of medical applied science, and we don't have high qualifications such as master's degrees". [Participant MLS (5)]

Conversely, participant P4 added that the community showed more appreciation for MLS than the healthcare professionals who worked in the medical field:

(P4): "People who are working in the medical field say, "what do you do?" They say that we do not have work to do. We find appreciation from society more than those working with us in the hospital." [Participant MLS (4)]

But,

(P20): "Society still has not any awareness about laboratories staff and do not have any idea about the role of it." [Participant MLS (20) FG.1]

However, not all participants shared the same opinions with regard to society's perception of the MLS profession. Also, it was evident that when staff gained new qualifications, there was no recognition of their achievement from other employees:

(P9): "After I become a first specialist! [got a master's degree] There is no difference here and I am doing the same as my previous work. It is not much different." [Participant MLS (9)]

The MLS also mentioned that there was very little recognition and appreciation from the leaders and supervisors of their laboratories:

(P22): "We miss incentives even the simple ones such as recognition incentives, regardless of rewards incentives. The leader should be incentivising his staff" [Participant MLS (22) FG.1]

On a wider level, there was a lack of recognition for the MLS profession from the MoH:

(P13): "The Ministry of Health and society do not recognize the importance of laboratories ... It should be entitled the ministry of doctors, not health." [Participant MLS (13)]

Summary

These data indicate that there was a general lack of recognition and appreciation within the medical laboratory profession. The poor level of recognition and appreciation, which has an impact on professional identity, could negatively impact on the job satisfaction of MLS. Three factors were identified by participants as sources of demoralisation: the community, healthcare professionals and laboratory systems. These factors could explain the average scores given for the work culture and condition dimension of job satisfaction in the quantitative data. The quantitative data also indicate that the dimension of work culture and conditions moderately correlates with professional commitment. Therefore, the dimension of professional commitment could perhaps be improved if the workplace culture and conditions were enhanced. Furthermore, the dimensions of leadership styles which are people-oriented and task-oriented showed a moderate positive relationship with the dimension of 'work culture and condition' of job satisfaction. This could perhaps explain the leaders' impact on the work culture and conditions of hospital laboratories. This point has been discussed in Chapter 5, leadership behaviour, and in the summary of theme 1.

Sub-theme 2 Professional growth

This sub-theme illustrates the lack of opportunities in relation to professional development. The following quote describes this situation in laboratories, with MLS who have not attended educational courses for many years feel this is having an impact on their level of knowledge. This could explain the low scores given for professional opportunities, MLS rated this dimension at 2.33 out of 5:

(P4): "If you ask members of staff a deep question about laboratories, you will be surprised because no one will answer you. No development. Even if you ask me, I do not have an answer because it has been two years without development or attending courses, I forget some of the information." [Participant MLS (4)]

Participants expressed their negative experiences, whilst some MLS were offered professional development, this was not the case for everyone and there were no research opportunities:

(P11): *“Unfortunately, some courses are reserved by the administration for specific people. They are reserved by the head of the Department for their friends and relatives. While more than a year ago I could not have any course! We suddenly heard the names of nominees. When I asked them, they said the nomination for courses can be in two ways - either to be nominated by the administration, or an adviser from the equipment company who selects you by name "I want this person", but unfortunately, we hear only when it is done, that there is a person nominated for five days! You will find the person who is nominated, going abroad, enjoying his time and takes this course as a trip.”* [Participant MLS (11)]

Participant P21 mentioned that the MoH system did not support the professional development of MLS in the same way that hospitals supported by a different ministry do:

(P21): *“If you have a talent in the laboratory, this person should be supported and given the opportunity to develop and improve, the military hospitals will support a training programme outside the kingdom for laboratory staff if he/she obtains an excellent evaluation. In our laboratory, that is not possible even if you get an excellent evaluation.”* [Participant MLS (21) FG.1]

However, a participant attributed the lack of professional growth to the fact that training courses were not compulsory and that advances in technology may result in highly skilled staff not being required

(P27): *“these updates provided us with comfort, but the problem lies in the employees as the ministry do not care about staff development and there are no training courses, but military hospitals compel their employees to have training courses ... every employee should be updated with development ...”* [Participant MLS (27) FG.2]

MLS expressed the view that the working environment lacked stimulus and did not encourage or motivate staff due to the lack of opportunities for professional growth. Participants commented that it was difficult to pursue continuing education because sabbatical leave was not available to them:

(P23): *“The work environment is not motivating because it does not care about development as there are no educational programmes, but our field is good ... there is neither motivation nor encouragement. Many of us would like scholarships but the requirements are difficult, and local study needs sabbatical leave”.* [Participant MLS (23) FG.2]

MLS discussed another serious topic; there were no research centres where they could undertake research and develop their skills. This was explained by participant P5: *“we do not have research centres, so graduates are only working in hospital laboratories.”* [Participant MLS (5)]

The lack of research centres has been identified as a disadvantage for MLS, and so they lack the opportunity to be creative and innovative:

(P9): *“I see that our speciality is a good thing but there are no research centres in the hospital, and often there are a million things to look at, but our ideas are limited in a laboratory and a hospital.”* [Participant MLS (9)]

The work system supports MLS' professional growth, it offers MLS certain days as study leave. This was supported by participant P2:

(P2): *“All employees are offered 14 days as a study leave by the work system.”* [Participant MLS (2)]

Summary

Participants cited the lack of opportunities for development and research as a factor which resulted in reduced job satisfaction. Participants felt the MoH should support MLS in terms of providing them with training opportunities. The lack of equality when selecting staff for development was also identified by MLS, this is considered to be a leadership issue, as discussed in the previous chapter on leadership behaviour. The data in this sub-theme corresponds closely with the quantitative data, MLS in both laboratories gave a score of 2.33 out of 5.

Furthermore, the correlation between the professional opportunities dimension of job satisfaction and the professional commitment dimension of professional identity showed only a weak positive relationship. The lack of opportunities for professional development

could be impacting upon the job satisfaction of MLS as well as their general commitment to the profession. In addition, the dimensions of leadership styles which are people-oriented and task-oriented showed moderate positive relationships with professional opportunities. This could play a key role in developing MLS and creating opportunities for their professional growth.

Sub-theme 3 Staff relationship

This sub-theme illustrates the importance of staff relationships as a factor affecting job satisfaction in medical laboratories. MLS reported that working relationships were good and mutually supportive. Job satisfaction improves when there are good working relationships and staff work collaboratively, it has previously been identified (in the leadership chapter) that teamwork was generally positive. MLS gave a score of above average for the “collegial relationship” dimension. The quantitative data demonstrated, however, that there was only a weak positive relationship between the collegial relationship dimension of job satisfaction and the professional autonomy dimension of professional identity. MLS felt their roles were not fully autonomous because some laboratory consultants were carrying out the roles of medical technologists. This point is discussed under sub-theme 2, job clarity and autonomy. In addition, both dimensions of leadership style showed a moderate positive relationship with the collegial relationship.

The following quotes show the positive relationships amongst MLS in the laboratory:

(P8): “We are like one family, no matter what happens, even if there are mistakes, we cover them and we work together.” [Participant MLS (8)]

This was supported by participant P6:

(P6): “The staff are great, especially in the XX department, they are really wonderful.” [Participant MLS (6)]

The MLS felt that positive staff relationships were important and could lighten the burden of routine work:

(P18): “Researcher: Did you like the laboratory routine, every day you are doing the same thing?”

Participant: Yes, it is routine work, but I get used to it and I prefer it.

Researcher: why?

Participant: well, there is great staff I work with and I am sure the eight hours will pass quickly” [Participant MLS (18) FG.1]

Communication between the management team and staff was good, the relationships helped to create a positive working atmosphere. The following quote was taken from an interview with a member of the administration team:

(P15): “We joke and laugh away from work we sometimes talk about work in our WhatsApp group, but most of the time we enjoy joking and laughing and passing our regards to each other's family and this is what it is supposed to be like ... I am aiming to spread this out to other departments.” [Participant MLS (15)]

Most responses indicated that the workplace was a positive environment, however, some participants and observation data revealed a different story. It might still be a problem, however, since the score for colleague relationships in the quantitative data revealed that MLS were not completely satisfied.

This was corroborated by observation data. The following observations were made from lab B.

Place: At Lab B, **Actor:** A member of staff, **time:** 8 am – 12 pm morning session

Event: A disappointed member of the staff

I saw a female staff member leave the XX department tearful and disappointed after she had a conversation with the supervisor. I did not know the reason.

And,

(P5): “There is a negative atmosphere in our laboratory. For example, if you ask an employee at the end of the working day, if you ask him/her, can you return to ED to run an ED sample, they say no, we do not want to work on at the end of working hours because of the negative atmosphere that exists, and this is a dangerous indicator. Because the atmosphere is full of problems between staff.” [Participant MLS (5)]

Summary

Data in this sub-theme indicated that staff relationships were a major factor in relation to job satisfaction. The qualitative data indicated that whilst the majority of participants had a good relationship with their colleagues, some participants did not. In this respect, the qualitative data corresponds with the quantitative data. The quantitative data identified only a weak positive relationship between the collegial relationship dimension of job satisfaction and the professional autonomy dimension of professional identity. Some MLS in both laboratories were not practising their role autonomously due to laboratory medical consultant's intervention. Furthermore, the dimensions of leadership styles, which are people-oriented and task-oriented, showed a moderate positive relationship with the collegial relationship. This could explain the impact that leaders' interactions have on collegial relationships and workplace culture in laboratories.

6.3.2 Theme 2: Disadvantages of MLS career

This theme explores the disadvantages of this career choice, such as financial rewards, job clarity, autonomy and work /life balance, and these form the three sub-themes that will be presented (see Figure 25). These aspects of the role can impact on workers' satisfaction in hospital laboratories services in SA. Participants' detailed responses provided answers to the research question number two in relation to job sensitisation of MLS.

Figure 25 Theme 2 - Disadvantages of MLS career



Sub-theme 1 Financial rewards

This sub-theme illustrates that salary and promotion are major factors affecting job satisfaction. Participants' views varied in relation to this sub-theme. This could help explain the average scores in relation to the dimension of extrinsic reward. The first quote was taken from a participant who was content with their salary:

(P7): *"We have an excellent job, position and high salaries."* [Participant MLS (7)]

In contrast, the following quote provides an example of a professional who was more dissatisfied with the salary received:

(P3): *"I feel that the salary is not enough to meet my needs."* [Participant MLS (3)]

A further explanation was provided in relation to the low salaries:

(P5): *"You know we are in lower ranks than the other health staff members in the Ministry of Health. We are at a low level of wages unlike other members of staff. There is an injustice here. 60 % to 70 % of our rights are not given to us. It is our right to have a housing allowance and other allowances".* [Participant MLS (5)]

Participant P7 also claimed that their allowances were inadequate compared with other medical professionals:

(P7): *"Allowances are considered as parts or ways of increasing salaries, for example, other specialities like pharmacy receive a risk infection allowances, but why? They take it, for what? They only dispense medications to patients in the pharmacy. They only have to deal with medication, but those in the laboratory who handle the samples, they may get infectious diseases and be unwell."* [Participant MLS (7)]

Participant P12 considered salaries and promotions as factors which would improve MLS productivity and discipline:

(P12): *"Yes, if the salaries and promotion are modified and resolved, you will see an increase in productivity and more discipline. Staff will appreciate it and will be more relaxed, they will be able to afford to pay school fees. You will also be*

psychologically, financially, and physically content. Things will improve, so financial matters must be improved significantly." [Participant MLS (12)]

In addition to this sub-theme, participants were happy with the compensation system. This was added by participant P11: *"We are financially compensated during the Hajj season."* as MLS then need to work 12-hour shifts.

This finding was corroborated by observation data. The following observations were made from laboratory A.

Place: At lab A, **Actor:** Staff member, **time:** 8 am – 12 pm morning session

Event: A disappointed member of the staff

When I was in the laboratory collecting observational data, I overheard a conversation between staff: A member of staff was disappointed because there was an issue with the salary system, and they had to defer his salary to the next month and no one could help. Interpretation: An issue like this will have an impact on the attendance of the employee in terms of physical attendance at work or mental attentiveness. This job requires a high level of concentration as each result can affect a patient's life.

Since the laboratories in this study are predominantly staffed by females, more than 50%, participants also expressed concerns regarding the provision of maternity leave and salary:

(P24): "We hope for more help, during maternity leave we receive ¼ of salary for 3 years, our pension is deducted from this ¼ salary, it's a problem" [Participant MLS (24) FG.2]

The system of work is supportive for females during and when they return to work after maternity leave, there is a policy that helps to reduce the working hours from eight to seven hours allowing the mother to take care of the children. The policies seem to cover the most important aspects of appropriate support for females' employees.

Summary

Participants' responses varied with regard to salaries and promotion. Some participants considered the salaries to be sufficient whilst the majority felt they were too low. They argued that some healthcare professionals were rewarded with higher salaries than MLS,

partly due to extra allowances received. Allowances seemed to be a contentious issue for MLS, some professionals are paid an allowance due to the risk of infection. This is not the case for MLS, they are not in receipt of such an allowance. Some health professionals are also paid an allowance for housing whilst MLS are not. The work system of the hospital laboratory is responsible for making decisions on these matters and has put policies in place to support pregnant women. Furthermore, the correlation results revealed that there was a moderate positive relationship between the dimension of extrinsic reward of job satisfaction and the professional commitment dimension of professional identity. This could be explained by the relatively high salary and high commitment to this profession. Furthermore, the dimensions of leadership styles, which include people-oriented showed only a weak positive relationship with extrinsic rewards and no relationship with task-oriented style. This could explain the reason why people-oriented leaders pay more attention to the job satisfaction of their staff; leaders are not able to award salary increases but they can assist staff in finding ways to gain extra allowances. Leaders can also nominate members of staff for extra allowances as a reward for hard work and they can submit an application to the MoH.

Sub-theme 2 Job clarity and autonomy

This sub-theme considers the importance of the job description and of autonomy, both have a major impact on job satisfaction. Under this sub-theme, participants described a lack of role clarity in the workplace, and how this threatened their autonomy. The expectations of MLS were not met because they had not been provided with a clear job description, the technologists cannot do the same role as technicians because technologists have not had a better education. The existing job description is currently identical for all MLS. The following quotes explain the role of the current participant in the hospital laboratory:

(P5): "How is it that a technologist works a technician's job! A doctor works as a technologist in addition to his job! And sometimes the specialist also works a doctor's job! So on" [Participant MLS (5)]

The provision of clear job tasks and duties could improve MLS' job satisfaction:

(P10): "... as I mentioned to you in the first question in the first section is to explain to people their basic tasks and each one's role so that people feel comfortable...But, if things are ambiguous, there will be no job satisfaction..." [Participant MLS (10)]

The lack of job clarity resulted in duplication of work and confusion regarding tasks, it threatened the autonomy of MLS and compromised their efficiency. This had a negative effect on job satisfaction. This was explained by participant P9:

(P9): "Participant: Each one has a role in the laboratory, but technologists work on devices as technicians, and they leave validation of results to the laboratory consultant to do on the morning shift.

Researcher: Is this a validation problem?

Participant: As a specialist, it has to be my role to make a decision and practice my job." [Participant MLS (9)]

One example was provided by participant P22, this showed that a technologist is actually qualified to do the work of a laboratory medical consultant:

(P22): "There was a case where the sample had blood toxicity due to high doses of vitamin D, the laboratory consultant laboratory accepted the results without notifying the medical department, which was the ICU. The laboratory consultant was not qualified and competent. I notified the relevant department (ICU), in my role as technologist, that the result had been released" [Participant MLS (22) FG.1]

The above quote supports the fact that MLS are competent to practise their profession without the need for laboratory consultants. Furthermore, the laboratory medical consultants could also make errors due to the huge volume of samples. It seems that the roles of professionals within the hospital laboratory are complementary to each other, but this can also be unclear at times.

In addition, lack of job clarity can result in unequal distribution of tasks and present major challenges for supervisors, it is difficult for them to assign tasks which are not included in the employees' job description. Also, employees' rights will be violated if they are asked to

perform tasks which are not ascribed to them. The following quotes were taken from a member of the management team:

(P13): "You will notice that some of them are diligent and will accomplish everything at work, while others do not know what to do!" [Participant MLS (13)]

And,

(P10): "I think we [MLS] are not forced to perform a certain task unless you clarify their rights." [Participant MLS (10)]

Summary

Participants revealed the importance of role clarity as a factor for job satisfaction, lack of clarity threatens MLS' autonomy and rights. The data indicated that MLS are qualified to judge and practise their work independently, however, this does not mean that laboratory consultants have no role to play. Indeed, a more clarification is required to determine the role of each professional in the hospital laboratory. The lack of role clarity was also considered to be a challenge for supervisors, this could explain the average score for MLS' job satisfaction, particularly at the dimension of work culture and condition.

Sub-theme 3 Work-life balance

The challenges in this final sub-theme relate to the balance between work and social life in both laboratories. The challenges include workload, long working hours, few holidays, stress, the high demand for tests and quality assurance requirements.

The following are typical quotes, they were taken from participant P13:

(P13): "The number of shifts increased, the number of employees decreased, this is a big problem. Employees were overstressed meaning that an employee was taking one shift a month. But now an employee is taking two a month or more! Apart from that, where is the care of employees' rest! ... Honestly, work pressure is too much. Because we have a large number of samples and work pressure is increasing day by day." [Participant MLS (13)]

Another participant commented on the long working hours in the laboratory. This was added by a female participant and revealed female views in relation to the profession:

(P3): *“I feel that the working day is very long and there are many shifts. The working day is very long. Three-quarters of the day is taken especially if one has a family and a commitment.”* [Participant MLS (3)]

The number of working days and the critical role of MLS in patients’ life can make this job very stressful:

(P19): *“The biggest disadvantage in the laboratories is the fact that a patient’s life is in your hand, we work under extreme pressure. This has an effect on the sample results. We also work the whole week, seven days, which can impact on our social lives.”* [Participant MLS (19) FG.1]

Doctors increase the laboratory workload when they request all available tests rather than selecting the ones that are required:

(P7): *“When it comes to analysis sheets, doctors [who request the tests] sometimes do not know which to tick? They do not know if it is necessary or confirming the other parts of the analysis. After that, doctors start giving orders all the time. But if MLS reject their orders, they come to you. They ask why did you do that? They say we know everything. If you really know everything on, what basis did you tick that box of analysis? Why do you ask for things that as a doctor will not benefit you in the treatment or diagnosis of a patient?”* [Participant MLS (7)]

MLS regard quality requirements as extra work, it is considered as a form of overload. They also feel that they need more assistance in carrying out the requirements:

(P16): *“You are asking me to do calibration, but it is an overload to me so, why don't you make it easy for me to work in a relaxed way. Bring staff in to do what you need and to provide you with more productivity, but in the end if people feel that you are not helping them, they won't work well.”* [Participant MLS (16)]

The system does not support part-time work, this is another disadvantage for staff, and the quantitative data demonstrated that more than half the participants were dissatisfied. The researcher asked about the availability of part-time work:

(P8): *“It could be possible. There are people who have problems in life so they can apply it. Some people have pressure and children so, they cannot work full-time hours...”*

Part-time staff are required to work four days a week or three days a week only. It is possible, but outside the country. We do not have part-time work here.”

[Participant MLS (8)]

Summary

As can be seen from the results, MLS identified work-life balance as a factor which can impact on their level of job satisfaction. Participants confirmed that workload, stress, long working hours, the lack of part-time work and quality requirements are all factors which affect their level of job satisfaction and have an impact on their work-life balance. The qualitative data substantiated the average scores found in the results of the quantitative data with regard to job satisfaction.

6.3.3 Theme 3 Supervisory style and workplace environment

This theme illustrates the style of supervision in terms of directing, managing, motivating and communicating with MLS. Three sub-themes will be discussed, leaders' quality, professional treatment and communication, and the workplace environment (see Figure 26).

Figure 26 Theme 3 - Supervisory style and workplace environment



Sub-theme 1 Quality of leaders

This sub-theme explores leaders' quality as a factor which can impact on the job satisfaction of MLS in hospital laboratories. This sub-theme has also been discussed in the previous

chapter on leadership behaviour, and under the main theme of effective leadership and ineffective leadership. The quantitative data shows that there was a significant difference between the leadership behaviour of lab A and that of lab B. MLS in lab B rated their leader more highly than staff in lab A. The purpose of this sub-theme is to link these qualities with job satisfaction in order to provide answers and an explanation of the quantitative data.

Good leadership could play a significant role in improving MLS' job satisfaction, important qualities for a good leader include the following: the ability to motivate, being approachable, just and an active listener. In addition, consulting staff and allowing them to influence decision making (Yenice and Randell 2018). The following quote was taken from a member of the management team:

(P1): "I also instilled in them the spirit of continuous education and self-development, at the same time we did not focus on certain employees and leave others out. Some staff come to my office and express a desire to attend certain courses at their own expense. I make it easier for them and encourage them and sometimes I try to help them through the laboratory budget. Employees were given the opportunity to decide what they thought and what was appropriate for the laboratory and how they wanted to see the laboratory." [Participant MLS (1)]

This leader in lab B displayed good leadership qualities, however, the data from the study showed that the leader changed his decisions frequently. MLS would like more involvement in decision making to avoid this situation:

(P20): "I do not know if it is an advantage or a disadvantage, when some decisions are applied it is clear that the manager has no experience or has never been in a laboratory before or even that it was an emotional decision." [Participant MLS (20) FG.1]

And,

(P21): "Participant: Yes, in our laboratory whenever a decision is made, some people can influence the leader, this leads to him changing the decision, he can be influenced by them.

Researcher: Do you consider it as courage when someone changes their decision?

Participant: No, it is a random decision, if all aspects of the decision are taken into consideration, then it should not need to be changed.” [Participant MLS (21) FG.1]

Motivating and rewarding staff were considered to be important factors, leaders can motivate employees, but the work system can also contribute to this. The following quote was taken from a member of the management team in lab B:

(P2): “If a person does a lot of sampling, sometimes he or she works hard, and they work until 4 pm, this employee can be motivated by vacations and motivated morally ... I told them everybody would get 10% bonus on their basic salary for a year if they got a certificate of thanks from the general manager or the director of health affairs ... Every year I choose employees who are honoured and given incentives.” [Participant MLS (2)]

Another quote provides an example of supporting an employee, this employee was given support to practise their chosen hobby in lab B:

(P7): “my hobby was in Multimedia before I got this job, when I finished in university, I enjoyed practising my hobbies and they do not interfere with my work. I practise my hobbies at work and try to educate people in my field. I have a passion for that.” [Participant MLS (7)]

MLS also expressed their discontent at the fact that they were not given the opportunity to contribute and express ideas and opinions in the workplace. Decisions are made without staff input:

(P9): “At work, I cannot tell the head of the laboratory that he doesn't know how to make decisions, because he may say you have no right to say that. In the end, you do not want to be fired from your work because of this. I feel that it is difficult.” [Participant MLS (9)]

One participant suggested that the MoH could assign inspectors to investigate staff issues since professionals were not allowed to express their opinions:

(P27): *“The ministry should send inspectors to the laboratories to investigate the complaints and talk to employees about matters”* [Participant MLS (27) FG.2]

Some inappropriate qualities were also displayed in lab A, making MLS unhappy with their profession:

(P8): *“Justice is not available; planning is not available. There is marginalization, preference, and favouritism.”* [Participant MLS (8)]

An MLS from lab A described another example of poor leadership when a member of staff required help and was not given any support:

(P5): *“Yes, once I was working at night and at certain times, we do not receive samples from the internal wards unless it’s an emergency. I then received routine samples after the allowed time, there is a policy that rejects any samples received outside the allowed time, and it is an emergency sample.”*

Researcher: Policies from who?

Participant: From the administration of the hospital and the leader of the laboratory but I was surprised that they wanted me to break such policies and accept this sample! I did not receive any support from our leader because the management? say everything we do is for the patient's sake!” [Participant MLS (5)]

This was corroborated by observation data. The following observations were made from lab A.

Place: At lab A, **Actor:** Senior MLS (bachelor’s degree, more than five years’ experience, he has been working in different hospitals in various regions of the kingdom), **time:** afternoon session 1-4 pm

Event: A senior had refused blood samples which came to the laboratory after 7 hours because they had not been stored in the proper way. A physician called the laboratory, expressed his /her anger, and asked to analyse these samples. However, the senior refused and reported this using a particular form to the head of the laboratory, but the head of the laboratory asked the senior again to run these samples or he would report him. Feelings and interpretation: an issue like this showed that the head of the laboratory did not support

his staff or the policy and standards of the laboratory. This might lead to a decrease in satisfaction levels among the MLS in the laboratory. Moreover, the power that physicians have to put pressure on MLS and the heads of laboratories should be limited through the use of stronger policies.

Summary

Data indicated that the quality of leadership varied, the leader of lab B displayed strong leadership skills whilst the other one did not. Staff in lab A where the leadership skills were less well developed only rated their job satisfaction as average, understandably. However, staff in the other laboratory where leadership quality was felt to be excellent, also gave an average score as shown in the quantitative data. Further investigation was therefore necessary to identify other factors which were impacting on MLS' job satisfaction, for example workplace environment. This is discussed under sub-theme 3 in the main theme 3 of this chapter.

Sub-theme 2: Professional treatment and communication

This sub-theme illustrates the professional treatment and communication between employees. Professional treatment is an area requiring improvement since favouritism was evident in both laboratories. The following quote discusses the issue of favouritism and a general lack of fairness, these could have an impact on the job satisfaction of MLS.

Participants P8 from lab B described the situation in the laboratories in terms of developing some employees:

(P8): "What is happening is that the development of certain people is not for the sake of work but for the sake of personal interest" [Participant MLS (8)]

Participant P11 also defined the above behaviour of laboratory leaders as favouritism:

(P11): "One of the negatives that I have witnessed is favouritism. He says this works with me and this is my friend etc. There is favouritism, he makes things easy for his friends and treats them differently, this is a negative point that exists" [Participant MLS (11)]

Another participant from lab A defined the leaders' behaviour, as mentioned by participant P8 and P22, as favours between the leader and his/her friends:

(P5): *"First of all, the compliments must be abolished. It must disappear. Do not be complacent at the expense of work. If the courtesy disappears, the sincere relationship of friendship will be established, the relations will be honest between the staff, there will be loyalty to the workplace, there will be good work. A person will work enthusiastically, and this is what I think is the best way."* [Participant MLS (5)]

And,

(P22): *"Leaders should take work as work, regardless of interpersonal relationships, if they make a decision, they should make it without favouritism"* [Participant MLS (22) FG.1]

There was evidence of poor communication, particularly with the opposite gender, throughout the interviews. Poor communication, whether it is between MLS themselves or with the management team, is another factor that can impact on job satisfaction. Due to the mixed workplace environment and the culture within SA women generally refused to communicate with men. This issue was a common challenge for leaders and supervisors in both laboratories. The following quote was taken from a member of the administration team:

(P16): *"Females communicating with other females was generally not a problem but communication with any man was difficult. We had a WhatsApp group and there was one male member only. He was middle aged [old generation], and there was one female, she was always quiet because he was present and there was no contact from her. He was not engaging with the female either, so, if he needed anything, he instantly called the supervisor."* [Participant MLS (16)]

Another quote from lab B described the fact that females do not like to talk with males and explained that this issue was also due to the culture:

(P17): *"People are different. There are some people [females] who feel that they do not like to communicate with men! There is a big barrier until recently. For example,*

some people over the age of 45 cannot communicate well with the opposite gender. There are young females who cannot speak to those older than them. They feel shy. Our problem is the culture” [Participant MLS (17)]

Another quote provided by participant P12 from lab A identified communication skills as a necessary requirement for the MLS environment: *“I expect that communication is the thing we need at work.” [Participant MLS (12)]*

This was corroborated by observation data. The following observations were made from lab A, they showed a lack of professional communication between MLS.

Place: At lab A, **Actor:** A member of staff and a supervisor (diploma degrees, more than 20 years' experience), **time:** Afternoon session, from 1 pm to 4 pm

Event: A dispute between an MLS and a quality coordination supervisor.

I was in the quality control office when a member of staff came in with a bag of blood samples that had been rejected. The staff member asked the quality coordinator to write a report and said, in an unprofessional way: “These are your rules, do it,” and he left the place. The supervisor followed him with the bag, but I did not go with him, as the situation was very critical. **Interpretation:** I think the member of staff refused to follow the quality standards or was not aware of the importance of reporting rejected samples, so he refused to do it and he thought that it was an extra job. The supervisor has been treated rudely and this allows others to do the same thing, incivility spreads. There are two other factors which could have led to this: the time at the end of the shift or the middle age of the member of staff.

Summary

Participants from both hospital laboratories were affected by the unprofessional treatment of staff, poor communication and favouritism. The mixed-gender environment was a barrier to communication due to cultural values. All the above have been identified as factors which resulted in reduced job satisfaction and posed a challenge for leaders, these problems were exacerbated by the presence of a large number of female staff in hospital laboratories. The qualitative data were in agreement with the quantitative data, it provided

an insight into the average scores for work culture and conditions. Other factors, which could lead to a decrease in the job satisfaction of MLS, were identified and are presented in the next sub-theme.

Sub-theme 3 Workplace environment

This sub-theme illustrates the importance of a good workplace environment or facility in terms of the layout, availability of break rooms and education rooms, good air conditioning and furniture. These were shown to affect participants' job satisfaction regardless of the quality of leadership. The two laboratories were not identical, participant P4 claimed that the operation of lab A needed to improve in line with the resources which had been offered by the government:

(P4): "It is a wonderful hospital that our government presented it to Makkah's people as a great gift, unfortunately, the government did not take into consideration the people who are going to run such a huge place. It is just like building the most beautiful airport in the world and bringing people in to operate it but in the same way that the old members of staff did!" [Participant MLS (4)]

In contrast, the layout of lab B was a problem for MLS, this could negatively impact upon the level of job satisfaction despite the fact that the leadership was rated as moderately high:

(P7): "Re-engineering and re-designing the lab in a suitable manner like adopting more safety rules and making the work area of the lab more suitable for the staff as a good working area because most of the staff are facing problems." [Participant MLS (7)]

This was corroborated by observation data. The following observations were made from the two laboratories.

Differences between the two laboratories:

Lab A is well lit, airy; the colours of its walls and floors are light and it is spacious. The building of this hospital was developed five years ago. It has relaxation areas for staff and is very well organised. While lab B did not have relaxation areas for staff, and it was a small laboratory. It has had a number of extensions to increase its size. The last expansion took

place 8 years ago. However, at the time that I was in the laboratory, there were new reconstructions for one department in the laboratory to meet the standards to become a training centre that will offer the Saudi medical board certificate in a particular speciality.

In addition, furniture has been identified as another issue in the lab B:

(P16): "You are trying to provide a good service to the patients, but you need to provide a good environment, for example ensuring the chair provided is comfortable. If it is uncomfortable, the employee will not work well. On the contrary, if you provide a good environment, he will work and even if there are many things to do or at difficult times like Hajj, he will work, support and help." [Participant MLS (16)]

The above observation, by the researcher, identified that there was no restroom available for the staff in lab B, the question was therefore asked as to where they spent their break time:

(P14): "Researcher: Where do you take your break?"

Participant: In different places like corridors, in the hospital's coffee shop, in the car or we go outside. Each one goes on his way." [Participant MLS (14)]

And,

(P20): "We do not have a break room at work." [Participant MLS (20) FG.1]

Participant P15 from lab B identified that there was no allocated space for the teaching and education of staff:

(P15): "We do not have a place for education, for training the staff or to have meetings." [Participant MLS (15)]

Summary

Participants from lab B revealed that the workplace or facility was not of a sufficiently high standard and that this had an effect on their level of job satisfaction. The two laboratories differed in this respect; lab A has been moved into a new building whilst lab B was located in an old building.

6.4 Part III: Conclusion and mixed-method inferences

Participants' responses to the questionnaire informed the research question, to answer the second research question: *What are the possible relationships between MLS' perceptions of professional identity and job satisfaction?* And the third research question: *how might leadership behaviour affect job satisfaction?* The results of the quantitative data revealed that the mean score for job satisfaction in both laboratories was almost identical. The mean comparison of the two groups were tested, these showed there were no significant differences between the two laboratories. There were moderately significant correlations between the 'extrinsic rewards', 'scheduling and family work balance', 'work culture and conditions' dimensions of job satisfaction and professional commitment dimension of professional identity (see Table 25). Furthermore, four dimensions of job satisfaction showed moderate significant correlations, these were 'scheduling and family/work balance', 'work culture and condition', 'collegial relationship' and 'professional opportunities', with the people-oriented and task-oriented dimensions of leadership behaviours (see Table 26). The qualitative data enabled the researcher to identify the reasons for the discrepancies between the two laboratories.

The purpose of the qualitative data was to gain a greater understanding of the responses given and a deeper insight into the working environment. The interview transcripts and observational data revealed three primary themes, MLS identified a number of factors which had an impact on their job satisfaction: recognition and appreciation, professional growth, and staff relationship. The second theme relates to the disadvantages of this career, factors which had an impact on job satisfaction were identified as follows: financial rewards, job clarity and autonomy, and work and life balance. The final theme was the supervisory style and workplace environment. Although one laboratory leader had excellent leadership qualities, MLS job satisfaction was no better than that found in the second laboratory. Further investigations were conducted in order to identify the effect of the physical workspace on job satisfaction, for example, the availability of restrooms, the layout of the workplace, and the resulting impact on job satisfaction.

In conclusion, the results from the current study indicate that MLS job satisfaction was impacted by a number of different factors such as salaries, stress, quality requirements,

lack of professional opportunities, workplace environment and the lack of job clarity. Evidence showed that leadership behaviour had an impact on the level of job satisfaction and that this affected professional identity. The quantitative and qualitative data were in accord, no discrepancies were found. In the next chapter, the quantitative and qualitative data will be discussed.

CHAPTER SEVEN - Discussion

7.1 Introduction

Drawing on the empirical evidence and narrative accounts obtained, this chapter discusses the findings from this study which set out to explore the professional identity, job satisfaction and leadership behaviour of MLS in Saudi Arabian hospital laboratory settings. The chapter begins by discussing of the MLS's demographic data. This is followed by a discussion of the key findings for each of the three research questions, the implications of those findings for MLS and the contribution to existing knowledge. Consideration is also given to the limitations of the study and the effectiveness of the design. Papadopoulos Cultural Competence model as a theoretical framework is presented as being useful in this study to provide leaders of laboratories with understanding of the importance of cultural knowledge, cultural competence, cultural sensitivity and cultural awareness of SA. Recommendations for MLS leadership, MLS education and MLS practice follow. Then, the application of the Healthcare scientists framework in SA. Finally, the conclusion will close this thesis.

7.2 Overview of MLS demographic data

A purposive random sample (N = 99) with a response rate of 66%, was drawn from the MLS across two hospital sites in the Saudi region of Makkah city in this explanatory sequential mixed-methods study. In SA, as of 2016, the total population of MLS comprised 11,360 laboratory staff. Of this 10,753 are Saudis and 607 are non-Saudis working for the MoH (Ministry of Health 2016). The current study, therefore, has represented the views of 14% of the total population of MLS in SA working in the region of Makkah city.

The data showed that the response rate (66%) for this study was good (Fincham 2008) and higher than for the two previous studies (Albeladi and Elrayah 2018; Al-Qathmi and Zedan 2021) conducted in SA. Albeladi and Elrayah (2018) obtained a response rate of 32% in their cross-sectional study of 75 MLS in the Eastern province which examined the potential correlation(s) between transformational leadership and job satisfaction levels. Al-Qathmi and Zedan (2021) obtained a response rate of 40% in their cross-sectional study of MLS job turnover and satisfaction in the capital city of SA. The data collection approach in this study was a paper-based survey administered by the researcher face to face and with the

personal interaction and encouragement of the researcher. These strategies were adopted as they were more likely to lead to a good response rate (Nulty 2008). Other strategies were also used to boost response rate in this study, such as repeat reminders, providing participants long duration (six weeks) and assured participants of the anonymity (Nulty 2008).

The response rate showed a broadly similar number of male and female respondents (51.5% females: 48.5% males). This is similar to one other recent study conducted in SA (Al-Qathmi and Zedan 2021) and in contrast to earlier studies where the percentage of males was usually greater Alyaemni and Qassam (2017) and Albeladi and Elrayah (2018). The current study attempted to avoid gender bias by achieving almost an equal response rate between males and females (Ritz et al. 2014).

Similar to other relevant studies (Alyaemni and Qassam 2017; Albeladi and Elrayah 2018; Alrawahi et al. 2018) this study found that nearly half of respondents were aged between 26-30 and represented 42% of MLS. Hospital laboratories appear to be predominantly run by younger people. In terms of years of experience and qualifications of MLS, the data on years of experience in the current study showed the highest percentage was between 1-5 years. This is supported by similar findings in other studies (Alyaemni and Qassam 2017; Alrawahi et al. 2019b; Al-Qathmi and Zedan 2021). The data on qualifications also revealed that the highest percentage was MLS holding a Bachelor's degree, which was followed by Diploma and lastly a Master's degree. Studies with similar findings include Alyaemni and Qassam (2017). However, in the research by Al-Qathmi and Zedan (2021) none of the participants had diplomas, the highest percentages were for a Bachelor's degree and a Master's degree. This could be explained by the availability of more than 40 colleges offering MLS Bachelor's degrees, most of them are government colleges and free (Saudi Commission for Health Specialities 2018) whereas for Master's degrees, most of them are not free programmes.

7.3 Research question: How do MLS describe their professional identity?

Professional identity

Professional identity plays a key role in helping individuals understand the norms, values, skills and behaviours of their profession (The Academy of Medical Royal Colleges 2020) and

reflects on their thinking, feelings, and acting as a member of a professional group (Crues et al. 2014). This is the first study in SA to measure and explore the professional identity of MLS. Furthermore, it is important to mention that there has been a dearth of studies conducted on the MLS field worldwide and, as previously stated, no studies conducted in SA. Therefore, the researcher has tended to use the nursing literature to support this discussion as there is no substantial body of MLS literature in this field. There are also some similarities in the profession such as nursing professionals who may also feel that they have a second-class job (Mayaki and Stewart 2020). In healthcare, professionals are part of a team, and a worker in a large organisation as well as being a participant in a professional body.

In addition, the data here suggest that professional identity was rated consistently across both sites. This may be due to the fact that both laboratories' professionals are working in the same society, culture, and they had similar qualifications, standards and policies. This could be also explained by the fact that nearly half of respondents had been MLS for more than six years and that professional identity can be expected to develop over time (Nancarrow and Borthwick 2005). With a young profession (Saudi Commission for Health Specialities 2018), it becomes important to address how best to build professional identity. This could be because professionals will better understand the values, customs, standards, problem- solving skills, and the profession's language. Schill (2017) used the same survey as in this study to measure professionalism among American MLS. Schill found that recent graduate professionals (less than one year) had a higher level of professional identity than novice professionals (less than three years). This was due to the novice professionals having had more experience in the field and associated works challenges, such as work stress and poor visibility, were now well known to them (Schill 2017).

Three subtopics were identified in the current study to describe the perceived professional identity by MLS. These are: MLS are proud to work in this profession, but, they do not feel valued; a lack of professional recognition and role clarity; and the role of the SCHS' and MLS' perceptions towards the SCHS.

7.3.1 *MLS' Value and recognition*

Both responses to the questionnaire and the interviews found that the MLS stated a strong belief in the importance of their work. The current study shares similar results with Butina and Schell (2011) that suggested that MLS play a significant role in saving patients' lives. Similarly, Schill (2017) and Camillo (2019) found MLS professionals were proud of their work and believed their position was vital. Despite some differences in workplace environments, regulations and cultures, the MLS held the same positive perception towards the profession.

Poor visibility also emerged as a sub-theme of this study. The MLS role is generally not well known (Butina and Schell 2011), and this could make MLS felt less valued (O'Connell-Spalla 2021). Three patterns were generated describing the way society and the medical community perceived the MLS profession: there were reports of invisibility, the impact of blue lab coats and the lack of prestige. The participants felt that they were valued but that no one noticed them - neither society nor the medical community. The literature also portrays the profession as invisible, as a result it tends to be misunderstood and unrecognised (Doby 2016; O'Connell-Spalla 2021).

It could be suggested that the MLS uniform, which consists of blue lab coats, has a powerful impact on the profession. The Royal College of Nursing in the UK recently disclosed that uniforms gave nurses an identifiable identity that facilitates the fostering of trust and confidence in Society (Royal College of Nursing 2020). Importantly, the colour blue is usually assigned to cleaners in SA hospitals. Concerns regarding the blue lab coats were only mentioned by females who often wear lab coats to function as 'Abaya' a loose full-length outer garment like a robe dress which is worn by Muslim women. Shaw et al. (2010) stressed the importance of a uniform which enabled professionals to 'feel professional' and contributed to good self-image. Nurses have had similar issues with uniforms which had made them feel like a 'cleaner' and not 'very professional' (Shaw et al. 2010). Consequently, the prestige of the MLS profession could be affected negatively by this practice. It could also be suggested that a simple change, such as allowing MLS to wear white coats, like physicians or other scientists, could enhance the professional identity of MLS. Indeed, it has been found that white lab coats serve as a status symbol of science and are positively correlated with professionalism (Spragley and Francis 2006). They act as non-verbal forms

of communication associated with the wearer's identity, status, power and profession (Kaser et al. 2009).

The culture in SA could also impact on a person's choice of profession and the value placed upon it. In SA, children are encouraged to choose a valued career as this will enhance the image of the family prestige (Aldhobaib 2017). Furthermore, the SA society does not accept individuals having low status profession. The medical professions generally have a high level of prestige and parents are keen to encourage their children to choose this as a career. This seems significantly important, as the discussion above revealed that the MLS profession is generally unknown and invisible, therefore parents, and society in general, may value this profession less and this will impact on how those in the profession perceive their own employment choice. This can be supported by the fact that professional identity is linked with the situation and it may possibly be different from country to country because it links with the educational system, job role and perception towards the MLS profession (Perkin 2002).

Interestingly in this study, the MLS profession was not the first choice for most participants. The SA Government offers free education in medicine and other medical programmes which receive a high number of applicants. However, the number of spaces is limited, which prevents some of those wishing to pursue a medical degree from doing so. It is at this point that those students often select other courses or modules within medical colleges (including MLS courses). Globally, the presence of a strong sense of vocation contributes to professional identity and, more specifically, the pride in being a member of this profession (Professional Standards Authority of the United Kingdom 2016). In this study, most MLS were not primarily focused on their current career, and they had other ambitions. The issue of potential applicants being unaware of the MLS profession has been identified as a major finding in studies on MLS by Butina and Schell (2011) and Doby (2016). Therefore, role extension or post-qualification acquisition of skills, responsibilities and the associated additional professional accountability would help build professional identity in MLS. In fact, role extension programmes were previously available in SA but were only open to male applicants in the capital city. Currently, it is available for both genders, but the number of places is still very limited.

The participants in this study suggested other ways in which the public's awareness and opinion could be improved for them to feel more valued. MLS staff could assist with health awareness campaigns, in hospitals or shopping malls, for example, in order to raise societal awareness. The researcher recognised that both laboratories were already actively participating in such events. Promotion of the profession and the suggestion that this is the responsibility of MLS themselves was also one of the findings in MLS' study by Camillo (2019).

7.3.2 Misunderstandings, perceptions and role clarity

MLS are proud of their profession and feel that they hold an important position in healthcare provision. A common concern raised by participants, however, was that they felt the MLS profession was misunderstood by the medical community. This could reflect the fact that society and medical professionals do not understand the MLS profession within the healthcare sector (Butina and Schell 2011). Data analysis revealed an issue related to a lack of respect showed by medical colleagues as they were underestimated the role and the profession of MLS. A lack of recognition or respect is an issue frequently discussed in the literature (Beck and Doig 2005; Butina and Schell 2011) that led professionals to question their career choice.

The MLS in this study raised concerns about lack of role clarity of their profession that could be due to medical laboratory consultants challenging their professional autonomy. This was consistent across both laboratories. The MLS' professional autonomy score in this study was not strong for the participants from both hospitals. This was not expected as 65% of participants had more than six years' experience in the profession. Recent studies (Albeladi and Elrayah 2018; Mayaki and Stewart 2020) have also found that professional identity of MLS was not at the optimal level. Albeladi and Elrayah (2018) their participants from SA rated themselves very poorly on some items that measured autonomy, such as 'the freedom to use my own judgment' and 'the chance to try my own methods of doing my job'. Mayaki and Stewart (2020) employed a qualitative approach which included nurses, doctors, and MLS. Mayaki and Stewart (2020) also stated that MLS regarded the use of the laboratory by other healthcare professionals, such as doctors, as an intrusion due to doctors' lack of training in laboratory procedures and laboratory licenses. It appears that the intrusions of doctors in MLS profession were not unique in SA.

The data from the current study gave a further explanation regarding professional autonomy. The MLS in the current study felt fully qualified and competent to practise their job independently. In addition, data analysis revealed that the role of MLS is similar to machine operators. Because medical consultants of the laboratory interpret the results instead of MLS, this does not meet MLS' expectations and as a consequence affects their professional identity and job satisfaction. Mayaki and Stewart (2020) sought the opinions of doctors with regard to their intrusion in the MLS' role and also the nursing role. Doctors perceive their position in the medical healthcare hierarchy as central with other healthcare professionals, contributing to the diagnosis, treatment and prevention of disease or injury (Mayaki and Stewart 2020). Both MLS and nurses perceive their roles to be complementary to that of doctors, they respond to issues that doctors are unable to address (Mayaki and Stewart, 2020).

MLS leaders of this study shared their opinions regarding the current graduates of applied medical sciences (technologists) which are highly qualified and ready to practise when they complete their studies. Whereas the graduates of science colleges (technicians) did not have the same medical background. It seems that the graduates of science colleges also formed a first weak impression or status of the medical laboratories profession which was also shared by the medical community and society in general. Data analysis indicated to the issue of MLS profession is related to the system of work, or the workplace policies in medical laboratories, as they have not been updated and also allow a medical consultant of laboratory science to practise the work of laboratory technologist (Alrawahi et al. 2019a). Roles and boundaries of the MLS profession are strongly associated with professional identity development. Professional bodies work on defining these roles, boundaries, policies, regulations and standards that subsequently shape identities. Next point will thoroughly discuss the role of the Saudi Commission for Health Specialties as a professional body.

7.3.3 The role of the Saudi Commission for Health Specialties and MLS perception towards the SCHS

The SCHS is a governmental body works on setting licensing, regulations, standards and policies for all medical professionals in SA. The participants from both laboratories indicated that the role of the SCHS needs further improvement. It has been noted that the

professional bodies have a strong influence in defining professional identity since they are responsible for training, education, setting standards and regulations (Joynes 2014).

Two quantitative dimensions measured the role of SCHS. Firstly, profession as a referent, that is 'sharing consciousness' (Frankford et al. 2000) is a dimension of professional identity. In SA, the SCHS is the only organisation with the responsibility to represent all medical professionals including MLS. The purpose of professional bodies is to represent the interests of the members, protect the integrity of the profession and improve the standard of work (The Academy of Medical Royal Colleges 2020). This means that the SCHS may not be able to develop knowledge and skills of all healthcare professionals. This can be evidenced by the limited number of courses available for MLS (SCHS 2021). Education and training opportunities allow professionals to develop their skills, knowledge and enable them to engage within multi-professional teams and ultimately enhance their professional identity (The Academy of Medical Royal Colleges 2020). This could be explained further by the average rate was given by the MLS evaluating the SCHS. Comparing findings from the current study with the results of Schill's (2017) study showed that, in the US context, MLS scored above average regarding professionals as a referent. Internationally, there are some specialised or independent regulatory bodies, such as the Health and Care Professions Council (HCPC) regulate allied health professions in the United Kingdom, including MLS, whereas the American Society for Clinical Pathology-Board of Certification and the National Accrediting Agency for Clinical Laboratory Sciences are only for the MLS in the USA.

In this study participants reported that they had limited information about the SCHS. This could explain a lack of engagement between MLS and the SCHS in SA. In addition, participants indicated that the MLS field in SA was still relatively new when compared with the UK and the USA. For example, In the USA, the American Society for Clinical Pathology-Board of Certification established in 1922 and the National Accrediting Agency for Clinical Laboratory Sciences established in 1936. This could mean that the SCHS does not have enough experience to deal and improve MLS profession. The remit of the SCHS may be too broad to adequately reflect the needs of modern-day MLS and if this were developed perhaps professional identity levels would be stronger. Examples in other countries suggest that a professional body for MLS could raise professional identity (Schill et al. 2017)

The second dimension that measured the role of the SCHS is the belief in self-regulation. Self-regulation principally includes self-control (Snizek 1972). Professionals can be evaluated by the competency test that set through qualified professionals' colleagues. The SCHS is responsible for the issuance of regulations and standards for MLS. The recent introduction of the competency test may explain participants view of self-regulation (SCHS 2018) as a condition to license and practise the profession in medical laboratories. MLS needs to pass the test once to get the licence, then they need to attend a certain amount of continuing medical education (CME) as a condition for renewing them. Indeed, the licence of practice for the medical professions was deemed as the 'key indicator' for promoting professional identity (Gignac 2015). The participants may not be aware about the new regulation that requires new graduates to pass the competency test to practice the profession. This assumption is built on a previous study conducted by Schill (2012) found MLS believed that the profession is poorly regulated. This could explain the average score of the belief in self-regulation and poor recognition among society and the medical community. Hall (1968) who constructed the professionalism theory, found there was a high level of association between the actual existence of licensing (i.e., profession as referent) and self-regulation.

Alongside the SCHS and the Saudi Central Board for Accreditation of Healthcare Institutes (CBAHI) regulates the workplace of the MLS. CBAHI is a quality and safety standards for medical laboratories and blood banks (CBAHI 2021). It is also responsible for creating and issuing regulations and standards that MLS need to follow in the hospital laboratories. Thus, CBAHI aims to ensure that MLS are applying quality standards in the medical laboratories to produce high-quality work and promote patient safety. The findings reveal that few participants may be unaware of the role of the accreditation programme for the laboratory. Indeed, one laboratory took so much time to get the laboratory accreditation for quality and safety standards for medical laboratories (CBAHI). Nurses' believe that the existence of standards and regulation gives 'professional credibility' to nursing members (NHS 2016) and would enhance professional status (Professional Standards Authority of the United Kingdom 2016).

The descriptions and job titles were others concerns raised by the participants. The MoH in SA describes MLS as Allied Health Services (Ministry of Health 2018). In the UK, the MLS

are not described as Allied Health Services, they are called healthcare scientists or biomedical scientists (NHS 2021a). The society in SA uses derogatory words to describe the role as identified in the current study, such as speciality of stool and urine, this is due to the nature of their work. In the nursing field, SA society may also view the role of nurses as housekeepers (Aldawood 2017). Data analysis revealed that the certification and classification of MLS by the Saudi Commission for health specialities is not clear. They have more than one category for classifying MLS even though they hold the same qualifications, for example, medical laboratory specialists and clinical laboratory specialists. The MoH uses these categories when awarding extra allowances, and as a result not all MLS receive them. Otto (2018) stated that the use of multiple titles for professionals simply causes more uncertainty with regard to professional identity.

Summary

The above section discussed the professional identity of MLS and linked it to existing body of literature in order to describe the professional identity of MLS in SA and answering the research questions whenever possible. This study has found that the professional identity of MLS in SA is not strong. Reasons for this are both unique to SA, and also a global concern for MLS in general. The presence of one professional body, which is the SCHS, to serve all healthcare professionals has led to impact its function negatively. The next section will discuss the effect of professional identity on MLS satisfaction with their profession.

7.4 Research question: What are the possible relationships between MLS' perceptions of professional identity and job satisfaction?

Five factors of job satisfaction were evaluated using the Mueller McCloskey Job Satisfaction survey (Mueller and McCloskey 1990) this included extrinsic rewards, work culture and conditions, scheduling family/work balance, collegial relationships and professional opportunities. Overall, job satisfaction was average with professional opportunities reported as below average, in contrast, 'Collegial relationship' received the highest level of satisfaction from MLS. Many studies have been conducted on MLS reported that MLS were generally satisfied with their co-workers (Albeladi and Elrayah 2018; Alrawahi et al. 2018; Chaava 2020; Al-Qathmi and Zedan 2021). This suggests that the relationship between co-workers is a very important factor can enhance job satisfaction of MLS. In addition, both

dimensions of leadership measured in this study determined positive correlations with the collegial relationship dimension of job satisfaction. This suggests leaders in medical laboratories can play a role in enhancing collegial relationships and which may be just as important as pay.

The result of the current study was compared with that by Albeladi and Elrayah (2018), who conducted a survey on staff in a medical laboratory in the Eastern region of SA. This suggests similarities between both studies in terms of national culture and system of work. Their study did not report the validity and reliability of surveys that evaluated leadership behaviours (Multi-Factor Leadership Questionnaire (MLQ)) and job satisfaction (Minnesota Satisfaction Questionnaire) of MLS. However, these surveys are well known and frequently used (Martins and Proença 2012; Batista-Foguet et al. 2021). In essence, despite two different measures being used the job satisfaction from both studies was broadly similar. The MLS in both studies did not experience high levels of job satisfaction. There were two possible reasons that could have led to impact job satisfaction of MLS in the current study. The first possible reason is that the low score of leader behaviour demonstrated in one laboratory. However, Albeladi and Elrayah (2018) reported that MLS rated themselves 3.29 out of 5 despite the absent of transformational behaviour. This could suggest that the leader could follow another leadership behaviour positively impact the job satisfaction, but the authors did not consider this. Moreover, data analysis of the current study suggests that the poor workplace readiness, such as no restroom available and poor air-condition, has been found to negatively impact job satisfaction of MLS. Indeed, Albeladi and Elrayah (2018) did not describe the workplace readiness of the MLS.

The results of job dissatisfaction are now discussed, and this is followed by a discussion on the relationship between professional identity on job satisfaction. There has not been any research into the relationship between professional identity and job satisfaction in medical laboratories among MLS, and for this reason nursing research was considered. Nurses and MLS have been treated in a similar way by medical colleagues', particularly doctors, and for this reason they may regard themselves as inferior (Mayaki and Stewart 2020). Professional identity was shown to be closely linked with job satisfaction and the desire to leave the nursing profession in several studies (Cowin et al. 2008; Sharbaugh 2009; Sabanciogullari and Dogan 2015).

Three main subheadings will be discussed under this topic as follows: that MLS felt underpaid, that there were no opportunities for professional growth and that their workload was heavy.

7.4.1 MLS felt underpaid

MLS in the current study rated themselves as above average on the statement of salary. Financial rewards were an important factor, this had an impact on the job satisfaction of employees (Alrawahi et al. 2019). Albeladi and Elrayah (2018) found that MLS rated themselves as 3.1 out of 5. Both results were above average, this means MLS were moderately satisfied with their salary. The similarity between scores could be explained by the fact that both professionals are paid by the same employer which is the MoH.

The qualitative data revealed conflicting views in regarding MLS' satisfaction with the payment received. Furthermore, the lack of allowances was identified as an issue affecting MLS' salaries and their job satisfaction level. This result is similar to the qualitative data of Alrawahi et al. (2019), the study was conducted in a medical laboratory in Oman, a neighbouring country with a predominantly Arab culture. They found that participants were generally content with the salary but were dissatisfied with the promotion system. Austin (2019) posed a possible reason that may clarify the variation in opinions of MLS regarding the salary because the profession is undervalued and underpaid when compared with other healthcare professions, especially nurses. Beck and Doig (2005) reported that MLS identified recognition from individuals outside the laboratory as being an important factor for retention in the profession, second to salary.

Doby (2016) described the difference in opinions regarding salaries as an ongoing problem resulting from the lack of a clear distinction (role clarity) between Clinical Laboratory Scientists (CLS) and Clinical Laboratory Technicians (CLT) staff and a disparity of staff accommodation. Translating these terms to the SA medical context, medical laboratory technologists who are equal to CLS and medical laboratory technicians who are equal to CLT. CLS staff felt underutilised and CLT staff felt they were doing the same job for less pay. The findings suggest that a lack of role clarity could impact the professional autonomy of MLS. Moreover, data analysis determined a positive correlation between professional autonomy and collegial relationship dimension of job satisfaction. This means that if MLS

are given clear instructions for practising their role, more freedom in terms of decision making and results validation, it will strengthen the collegial relationship.

The current study also determined a significant positive correlation between extrinsic rewards and professional commitment. However, extrinsic rewards showed only significant weak positive correlations with the belief in public service and profession as referent. Sabanciogullari and Dogan (2015), in their study on nurses, found there was a stronger relationship between professional identity and extrinsic job satisfaction than between professional identity and intrinsic job satisfaction. Intrinsic job satisfaction includes recognition, responsibility, achievement, autonomy and progress in the psychological needs of people. The current study identified moderate and weak correlation with dimensions that covered intrinsic job satisfaction and professional identity dimensions, this is consistent with Sabanciogullari and Dogan (2015) results. The culture of Turkey is different to the SA, however, as nurses and MLS may have the same professional status, as they felt that their job was second class (Mayaki and Stewart 2020). The result for job satisfaction indicated agreement with regard to payment (extrinsic rewards), MLS were generally satisfied with the dimension of the extrinsic reward of job satisfaction.

McClure (2008) identified that MLS would be more likely to leave the field if the pay were reduced because they would not feel adequately rewarded for their knowledge and daily workload. Indeed, McClure (2008) is an older study, but its findings are still valid as MLS currently expresses concerns regarding their extrinsic rewards. Therefore, the enhancement of extrinsic rewards would increase the professional commitment of MLS. However, increasing extrinsic rewards was found to be only a short-term solution (McClure 2008).

The current study determined a significant positive correlation between extrinsic rewards and belief in the public service and profession as referent dimensions of professional identity. This indicates the more belief there is in the value of public service, the more MLS will be willing to accept and be satisfied with the salary (Ferreira et al. 2016). The explanation for this is that MLS view themselves as indispensable members of the healthcare team, the results they provide assist in the diagnosis and treatment of disease, but the study suggests are misunderstood and unrecognised (Butina and Schell 2011). When MLS receive the recognition and social acceptance they deserve, their needs will be

met and extrinsic rewards will be less important (Ferreira et al. 2016). The positive correlation between extrinsic rewards and profession as referent shows the influence of the SCHS' role on MLS's satisfaction level. If the SCHS were to provide MLS with support, such as educational courses, this could result in an improved level of satisfaction.

7.4.2 No opportunities for professional growth

Professional opportunities received the lowest rating by MLS in the current study, these include continuing education, the ability to undertake research and to publish, improvement in job performance and professional development. Similar results were reported by Albeladi and Elrayah (2018) who found that participants evaluated themselves as poor in several statements, including opportunities for advancement in the current job, continuing education classes and professional training. Al-Qathmi and Zedan (2021) and the Department of Health and Human Services (2018) in Australia, both reported that MLS were dissatisfied with this job due to the lack of professional growth.

The qualitative data from the current study indicated that the presence of advanced technology, more specifically automated machines that minimise the intervention of humans, could limit the opportunities for professional growth. A recent study conducted by Lippi and Da Rin (2019) confirmed that experienced and knowledgeable staff were not required to run the laboratory tests, all that was needed was a few technical staff with general background knowledge. However, they identified the serious consequences which can result from using auto machines, for example automation analysers, as they limit the experience MLS acquire in their daily work. In addition, their skills and expertise in analytical procedures would be reduced and less staff would be required (Lippi and Da Rin 2019).

The issue of lack of professional growth was reported in the qualitative study of Alrawahi et al. (2019). They identified a lack of opportunities for training and professional development and inequality and inequity in the selection of staff for training courses. In addition, Alrawahi et al. (2019) found the lack of professional training led to negatively impact MLS commitment toward the profession. This supported the positive significant relationship found between professional commitment (a dimension of professional identity) and professional opportunities (a dimension of job satisfaction) in this current

study. The demand for training replicates the findings of a study conducted by Al-Enezi et al. (2008) in Kuwait, they confirmed that the provision of training and development opportunities was a major factor in determining work motivation and satisfaction for MLS. The correlational analysis identified a significant association between professional identity and job satisfaction. A positive correlation between profession as referent of professional identity, and professional opportunities of job satisfaction showed important results. As identified (see Section 7.3.3), the profession as referent mainly measures the role of SCHS and its responsibility for developing MLS. This could suggest the more importance the SCHS attach to the MLS role, the more opportunities there will be for professional development. This result was supported by Alyaemni and Qassam (2017), they conducted a quantitative study to identify the perceptions of medical laboratory professionals towards continuous medical education offered by the SCHS in SA. They concluded that most laboratory staff reported a positive perception of continuous medical education (CME) programmes, they felt that they increased professional confidence and competency. Studies have also reported that job satisfaction and professionals' competence to be linked to quality and job performance (Deriba et al. 2017; Hartanti 2019; Chaava 2020).

7.4.3 Workload

Data analysis revealed that the score scheduling and family/work life balance showed that MLS had an average level for this dimension, they also expressed high dissatisfaction on the part-time work statement. Workload, the lack of flexibility and limited choices within the workplace have been identified as a factor which impacts on job satisfaction (Kenwright 2018; Garcia et al. 2020). An Australian report issued by The Department of Health & Human Services (2018) also found that 50% of MLS, out of a total of 264, were only moderately satisfied with their work-life balance. The qualitative data for the current study indicated that MLS worked long hours and spent most of the day in the laboratory. Alrawahi et al. (2019) identified similar issues to the current study, a growing demand for samples with no extra staff being recruited. Workload and long working hours have been considered as factors impact job satisfaction and prevent workers from fulfilling their personal commitments (Alrawahi et al. 2019).

The qualitative data also identified that the culture of SA has a role on impacting job satisfaction. More specifically, females from the current study expressed the greatest concern regarding increased shifts, this was due to their family commitments. In SA, women play a special role in maintaining the family structure and society unity (Alireza 1987; Rajkhan 2014) (see chapter one). The qualitative data also suggested that part-time work could be a solution for MLS as many are females have family commitments. In this regard, participants gave a low score for part-time work, the reason for this being that part-time work is not available in SA.

Furthermore, the qualitative data from the current study also indicated that some doctors were not well informed with regard to laboratory tests that may lead to increase workload. Similarly, Doby (2016) identified that a possible reason for the increased workload was the increase in the number of laboratory tests. Some tests requested by doctors were not really necessary, this was due to lack of knowledge. Consequently, the number of false positive tests could increase, this could lead to other referrals that were not necessary and thus lengthen the process of medical diagnosis. The inappropriate use of laboratory investigations, associated with a lack of knowledge about laboratory results, has reduced the efficiency and quality of laboratory tests (Doby 2016). Zhi et al. (2013) reported that doctors had become heavily dependent on medical laboratories in recent years for the following reasons: easy access, the presence of auto-analyser machines that released results very quickly and the development of new tests. This could be one of the disadvantages of the MLS profession.

This study identified a significant positive association between the dimensions of professional identity and job satisfaction. Positive correlations have been reported in the current study between the scheduling and family/work balance dimension of job satisfaction and the three dimensions of professional identity, these were professional commitment and belief in public service and profession as referent. This could suggest that a significant improvement in professional commitment and belief in public service and profession as referent, will probably result in a higher satisfaction level for scheduling and family/work balance. In fact, the MLS in this study showed that they were managing their time, despite a heavy workload, and working to promote the profession amongst society and the medical community. Camillo (2019) found a link between the promotion of the

profession and professional commitment. The profession as referent is represented through the SCHS, this area requires more attention as mentioned in section (7.3.3).

Summary

The above section discussed the MLS' job satisfaction and linked it to existing body of literature in order to describe and explore the association between professional identity and job satisfaction among MLS in SA and answering the research questions whenever possible. Job satisfaction of MLS in SA was not strong, and reasons were similar to MLS worldwide. Issues related salaries and promotions were discussed in this study. The need for more opportunities to develop MLS professionals was a demand. The increase of workload on MLS was mainly due to the diversity of tests and lack of knowledge demonstrated by doctors. Finally, the influence of professional identity on job satisfaction has been explored.

7.5 Research question: What is the leadership behaviour of medical laboratory directors, and how might this affect the professional identity and job satisfaction of MLS?

Leaders have a key role in guiding workplace culture and improving the quality and progress of the laboratory over time. Leaders in medical laboratories deal with various staff from phlebotomists to consultants. This subtopic answers the last research question by evaluating the leadership behaviour of medical laboratory leaders; and exploring the possible association between the professional identity and job satisfaction.

MLS in both laboratories rated their leaders' leadership style by measuring task-oriented leadership and people-oriented leadership (Northouse 2016). Data analysis revealed that there was an adequate level of task-oriented leadership and people-oriented leadership demonstrated in lab B. Whereas in the lab A, the task-oriented leadership and people-oriented leadership were almost absent. Indeed, the authoritative management style was mainly present in lab A, and statistical analysis also confirmed the scores of the two laboratory leaders were statistically different. This could be explained by the fact that the authoritative style is one of the common styles present in SA organisations (Dirani et al. 2017).

In addition, the scores for leadership in the quantitative data demonstrated that MLS did not hold strong opinions when they rated the statements in the questionnaires. However, MLS responded strongly to one statement on the leadership questionnaire, 'Acts friendly with members of the group', the quantitative data revealed that the majority of participants who gave this a high score worked in lab B. It could be suggested that the leadership qualities presented in lab B are higher than the leadership qualities of lab A. Generally, the quantitative data indicated that more people-oriented and task-oriented qualities presented in lab B than in lab A.

The results of the current study showed that the levels for job satisfaction and professional identity of MLS were almost identical in both laboratories. However, there were differences between the levels of leadership styles. The study found that more people-oriented, and task-oriented leadership qualities presented in lab B, however, the level of MLS's satisfaction was the same as in lab A. Indeed, job satisfaction is complex as there are many factors could influence it, such as workload, promotion, health and safety in the laboratory, relationship with superiors, professional status (recognition and appreciation), and certain hospital policies (Alrawahi et al. 2018). It seems that leadership style could influence job satisfaction if the other factors mentioned above are also optimal. It is apparent that each laboratory perceived different leadership qualities and each had different effects on the workplace.

The literature review supports that leadership style and professional identity have an impact on job satisfaction (Rad and Yarmohammadian 2006; Abualrub and Alghamdi 2012; Kabeel and Eisa 2017; Musinguzi et al. 2018). It has been identified that a high level of professional identity is combined with a high level of job satisfaction (Sabanciogullari and Dogan 2015; Kabeel and Eisa 2017). Also, a high level of leadership style is combined with a high level of job satisfaction. However, this was not the case in this study, three subheadings are discussed which are Leaders face challenges to maintain job satisfaction and professional identity of MLS, Important leadership qualities for running medical laboratories and Leaders' training and development.

7.5.1 Leaders face challenges to maintain job satisfaction and professional identity of MLS

The topic 'multiplicity of professionals' was discussed extensively by participants. The findings indicated that this was a challenge for leaders in both laboratories and the results are exhibited under the main theme: leadership challenges in medical laboratories services (see section 5.3.3). Staff employed in the laboratory held a wide variety of professional qualifications depending on their specialisation. However, this had a negative impact on the professional identity of MLS. This was due to the fact that some professionals did not have medical backgrounds, such as the graduates of chemistry and biology. The graduates of laboratory medicine have medical backgrounds, and they also study physiology, anatomy, pharmacology and toxicology.

The findings revealed that the existence of a multiplicity of professional specialisation becomes a challenge for laboratory leaders. This is because the lack of role clarity as the roles of technologists and technicians are almost identical at the laboratories included in this study. In addition, the inappropriate preparation for the graduates of chemistry and biology who want to become professionals. In SA, the graduates of chemistry and biology require to do one year training (placement) in a medical laboratory and then the exam to be classified as medical technicians (SCHS 2019). Indeed, the purpose of this training is to get the skills of doing tests and operating the machines.

Data analysis also revealed the reaction of both laboratory leaders towards the lack of role clarity. Leaders who have high leadership qualities worked on defining the roles and set tasks for MLS. However, the leader who exhibited low leadership qualities did not address this problem. The reason for this could be that the leader was aware of the roles of his staff but did not find it necessary to clarify it for them. As a result, the leader who exhibited low leadership qualities did not exhibit clear qualities of task-oriented leadership style. A task-oriented leader must be precise when delivering information to followers through constant communications to ensure targets are clearly understood (Rüzgar 2018).

Communication was one of the major concerns for laboratory leaders due to the SA culture and society. Despite the openness and huge changes in SA culture, communication with the opposite gender remains difficult. This could be attributed to the imposition of gender

segregation through religion, community power and cultural influences within SA. Women are not permitted to communicate without a reason or work with men; they are not a relative in blood in most settings, especially in a healthcare context. The Saudi Arabian community prefers to separate gender at all life stages, this includes education, health services and the workplace environment (Aldosari 2017). It is not surprising, therefore, that communication barriers exist between males and females due to cultural values and religious boundaries. Good communication is evidence of a strong connection between a leader and their followers, it can play an important role in improving job satisfaction. This was confirmed by Al-Enezi et al. (2008), they found that MLS with a high level of job satisfaction were communicating effectively with their leader. Alrawahi et al. (2019) found a lack of communication could make the MLS feel they were not respected.

The presence of toxic employees in the workplace was another challenge for leaders of medical laboratories. The definition of a toxic employee is a worker who engages in behaviour which has a negative impact on colleagues, hospital resources or an organisation's performance (Housman and Minor 2015), characteristic behaviours were reported in section 5.3.3. The findings from the current study revealed that a leader who exhibited low leadership qualities, and had not taken immediate action to prevent this type of behaviour, had an adverse effect on the culture of the workplace. As a result, there may have not been any developments at the level of the MLS or in the workplace. Task-oriented leaders tend to encourage their group to focus on time and skills, this ensures that work is completed in a timely manner (Rüzgar 2018). However, if the leader realises that members of the team are diverting away from the original task, goals and plans, then they must intervene with an action plan (Northouse 2019). If the leader leaves toxic employees without a clear action, good employees could soon copy the same behaviour, and this may have an impact on the quality and development of work, as was the case in lab A.

Some challenges were identified in this study, these were in the areas of workload and quality (see section 7.4.3). A leader who achieves high scores for both leadership styles, people-oriented and task-oriented, should be able to overcome these challenges with ease. The findings revealed that leaders who exhibited high leadership qualities, the laboratory had achieved three accreditation certificates for healthcare quality and patient safety whilst the second laboratory has only received accreditation recently. This can be explained

by people-oriented leaders being focused on supporting, motivating and developing their employees. In addition, they encourage teamwork and collaboration by building positive relationships and encouraging communication (Northouse 2019). The findings also indicated that the leader who exhibited high leadership qualities in people-oriented, and task-oriented approaches created a clearer plan and vision for supporting the workplace and employees. Therefore, the team was more productive and willing to take risks, they were confident that the leader would support them if required as was the case in lab B (Northouse 2019).

7.5.2 Important leadership qualities for running medical laboratories

Data analysis revealed that the leader in lab B showed evidence of some good quality leadership, most notably the leader demonstrating a people-orientated style. For example, Interpersonal skills and good communication skills have been reported by the participants of this study. Weiss (2011) found these qualities as important for laboratory leaders. Interpersonal skills play a key role in enhancing the understanding among MLS, as well as producing more effective communication (Northouse 2019). Interpersonal skills refer to a strong association between the leader and the followers who strive to build trust, honesty and respect. Indeed, the work of the medical laboratory takes place behind the scenes. This means MLS may have little communications with outsiders and there is a need for a positive atmosphere. People-orientated leaders can support the presence of positive environments (Bishop et al. 2014).

Active listening was another important aspect of interpersonal skills favoured by MLS in the medical laboratory. Active listening is a form of communication and it indicates that the leader has effective communications in the workplace (Turnbull 2005). Effective communications promise excellent services (Passiment and Linscott 2013). The findings of this study indicated that the leader who has higher leadership qualities, MLS were able to visit the leader's office at any time to discuss ideas or concerns, they felt this was important. In addition, the researcher noticed that during observations, the door of the leader's office was usually open and staff members were present. The advantage of active listening is that it makes followers feel accepted and appreciated, this establishes a positive workplace environment (Bregenzler et al. 2020). This is because the presence of communication can reduce conflict and it makes easy to attend workplace targets (Turnbull 2005; Passiment

and Linscott 2013). Indeed, the quality of laboratory tests is one of the important targets. Data analysis indicated that a leader who exhibited high leadership qualities as well as effective communication, that laboratory gained many accreditation certificates. Data analysis also revealed when these high leadership qualities are missing, such as in lab A, the leader was rarely listening to followers. This action can make MLS feel excluded or that they are not valued members of staff and this may reduce the level of job satisfaction (Lloyd et al. 2017).

Involving MLS in decision-making is a sign of a people-oriented leadership style, it enhances job satisfaction (Alrawahi et al. 2018). The qualitative data of the current study showed that the leader who exhibited low leadership qualities rarely involved staff in decision-making. A negative experience was shared with the researcher of the current study, it had adversely affected the MLS. Their relationship with the leader was threatened, trust was lost and there was a negative impact on the workplace environment as they could not speak out. This experience affected the collaboration and cooperation between the leader and staff and also between the staff members themselves. The absence of people-oriented leadership qualities in lab A may impact the welfare of every single employee; this event had a negative effect on the leadership and working relationships (Northouse 2019). Whilst involving MLS in decision-making would have strengthened the quality of the relationship between leaders and staff. Al-Enezi et al. (2008) conducted a study in Kuwait, they found a high level of job satisfaction linked with participants who were encouraged to participate in decision-making.

Building an effective team was another leadership quality mentioned by the participants of the current study. Data analysis also revealed that the leader who exhibited higher leadership qualities was aware of the benefits of building an effective team in the workplace. During observations, the researcher noticed that these MLS' were more sociable, had good relationships and arranging a celebration for their colleague. These things were rare to see in the laboratory where low leadership qualities were exhibited. This could be explained as the people-oriented leaders are aware that productivity requires effective team building and a positive environment where staff feel motivated (Bishop et al. 2014).

Training and coaching are other aspects of building effective teamwork that people-oriented leaders characterise (Northouse 2019), this was the case for the leader who exhibited high leadership qualities. According to Marinucci et al. (2013), 90% of MLS indicated that the major factor affecting employees' job satisfaction was the lack of professional training and development. In addition, attending formal and informal education with other professionals increases social interaction and builds professional identity (Schill 2017).

Data analysis revealed that treating people fairly was another important aspect of maintaining a good relationship between leaders and staff. The favouritism behaviour was mainly exhibited by the leader who demonstrated lower leadership qualities. The impact of favouritism was reported by a study conducted on health workers in hospitals, which reported that favouritism, bad attitude and poor behaviour influenced job satisfaction (Yavuz et al. 2020). Favouritism behaviour demonstrated in the current study, such as the leader favoured some employees by providing them with promotions or training courses. A negative environment results because excellent employees know they will not be rewarded. Moreover, the same employees will have training and development every time. This could lead to impact the quality of work and patient safety because of the lack of fair training distribution.

The qualitative data of the current study suggested that the laboratory leaders displayed some leadership qualities of a task-oriented style. The delegation of authority and distribution of tasks were apparently exhibited in the laboratory led by the leader who demonstrated higher leadership qualities, as reported by the participants. When authority delegation is missing, this means the communication between the leader and MLS in the laboratory was poor, thus trust, credibility and willingness to cooperate were also decreased (Turnbull 2005). In addition, failure to delegate authority may lead to duties not being completed in a timely and productive manner (Anzalone and Chris 2012).

The data analysis also suggests that failing to delegate authority to departmental supervisors may lead to inhibit staff creativity. Because they feel that the leader is controlling them constantly. The leader who exhibited high leadership qualities was supportive of staff ideas and opened dialogues to discuss and develop them, this approach is likely to lead to greater improvement and success. Allowing MLS to be creative is a quality

of a relationship-oriented style. A systematic review, including healthcare studies, revealed that task delegation led to increased job satisfaction (Riisgaard et al. 2016). Furthermore, Riisgaard et al. (2016) stated that delegating authority was an effective tool when a leader allowed a team or a staff member the freedom and creativity to accomplish organisational goals.

7.5.3 Leaders' training and development

An emerging sub-theme was identified in this study, this was in relation to poor management and a weaker leadership style. Globally, the context of healthcare services is continually changing and becoming more complex. It is vitally important that a leader is able to recognise the differences between leadership and management tasks and duties. Leaders with clear plans and visions will help to successfully lead the workplace and reach its goal (Yenice and Randell 2018). It is suggested that regular communications can help achieve the workplace's vision (World Health Organization 2011), however, communications skills presented weak especially in lab A as shown in this study. Management tasks could be delegated to other staff to encourage good leadership. Leaders also need to have a sound understanding of the workplace in order to develop the employees and the workplace as was shown in the current study.

The data of this study revealed that one leader had higher leadership scores, and the second leader had low leadership qualities, however, MLS job satisfaction was only rated average in both laboratories. The average level of job satisfaction in both laboratories may be explained by differences in the work environment, so staff with a good leader were affected by their environment (Alrawahi et al. 2018). This was matched by the situation where the leader had superior leadership qualities, but the preparation of the workplace was poor. While the leader who exhibited low leadership qualities, had a newly built work environment.

Data analysis revealed that leaders of both laboratories have weak support from the MoH in terms of workshops about leadership and management. This means leaders need to develop themselves. When the researcher met the leader of lab B, the researcher has been asked to look at the shelf that was full of certificates that the leader attended by funding himself included many workshops in leadership, communication skills and interaction, lean

rethinking and six sigma. The attendance of these workshops and courses could help the leader in producing good leadership in others. Yenice and Randell (2018) stated that laboratory leaders need to be supported to determine their leadership strengths and find ways to develop them. If there are weak supports provided to those laboratory leaders as shown in this study, the availability of certain criteria could help in selection leaders meet the expectation of staff and workplace. Aldawood (2017) conducted a study on nursing leadership in SA believed that the selection of leaders must follow clear criteria, and at the very least the person should have appropriate skills and personality traits. Appointing leaders with little knowledge of rules and policies may lead to a poorly functioning workplace.

The participants in this study stated that in their interviews that education level in SA culture could influence the way people are perceived. The hospital area has multidisciplinary professionals. This means professionals' hierarchy is present among workers. Indeed, physicians in hospitals feel that they are on the top of the healthcare pyramid, that give them the authority to support their opinion (Mayaki and Stewart 2020). Therefore, leaders of laboratories need higher qualification degrees to match the level of the Doctors, so they can work effectively together. This may put leaders of laboratories in a strong position when talking in front of the physicians of the medical council of the hospital.

Despite the important role of MLS, particularly during emergencies and critical situations such as the COVID pandemic, professionals involved in this career are still marginalised in SA as shown in this study. This includes the quality of leadership in hospital laboratories which needs to be improved in order to meet the demands of staff and healthcare services. The Covid-19 pandemic has emphasised the vital role of MLS, who are part of a team providing healthcare with other medical specialities, their work is aimed at halting the spread of this disease (Luo et al. 2021). This situation provides a strong message for ministries, organisations and agencies, who are responsible for MLS, to pay extra attention and satisfy their career needs, including the development of staff skills through training education programmes. Indeed, the current study suggests the need for a framework for healthcare scientist (HCS) careers since there were some of the challenges that MLS

experience in SA that were also reflected in Wales, UK. More details will be provided in section 7.10.

Summary

The above section discussed the leadership behaviours presented in both laboratories and linked it to existing body of literature in order to describe and explore the association between leadership behaviours, professional identity and job satisfaction among MLS in SA and answering the research questions whenever possible. Leadership behaviours presented by these laboratory leaders were not the same. Multiplicity of professionals, role clarity, communication, culture, workload and quality were the most pressing challenges for Leaders. The significance of the application of people-oriented and task-oriented leadership behaviours were demonstrated. The demand for providing unified leadership training for laboratory leaders was also identified. Finally, the influence of leadership behaviours on professional identity and job satisfaction has been discussed.

7.6 Reflexivity

First impression of being a researcher in field

Reflexivity is an ongoing self-evaluation and reflection process which assesses the possible impact of the researcher's stance and personal experiences on the research process and findings (Walker et al. 2013). When I began the research study my knowledge was limited to theories of leadership and health management, job satisfaction and professional identity concepts. I had no practical research experience, although I did have some personal experience around the area of MLS. In fact, I have come to realise that there is a significant gap between the theoretical background and the real life of a health organisation. Leadership and management were more complicated and complex to research than I had expected. From reflections, I have learned that is necessary to understand the theories of leadership and core management, people's needs, communication skills and interaction, the culture of the workplace, and the differences between the needs of both genders in SA. This was achieved by recognising that the researcher's background, both as an educator in the area of leadership and management, and his previous role as an MLS, with one year of experience might have influenced the research process.

Questionnaires distribution

Many practical lessons were also learned whilst researching this topic area. The first lesson was in relation to gaining people's trust. When data collection commenced and questionnaires had been distributed, staff in one hospital laboratory were more apprehensive about participating in the study than in the other hospital. In fact, this may have been coming from the leadership of the head of the laboratory. One possible reason for this was that no previous studies had been undertaken in the laboratory area, so these people had no prior experience and no knowledge of the ethics of the research. This challenging situation was overcome by making people aware of my identity as a research student, the purpose of the research into MLS, the ethics of the research and how people's identity would be protected. They were reassured by the issuing of consent forms which explained their rights in relation to participation in the research. Finally, key people from within the laboratory, facilitated the conduct of the study and distributed the official letters from the MoH to increase their trust. When questionnaires were distributed to the second hospital this situation was avoided by use of the above strategies (Nulty 2008).

This previous action triggered my curiosity to understand, to probe and to find out more about the way each laboratory was operating and the relationship between the leader and their staff, or followers (Leung et al. 2018). The next stages of this study provided me with many answers to this.

Fieldwork observation

There were many benefits from doing fieldwork observations. Firstly, the fieldwork observation developed my observation skills, particularly, when this took place in different locations. I believe it is very important for leaders and managers to know how their organisations are working and behaving and to understand how staff feel in the workplace (Kawulich 2005). Leaders make decisions based on supervisors' feedback and information provided by colleagues. Furthermore, getting down to the baseline staff of an organisation (level of followers) is a very significant step. This step can reduce the gap between leaders and followers, help leaders to see and understand people's needs, assist leaders in their understanding of work processes and the importance of changes or updates. This is particularly important for leaders who come to the field from outside the laboratory

environment or who spent a long time outside of the field of hospital laboratories. Another benefit from doing fieldwork observation was that it involved regular visits to the laboratory over a six week period, this helped to break down barriers and built a kind of affinity (Kawulich 2005). Later when focus groups and interviews commenced, people were more approachable and may have felt more comfortable. Fieldwork observation certainly gave me an insight into the MLS' workplace that would not have otherwise been possible. People do not always voice their needs and issues.

The first stage, which included fieldwork observation and questionnaires, gave me an overview of the laboratory environment and key indicators for the second stage of this study.

Reflections on qualitative data collection

There were also challenges during the second stage of this study. The researcher conducted interviews with MLS, supervisors and leaders of the department, the challenges were around getting people involved in focus groups within their break time (one hour) to cover all questions. Unfortunately, the focus groups did not always achieve their purpose, this was based on feedback from the supervisory team on the sample of focus group data that were sent. In addition, the focus of this study was on MLS themselves, thus it helped to achieve a good response rate and a greater number of interviewees. However time was limited, particularly, when conducting the qualitative part of the study (Anderson 2010). For example, MLS were not able to leave their work for long periods in order to attend focus groups, thus there was insufficient time for people to fully discuss their experiences. As a result, my supervisors suggested that I also conduct face to face individual interviews, as it was felt that people would talk more openly when their peers were not present. Some staff were taking holidays during the data collection period, and this had not been taken into account during the planning stage, thus it took longer than had been anticipated.

The researcher had concerns about navigating the interviews in a specific way given that he had previously been an MLS and was now a lecturer. So, the lecturer is mainly student centred, providing information in one direction with minimum discussion or short answers from students. When conducting interviews, the situation is different, it is important to let participants speak whilst encouraging them to focus on the research topic (DeJonckheere

and Vaughn 2019). When the researcher reviewed the first two interviews, it was apparent that the participants required more time to talk and to feel at ease. Conducting interviews was a learning process and as more interviews were completed my confidence grew and I was able to recognise when the participant was in need of reassurance. As the interviews progressed, I found that I was able to probe and encourage participants to talk in more depth about their experiences. Participant feedback was very rewarding, I was told that I had a good charisma, and that people felt comfortable in my presence and able to talk. I used this feedback to encourage others to participate in my study. This feedback increased my confidence and the credibility of the collected data.

In addition, I also learnt not to use interviews as an opportunity to give participants information about topics, otherwise, the interview could become a consultation session. Participants, particularly those in management positions, needed to discuss the right way to deal with staff, whereas MLS needed to discuss their professional identity and job satisfaction. With experience, I learnt to adapt the questions or discussion on different topics until the end of the interview.

Culturally the position of women is very distinct in SA society as it is influenced by Islam. I felt that women participants were uncomfortable to be in my presence, although they did not show this. After a couple of interviews had been conducted women began to realise that the topic was of interest and there was nothing to be concerned about. I used strategies such as meeting female participants in an open room where it was quiet, for example, a room with one full glass wall. In the case of focus groups, the researcher made more space for women so that their privacy was maintained, and they felt more comfortable. I introduced myself as a member of university staff with the same background as the participants and knowledge of the technical terms used. On the other hand, men had no problem with being part of a focus group or taking part in interviews. However, the women tended to provide more information.

COVID-19 and managing time

The pandemic of COVID-19 was one of the most challenging parts of this study, and my father-in-law passed away during our stay in the UK. All flights to SA were cancelled due to COVID-19. In the UK, the government-imposed a lockdown so no one was able to visit us

from our friends in the UK to support us, particularly my wife as she had lost her father and was not able to attend the funeral. The situation of COVID-19 as a pandemic was difficult and stressful for everyone, both in the UK and SA.

Following the announcement of lockdown, we were asked to leave the UK. Upon our arrival in SA, I became infected with COVID-19 and had to stay in quarantine for around 30 days. A second Covid-19 test 14-days later also proved to be positive so there was a further quarantine of 14-days. Returning home was reassuring, but it proved to be time consuming. Rent was also payable on our home in Cardiff and still had many of our belongings in it. After planning with a company to pack our belongings and send to SA, I started to focus on my study.

I had to prioritise in order to manage the situation, my family was obviously the highest concern. Seeking support from my parents and relatives to manage my life in SA, and supervisors to assist me in managing my study, allowed me to manage the available time.

Personal growth

This was my first time to live in the UK, but I was familiar with western culture as I hold my master's degree from Australia. Thus, the language and communication were not major challenges for me. The UK culture and food were not different to us; however, the weather (especially in winter) was so challenging. Thus, we had to learn new techniques to keep my family members warm otherwise, we could spend the whole winter months at our flat. In general, the life in a foreign country teaches us how to be patient, creative, familiar with rules and regulations of the host country.

7.7 Summary

This thesis makes several important contributions for researchers and stakeholders who have an interest in MLS and hospital laboratories. This study fills the gap in the literature, more specifically in SA, as it is the first study to explore professional identity, job satisfaction and leadership behaviour within hospital laboratories. Several practical implications are revealed by the current study.

The first is related to the professional identity of MLS, the current level identified was not adequate. Leaders and MLS now need to promote the role to medical colleagues,

particularly doctors and nurses. Improved communication and greater visibility would give medical colleagues a better understanding of the MLS role, which would ultimately lead to a decrease in workload, a decrease in conflicts between MLS and medical colleagues and an improvement in the quality of laboratory tests. Better communication would improve the negative image held by medical colleagues.

Research shows that a relationship-oriented leadership style and a respectful and supportive working environment increases employees' feeling of identity with an organisation (Liu et al. 2013). The relationship between leadership and identification with an organisation is explained, to some degree, in the social identity theories of leadership (Hogg 2001a). Research conducted on this (Cicero et al. 2007; Hirst et al. 2009; van Dick and Kerschreiter 2016) found that a high level of staff identity within a team and the organisation was linked to positive results for the staff. Job satisfaction is improved, the organisation is more creative and negative outcomes, such as stress, are reduced. Therefore, van Dick and Kerschreiter (2016) advised leaders to concentrate their efforts more on improving staff identity.

Another possible outcome of improved professional identity would be closer teamwork between MLS and the medical community, including nurses and doctors. Three barriers to teamwork have been identified, these are: professional hierarchy, role ambiguity and poor communication (Mayaki and Stewart 2020). The explanation for this is that doctors regard themselves as being at the head of the medical pyramid because they hold leadership positions and receive higher remuneration (Mayaki and Stewart 2020). Nurses and MLS see themselves as being employed in second-class jobs. Mayaki and Stewart (2020) found that doctors, nurses and MLS perceived role ambiguity as a significant reason for tension and conflicts. MLS felt that doctors did not treat them respectfully, they blamed MLS when errors occurred in laboratory results, and doctors also agree that this was a barrier to good communication (Austin 2019). Therefore, enhanced teamwork between MLS and the medical community could improve levels of professional identity.

The second practical implication is related to the SCHS role, as focussing more attention on the career of MLS might mean that their professional identity and job satisfaction are improved. Courses and training programmes are now required to support MLS in their role within healthcare provision. In addition, there should be more opportunities for MLS to

undertake research and to publish their results. Recently MLS professionals played an important part in diagnosing and containing the pandemic of COVID-19 (Luo et al. 2021), but they seem unrecognised as there are limited courses available to MLS on the SCHS website. The availability of a wider selection of courses and research opportunities would enhance the professional growth of MLS, it would also offer the opportunity to meet medical colleagues, share research and gain social recognition.

The final practical implication is related to leadership behaviour within hospital laboratories. Firstly, leaders and managers in medical laboratories need to be aware of the multiplicity of professionals working in these laboratories, who may have very different backgrounds. This study provides evidence that this diverse group of professionals was distorting the image of the profession because some unqualified professionals, such as the graduates of biology and chemistry, do not have a medical background. Professionals who are not appropriately qualified would be unable to provide sufficient information to doctors and patients. Leaders and managers must understand this challenge and prevent this situation occurring. The MoH should now devise a development programme which will equip future biology and chemistry professionals with the necessary skills and qualifications to have the same level of information as the graduates of laboratory medicine programmes.

Secondly, leaders and managers in hospital laboratories need to understand the impact of SA culture on the mixed-gender workplace. This topic can be considered as one of the most challenging areas for SA workplaces; specifically, following the introduction of 'Vision 2030' the government plans to engage more females in employment (Aldhobaib 2017). Therefore, following government policies and resources could address several dilemmas facing female workers and laboratory leaders. Working in mixed-gender workplaces can create personal issues for females and, more specifically, married female workers (Abalkhail and Allan 2015; Alqahtani 2016). Two reasons were identified Aldhobaib (2017) who conducted a study on Saudi organisations: the social structure of Saudis (the obligations of Saudi men and women) and several unchanged social and Islamic norms despite the fact that numerous norms have changed in SA in the last decade (Abalkhail and Allan 2015; Najm 2015). Consequently, leaders of laboratories should explore a possible solution for female workers, including for example, flexible working hours. Aldhobaib

(2017) suggested that leaders should consider the discrepancies between social and religious norms in order to improve communication and encourage more interaction. Social norms can be changed more easily than norms which are associated with Islamic traditions. For example, male workers will not exhibit extreme resistance to changing their traditional dress compared with female workers in changing their Hijab. The traditional dress is constructed socially whereas the Hijab is a religious construction (Aldhobaib 2017).

The last point, which has practical implications for leadership behaviour, is the importance of providing training for leaders and the use of different types of leadership behaviour such as people-oriented and task-oriented. Training of hospital laboratory leaders is essential for the development of MLS and the improvement of the workplace. Most leaders assigned to lead medical organisations were not sufficiently qualified and did not have leadership and management backgrounds (Ghiasipour et al. 2017). The current study found the use and appreciation of different styles of leadership was essential in order to improve hospital laboratories and their staff. Although the current study does not produce good results for job satisfaction and professional identity overall, the leader of laboratory B demonstrated some good quality leadership as the laboratory had gained quality qualifications and been accredited as a training centre.

7.8 Limitations of the study

Although this study provides important insights into professional identity, job satisfaction and leadership behaviours among hospital laboratories in SA, it does have some limitations. To begin with, the study was conducted in two out of a total of thirteen hospitals in Makkah city. It could be argued that the current results may not be representative of all SA hospital laboratories in general. The results would have been more comprehensive if they had included other cities. However, such research would have been outside the human and financial resources available for the project. Although there are some differences between cities in terms of demographics, geography and industry, the administration of the healthcare system and the laboratories' system are comparable.

Another potential limitation is researcher bias, particularly in the qualitative phase of the study. However, the researcher had not been employed in a hospital laboratory and did not have 'insider status', also the researcher was unknown to all MLS and leaders.

Another potential limitation relates to the possibility that participant bias may have skewed the results of the quantitative and qualitative data or that some participants could have given dishonest or incorrect information in questionnaires, interviews and focus groups. The social desirability bias was also considered, where some participants might consciously attempt to create a favourable impression of either themselves and/or their workplace. Some participants may deliberately recount desirable events, whilst intentionally neglecting real issues, because they wanted to protect their jobs or their position in the workplace (Holtgraves 2004; Zikmund et al. 2013).

7.8.1 Effectiveness of the study design

The study recognises the value of using two complementary approaches, quantitative and qualitative, to collect a rounded insight into the MLS situation. The data collected using the two approaches were generally in agreement and provided various perspectives for the same phenomenon. In addition, researcher participation in the research procedure must be assessed. Conducting the study on two sites using two different approaches would allow a more in-depth and richer exploration. The researcher made a conscious effort to maintain objectivity and reflexivity whilst in the study context and analysing the collected data. As a result of this the researcher recommends conducting further studies, they could reveal different findings and observations.

7.9 Recommendations for future research

Some key recommendations will be offered for future researchers who may be interested in conducting further studies on the MLS field. More studies should be conducted on hospital laboratories in SA in order to examine the professional identity of MLS as this study was the first of its kind. This study focused on MLS and leaders within two hospital laboratories located in one city. Future studies should focus on hospitals in other geographic locations in SA. Another suggestion for future research is that data is collected from healthcare colleagues, such as nurses and doctors. It seems to be linked to how the MLS think they are perceived. In addition, there is an administration for hospital laboratories in each geographic region in SA, future studies could also examine their perceptions of supporting MLS in terms of professional identity, job satisfaction and leadership behaviour in hospital laboratories. The study also recommends Papadopoulos

cultural competence model for laboratory leaders to offer them with understanding of the importance of SA culture.

Papadopoulos cultural competence model

Papadopoulos' cultural competence model may be one way to apply these findings and achieve changes in SA. The model has four stages Cultural Awareness, Cultural Knowledge, Cultural Sensitivity and Cultural Competence (Papadopoulos et al. 2016). According to Papadopoulos's Cultural model, these are some important considerations to be aware of, including the role of cultural identity, self-awareness, ethnocentricity, heritage adherence, stereotyping, ethnohistory, diagnostic skills, health beliefs and behaviours, interpersonal and communication skills, respect, appropriateness and health inequalities. The hospitals' context of the current study has similarities to this model as most of MLS are Saudis who shared the same language, religion, customs and background and meant that communication and gender issues are still challenges in most Saudi organisations (Aldhobaib 2017) and as shown in this study. Thus, any changes in relation to MLS must be culturally competent, and this model offers a way to examine this in practice.

Cultural awareness in relation to laboratory leaders include leaders' awareness about their own cultural background and identity (Papadopoulos et al. 2016). Findings of the current study revealed leaders of laboratories were Saudis, as were most MLS staff, and they may be aware, but also very influenced by, Saudi culture. However, the full effect of SA culture on the workplace might not always be clear to those involved. Inadequate cultural awareness by laboratory leaders could even lead to ineffective leadership and health care services (Mannion and Davies 2018). Findings indicate that MLS leaders should be aware of the different social implications, and MLS should assess and give credit to SA cultural practices, however, this may not normally be seen. For example, females who are working in laboratories raised concerns about working night shifts and communicating with opposite gender due to social and cultural norms of SA society. Thus, the pressure on females to comply with SA cultural norms may lead to job dissatisfaction and may impact the quality of healthcare provision.

The second aspect of Papadopoulos' cultural competence model is cultural knowledge (Papadopoulos et al. 2016). Communication that can be achieved through assorted social

interaction with different healthcare teams is one way to acquire better cultural knowledge. Leaders, in order to be culturally competent, need to know staff about the workplace culture, the medical community culture as well as SA culture. The definition of cultural competence, which is the third aspect of the model, is a "...complex integration of knowledge, attitude and skills..." (Andrews and Boyle 2003, p. 15). Applying this may help develop and improve leaders' cultural knowledge of laboratories and being competent to work in an effective way within the cultural context of MLS, either as society or medical community.

One essential part of reaching social affectability, which is the fourth aspect of the model, is known as cultural sensitivity (Papadopoulos et al. 2016). This may include the way MLS view the people in their care. Unless clients, including doctors who order tests, as well the healthcare community and society more widely, need to understand each other; otherwise, the perception and sensitivity of cultural care will be hard to succeed.

It is important that laboratory leaders have awareness of cultural beliefs (Papadopoulos et al. 2016); another aspect of cultural competence. Therefore, leaders need to know how MLS view themselves in this profession and how the medical community and general society perceive the MLS profession. The cultural competence model has relevance to the outcomes of this study and needs to be considered when the implications and recommendations for SA are considered.

7.9.1 Recommendations for MLS leadership

- Offering culturally competent training and courses on leadership and management.
- Offering culturally competent courses on active communication and listening skills.
- An increase in promotion and allowances could be a way for the MoH in SA to enhance job satisfaction, as suggested by participants of the current study and participants of Alrawahi et al. (2019).
- Leaders of hospital laboratories should have the capacity to promote the MLS profession through sharing a sense of identity both inside and outside the laboratories to facilitate collaboration with individuals who hold differing views of the MLS profession; this is known as the social identity theory of leadership (Hogg 2001b; Reicher et al. 2005).

7.9.2 Recommendations for MLS education

- Laboratory medicine is a hidden profession, MLS would benefit from communication skills courses. This would enable them to communicate effectively with other medical colleagues in order to represent their profession appropriately.
- The SCHS should provide culturally competent courses and training programmes for the MLS, such as role extension.
- Universities should provide comprehensive information about medical specialities before allowing students to enrol on courses.

7.9.3 Recommendations for MLS' practice

- The work policy of MLS practice should be reviewed to allow technologists to do consultants' role since medical laboratory consultants do the technologists' role.
- The role of technologists and technicians need to be clarified.
- The MoH and SCHS should devise a high-quality programme to allow graduates of the faculties of applied sciences, such as biology and chemistry, work in medical laboratories. In the UK, for example, graduates of chemistry and biology are allowed to practice after qualifying and can then upgrade their level through a three years Scientist Training Programme (STP) (NHS 2021b).

7.10 The application of HCS framework in SA

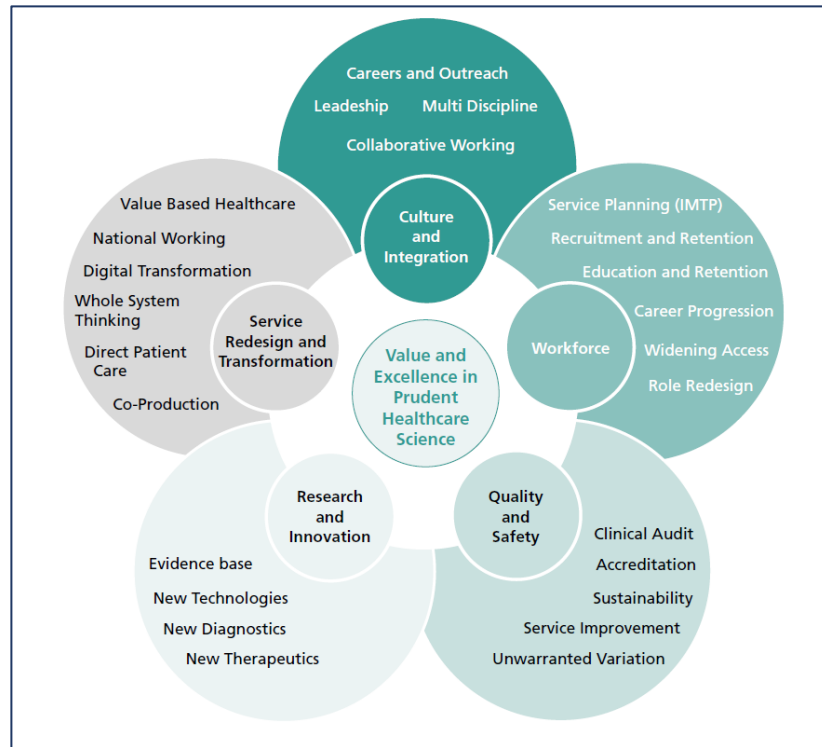
This study had undertaken in Wales, UK, and it was evident that some of the challenges that MLS experience in SA were also being reflected in Wales. Thus, this study could draw attention to the Strategic Healthcare Science (HCS) framework developed by NHS Wales (Welsh Government 2018) to transform the health workforce in SA. In general, the HCS framework in Wales focuses on the workforce, culture and service. Therefore, there is a clear synergy with the current study. The HCS will contribute to transform healthcare through providing collective planning and service delivery, improvement, education, research, innovation and system leadership. All these elements will support and enhance the professional identity and job satisfaction of MLS. The framework will be linked with Vision 2030 that plans to transform all sectors in SA, including the healthcare sector. The MoH in SA, has a strategy named the Transformation Strategy of the MoH as part of Vision

2030, which launches in 2021. One of the goals of Vision 2030 is to improve healthcare through improving the services' quality, performance and accountability of healthcare organisations (Vision 2030 2016). These will be achieved through providing the staff with a prudent transformation plan to deliver safe, effective, patient-centred, timely and equitable care. Therefore, the Transformation Strategy of the MoH could further focus on individual professions as they have done in Wales. The Strategic Healthcare Science framework in NHS Wales has five thematic areas linked with a bundle of action areas as well as it involves key indicators of success to measure outcomes (see Figure 27).

This study has analysed the context of MLS in SA; therefore, the HCS framework could also be utilized to improve the MLS. MLS has been providing a critical role during the pandemic to contain the disease, control infection and develop vaccines. This study has the potential to offer the MoH and the Saudi Commission for Health Specialties (SCHS) a strategic action plan to transform the health workforce in general. It is essential to mention that the HCS of NHS Wales has named many originations that work closely with NHS, such as Health Education and Improvement Wales (HEIW), Executive Directors of Therapies and Health Science (DoTHS), Academy for Healthcare Science (AHCS) and others. Therefore, this study suggests that the MoH and the SCHS need to establish a specialised regulator, organisations and associations for MLS.

Vision 2030 is working on establishing health clusters that aim to separate the Kingdom into approximately 20 geographically defined, vertically integrated Accountable Care Organisations (ACOs). Each ACO could consider creating a committee to use this Strategic Healthcare Science framework to support the transformation vision plan 2030 for the healthcare sector. In addition, a suggestion would be helpful to support the implementation of the Vision that each health profession has to have such a network, and one should be named as the MLS network (see Appendix L).

Figure 27 Strategic Healthcare Science framework of NHS Wales



Source: (Welsh Government 2018)

7.11 Conclusion

This study explored the professional identity, job satisfaction and leadership behaviours of MLS in SA. Research questions of the current study were answered whenever possible. The current level of professional identity is not adequate and needs further enhancement. Not feeling valued, lack of recognition and the modest support offered by the SCHS were the main reasons that the professional identity of MLS was found to be only at an average level. MLS satisfaction levels were only rated as moderate due to the inadequate salary, the dearth of opportunities for development, lack of conducting research and publishing due to the heavy workload. Leaders of both these hospital laboratories in SA face many challenges such as the multiplicity of professionals, poor communication and teamwork as well as cultural issues. In addition, some MLS reported that their leader did not always treat members of staff equally within the laboratory. The findings showed a variation in the scores for leadership behaviour, which demonstrates the need for unified leadership and management programmes that are culturally appropriate, so that all laboratories perform to the same high level.

This thesis has highlighted the importance of exploring issues such as professional identity, job satisfaction and leadership behaviour within hospital laboratories, it has identified the way in which MLS perceive themselves in relation to their profession. The association between professional identity, job satisfaction and leadership behaviours have been explored for the first time in SA.

This study has thus provided new insights for future researchers, leaders of hospital laboratories and the SA MoH to now develop the profession of MLS to the next level. This study offers the foundation for further research into the challenges of working within hospital laboratories in SA, especially in terms of the important relationship between professional identity, job satisfaction and leadership behaviour.

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Appendix A Invitation Letter

Invitation Letter

All recruited subjects

Study Title: Leadership behaviour, job satisfaction and the professional identity of medical laboratory staff in Saudi Arabia: An exploratory study

I am inviting you to take part in a study that aims to explore the professional identity, job satisfaction and leadership behaviour of Medical Laboratory Staff (MLS) in Saudi Arabian hospital laboratory settings. This study will provide a background for future research that will be conducted in Saudi Arabia with MLS.

I am a lecturer working at the department of health management and technology in Umm Al-Qura University. I am currently enrolled in the Doctorate in Philosophy (PhD) course at Cardiff University in Wales (UK). Before you decide whether to take part in this research would like you to read the information sheet that is enclosed with this letter. The information sheet explains why the research is being done and what it would involve for you. If you would like to discuss any aspect of this research without any obligation to take part, please call Rayan Khayat, if there is anything that is not clear.

Yours sincerely

Rayan Khayat

Appendix B Participants Information Sheet



(Questionnaires)

Study Title: Leadership behaviour, job satisfaction, and the professional identity of medical laboratory staff in Saudi Arabia: An exploratory study

What is the purpose of the study?

The aim of this study is to explore the professional identity, job satisfaction and leadership behaviour of MLS in Saudi Arabian hospital laboratory settings. This study will provide a background for future research that will be conducted in Saudi Arabia with medical laboratory personnel.

Why have I been invited?

You have been invited because you are a member of the medical laboratory staff and work in the hospital laboratory environment. I would like to ask you about your professional identity and job satisfaction, and to consider the leadership of the laboratory in which you work.

Do I have to take part?

Whilst your contribution would be valuable, it is up to you to decide to join the study. If you agree to take part, I will then ask you to sign a consent form. You are free to withdraw at any time, without giving any reason. If you decide to withdraw from the study, with your permission I would like to keep and use any information that you have provided whilst taking part in the study.

What will happen to me if I take part?

If you agree to participate in this study, you will be asked by Rayan Khayat to complete a questionnaire containing questions about professional identity, job satisfaction and leadership behaviour. This stage will take four weeks, to allow you to complete the questionnaires. The questionnaires used in this study have been designed by the

Researcher: and supervised by expert opinions from the School of Healthcare Sciences, Cardiff University, Cardiff, UK.

What will I have to do?

As a medical laboratory staff, I would like you to participate in completing questionnaires that will ask you about leadership behaviour and assess your job satisfaction and professional identity. The result of the analysis may be used for publication in the future, however, the anonymity of all participants will be maintained.

What are the risks of taking part in this study?

There are no known risks from participation are anticipated in this study. If you find this questionnaire is upsetting, you are free to not complete it. However, the collected questionnaire will be treated confidentially, and your name will be changed to protect your identity during the analysis and writing phases of this study. All of the information collected in the study will also be securely stored and subsequently destroyed, using the guidance for storing research information set out by Cardiff University.

What are the possible benefits of taking part?

There are no personal benefits but there is a general benefit to increasing knowledge and possibly improving the quality of medical laboratory staff in SA.

Will participation in this study be kept confidential?

The identity of your organisation will be known, but your identity and place of work (e.g. name of unit) will be protected. I will follow the ethical and legal practice of Cardiff University and all information about you will be handled in confidence. The collected questionnaires will be stored in a secure locker during the data collection phase in SA. This locker will be located in the researcher's office at Umm Al-Qura University. In the UK, the collected questionnaires will be stored in a secure locker located in the School of Healthcare Sciences, Cardiff University. Only the research team will access the saved data.

What will happen to the results of the research study?

The results of this study may be presented at conferences and published in scientific journals. If you would like a summary of the results, please send an email to the Researcher: and the results can be sent to you after completion of the study.

Who is organising and funding the research?

The study is for the completion of my PhD. The study will be carried out by the main Researcher: Rayan Khayat with supervision from Professor Daniel Kelly and Dr Angela Parry. This study is funded by the Ministry of Education in Saudi Arabia.

Who has reviewed the study?

The study has been reviewed by the School of Healthcare Sciences Research Screening and Ethical Review Committee in Cardiff (Wales), and by the Research Ethics Committee in health affairs in Makkah, Saudi Arabia.

What if there is a problem?

If you have a concern or a problem about any aspect of this study, you may speak to [REDACTED], Director of Post Graduate Research, School of healthcare science, Cardiff University. Tel: [REDACTED]. Email: [REDACTED]

Contact for further information

If you would like to discuss any part of the project in detail then please do not hesitate to contact Rayan Khayat at:

School of Healthcare Sciences, Cardiff University
Eastgate House
35-43 Newport Road
CF24 0AB
Cardiff
Tel: +44 (0) 2920917727
Email:
Thank you for your time and consideration
Rayan Khayat

Participants Information Sheet

(Focus group)



Study Title: Leadership behaviour, job satisfaction, and the professional identity of medical laboratory staff in Saudi Arabia: An exploratory study

What is the purpose of the study?

The aim of this study is to explore the professional identity, job satisfaction and leadership behaviour of MLS in Saudi Arabian hospital laboratory settings. This study will provide a background for future research that will be conducted in Saudi Arabia with medical laboratory personnel.

Why have I been invited?

You have been invited because you are a member of the medical laboratory staff and work in the hospital laboratory environment. I would like to ask you about your professional identity and job satisfaction, and the leadership of the area that you work in.

Do I have to take part?

Whilst your contribution would be valuable, it is up to you to decide to join the study. If you agree to take part, I will then ask you to sign a consent form. You are free to withdraw at any time, without giving any reason. If you decide to withdraw from the study, with your permission I would like to keep and use any information that you have provided whilst taking part in the study.

What will happen to me if I take part?

If you agree to participate in this study, you will be contacted by Rayan Khayat to arrange a mutually convenient time for conducting focus group session will include six members of MLS. The interview procedure of this focus group will be clearly explained to you before the interviewing process commences. The interview procedure and questions used in the interview have been developed using expert opinions from the School of Healthcare

Sciences, Cardiff University, Cardiff, UK. All the questions will be about professional identity, job satisfaction and leadership in your laboratory. This focus group session will not include any sensitive questions, and you may skip any questions you feel uncomfortable answering. The focus group discussion will be audio recorded using an electronic digital audio recorder.

What will I have to do?

As a medical laboratory staff, I would like to you participate in a focus group session that you will be asked about the leadership of the laboratory and your job satisfaction professional identity level. The focus groups will last around 60 minutes. The focus group discussion will be recorded and transcribed anonymously for the purposes of analysis. The result of the analysis may be used for publication in the future, however, the anonymity of all participants will be maintained.

What are the risks of taking part in this study?

There are no known risks anticipated in this study. If you find the focus group questions upsetting, you are free to withdraw. However, the collected data will be treated confidentially and your name will be changed to protect your identity during the analysis and writing phases of this study. All of the information collected in the study will also be securely stored and subsequently destroyed, using the guidance for storing research information set out by Cardiff University.

What are the possible benefits of taking part?

There are no personal benefits but there is a general benefit to increasing knowledge and possibly improving the quality of medical laboratory personnel in SA.

Will participation in this study be kept confidential?

The identity of your organisation will be known, but your identity and place of work (e.g. name of unit) will be protected. I will follow the ethical and legal practice of Cardiff University and all information about you will be handled in confidence. The recorded conversation will be transcribed anonymously and stored electronically on a secure encrypted server (OneDrive) provided by Cardiff University. The Researcher: will use a digital audio device to record the conversations and will immediately upload the

conversations on a secure encrypted server (OneDrive) provided by Cardiff University. Then, the conversations will be deleted from the audio device. The previous steps will be followed to maintain the confidentiality of the participants. Only the research team will access the saved data.

What will happen to the results of the research study?

The results of this study may be presented at conferences and published in scientific journals. If you would like a summary of the results, please send an email to the Researcher: and the results can be sent to you after completion of the study.

Who is organising and funding the research?

The study is for the completion of my PhD. The study will be carried out by the main Researcher: Rayan Khayat with supervision from Professor Daniel Kelly and Dr Angela Parry. This study is funded by the Ministry of Education in Saudi Arabia.

Who has reviewed the study?

The study has been reviewed by the School of Healthcare Sciences Research Screening and Ethical Review Committee in Cardiff (Wales), and by the Research Ethics Committee in health affairs in Makkah, Saudi Arabia.

What if there is a problem?

If you have a concern or a problem about any aspect of this study, you may speak to Dr [REDACTED], Director of Post Graduate Research, School of healthcare science, Cardiff University. Tel: [REDACTED]. Email: [REDACTED]

Contact for further information

If you would like to discuss any part of the project in greater detail, then please do not hesitate to contact Rayan Khayat at:

School of Healthcare Sciences, Cardiff University
Eastgate House
35-43 Newport Road
CF24 0AB
Cardiff
Tel: +44 (0) 2920917727
Email:

Thank you for your time and consideration
Rayan Khayat

Participants Information Sheet

(Individual interviews)



Study Title: Leadership behaviour, job satisfaction, and professional identity of medical laboratory staff in Saudi Arabia: An exploratory study

What is the purpose of the study?

The aim of this study is to explore the professional identity, job satisfaction and leadership behaviour of MLS in Saudi Arabian hospital laboratory settings. This study will provide a background for future research that will be conducted in Saudi Arabia with medical laboratory personnel.

Why have I been invited?

You have been invited because you are a director or a supervisor and work in the hospital laboratory environment. I would like to ask you about issues of professional identity and job satisfaction of MLS, and leadership of the laboratory that you work in.

Do I have to take part?

Whilst your contribution would be valuable, it is up to you to decide to join the study. If you agree to take part, I will then ask you to sign a consent form. You are free to withdraw at any time, without giving any reason. If you decide to withdraw from the study, with your permission I would like to keep and use any information that you have provided whilst taking part in the study.

What will happen to me if I take part?

If you agree to participate in this study, you will be contacted by Rayan Khayat to arrange a mutually convenient time for individual interviews. The interview procedure will be clearly explained to you before the interviewing process commences. The interview procedure and questions used in the interview have been developed using expert opinions from the School of Healthcare Sciences, Cardiff University, Cardiff, UK. All the questions will

be about professional identity and job satisfaction of MLS, and leadership of the laboratory. The Interview will not include any sensitive questions, and you may skip any questions you feel uncomfortable answering. The interviews will be audio recorded using an electronic digital audio recorder.

What will I have to do?

As a director or a supervisor, I would like you to participate in a face to face interview. The interviews will last for 60 minutes. The interview will be recorded and transcribed anonymously for the purposes of analysis. The result of the analysis may be used for publication in the future however the anonymity of all participants will be maintained.

What are the risks of taking part in this study?

There are no known risks from participation are anticipated in this study. If you find the question of the interview is upsetting, you are free to withdraw. However, the collected information will be treated confidentially and your name will be changed to protect your identity during the analysis and the writing phases of this study. All of the information collected in the study will also be securely stored and subsequently destroyed, using the guidance for storing research information set out by Cardiff University.

What are the possible benefits of taking part?

There are no personal benefits but there is a general benefit to increasing knowledge and possibly improving the quality of medical laboratory personnel in SA.

Will participation in this study be kept confidential?

The identity of your organisation will be known, but your identity and place of work (e.g. name of unit) will be protected. I will follow the ethical and legal practice of Cardiff University and all information about you will be handled in confidence. The recorded conversation will be transcribed anonymously and stored electronically on a secure encrypted server (OneDrive) provided by Cardiff University. The Researcher: will use a digital audio device to record the conversations. These conversations will be immediately uploaded to a secure encrypted server (OneDrive) provided by Cardiff University. Then, the conversations will be deleted from the audio device. The previous steps will be followed to

maintain the confidentiality of the participants. Only the research team will access the saved data.

What will happen to the results of the research study?

The results of this study may be presented at conferences and published in scientific journals. If you would like a summary of the results, please send an email to the Researcher: and the results can be sent to you after completion of the study.

Who is organising and funding the research?

The study is for the completion of my PhD. The study will be carried out by the main Researcher: Rayan Khayat with supervision from Professor Daniel Kelly and Dr Angela Parry. This study is funded by the Ministry of Education in Saudi Arabia.

Who has reviewed the study?

The study has been reviewed by the School of Healthcare Sciences Research Screening and Ethical Review Committee in Cardiff (Wales), and by the Research Ethics Committee in health affairs in Makkah, Saudi Arabia.

What if there is a problem?

If you have a concern or a problem about any aspect of this study, you may speak to Dr [REDACTED], Director of Post Graduate Research, School of healthcare science, Cardiff University. Tel: [REDACTED]. Email: [REDACTED]

Contact for further information

If you would like to discuss any part of the project in greater detail then please do not hesitate to contact Rayan Khayat at:

School of Healthcare Sciences, Cardiff University
Eastgate House
35-43 Newport Road
CF24 0AB
Cardiff
Tel: +44 (0) 2920917727
Email:
Thank you for your time and consideration
Rayan Khayat

Participants Information Sheet

(Observation)

Study Title: Leadership behaviour, job satisfaction, and professional identity of medical laboratory staff in Saudi Arabia: An exploratory study

What is the purpose of the study?

The aim of this study is to explore the professional identity, job satisfaction and leadership behaviour of MLS in Saudi Arabian hospital laboratory settings. This study will provide a background for future research that will be conducted in Saudi Arabia with medical laboratory personnel.

Why have I been invited?

You have been invited because you are a hospital laboratory director, a supervisor or member of the medical laboratory staff and work in the hospital laboratory environment. I would like to observe your work by attending two days a week, four hours at morning shift (day one) and four hours at afternoon shift (day two), this will last for five weeks.

Do I have to take part?

Whilst your contribution would be valuable, it is up to you to decide to join the study. If you agree to take part, I will then ask you to sign a consent form. You are free to withdraw at any time, without giving any reason. If you decide to withdraw from the study, with your permission I would like to keep and use any information that you have provided whilst taking part in the study.

What will happen to me if I take part?

If you agree to participate in this study, you will be observed for five weeks by Rayan Khayat. The Researcher: will attend your laboratory two days, four hours at morning shift and four hours at the afternoon shift; this will be last for five weeks. The Researcher: will let you know when he will start the field observation. The Researcher: will inform the whole

staff by attending staff meeting about the study; and the dates and times of observational sessions. Moreover, the Researcher: will attach a timetable of his attendance on the main advertisement board in the laboratory. In addition, the Researcher: will place a poster in front of the main gate of the laboratory tells the staff: observation session is running.

The Researcher: will collect the data by attending staff meetings, new employment induction, presentations, and discussions about the volume of work, the work environment, daily interactions with the MLS themselves and their leaders; and observing instances of formal and informal leadership of MLS.

These steps will be followed to maintain the confidentiality and gain consents of the participants.

In general, all field observations will be about professional identity, job satisfaction and leadership in the laboratory. The Researcher: will not include any sensitive data, and you may opt out this session if you feel uncomfortable. The observation will be mainly written in a single notebook. If it is impossible to write down, then the Researcher: will audio recorded using an electronic digital audio recorder.

What will I have to do?

As a laboratory director, a supervisor or a medical laboratory staff I would ask you to confirm that you will be a participant in this study by being observed. The observation will be focused on issues and events related to leadership, and job satisfaction and professional identity of MLS. The result of the analysis may be used for publication in the future, however, the anonymity of all participants will be maintained.

What are the risks of taking part in this study?

There are no known risks from participation are anticipated in this study. If you find being observed upsetting, you are free to tell me and I will not include you. However, the collected data will be treated confidentially and your name will be changed to protect your identity during the analysis and the writing phases of this study. All of the information collected in the study will also be securely stored and subsequently destroyed, using the guidance for storing research information set out by Cardiff University.

What are the possible benefits of taking part?

There are no personal benefits but there is a general benefit to increasing knowledge and possibly improving the quality of medical laboratory personnel in SA.

Will participation in this study be kept confidential?

The identity of your organisation will be known, but your identity and place of work (e.g. name of unit) will be protected. I will follow the ethical and legal practice of Cardiff University and all information about you will be handled in confidence. The recorded conversation on the researcher's notebook will be transcribed anonymously and stored electronically on a secure encrypted server (OneDrive) provided by Cardiff University. If the Researcher: uses a digital audio device to record the conversations, these conversations will be immediately uploaded to a secure encrypted server (OneDrive) provided by Cardiff University. Then, they will be deleted from the audio device. The Researcher: will destruct the notebook after the transcribing using the confidential waste services provided by Cardiff University. The previous steps will be followed to maintain the confidentiality of the participants. Only the research team will access the saved data.

What will happen to the results of the research study?

The results of this study may be presented at conferences and published in scientific journals. If you would like a summary of the results, please send an email to the Researcher: and the results can be sent to you after completion of the study.

Who is organising and funding the research?

The study is for the completion of my PhD. The study will be carried out by the main Researcher: Rayan Khayat with supervision from Professor Daniel Kelly and Dr Angela Parry. This study is funded by the Ministry of Education in Saudi Arabia.

Who has reviewed the study?

The study has been reviewed by the School of Healthcare Sciences Research Screening and Ethical Review Committee in Cardiff (Wales), and by the Research Ethics Committee in health affairs in Makkah, Saudi Arabia.

What if there is a problem?

If you have a concern or a problem about any aspect of this study, you may speak to Dr [REDACTED], Director of Post Graduate Research, School of healthcare science, Cardiff University. [REDACTED]. Email: [REDACTED]

Contact for further information

If you would like to discuss any part of the project in greater detail then please do not hesitate to contact Rayan Khayat at:

School of Healthcare Sciences, Cardiff University
Eastgate House
35-43 Newport Road
CF24 0AB
Cardiff
Tel: +44 (0) 2920917727
Email:
Thank you for your time and consideration
Rayan Khayat

Appendix C Consent Forms



Questionnaires Consent Form

Study Title: Leadership behaviour, job satisfaction, and professional identity of medical laboratory staff in Saudi Arabia: An exploratory study

Please Initial box

- 1- I confirm that I have read the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
- 2- I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my legal rights being affected.
- 3- I understand that the questionnaire will be collected non-anonymously, I give permission for this.
- 4- I understand that data collected will not be transferred to any commercial organisation but may be used anonymously for publication, presentation at conferences, for teaching purposes and for future studies. I give permission for this.
- 5- I understand that if I lose the capacity to consent, that I will be withdrawn from the study. I understand that any information collected from interviews before the loss of consent will still be included in the study. I give permission for this.
- 6- I agree to take part in the above study

Name of Participant	Date	Signature
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Name of Person taking consent	Date	Signature
-------------------------------	------	-----------

Subject Identification Number for this Investigation:

Focus Group Consent Form



Study Title: Leadership behaviour, job satisfaction, and professional identity of medical laboratory staff in Saudi Arabia: An exploratory study

Please Initial box

- 1- I confirm that I have read the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
- 2- I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my legal rights being affected.
- 3- I understand that my interview will be recorded on a digital recording device, I give permission for this.
- 4- I understand that data collected will not be transferred to any commercial organisation but may be used anonymously for publication, presentation at conferences, for teaching purposes and for future studies. I give permission for this.
- 5- I understand that if I lose the capacity to consent, that I will be withdrawn from the study. I understand that any information collected from interviews before the loss of consent will still be included in the study. I give permission for this.
- 6- I agree to take part in the above study

Name of Participant	Date	Signature
---------------------	------	-----------

Name of Person taking consent	Date	Signature
-------------------------------	------	-----------

Subject Identification Number for this Investigation:

Interview Consent Form

Study Title: Leadership behaviour, job satisfaction, and professional identity of medical laboratory staff in Saudi Arabia: An exploratory study

Please Initial box

- 1- I confirm that I have read the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

- 2- I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my legal rights being affected.

- 3- I understand that my interview will be recorded on a digital recording device, I give permission for this.

- 4- I understand that data collected will not be transferred to any commercial organisation but may be used anonymously for publication, presentation at conferences, for teaching purposes and for future studies. I give permission for this.

- 5- I understand that if I lose the capacity to consent, that I will be withdrawn from the study. I understand that any information collected from interviews before the loss of consent will still be included in the study. I give permission for this.

- 6- I agree to take part in the above study

Name of Participant	Date	Signature
---------------------	------	-----------

Name of Person taking consent	Date	Signature
-------------------------------	------	-----------

Subject Identification Number for this Investigation:

Appendix D Questionnaires

Code No: H-02-K-076-1809



Leadership behaviour, job satisfaction, and professional identity of medical laboratory staff in Saudi Arabia: An exploratory study

The career of the medical laboratory has a very important role in healthcare provision. I am conducting a study to explore the leadership behaviour, job satisfaction and professional identity of medical laboratory staff in Saudi Arabian hospital laboratory settings.

Please complete this questionnaire by circling the numbers that best represent your answer. There are no right or wrong answers. If you feel that any of the questions are inappropriate, please do not feel that you have to answer them.

Anything that you tell me in this questionnaire will be treated confidentially. Your name is not required on any part of the questionnaire and therefore your participation is anonymous.

If, after completing these questions, you want to add some more information then please use the space provided on the back page.

Section RESEARCHER: Job Satisfaction

Please circle the appropriate response.

How satisfied are you with the following aspect of **your current job**?

Items	Very dissatisfied	Moderately dissatisfied	Neutral	Moderately satisfied	Very satisfied
1. Salary	1	2	3	4	5
2. Holidays	1	2	3	4	5
3. Other allowance (e.g. study leave)	1	2	3	4	5
4. Working hours	1	2	3	4	5
5. Flexibility in scheduling your hours	1	2	3	4	5
6. Opportunity to work straight days	1	2	3	4	5
7. Opportunity for part/time work	1	2	3	4	5
8. Weekends off per month	1	2	3	4	5
9. Flexibility in scheduling your weekends off	1	2	3	4	5
10. Compensation for working weekends	1	2	3	4	5
11. Special leave (e.g. maternity and paternity leave)	1	2	3	4	5
12. Your supervisors	1	2	3	4	5
13. The other professionals you work with	1	2	3	4	5
14. The work practice	1	2	3	4	5
15. Opportunity for social contact with your peers at work	1	2	3	4	5
16. Opportunities for social contact with colleagues after work	1	2	3	4	5
17. Opportunities to interact professionally with other disciplines	1	2	3	4	5
18. Control over what goes on in your work setting	1	2	3	4	5
19. Recognition for your work from your supervisors	1	2	3	4	5
20. Recognition for your work from your peers	1	2	3	4	5
21. Amount encouragement and positive feedback	1	2	3	4	5
22. Opportunities to participate in research	1	2	3	4	5
23. Opportunities to write and publish	1	2	3	4	5
24. Your control over work conditions	1	2	3	4	5
25. Your participation in organisational decision making	1	2	3	4	5

Reference: Lee et al. (2016)

Section PARTICIPANT: Professional Identity

Thinking about your **profession**, how you feel and behave as a medical laboratorrt staff?

The definition of professional identity is “the concept which describes how we perceive ourselves within our occupational context and how we communicate this to others”.

Please circle the appropriate response.

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. If I could go into an alternate profession with similar salary, I probably would.	1	2	3	4	5
2. I definitely want to make a career in the profession I am in.	1	2	3	4	5
3. If I could do it all over again, I would not choose the same profession.	1	2	3	4	5
4. I like this profession too well to give it up.	1	2	3	4	5
5. I am disappointed that I ever entered my profession.	1	2	3	4	5
6. I make my own decisions regarding what is to be done in my work.	1	2	3	4	5
7. My own decisions are subject to review.	1	2	3	4	5
8. I am my own boss in almost every work-related question.	1	2	3	4	5
9. Most of my decisions are reviewed by other people.	1	2	3	4	5
10. Other professionals are more vital to society than mine.	1	2	3	4	5
11. I think that my profession, more than any other, is essential for society.	1	2	3	4	5
12. Some other occupations are actually more important to society than mine.	1	2	3	4	5
13. If ever an occupation is very important it is this one.	1	2	3	4	5
14. I regularly read professional journals.	1	2	3	4	5
15. I regularly attend local professional meetings.	1	2	3	4	5
16. Professional bodies do little for the average member.	1	2	3	4	5
17. Although I would like to, I don't read professional journals too often.	1	2	3	4	5
18. My fellow professionals have a pretty good idea about each other's competence.	1	2	3	4	5

19. A problem in this profession is that no-one knows what colleagues in other organisations are doing to improve standards.	1	2	3	4	5
20. We really have no way of judging each other's competence.	1	2	3	4	5
21. There is not much opportunity to judge how another professional does his/her work.	1	2	3	4	5

Reference: Swailes (2003)

Section C: Leadership Behaviour



Read each item carefully and think about **your leaders** in the workplace, and how they engage in the described behaviour.

Please circle the appropriate response.

Items	Never	Seldom	Occasionally	Often	Always
1. Tells group members what they are supposed to do.	1	2	3	4	5
2. Acts friendly with members of the group.	1	2	3	4	5
3. Sets standards of performance for group members.	1	2	3	4	5
4. Helps others feel comfortable in the group.	1	2	3	4	5
5. Makes suggestions about how to solve problems.	1	2	3	4	5
6. Responds favourably to suggestions made by others.	1	2	3	4	5
7. Makes his or her perspective clear to others.	1	2	3	4	5
8. Treats others fairly.	1	2	3	4	5
9. Develops a plan of action for the group.	1	2	3	4	5
10. Behaves in a predictable manner toward group members.	1	2	3	4	5
11. Defines role responsibilities for each group member.	1	2	3	4	5
12. Communicates actively with group members.	1	2	3	4	5
13. Clarifies his or her own role within the group.	1	2	3	4	5
14. Shows concern for the personal well-being of others.	1	2	3	4	5
15. Provides a plan for how the work is to be done.	1	2	3	4	5
16. Shows flexibility in making decisions.	1	2	3	4	5
17. Provides criteria for what is expected of the group.	1	2	3	4	5
18. Discloses thoughts and feelings to group members.	1	2	3	4	5
19. Encourages group members to do quality work.	1	2	3	4	5
20. Helps group members get along.	1	2	3	4	5

Reference: Northouse (2016)

Section E: Demographic Data



This final section is about you and the work you are currently doing. Please tick the answer that applies:

Demographic data	Tick the best answer for you						
Years of experience	<input type="checkbox"/> Less than 1Y	<input type="checkbox"/> 1-5	<input type="checkbox"/> 6-10	<input type="checkbox"/> 11-15	<input type="checkbox"/> 16-20	<input type="checkbox"/> 21-25	<input type="checkbox"/> 26Y or above
Gender	<input type="checkbox"/> Male			<input type="checkbox"/> Female			
Healthcare professional	<input type="checkbox"/> Phlebotomist	<input type="checkbox"/> Medical technician	<input type="checkbox"/> Medical Technologist	<input type="checkbox"/> Medical Technologist I	<input type="checkbox"/> Pathologist with Medical laboratory degree	<input type="checkbox"/> Pathologist with doctor of medicine degree	<input type="checkbox"/> other
Educational background "Tick the last qualification"	<input type="checkbox"/> Health science diploma	<input type="checkbox"/> Higher health science diploma	<input type="checkbox"/> Bachelor degree	<input type="checkbox"/> Postgraduate diploma	<input type="checkbox"/> Master degree	<input type="checkbox"/> PhD or MD	<input type="checkbox"/> Still studying
Position at work	<input type="checkbox"/> Normal staff	<input type="checkbox"/> Senior staff	<input type="checkbox"/> Supervisor	<input type="checkbox"/> Lab director	<input type="checkbox"/> Other		
Salary/month	<input type="checkbox"/> SR 3000-8000	<input type="checkbox"/> SR 8001-13000	<input type="checkbox"/> SR 13001-18000	<input type="checkbox"/> SR 18001-23000	<input type="checkbox"/> Above SR23000	<input type="checkbox"/> Other	
Age	<input type="checkbox"/> 21-25	<input type="checkbox"/> 26-30	<input type="checkbox"/> 31-35	<input type="checkbox"/> 36-40	<input type="checkbox"/> 41-45	<input type="checkbox"/> 46-50	<input type="checkbox"/> 51 or above
Nationality	<input type="checkbox"/> Saudi			<input type="checkbox"/> Non-Saudi			

Appendix E Focus Groups and Interviews Questions

Focus Groups Questions (MLS)



Introduction

Aim:

The purpose of these focus groups is to stimulate the discussion and check your views about MLS professional identity, job satisfaction and leadership.

1. Tell me what you think is the most important feature of a good leader?
2. Can you identify some people who are good leaders and determine their talents?
 - How far do you think these talents are available in these laboratories? If not
 - What is missing do you think?
3. How might are leaders improve their roles, and how might this impact on you, or your work?
4. Leading from this, what are the best subject of the MLS role here?
 - And what could be better e.g. workload, how people view our department, how we work as a team, or how we feel about jobs?
5. In relation to this how do you think the MLS role is perceived? Here in the hospital, and more generally in Saudi culture?
 - Do young people want to become MLS, if not why?
 - How do you feel about your career choice now? Would you do it again?
6. I am coming to the end of the focus group discussion. So can you tell me what you would change here to make:
 - a) The job better.
 - b) People's understanding better of our roles.
 - c) Leadership more effective.

Any other comments about professional identity, leadership and job satisfaction of MLS?

Thank you for your time!

Interview Questions



Introduction

Aim:

The purpose of these individual interviews is to stimulate discussion around issues of professional identity and job satisfaction as well as MLS leadership more generally.

1. **What are the key challenges face leaders here?**
2. **Can you tell me how it works to make changes or to develop the services here?**
 - Is it easy or challenging? Any examples?
3. **Do you think that leaders need more support or training or other resources?**
 - Can you tell me what sort of training might be most useful?
4. **Leading from this, what are the best aspects of the MLS services here?**
 - And what could be better e.g. workload, how people view our department, how we work as a team, or how we feel about jobs?
5. **In relation to this, how do you think the MLS role is perceived? Here is the in the hospital, and move generally in Saudi culture?**
 - Do young people want to become MLS, if not why?
 - How do you feel about your career chosen now? Would you do it again?
6. **I am coming to the end of this interview. So can you tell me what you would change here to make:**
 - a) The job better
 - b) Improve people's understanding of our roles.
 - c) Leadership more effective.

Any other comments about professional identity, leadership and job satisfaction of MLS?

Thank you for your time!

Appendix F Cardiff University Ethics Approval

School of Healthcare Sciences
Head of School and Dean Professor David Whittaker

Ysgol Gwyddorau Gofal Iechyd
Pennaeth yr Ysgol a Deon Yr Athrawes David Whittaker



09 August 2018

Cardiff University
Eastgate House
13th Floor
35 – 43 Newport Road
Cardiff CF24 0AB

Tel Ffon: +44 (0)29 20 688559
Email E-bost: HCAREethics@cardiff.ac.uk

Prifysgol Caerdydd
13^{ed} Llawr
Ty Eastgate
35 – 43 Heol Casnewydd
Caerdydd CF24 0AB

Rayan Khat
12th Floor
Eastgate House

Dear Rayan

Leadership behaviour, job satisfaction, and professional identity of medical laboratory staff in Saudi Arabia: An exploratory study

The School's Research Ethics Committee Chair has considered your re-submitted research proposal. The decision of the Committee Chair is that your work should:

Pass –and that you proceed with your Research

This decision will be ratified at the meeting of 14 August 2018.

Please note that if there are any subsequent major amendments to the project made following this approval you will be required to submit a revised proposal form. You are advised to contact me if this situation arises. In addition, in line with the University requirements, the project will be monitored on an annual basis by the Committee and an annual monitoring form will be despatched to you in approximately 11 months' time. If the project is completed before this time you should contact me to obtain a form for completion.

Please do not hesitate to contact me if you have any questions.

Yours sincerely



Mrs Liz Harmer – Griebel
Research Administration Manager

Cc : Danny Kelly/Angela Parry

Appendix G Ethical Approval from Ministry of Health, Saudi Arabia (Arabic).



وزارة الصحة
Ministry of Health

المملكة العربية السعودية
وزارة الصحة
المديرية العامة للشؤون الصحية
بصحة منطقة مكة المكرمة
اللجنة المحلية لأخلاقيات البحوث
بصحة منطقة مكة المكرمة
(H-02-K-076)
1439/4/28

قرار لجنة أخلاقيات البحوث بصحة منطقة مكة المكرمة

	تاريخ الاصدار
2018-09-20	
Leadership behaviour, job satisfaction and the professional identity of medical laboratory staff in Saudi Arabia: An exploratory study	عنوان البحث
ريان عبدالله خياط	الباحث الرئيسي
H-02-K-076-1809-046	رقم القرار
موافقه مشروطة	نتيجة القرار

الباحث / ريان عبدالله خياط

نفيدكم علما بأنه تم الاطلاع على المقترح البحثي المقدم بالعنوان المشار اليه اعلاه وقد تمت مناقشته ومراجعته من قبل اللجنة المحلية لأخلاقيات البحوث بصحة منطقة مكة المكرمة و الافادة بنتيجة الدراسة وفقا للتعليمات والتوصيات لأخلاقيات البحوث المعتمدة من اللجنة الوطنية.

ونص قرار اللجنة موافقة مشروطة بعد إتمام بعض التعديلات المطلوبة على المشروع البحثي.

يرجى ملاحظة بأن هذه النتيجة صادرة من المنظور والنطاق البحثي ، وحيث أن الباحث لا يزال بحاجة الى الحصول على الأذن وخطاب تسهيل المهمة من ادارة التخطيط والبحوث بصحة منطقة مكة المكرمة للبدء بالمشروع وجمع البيانات.

نتمنى لكم كل التوفيق والنجاح في المشروع البحثي واستنادا على اللوائح يتوجب عليكم إبقاء الجهات المختصة على علم وإحاطة بالمستجدات وذلك برفع التقارير الدورية كل ثلاثة أشهر مع الاحتفاظ برقم القرار الخاص بكم في المراجعات.

وللأهمية يجب اعلام لجنة أخلاقيات البحوث بنتائج الدراسة بعد اتمام البحث وذلك للحصول على الموافقة قبل النشر.

ملاحظة: على الباحثين التأكد من استحواذهم على شهادة الأخلاقيات (NIH) او(NCBE) وتكون سارية المفعول.

وفي حال وجود أي استفسار التكرم بالتواصل على العنوان التالي :

(research-makkah@moh.gov.sa)

وتقبلوا أطيب التحيات ...

رئيس اللجنة المحلية لأخلاقيات البحوث

الدكتور / نادر بن حمزة مطير



مقرر اللجنة
/ هشام السليماني

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Appendix H English Translation of MOH Ethical Approval

Kingdom of Saudi Arabia
Ministry of Health
Institutional Review Board
(H-02-K-076)

Institutional Review Board Opinion

Letter Date of Issue	20-09-2018
Research Title	Leadership behaviour, job satisfaction and the professional identity of medical laboratory staff in Saudi Arabia: An exploratory study
Primary Investigator	Rayan Abdullah Khayat
IRB Number:	H -02- K076- 1809-046
Category of Approval	Approved (Expedite)

Dear / Rayan Khayat

This is to inform you that the above-mentioned proposal has been reviewed and discussed by IRB Committee and was approved according to ICH GCP guidelines. Please note that this letter is from research perspective only. You will still need to get permission from the head of research department in the Directorate of health affairs, Makkah Region to commence data collection and start your project.

We wish you all the best in your project and request you to keep the IRB informed of the progress on a regular basis, using the IRB log number shown in this letter.

Please be advised that regulations require that you submit a progress report on your research every 3 months. You are also required to submit any manuscript resulting from this research for approval by IRB before submission to journals for publication.

As a researcher, you are required to have a valid certification on protecting human research subject. If you have further questions, feel free to contact me:

research-makkah@moh.gov.sa).

Dr Nadir Hamza Motair

Chairman, institutional Review Board (IRB),

Makkah

Appendix I Translation Service



Quality Education Holding Company

09, Riyadh

Kingdom of Saudi Arabia

October 02, 2019

TO WHOM IT MAY CONCERN

RE: Dr. Badr Mubarak

This is to certify that Dr. Badr Mubarak has worked in the capacity as a translator from January 2016 to date January 2019. I write this letter of recommendation for Dr. Badr Mubarak with great enthusiasm for the exceptional quality of his work as a translator of written Arabic to English and English to Arabic. While he is vigorous in insisting on exact meanings for words, in both languages. He also understands that words are, at best, symbols for expression. Thus, he is capable of more than literal transposing from English to Arabic and vice versa. While his command of spoken English is more than adequate for any situation. If you are looking for an intrinsically motivated translator for your documents, journals, manuals or correspondence, Dr. Badr is someone well worth full consideration.

Sincerely,

Mr. Owais Ahmed
Project Manager



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Quality Education Company

www.QEHC.edu.sa

Kingdom of Saudi Arabia - Tel +966 11 2786291 - +966 11 2773140 Fax +966 11 2455118 P.O Box 101390 Riyadh 11655

Appendix J Example of Fieldwork Observations

Layouts of laboratories

▪ Layout of Lab A

The laboratory is located on two floors of the hospital. The first floor has the core lab and the ground floor has the blood bank and a small emergency lab to do urgent tests. In general, this lab is well lit, airy, the colours of its walls and floors are light and it is spacious (the hospital moved into this building five years ago).

First floor:

Let us start with first floor. It is L-shaped and houses the core lab and management offices. All the management offices are outside the core lab, but they overlook the main gate of the lab. These offices belong to the head of the laboratory, the head technician and the quality coordinator.

The entrance of the lab is a corridor. It is 3m by 6m and leads to a wide, open-plan area. This starts with the reception room on the left-hand side and on the right-hand side of this corridor are seven fridges used to store reagents and patients' samples. The role of the reception is to receive patients' blood samples and to answer enquiries about samples. It has a small window overlooking the main corridor of the hospital. For this reason, it is considered a point of interaction between MLS, nurses and physicians.

After the corridor is a wide open-plan area. On the left-hand side of this area is the haematology department. The machines of this department are all on benches. This lab is U-shaped and has two rooms: one for the consultant and one for the supervisor. In the middle of this department, there is a bench which serves as an internal reception and for doing manual tests.

On the left-hand side of this wide open-plan area and after the haematology department is the serology department. This department is located inside a room with a door, but it is part of the wide open-plan area of the lab. On the right-hand side of the serology door, a TV hangs on the wall, but it has not been using effectively. Inside this department, there

are some machines on white benches to do very important tests such as HIV, Hepatitis A, B and C, etc. Inside this department, there is a small room with a desk for the supervisor.

On the opposite side of the serology department is the chemistry and hormones department. This lab is G-shaped. It has many machines but no benches and it has a reception desk in the middle. In this department, there are no rooms for the supervisor or the consultant; their desks have been allocated on the left and right-hand sides of the department. The area is very noisy and has many windows to let the sunshine into the lab.

Moving inside the lab, there is a corridor which has two small rooms in front of each other. One is a cleaning room and the second is an archive room. After these two rooms, on the right-hand side, is the histopathology lab. Then the corridor turns left to form an L shape. The histopathology department has many staining machines, a washbasin for staining and two rooms, one for the supervisor and one which is a grossing room. This department has many windows on two sides of the room.

Then there is an emergency exit on the right-hand side. After that, there is a small room for the histopathology consultant.

The microbiology department is on the right-hand side of the corridor. It is a big department; it has three main areas divided by benches. At the end of this lab, there are two rooms, one for the supervisor and one for the consultant. This lab has three windows.

On the opposite side of the microbiology department is the send-out room. As there are some tests which cannot be done in the lab because they are rare and too expensive to be made available in each hospital, they are sent out to other specialised labs.

At the end of this corridor, there are two very spacious relaxation areas, one for males and another for females. Both rooms have toilets, a small kitchen, lockers and a rest room with a TV. They are airy and well-lit. They have comfortable sofas and lockers. I could not access the female rest room, but I expect it has the same design based on the lab layout.

Ground floor:

The blood bank and donation area is located on the ground floor. It has four units, which are crossmatch, separation, blood store and the donation area. It is located on the ground floor near the ER entrance to facilitate the donation of blood to donors, so they do not

need to get inside the core lab on the first floor of the hospital and make the area crowded. At the donation area, there are food, drinks and a rest area to allow donors to refresh themselves.

On the ground floor, there is an emergency lab for urgent tests during the evenings and night time. It has a main lab to test, for example, chemistry, hormones and haematology. It is a small lab (2m by 2m) and it has a hatch to receive the blood samples and communicate with patients and health practitioners.

▪ **Layout of Lab B**

The laboratory is located on the ground floor of the hospital. The entrance of the lab is a long corridor 2m in width by 10m in length. On the right-hand side of this corridor is the reception for the lab. The role of the reception is to receive patients' blood samples and answer enquiries about samples. It has a big window overlooking the main corridor of the hospital. It is considered a point of interaction between MLS, nurses and physicians.

On the same side, after the reception, is the blood bank department. It consists of three units which are: crossmatch, separation and blood store. It has another outside attachment at the main hospital entrance behind the coffee shops, which is the donation area. It is located outside the main building of the hospital to facilitate the donation of blood by donors, so they do not need to go inside the hospital and make the area crowded. In the donation area are food, drinks and a rest area to allow donors to refresh themselves.

After the blood bank department comes a small clearing room.

Moreover, on the right-hand side of the same corridor, after the blood bank department, is the serology department. This department is secured with a fingerprint lock. Inside this department there are some machines on white benches used to carry out very important tests, such as HIV, Hepatitis A, B and C, etc. Inside this department there is a small room which has a desk for the supervisor and a three-seater sofa.

After the serology department comes the microbiology department. This department is not part of the wide open-plan space. It has an archway to access it and contains benches, medical machines, e.g. incubators, blood culture and biosafety cabinets, a wash basin for staining and a supervisor's desk.

Moving on to the left-hand side of the main lab corridor, the first two rooms after the main gate of the lab are relaxation areas, one for males and another for females, both with toilets and seats. In fact, the male relaxation area is not very well-ventilated, narrow (2m in width by 4m in length) and poorly lit. I could not access the female restroom, but I expect it has the same design based on the lab layout. I did not see any staff using this room to relax or have casual conversations.

After the relaxation areas, there is an office for the coordinator of training (internship students) which is well-lit, very narrow and contains one desk.

Then, a very narrow corridor contains all the management offices. This corridor contains many offices; for example, the head of the laboratory (3m by 3m), the head technician (3m by 3m), the secretary's office (3m by 3m) and a meeting room (2.5m by 4m).

After the management corridor comes the histopathology department. This department has many staining machines, a wash basin for staining and the supervisor's office. This department is at the end of the corridor.

After the long corridor, there is a very wide open-plan space. It has three departments which are: the chemistry department, the hormones department and the haematology department (the biggest area). All these departments are located on the right-hand side of this space. This means if someone comes from the long corridor they will continue on the same path to the end of the lab. On the right-hand side of this path, there are two departments, chemistry and hormones. The haematology department is at the end of this path with the haematology reception.

The chemistry department is the first department after the corridor. It has many machines, no benches and a reception desk with two computers to programme the blood samples for the machines. The area is very noisy. There is a desk for the supervisor to do her tasks.

Next is the hormones department, but there is not a physical barrier between all the departments. The machines in each department have been allocated to separate each department. The hormones department is the smallest. It has a reception, a desk for the supervisor and no benches because all the work is done on the machines.

The last and biggest area in this space is for the haematology department. The machines of this department are all on benches. This lab is L-shaped. It has an emergency exit on the right-hand corner and it has many windows from the left-hand to the right-hand corners located on the upper part of the wall and attached to the roof. These windows let sunshine into the lab.

On the right-hand side of this wide open-plan space there is a small secure storage room for toxic reagents and another big room is under reconstruction. On the opposite side of this wide open-plan space, there are three small offices, two for lab consultants and one for the coordinator of supplies.

At the time I did this observation, the whole lab was under development. New machines were being brought to the lab to convert it into a fully-automated core lab. This will bring 5 departments to work together in one spot, which is in the wide open-plan space. The usual machines will be on standby if this core lab (automated lab) is not functioning.

Differences between the two labs:

The lab of lab A is well lit, airy; the colours of its walls and floors are light and it is spacious. The building of this hospital has been developed five years ago. It has relaxing areas for staff and very organised. While, lab B does not, it was a small lab. Many expansions have been done on it to increase its size. The last expansion was 8 years ago. However, at the time I was in the lab, there was new reconstructions for the microbiology lab to be met the standards of the training centre that it will offer the Saudi medical board in microbiology.

MLS observations

*MLS refers to medical lab staff

*Purple colour: my interpretation and feelings

Place: At Lab A, **Actor:** senior (bachelor's degree, more than five years' experience, he has been working in different hospitals in different regions of the kingdom), **time:** afternoon session 1-4 pm

Event: a senior who had refused blood samples came to the lab after 7 hours because they had not been stored in a proper way. A physician called the lab, expressed his /her anger, and asked to analyse these samples. However, the senior refused and reported this using a particular form to the head of the lab, but the head of the lab asked the senior again to run these samples or he would report him. The senior stuck to his decision and used CBAHI standards to defend his action. *Feelings and interpretation: an issue like this showed that the head of the lab did not support his staff or the policy and standards of the lab. This might lead to decreases satisfaction levels among the MLS in the lab. Moreover, the power that physicians use to put pressure on MLS and the heads of labs should be limited by using strong policies.*

Place: At Lab B, **Actor:** MLS, **Time:** morning session 8 am – 12 pm

Event: corridor conversation

I heard a staff member in the corridor say they wanted to move to the chemistry department. *This prompted another big question in my mind: Why the chemistry department? This department is well known for having a heavy workload. From the observation, I could see people in this department were more social and doing some events (celebrations), meaning they had good relationships because people had to prepare and spend money to arrange these kinds of celebration. However, I think I need to start informal interviews with staff members in the chemistry department in order to make a very thorough investigation, to identify what types of culture they have and what kind of leadership their supervisor is following. I realised the supervisor of the chemistry department was working after-work hours and stayed with the staff on the evening shift. When I was distributing my questionnaires, there was a department consisting of 5 MLS which refused to participate at all. I was informed later on about this department that they are very disconnected from the whole staff.*

Place: At lab A, **Actor:** a conversation between a member of staff and a supervisor (diploma degrees, more than 20 years' experience), **time:** after session, from 1 pm to 4 pm

Event: A dispute between an ordinary member of staff and a quality coordination supervisor

I was in the quality control office when a member of staff came in with a bag of blood samples that had been rejected. The staff member asked the quality coordinator to write a report and said, in unprofessional way: "These are your rules, do it," and he left the place. The supervisor followed him with the bag but I did not go with him, as the situation was very critical. **Interpretation:** I think the member of staff had refused to follow the quality standards or had not been aware of the importance of reporting rejected samples, so he refused to do it and he thought that it was an extra job. This lab had recently been granted a quality accreditation certificate, but the staff member seemed to reject the new quality programme requirement. The supervisor has been treated rudely that allow other to do the same things; incivility is a bug. There are another two factors which could have led to this: the time at the end of the shift or the age of the member of staff.

Appendix K Example of Transcript Extract

Interview 2

Location: Lab A

Date: 18/12/2018

Number of participants: one (supervisor)

Duration: 70 min

Researcher: what are the challenges you face as a supervisor in the department here?

Participant: When I started working, it was the first time to start in the field of supervision. I was a senior manager, and I was accepted to be a department supervisor. But as a senior, I used to do what the female supervisor tells me. I was doing the job.

My boss and I were following this way. I was applying for orders. Unfortunately, I was applying for orders. I spent two years, but unfortunately, all of them were extra orders besides my actual work as a laboratory specialist. I worked and felt that my role was not outstanding because I was just implementing, and I was carrying out orders of the top managers.

I faced problems with the staff because there were no new jobs available for a long period of time. Then, the Self-Operation Program for Health Services started (SOPHS) and we were the first batch of this program worked in this hospital, there was a conflict of ideas regarding the SOPHS and at that time I was recently graduated....

Researcher: What are the most important characteristics of the staff?

Participant: Resistance, I mean, some of the staff say that no one can change our system.... I trained in more than one hospital like King Fahd Hospital and King Fahd Research Centre. I worked in three centres, and I found advantages and disadvantages everywhere. I wanted the place where I worked there to run smoothly. I tried to develop work partially during my supervision period, and after I became a supervisor since last year with the new director came. He made me a department supervisor and I felt ok with the new director. Then, I

became officially the supervisor after three years. I had more confidence, I tried to develop my skills and he gave me power. We had full power for two years, for example, I am working on issuing staff permissions, coordinating timetables and holidays but there were people who did not want to work so, they went to other departments. I myself one of those people who encountered good people may be for my nice cooperation and dealing with them. Ok. Actually, they like to develop themselves and learn.

Participant: I knew how to deal with them nicely. I knew that each person is good in certain areas. I knew how to use each person's strength points, what suits him/her, if it is at night, then I put him in the night shifts. I knew how to deal with everyone .

Researcher: What is the age group of these people?

Participant: When I started working during the first three years, he gave me different age groups.

Participant: I felt that my manager was supporting me at the beginning I felt that he was testing me and sometimes I feel that he hurts me, but not tests me. He sent me people who cause problems. Some of them were always working at night or those people had problems. For example, they did not like working and Changing. Some of them want to work while others did not

Researcher: Who are these people?

Participant: These are old people who were old employees. They had a certain idea that is "they do not like change."!

Participant: They say you are not the one who teaches us! You learned yesterday and you come to teach me today!

Participant: I came across some of them, but everything went well. We disputed things but the system was the last solution. I faced some of the staff went out of work and came late, but they started day by day to learn the system. You can get rights thru a system, but if you leave your work, you are responsible, if you have things to do, the others have as well! I noticed that by the end of the working hours, he/she performs the work anyway, but the advantage of my department is when you have incomplete samples then those tasks are waiting for the employee to complete them. There is nothing necessary. But, if you do not

do your job, I will escalate that and write to the administration. You will be accounted for. In the beginning, the administration was not willing to write, account and hold any lazy employee. The administration was easy tolerance and defends the employee. After that, we applied a system and now we are supported. This is the difference. Then, I asked to bring new younger staff to my department who can understand. I mean that their minds are open and there is no objection in dealing with women and receive orders from her. We had a problem that was: "you are a female, and you want me to listen to you!", but the new staff have become supportive and they listen carefully because of their youngest age. Unfortunately, these powers were withdrawn, why? because the staff complained to the administration saying that there were departments were not satisfied. Therefore, the administration took all the authorities and powers. It has become central.

Researcher: You mentioned that you used occurrence variance reporting (OVR) to report events or your staff. What is the effect of courtesies on the work?

Participant: You mean courtesy from us or from administration !

Researcher: From the administration

Participant: Yes, courtesies affect, like the grievance of your colleague who is with working you.

Researcher: Or my friend at work

Participant: This is not good. Or because he is my friend, but the problem is when you discipline another person who has the same situation...

Researcher: Does this effect on the new generation in terms of preference, you prefer this one on that? Old employees on the new ones?

Participant: frankly it affects them Because of the many courtesies on him. Actually, there are problems. A highly motivated employee may come to work, but he gets frustrated and crashed. This, unfortunately, happened to us. Half of the staff were affected .

Participant: I am one of the people who faced problems because of patronage. If you make a mistake, we will report that, but what if X person makes that mistake? Why should not there be equality?

Researcher: Regarding the work environment, let's talk about theoretical things. There is what do we call "a culture of old age". The problem is that these people 50s and 60s generation. But we came from the generation of the 80s and 90s

Participant: We are in the age of their children.

Researcher: As you a supervisor of the department, how did you find a way of dealing with these people? You mentioned that the old generation is difficult, but the new generation is easy did you suffer from this thing?

Participant: For me, any person who does not listen, I deal with him officially. I tell him you have the timetable apply what is there so, things went well. There are people who do not want to communicate so, I communicate with them through the timetable only. There is no other communication, for example, there is a good group, but my system if there is someone who wants to work on a certain bench or If he wants to work in the other bench, I say yes, do it. I do not mind. I tried to make it easier. But there other are people did not want to communicate with me verbally because I am a woman, I tried to make WhatsApp group and Telegram, but above all of these, some of them did not want to communicate as well. These days, everyone follows the work schedule. I mean, the system now is that everyone takes his turn to do the tasks per week depends on the weekly schedule.

[00:15:51]

Researcher: What do you think of dealing friendly with those people?

Participant: I used more than one way. I dealt with them officially through papers and in a friendly way. At the beginning it was friendly, but Unfortunately, I found exploitation. I tried to be official with appreciation. I told them we are colleagues, but there are things that have to be applied without harming anyone.

Participant: There are people who think that you are their enemy because you wrote to the administration about what they did! They do not understand that you did that because they caused a problem therefore, they must be held accountable, I do not mean that I am against you as a person, I am against that action, there is a difference.

There is still competency skill and every month we have a competency form which is the performance of the tasks in the department. I evaluate him/her in six months to tell him

that you are good at this and bad at that. He says no, I worked in the whole department I say yes, but here in this part you did not work well. Then, he gets 2 marks- minus, but such marks do not affect his annual evaluation. They do not affect the annual bonus. Frankly, all of them do not understand.

Researcher: From which generation?

Participant: Both of them, from the first and the new generation whether educated or uneducated, such as the school system, they say I do not want to lose my grades. Unfortunately, some of them come late, always absent and have many excuses. Above all of this if you gave him/her fair evaluation marks he gets angry!

Researcher: How do I differentiate between those who work hard and those who do not?

Participant: That is true. They have this idea "Why does he take this while I do not take it.!"

Participant: If you give a lazy employee thing he does not deserve on the keen employee so, the keen one will actually be crushed and say to you, he is like me and I am like him, I will not work then! He will be disappointed.

Appendix L The Application of HCS framework in SA

(Note: some terms were used in the model as suggested by the developers of this framework, so the Saudi government may create the same organisations/programmes as Wales in order to successfully develop the MLS)

1. Workforce

This is the first area of the framework, containing two subtopics: the shortage of the workforce and an attractive workplace environment (Welsh Government 2018). Beginning with staff shortages, the current data of Saudi Commission for Health Specialties (SCHS) showed that the number of freshly qualified graduates is more than 2000, which means that there is no medical laboratory staff (MLS) shortage in Saudi Arabia (SA) (Saudi Commission for Health Specialties 2018). Thus, it is evident that there is no shortage, but there is a need to find a place for unemployed graduates.

The second subtopic is the availability of an attractive workplace environment for retaining and training quality staff and producing high-quality work, as suggested by the Healthcare Science (HSC) framework of NHS Wales (Welsh Government 2018). Making the workplace environment of laboratories more attractive in SA requires the Ministry of Health (MoH) to invest in the training infrastructure, high-quality internships or placements and collaboration across disciplines, professions and organisations to share good practice. This is to transform the traditional workplace environment in a way to support learning, training and education in order to meet the goals of Vision 2030. The data from the current study showed that the workplace environment of the laboratories requires further attention. In addition, a lack of collaboration and communication were mentioned in the current study as there were limited communications between MLS, nurses and doctors. Therefore, there is a need to work more closely with other partnerships such as health organisations, academic partners and key stakeholders to facilitate the delivery of education and training courses in a more flexible manner (e.g., widening access, distance learning). For example, role extension has been suggested in the current study. Thus, career progression will be developed for in-service MLS and widen access to MLS careers, making them more attractive to new graduates. In addition, to make the workplace of medical laboratories

more attractive, there is a need to bring all professionals in the field who have various specialisms to speak together with one voice, as this will help to inform policy in a more organised way and significantly raise the profile of MLS, thus increasing their visibility amongst other medical professionals and within society. Therefore, the MLS Network that the researcher suggests establishing in SA will connect the different scientific specialisms of the MLS in 20 geographical regions of SA to act as an authorised channel for providing MLS with advice and policy developments. To increase the visibility and provide more information about MLS, there is a need to create a website called MLS One, similar to the one created for healthcare scientists in Wales called “Healthcare Science One” (Welsh Government 2018). The success in achieving all of the above-mentioned systems will enhance the professional identity and job satisfaction of an MLS. Table 1 presents possible solutions to address the issues related to the workforce.

Note: Terms of reference are made by the Healthcare Science Network Board (HCSNB). The HCSNB has been created to ensure that service planning and delivery keep functioning at national, regional and local levels and associated health professionals and organisations from different levels of care (primary, secondary etc.) to work collectively (Welsh Government 2018).

Table 1 presents possible solutions to address the issues related to the workforce

Action	Delivery*	Indicators		
		Process	Output	Outcome
Address workforce challenges by leading, communicating and collaborating to support workforce development, championing prudent and value-based healthcare approaches	Short- Long	Terms of Reference (ToR) of MLS Network	Annual report of MLS Network activities	Stable balanced workforce, more coordinated planning measured by workforce demographics
Develop a workforce action plan, aligned to the 2030 vision plan of the Ministry of Health, that addresses service level challenges by highlighting opportunities for workforce sustainability, recruitment and retention issues, career progression and support for equivalence, apprenticeships etc.	Short- Medium	Task and Finish Group working with SCHS and the MoH (laboratory administration department) and ACO	Workforce strategy Note: Workforce strategy is Wales' 10-year workforce strategy. In SA, this could be linked with the 2030 vision of the MOH	Stable balanced workforce, more coordinated planning measured by workforce demographics

<p>Strengthen and develop the Modernising Scientific Careers (MSC) education and training career framework for the MLS workforce to include specific education, training and clear career pathways from Healthcare Science Associate (diplomas degrees) through to Higher Specialist Scientist Training (HSST) consultants' level. (Note: the HSST and MSC could be created in SA to apply on MLS)</p>	<p>Short - Medium</p>	<p>Work with SCHS, the Ministry of Education, the Ministry of Health and the Ministry of Human Resources and Social Development (MHRSD)</p>	<p>Workforce strategy with a job planning section. A clear and cohesive career framework published</p>	<p>Improved recruitment, retention and progression figures Greater access and mobility for new and existing healthcare scientists</p>
<p>Inform and support workforce development for the current and future MLS, through reviewing areas of extending scope of practice, enabling transferability of knowledge and skills to allow diversification within the scientific and clinical sector</p>	<p>Short - Long</p>	<p>The MLS network will link to the Ministry of Education, the Ministry of Health and the Ministry of Human Resources and Social Development priority policy areas</p>	<p>Workforce strategy; section on extended and advanced practice</p>	<p>Agreement and recognition of extended and advanced practice roles in MLS in the Ministry of Education, the Ministry of Health and the Ministry of Human resources and Social Development. Number of MLS working in advanced practice or in extended roles. Annual Report</p>

Identify both new education routes and current education provision at risk to ensure future sustainability	Short - Long	The MLS network will link to the Ministry of Education, the Ministry of Health and the Ministry of Human resources and Social Development priority policy areas	Annual report Data fed into the Ministry of Education (represents by faculties of applied medical sciences), the Ministry of Health discussions	Engage with Bevan exemplars and fellows in service improvement, monitoring and recording uptake in healthcare science across the SA. The Ministry of Education (represented by the faculties of applied medical sciences) and the Ministry of Health better reflect service level needs
Champion broadening access to MLS (e.g., flexible approaches to learning) and enhance career progression pathways (e.g., through apprenticeships, equivalence, recognition of prior learning) to support flexible entry into the professions, career progression and retention of staff	Short - Long	The MLS Network will work with the Ministry of Education, the Ministry of Health and the Ministry of Human resources and Social Development to	Section in workforce strategy on broadening access to MLS	Demographic data Broadened access to healthcare science training and education pathways

		develop a position paper.		
Showcase and provide contextual examples of career pathways for the public, and both current and future MLS	Short - Medium	Working with SCHS to provide case studies for MLS careers to be published on MLS One	Publication of career pathways on MLS One	Monitoring of metadata from MLS One Increase in application for MLS training
Develop and promote the role of Clinical Academic posts for MLS between NHS and university partners	Short- Long	MLS network to work with the Ministry of Education	Workforce strategy with job planning section. Agreement on job plans for MLS in the Ministry of Health	More MLS engaged with research and development (R&D), national representation and teaching

* Delivery: Short (1 year) / Medium (1–3 years) / Long (1–10 years)

2. Applied Research and Innovation for Service Improvement

Applied research and innovation are core elements of healthcare science. They will allow an MLS to face service challenges by exploring and combining new and enhanced methods of techniques used in the field. The data from the current study showed that MLS are looking for more opportunities in applied research and innovation as there are limited areas which offer these opportunities. Vision 2030 is working on establishing the Saudi National Institute of Health to assist with the research and to create programs to prevent pandemics in the Kingdom (The Ministry of Health 2020).

The institute focuses on developing a sustainable and unified research environment for healthcare professionals, including many relevant government agencies such as the Ministry of Education (MoE), King Abdulaziz City for Science and Technology (KACST), Saudi Centre for Disease Prevention and Control (SCDPC), Saudi Food and Drug Authority (SFDA) and others. The main aims of the institute are to create a unified reference strategy for healthcare. Furthermore, it aims to solve the obstacles that delayed the progress of effective and high-quality research by enhancing synchronisation and improving the effect of the research and innovation systems. The national health research institute will finance the healthcare research, with focus on empowering health workers and innovation in the system by developing a national strategy and a funding framework that aims to achieve expenditure efficiency, as well as the optimum use of the funding and the available infrastructure. Finally, the institute seeks to encourage the private sector to invest in research and innovation to develop the healthcare sector.

Wales also provides great ideas that may help Vision 2030, by allowing the MLS to practice applied research and innovation. For example, Wales has a well-developed and coordinated research infrastructure for MLS through Health and Care Research Wales and the National Institute for Health research (NIHR). Health and Care Research Wales and the NIHR have several programs to assist both novice and experienced staff. All of these programs welcome MLS to conduct their research or as co-applicants or support for other healthcare researchers. Therefore, the MLS will provide evidence enabling new emerging technologies to be adopted to improve the healthcare service, new diagnostics to be developed and the creation of new therapy or prevention, as in the case of COVID and the vaccination developments.

A fundamental action for the success of MLS in SA is to facilitate their involvement and participation in the research and innovation activities that are managed by the national health research institute (NHRI), MoE, KACST, SCDPC, Saudi Food and Drug Authority (SFDA) and others. Table 2 presents the plan of the applied research and innovation for service improvement.

Table 2 presents the plan of the Applied Research and Innovation for Service Improvement.

Action	Delivery*	Indicators		
		Process	Output	Outcome
The MLS Network will monitor and report on MLS participation in research programmes	Short- Long	MLS Network will work with the MoH, MoE, NHRI, MoE, SCDPC and SFDA to develop an approach for evaluating active healthcare science involvement in research and innovation	Paper on MLS research and innovation (R&I) evaluation. Section in healthcare science R&I strategy Annual report	Agreed set of measures and framework to evaluate MLS research and innovation impact
Support MLS and work in partnership with MoH, MoE, SCDPC and SFDA to develop	Short - Long	Deliver workshop to MLS to support the development of an	Production of an R&I strategy for prudent and value-based	MLS R&I in prudent and value-based healthcare

strategic plans for prudent and value-based research, development, and innovation		R&I strategy for conducting research	healthcare science. Report on R&I in healthcare science	objectives embedded in Vision 2030
Working with scientific advisory groups such as MoH, MoE, SCDPC and SFDA to develop horizon scanning for new innovations and technologies that can be shared with MLS through MLS One	Short - Long	Workshop and paper with the Life Sciences Hub, national E- Health of MoH	Agreed mechanism to identify and share information on emerging scientific and technological advances for MLS	Metadata from MLS One Increased number of R&I applications from MLS
Working with MoE, MoH and MHRSD to develop job plans for MLS to support research, development and innovation	Short - Long	See actions relating to Workforce plan		
Working with MoH, MoE, NHRI, MoE, SCDPC and SFDA to maximise and raise awareness of opportunities for MLS to undertake research	Short - Long	Through MLS One	Opportunities for R&I funding opportunities posted through MLS One	MLS One Metadata
Provide a research mentoring and development scheme for MLS throughout	Short - Long	MLS Network will develop a mentoring	Functioning mentoring scheme	More engagement with MLS R&I

<p>their careers and provide support to other professionals who are engaged in health science research and innovation activities</p>		<p>scheme for MLS in SA</p>		<p>schemes in MoH, with outcomes measured as described in the first action of this section</p>
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* Delivery: Short (1 year) / Medium (1–3 years) / Long (1–10 years)

3. Service Redesign and Transformation

Vision 2030 is working on achieving three main goals for the transformation of healthcare (Ministry of Health 2019, p.13):

“1. Improve health: improve the quality, wellbeing and length of life, as well as expanding the life expectancy of people to 80 years by 2030.

2. Improve healthcare: By enhancing the consistency and quality of health services and the accountability and performance of healthcare organisations and staff to deliver care that is safe, effective, patient-centred, timely and equitable; and

3. Improve value: by improving costs efficiency, enhancing outcomes, managing public healthcare expenditure and driving new investment.”

MLS play a key role in healthcare provision, as shown during the pandemic. In Wales, MLS are an important element of the transformational plan that is collaboratively worked on by the Welsh Government, the NHS, university health boards and Trusts, and the education sector (Welsh Government 2018).

The MLS group use high quality standards such as prudent healthcare principles and value-based tools that help to make the necessary changes. To successfully achieve this transformational change, all medical groups, including MLS, should work collectively to create more prudent, clinically effective healthcare pathways and standards of care. The optimum use of the valuable MLS expert knowledge will facilitate that change (Welsh Government 2018).

New models of care need show functionality; a certain amount of this evidence will be available from new digital initiatives that provide information to be systematically analysed. In Wales, specific examples of current system-level changes that are started include obligations to promote independence through self-management and remote monitoring, provide care closer at home, earlier disease diagnoses, reduce variation, increase quality value via the consolidation of services and the adoption of new and emerging technologies, e.g., regenerative medicine, precision medicine and genomics.

Vision 2030 could use these ideas, and the fact is that many medical applications were developed during the pandemic to offer medical appointments and bookings for vaccines, repeat prescriptions and doctor appointments, and monitoring infected patients. Indeed, the effective participation of MLS in transforming the healthcare system will enhance their professional identity, as well as their job satisfaction. Table 3 offers more actions to support the participation of MLS in Service Redesign and Transformation.

Table 3 offers more actions to support the participation of MLS in Service Redesign and Transformation.

Action	Delivery*	Indicators		
		Process	Output	Outcome
Ensure that there is MLS representation on national service transformation programmes and policies e.g., Vision Realisation Office at MoE to be part of the transformational change	Short - Long	Identify leaders to participate in groups and feedback to networks. Within the ToR of the MLS Network, discussed on a quarterly basis and reported annually	Annual report highlighting MLS involvement in service transformation programmes	Change in service models whereby MLS are working at the top of their licence to address service challenges
Engage early with Vision Realisation Office at MoH discussions for digital transformation; including service needs and system specifications, training and implementation	Short - Long	Identify leaders to participate in groups and feedback to networks. Within the ToR of the MLS Network, discussed on a quarterly basis and reported annually	Relaying information from the director of MLS network to inform the planning process	Workforce engaged in digital transformation agenda

<p>Work with Vision Realisation Office at the MoH to prioritise and support the prudent and value-based healthcare agenda for MLS in addressing service challenges</p>	<p>Short - Long</p>	<p>MLS Network will work with the health associations (e.g., Saudi Society for Clinical Laboratory Sciences) to develop a prudent and value-based healthcare science strategic plan</p>	<p>Annual report and strategic plan on prudent and value-based healthcare science.</p>	<p>Prudent and value-based approaches embedded into all health science service transformation and redesign plans.</p>
<p>Support the development of evidence-based decision making through the systematic collection and analysis of data</p>	<p>Short - Long</p>	<p>MLS Network led multi-disciplinary stakeholder workshop on use of evidence and data in service redesign. Education and learning development Support other staff groups to access and use system</p>	<p>Paper from workshop on use of evidence from data.</p>	<p>Reduction in variation through the use of evidence consistently and transparently.</p>

		information and data to support service redesign		
Champion the benefits of active co-production and multi-professional approach in the design, implementation, evaluation and subsequent development of new models of care	Short - Long	ToR from MLS Network	Annual report MLS Network	Number of MLS involved in service redesign

* Delivery: Short (1 year) / Medium (1 – 3 years) / Long (1 – 10 years)

4. Culture and Integration

The presence of a good leader is vitally important in order to achieve the transformational vision that in turn will develop MLS and help them when facing service challenges (Welsh Government 2018).

In Wales, MLS already occupy senior leadership positions in the NHS, university health boards and Trusts, but the challenge they face is a lack of clarity regarding their clinical practice and leading roles, which may lead to the loss of their expertise from the clinical side. Currently, Consultant Clinical Scientists are leading, providing clinical and scientific expertise as well as strategic leadership. They also have national pathways and programmes for MLS, providing them with access to senior MLS positions. This requires the NHS to establish a strategic plan to ensure that MLS can acquire a strong professional leadership in Wales (Welsh Government 2018). However, MLS sometimes lack profiles or the authority to influence local decision making and planning decisions. Vision 2030 of the Ministry of Health in SA requires the engagement and involvement of MLS to participate in planning the transformational change of the healthcare service (Ministry of Health 2019).

Culturally, it is necessary to engage all professions to recognise the effect of each one and to contribute to the development and decision making for the transformation of NHS Wales (Welsh Government 2018). This process requires each profession to promote their roles with other healthcare colleagues and to recognise the important function of each profession as a vital factor for success. Healthcare science is a universal activity, and is clearly shown as one of the best practices available worldwide. Therefore, there is a need to provide MLS with overseas scholarships to explore, meet with and engage with other healthcare professionals. The advantage of this step is to apply what has been learned overseas in their country of origin and collaborate to solve service challenges. In SA, there is an active scholarship programme funded by the government, so the policy maker needs to use those people in a more active and sensible way.

Promoting the role of MLS requires educating and engaging programmes with future generations of healthcare workers. Future leaders need to be supported through the development of a systematic and strategic approach to meet their future leadership ambition (Welsh Government 2018). MLS also need to be actively engaged in the education

and training of health professionals from other disciplines to increase awareness of the MLS profession and support multidisciplinary team working. The data from the current study indicated that MLS in SA have undertaken many awareness campaigns to promote their profession and serve society. However, the data indicated that the profession was misunderstood and has a low job profile among other healthcare professionals. The HCS framework could therefore provide professionals in SA with more ideas to improve the status of the profession (see Table 4).

Table 4 presents the action plan of culture and integration

Action	Delivery*	Indicators		
		Process	Output	Outcome
Develop an MLS website (MLS One) for Saudi Arabia that will bring together information for workforce development in the kingdom, and act as a focal point for the MLS	Short - Medium	Workshop to agree content and secure domain name, develop web content	Website	Metadata and user feedback
Collaborate with MoE, MoH, MHRSD and SCHS to exploit opportunities where multi-disciplinary programmes can be developed e.g., leadership, value-based healthcare, informatics etc.	Short - Medium	ToR of the MLS Network	Annual report	MLS integrated into multidisciplinary training and education programmes
Promote healthcare scientist delivery of training and education of under and post-graduates for all healthcare professions	Short - Long	ToR MLS Network	Annual report	MLS integrated into multidisciplinary training and education programmes

Promote coherence and identity of the healthcare science community, with a series of workshops across SA	Short - Medium	Workshops	Report on engagement and co-production	Increased numbers of MLS in MLS Network members
Work with national professional bodies to highlight the roles of the MLS in the MoH	Short - Long	Links with other MLS bodies	Annual report	Greater engagement of MLS in whole kingdom with professional bodies.
Share good practice and celebrate successes of MLS in addressing service challenges and driving quality and improvement; championing prudent and value-based healthcare	Short - Long	Highlight and publish MLS success stories.	Annual report. Publish on MLS One	Awards, publications, media of MLS success in MoH, Honours
Promote the use of 'one voice' to communicate with the MLS profession and collaborate on important issues	Short - Long	Highlight and publish MLS success stories. Support	Annual report. Publish on MLS One. ToR MLS Network.	Awards, publications, media of MLS success in SA, Honours. Increased engagement and representation of the smaller professions

Develop a national leadership plan and programme for MLS	Short - Medium	Workshop with senior MLS and MoH, MoE and SCHS	Devise a plan for meeting leadership needs of MLS	Training programme for MLS and number of MLS undertaking training
Develop a travel fellowship programme for MLS	Short - Long	Develop a travel fellowship programme	10 travel fellowships per annum	Reports on prudent and value-based practices for publishing on MLS One and proposals submitted to MoH, MoE and SCHS programmes
Promote a culture where senior MLS are responsible for mentoring and supporting junior MLS and all healthcare professionals on their career journey	Short - Long	Engagement with MLS and workforce to develop the national mentoring framework for MLS	Section in workforce strategy	Supported health science mentoring

5. Quality and Service Improvement

NHS Wales have Triple Aim and Quadruple Aim which are quality systems. The former is based on ensuring better results, better patient experiences and better value to deliver safe, effective, patient-centred, timely, efficient and equitable care with committed and productive staff (Welsh Government 2018). The difference between The Quadruple Aim and Triple Aim system, is the former focuses on helping healthcare professionals to follow the equation: "improving the experience of care". Patient safety means that staff who are employed in the NHS have to comply with the above equation. In Wales, the accreditation of healthcare facilities by recognised national systems is another concern of the NHS. Also, there is a difference in applying and following professional regulation across healthcare science. The issues mentioned have been acknowledged in Wales and there is ongoing effort to solve these problems (Welsh Government 2018). In SA, there is a quality program run by the Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) which aims to grant accreditation certificates to all healthcare facilities. The Ministry of Health has compelled all of these healthcare facilities to be accredited and has provided a timeframe to accomplish this goal (CBAHI 2021).

The availability of a comprehensive quality database is important for the delivery of safe and effective clinical care (Welsh Government 2018). Through their daily activities in clinical settings, MLS manage huge amounts of patient data to help various administrators with the running of health systems. Data management is an important activity due to its benefits in driving service improvements and inform policy; thus, MLS should understand this very well. MLS should be adequately skilled to gather and utilise data in a meaningful way. In SA, there is ongoing work on this area, achieved by providing all hospitals with digitalisation and quality monitoring programs such as laboratory key performance indicators (KPIs) that the researcher noticed in hospitals when he performed data collection (see Table 5).

Table 5 presents the action plan of Quality and Service Improvement

Action	Delivery*	Indicators		
		Process	Output	Outcome
Provide national leadership and voice for MLS for non-devolved legislative changes	Short - Long	Nominated leads from the MLS Network	Annual report listing leads	Greater influence from the MoH on university programmes Enhanced leadership opportunities for MLS
Work collaboratively at national level informing and implementing the regulatory and registration requirements for MLS	Short - Long	MLS Network engagement with SCHS	Annual report	Increase in the number of accredited services, professions and the MLS
Link with CBAHI or other international accreditation such AABB to ensure coordinated high-level plans are developed relating to quality and safety	Short - Long	MLS Network engagement through the Saudi Health Council (SHC) annual report	Annual report	Joint papers from the MLS Network and SHCS

Monitor and report on accreditation of MLS-led services	Short - Long	MLS Network ToR	Annual report	Increase in accredited MLS-led services in SA
Work with professional leads to develop a national accreditation plan for MLS-led services and work with SHC at a national level towards more accredited services	Short – Medium	Task and finish group	Accreditation plan	Endorsement and the delivery of a plan with an increase in accredited services in SA
Act as a focal point and forum for MLS sustainability issues. Collect information on MLS staffing levels across hospitals, and primary health care and identify risks that can be escalated to relevant bodies (e.g., SCHS) and networked regional solutions to sustainability issues can be promoted by the network	Short - Long	ToR MLS Network Engagement with SCHS on training and commissioning	Papers	Reduction in demand MLS gaps Increase in regional solutions for service sustainability
Support the prudent and value-based healthcare agenda and help improve services by driving the use of data and	Short - Long	ToR MLS Network	Annual report	Increase in healthcare science led services

evidence to reduce unwarranted variation. Improve and transform services by adopting prudent and value-based healthcare principles			Papers on prudent and value-based healthcare	with prudent and value-based practice
Collaborate with MoH and SCHS in taking forward areas prioritised in the Digital Statement of Intent e.g., by evaluating informatics training needs for MLS	Short - Medium	MLS Network engagement with MoH Digital Health Strategy	Annual report (and digital strategy outputs)	Outcomes linked to Digital Health Strategy indicators
Work strategically with education and informatics providers to support the development of education and training to enable MLS to use data for service improvement purposes and facilitate evidence-based outcomes	Short - Long	Section in workforce strategy on health informatics education and training		Number of MLS undergoing training and increase in applications.
Act as a forum to discuss audit and benchmarking reports and propagate these to the director of MLS Network and other stakeholders	Short - Long	ToR MLS Network	Annual report MLS Network activities	Use of national audit and benchmarking reports to drive quality

				and service improvement
Monitor the number of senior MLS in the system, and proactively support recruitment and investments in these positions	Short - Long	See Culture and integration leadership plan action 7	Leadership plan and annual report from MLS activities	Increase number of senior MLS
Engage with Vision Realisation Office at MoE and MoH colleagues to embed value-based healthcare in service plans	Short - Long	MLS Network will work with the National Clinical Lead to develop a prudent and value-based healthcare science strategic plan	Annual report and strategic plan on prudent and value-based healthcare science.	Prudent and value-based approaches embedded into all health science service transformation and redesign plans.
Engage with Bevan exemplars (a UK commission) and fellows in service improvement, monitoring and recording uptake in MLS across SA	Short - Medium	MLS Network will work with Vision Realisation Office and Bevan programme to evaluate MLS involvement in	Section in MLS Network annual report	Increase in number of MLS involved in Bevan Technology Exemplar programme.

		Bevan Technology Exemplar programme		
Promote and recognise improvement champions	Short - Long	See Culture and Integration section	Annual report. Publish on MLS One	Awards, publications, media of MLS success

* Delivery: Short (1 year) / Medium (1–3 years) / Long (1–10 years)