Evaluation of the factors associated with inappropriate use of the emergency department and the role of primary care at King Fahd Hospital, Jeddah City

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List of Figures

List of Tables

9

Acronyms

SA	Saudi Arabia
KSA	Kingdom of Saudi Arabia
WHO	World Health Organization
MOH	Ministry of Health
DPT	Diphtheria, Pertussis (whooping cough), and Tetanus Vaccines.
OPV	Oral Poliovirus Vaccine
BCG	Bacillus Calmette-Guerin Vaccine/ Tuberculosis vaccine
MMR	Measles, Mumps and Rubella Vaccines
PCV	Pneumococcal Conjugate Vaccine
GDP	Gross Domestic Product
PHC	Primary Healthcare
PCP	Primary Care Provider
ARAMCO	Saudi Arabian Oil Company
GCC	Gulf Cooperation Council, they are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates
ED	Emergency Department
ED	Emergency Department Crowding
EM	Emergency Medicine
PC	Primary Care
PHCC	Primary Health Care Centre
PHC	Primary Health Care
GP	General Practitioner
CTAS	Canadian Triage and Acuity Scale
KFGH	King Fahd General Hospital
LOS	Length of Stay
OOH	Out of Hours
ZCTA	zip code tabulation area
QAS	Queensland Ambulance Service
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
US	United State

Abstract

Evaluation of the factors associated with inappropriate use of the emergency department and the
role of primary care at King Fahd Hospital, Jeddah City

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In Saudi Arabia, over 60% of healthcare services, including primary, secondary and tertiary services, are provided by the Ministry of Health. All citizens in Saudi Arabia can avail of free and unlimited health care, but there are several challenges to accessibility. One major challenge is that many patients directly visit the emergency department (ED) of hospitals, even in cases where their issues can be treated at primary healthcare centres (PHCCs). This impacts healthcare efficiency, as available PHCC services are underused and expensive ED services are overused. This research aims to understand why patients who could be treated at PHCCs seek care at EDs in Saudi Arabia. The planned study specifically examines whether there are differences in the characteristics, knowledge, behaviour and satisfaction of patients presenting at PHCCs compared to patients who present at EDs but could be treated at PHCCs. The main goal of this research is to identify factors that could be used by commissioners and policy makers in Saudi Arabia to improve the usage of PHCCs and reduce the inappropriate use of EDs.

Methods: A cross-sectional survey was conducted at King Fahd Hospital and three of its associated PHCCs in Jeddah city. This study included adult patients who consulted PHCCs and adult patients who presented at the ED of the hospital with non-urgent health problems (which are treatable at PHCCs). All participants were interviewed using structured questionnaires specifically devised for the purposes of this study. A participant information sheet explaining the purpose of this study was given to all potential participants, and informed consent was sought at the start of the study. Anonymised data were analysed using the SSPS software. Descriptive statistics used to define the characteristics of the study variables by using counts and percentages for the categorical and nominal variables and means and standard deviations for continuous variables. Reliability and validity tests were considered, I used a model of alpha (Cronbach) and communalities (factor analysis). The chi-square test was used to determine differences in categorical variables, t-test to calculate means and standard deviations for continuous variables, and Welch's t-test was used as an alternative test for data with non-normal distribution. To correlate the domains represented by means and standard deviation, the Pearson's correlation coefficient was used. The significant factors have been identified by a binary logistic regression model with 95% confidence intervals and a conventional p-value of

<0.05 was set as the criterion to reject the null hypothesis. Set of codes to describe the data were developed from free text responses. The codes were critically discussed within the research team, then they were categorised into broad themes. Finally, I observed the patient flow by drawing a map on an A4 paper and then translated it into a flowchart.

Results: A total of 410 adult patients were recruited, with males comprising 51.0% of the sample. As compared to the patients who presented at PHCCs, a significantly higher proportion of patients with non-urgent cases who visited the ED were not married (64.9%), were younger (62.5%), had lower education (56.4%) and had lower income (72.2%). Additionally, a significantly higher proportion of ED patients without emergencies did not have any chronic diseases. Most patients lacked health insurance, including some who worked for private sector companies. Most patients who visited the ED without emergencies thought the ED was the first place to consult when they experienced symptoms because they lacked knowledge about PHCCs and their services. Further, a significantly higher percentage of non-urgent ED visitors than PHCC visitors were not aware of the opening hours of PHCCs in their neighbourhood (87.9%). A significantly high percentage of ED visitors reported that their decision to visit the ED without emergencies was influenced by family or friends (63.4%), and most of them were not registered with their local PHCC (56.5%). A significantly higher proportion of ED visitors also reported that they received better services at the ED than at PHCCs (81.9%). These patients stated that it was difficult to get appointments at PHCCs, communicating with their PHCC physician was difficult, various investigation services were unavailable, there was a shortage of some medication, and they were appointed a different physician at each visit. Additionally, patients were more satisfied with PHCCs when their physician provided preventive counselling. Overall, the general satisfaction level of the PHCC visitors (84.29%) was higher than that of the ED visitors (69.89%) with regard to PHCC services.

Conclusion: The prevalence of ED overutilisation is high at the Ministry of Health hospital in Jeddah. Individuals who overused ED services were younger and single, and had lower income and education. The important modifiable risk factors identified for inappropriate use of ED are poor knowledge, negative behaviour and poor satisfaction with PHCCs. Thus, policy makers and healthcare providers face a challenging task with regard to controlling ED overuse. These findings indicate the need to develop and implement strategies and policies aimed at reducing non-urgent use of EDs and making healthcare services more accessible to the population.

Declaration

No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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Dedication

To my beloved parents Othman and Aisha; and my children Ahmed, Fatimah and Zainab.

Acknowledgements

Chapter 1

Introduction

1.1 Political Background and Governance

Saudi Arabia (SA) has seen progress in various areas, particularly in the healthcare industry. As a result of the preventive care services provided to Saudi citizens, life expectancy is high and infant mortality rates are low. As witnessed in many developing countries, these advances in healthcare have been critical in promoting overall economic development. In fact, the economic growth of SA has enabled the implementation of a social insurance program, and most working households are now covered by some form of health insurance. The organization and effectiveness of healthcare services are hence becoming important topics of political interest in SA (Mufti, 2000) (p.12). In this chapter, we will trace the development of healthcare services in SA within the socio-political context, and identify some of the key issues.

Prior to the discovery of large petroleum deposits, SA was a primitive country, and most of the population lived a nomadic lifestyle. At that time, there was no standardized healthcare system, and traditional practices and medicines were widely used. In 1926, King Abdulaziz Al-Saud—a visionary pioneer—established the Health Department. In 1970, the implementation of the first five-year development plan played a major role in the gradual improvement of the quality of health in SA. Currently, all Saudi citizens, as well as expatriates who hold an alien residency card, have free access to basic medical services. In 2006, 62% of the country's hospitals and 53% of its non-urgent care centres were operated by the Ministry of Health (MOH) (Mufti, 2000) (p. 3), and health services expenses accounted for 13% of the government's 2006 budget. Similar to many other developed countries, the SA healthcare system functions at two levels: The first level includes clinics that offer preventive healthcare, basic medical services, emergency services, and mobile clinics in rural areas, and the second level comprises specialized hospitals and covers urban areas (Altuwaijri, 2008) (p. 172).

1.1.1 Saudi Arabia's Healthcare Services in an International Context

The healthcare sector has been an important area of focus for the SA government, and therefore, healthcare services have progressed in terms of both quantity and quality. In a review of global healthcare systems, Gallagher asserted that 'Although many nations have seen a sizable growth in their healthcare systems, probably no other nation (other than SA) of large geographic expanse and population has, in comparable time, achieved so much on a broad national scale, with a relatively high level of care made available to virtually all segments of the population' (Gallagher, 2002) (p. 182). Further, according to a 2000 report by the World Health Organization, the Saudi healthcare system was ranked 26th among 190 countries worldwide which included developed countries such as Canada (which was ranked 30), Australia (which was ranked 32) and New Zealand (which was ranked 41), as well as other countries in the region, such as the United Arab Emirates (which was ranked 27), Qatar (which was ranked 44) and Kuwait (which was ranked 45).

In 2021, the Saudi healthcare system was ranked 55th among 163 countries, with the top ten countries in ascending order of rank being South Korea (1), Taiwan (2), Denmark (3), Austria (4), Japan (5), Australia (6), France (7), Spain (8), Belgium (9) and the UK (10). In comparison, the US was ranked 30; Canada, 23; the UAE, 20; Qatar, 33; and Kuwait, 71 (World Population Review, 2021). The lower rank in 2021 was the result of a decrease in several indicators of healthcare organizations.

The MOH pointed out that the healthcare system currently faces many hurdles, including 'human resource shortage, separation of the MOH's multiple roles (financing, provision, control and supervision of healthcare delivery), lack of financial sources, privatization of public hospitals, effective management of chronic diseases and development of practical policies for national crises.' To overcome these barriers, the MOH set frameworks that focused on 'diversifying funding sources; developing information systems; developing the human workforce; activating the supervision and monitoring role of the MOH in the healthcare service; encouraging the private sector to assume a greater role in providing health services; improving the quality of preventive, curative, and rehabilitative care; and distributing health care services equally to all regions' (Almalki et al., 2011).

1.1.2   Regions and Population Densities

It is important to clarify the different regions in SA (Figure 1) and the individual populations to better understand the size and importance of each. SA is divided into 13 administrative regions, as shown in Table 1.

Table 1. Regions of the Kingdom of Saudi Arabia

Regions	State	Percentage of the total population
Riyadh	Riyadh	25.2
Makkah	Makkah	26.2
Madinah	Medina	6.55
Qassim	Buraidah	4.37
Eastern region	Dammam	15
Asir	Abha	6.8
Tabuk region	Tabuk	2.8
Hail	Hail	2.15
The Northern Border	Arar	1.13
Jazan	Jazan	4.8
Najran	Najran	1.79
Al Baha	Al Baha	1.47
Al Jouf	Skaka	1.57

The administrative regions are divided into provinces, which are then divided into districts. These districts come under the jurisdiction of the province or principality (a state ruled by a prince). Each principality, province or district comprises a number of designated towns and villages, farms and water resources, as well as Bedouin communities, which are all under the same jurisdiction (Ministry of Health, Health Statistical Year Book 2018).

Figure 1. Map of the Kingdom of Saudi Arabia

1.2 Demographics of Saudi Arabia

To better understand the health status of any country, it is important to understand its demographics. The latest census, which was conducted in 2018, reported the population of SA as 33,413,660 million, compared to 22.6 million that was reported on the MOH website in 2004 (General Authority for Statistics, Key Indicator 2020). In 2018, the annual population growth rate for the Saudi population was 1.7% and for the non-Saudi population was 3.7%, and the total fertility rate was 1.9%. According to the 2018 census, Saudi citizens comprised approximately 62.2% of the total population: 50.9% were male, 49.1% were female, 8.3% were under the age of 5 years, and 16.3% were in the age group 5–14 years. The population aged 15–64 years accounted for 72.2% of the overall population, whereas those aged over 65 years accounted for 3.2% of the total population (Ministry of Health, Health Statistical Year Book 2018).

According to estimates of the United Nations, the population of SA will reach 39.8 million by 2025 and 54.7 million by 2050 (World Population, 2002). This increase in population is largely attributable to an increase in the birth rate (17.23 per 1000 individuals) and to an improvement in life expectancy (74.8 years), which exceeded the regional average by 6 years and the global average by 3.4 years. Another reason is the decreasing mortality rate among infants and offspring observed from 2006 to 2016 that was primarily a result of effective immunization coverage for DPT, OPV, BCG, MMR, and PCV across SA (an increase in coverage from 95% to more than 98%) (Ministry of Health, Health Statistical Year Book 2016). In fact, statistics show that the mortality rate for children under 5 years of age decreased from 250 per 1000 live births in 1960 (Aldossary et al., 2008) to 20.0 per 1000 live births in 2009 (Ministry of Health, Health Statistical Year Book 2009), and to 8.05 per 1000 live births in 2016 (Ministry of Health, Health Statistical Year Book 2016). Additionally, a

compulsory childhood vaccination program implemented in 1980 contributed to an increase in the population (Aldossary et al., 2008). Accordingly, the SA healthcare sector has been designed such that it is capable of handling the rapidly growing population and the simultaneously increasing demands on the healthcare sector (Yusuf, 2014).

1.3   Current Structure of the Healthcare System of Saudi Arabia

In this section, we compare the MOH services with other government and private services, and show that the MOH accounts for a higher percentage of healthcare services in SA. As a result of the rapid strategic growth in the healthcare sector, the total number of private and public hospitals in SA was 494 in 2018; this represents an increase of 7 hospitals (1.4%), as compared to the number in 2017. Moreover, the total number of beds across all hospitals was 75,225 (per 10,000 individuals) in 2018, which represents an increase of 3% as compared to the number in 2017 (70,844, 22.5 per 10,000 individuals). In fact, there was 1 bed for every 445 individuals in the population. With regard to the number of healthcare personnel available in 2018, the number of physicians was 31.4 per 10,000 individuals; the number of dentists, 5 per 10,000 individuals; the number of nurses, 55.2 per 10,000 individuals; and the number of allied healthcare personnel, 37.2 per 10,000 individuals (Ministry of Health, Health Statistical Year Book 2018).

Similar to many other wealthy countries, SA has a distinguished healthcare structure. At present, the MOH is considered as a key government supporter and supplier of healthcare services (Figure 2), which include 284 hospitals with 43,680 beds, with 13.1 beds available per 10,000 individuals. Moreover, primary healthcare (PHC) is available at 2390 centres, with an average of 13981 individuals served by each centre in 2018 (Ministry of Health, Health Statistical Year Book 2018). The MOH services accounts for 60% of the overall healthcare services in SA (Ministry of Health, Health Statistical Year Book 2009).

Figure 2. Percentages of MOH Hospitals and Physicians Compared to Other Government and Private Sectors
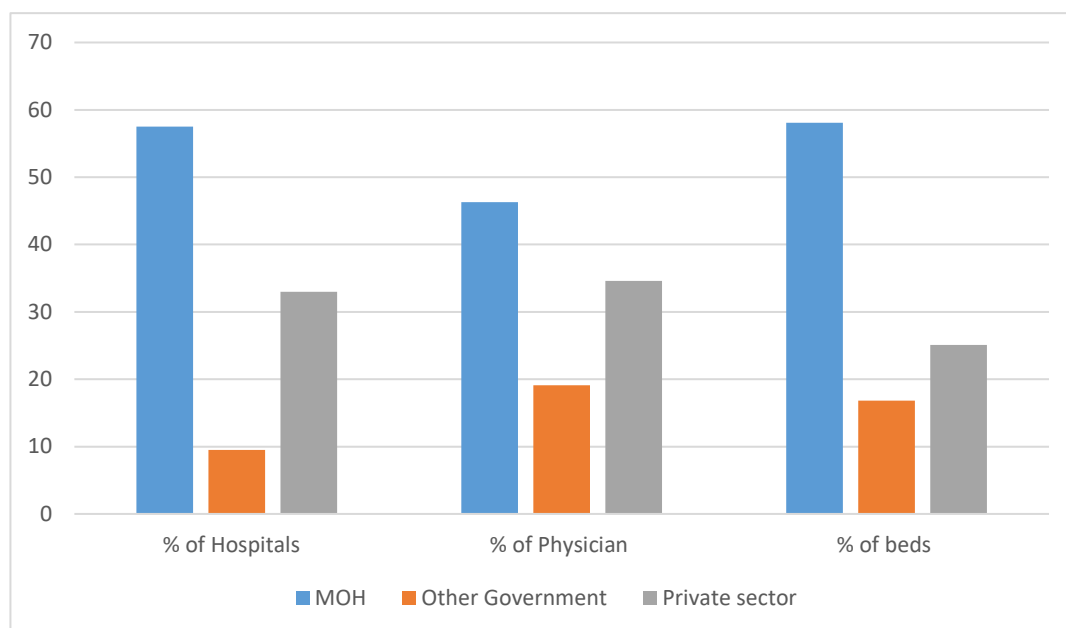
Other governmental bodies contribute 47 hospitals with 12,662 beds (Ministry of Health, Health Statistical Year Book 2018). This is only accessible to a defined population, employees and their dependents, although these institutes provide healthcare services to all residents during crises and emergencies. These hospitals include King Faisal Specialist Hospital and Research Centre, Security Forces Medical Services, Army Forces Medical Services, and the National Guard Health Affairs, in addition to the Ministry of Higher Education hospitals, Saudi Arabian Oil Company (ARAMCO) hospitals, Royal Commission for Jubail and Yanbu healthcare services, School Health Units of the Ministry of Education and the Red Crescent Society. With the exception of referral hospitals, the Red Crescent Society and the teaching hospitals provide services to all citizens at all times (Mufti, 2000).

The private sector also plays a major role in providing healthcare services (Figure 2), mainly in areas of high population density. Riyadh and Jeddah contributed to the highest percentage (50%) (40 hospitals in Riyadh and 40 hospitals in Jeddah) of all private hospitals; this translates to a total of 163 hospitals with 18,883 beds. The total number of general and specialized private polyclinics was 2922; of these, 1077 (37%) were present in the Riyadh Region and 423 (15%) were present in the Jeddah Region. These two regions account for 52% of the total number of polyclinics in SA. Of the 63 private clinics, 37% were located in the Riyadh Region and 35% were located in the Jeddah Region (Ministry of Health, Health Statistical Year Book 2018).

In order to improve MOH services, there is a need for more awareness of its massive role in healthcare and education. Accordingly, the next few paragraphs will cover all aspects of healthcare that the MOH is responsible for, such as managing the healthcare system, curative and preventive healthcare and cooperation with other healthcare providers.

1.3.1 Role of MOH in Healthcare Delivery

The Saudi government provides all citizens and expatriates working within the public sector with full and free access to all public healthcare services (Aldossary et al., 2008; Jannadi et al., 2008). The MOH is responsible for managing, planning and formulating healthcare policies and supervising healthcare programmes, as well as monitoring healthcare services in the private sector (Al-Yousuf et al., 2002). It is also responsible for advising other government agencies and the private sector on ways to achieve the government's health objectives (Mufti, 2000).

The MOH appoints and supervises 20 regional directorate generals of health affairs to various parts of the country. Each regional directorate is responsible for a specific set of hospitals and healthcare sectors, and every healthcare sector covers a designated number of PHC centres. The role of these 20 directorates includes implementing the policies, plans and programmes of the MOH; managing and supporting MOH healthcare services; supervising and organizing private sector services; coordinating with other government agencies; and coordinating with other relevant bodies (Al-Yousuf et al., 2002).

To provide all regions with healthcare services and to fulfil the curative and preventive healthcare demands of citizens, the MOH provides three levels of service: PHC includes PHC centres that offer primary care (PC) in the form of preventive and curative services, and refer crucial cases that require more advanced care, such as cases of cardiovascular diseases, obesity and diabetes, to a secondary healthcare provider (a general hospital), and cases that need more complex levels of care to a tertiary-level healthcare provider (central or specialized hospitals) (Ministry of Health, Health Statistical Year Book 2018).

1.3.2 Role of the MOH in Health Education

One of the main aims of the MOH is to improve the quality of human resources and training methods, and therefore, there is special emphasis on field and practical implementations of its programs. The MOH is also focused on the development of measures for training as well as providing local and foreign scholarships. Statistics show that in 2018, out of 84,172 students who attended university medical and health colleges, 53% were female. Further, the number of graduates was 14,372, and 54.9% were female. In order to increase the level of efficiency and performance so that it is on par with the most recent technical developments, methodologies and systems, the MOH offers training to its personnel within various specialties and professional categories. The objective of these efforts is to provide personnel with suitable knowledge and expertise in their fields. As part of these

efforts, in 2018, 1397 male and female students were enrolled in local and foreign fellowship and postgraduate programs (Ministry of Health, Health Statistical Year Book 2018).

SA has adopted different economic policies over the last few decades that are likely to affect healthcare development. At present, SA is undergoing a huge change as a result of the implementation of Saudi Vision 2030. Below, the various economic stages of SA and its financial indicators in comparison with that of other countries are described. Moreover, the new strategies adopted in the SA healthcare system are also discussed.

1.3.3   Financial and Economic Context of Saudi Arabia

Although the economy of SA has been mainly dependent on oil supply since the 1970s and the government's earning from oil comprises 80% of the total earnings (Alharbi, 2021), it has attempted to diversify the country's income sources as part of the national 2030 vision, for example, by producing and exporting industrial goods globally, and opening the doors for tourism.

According to one report, 'The sound economy and well-established industry base affects the Saudi community by increasing their income, leading to a per capita income of US\$ 24,726 in 2008 (Human Development Report, 2010), compared with US\$ 22,935 in 2007, US\$ 14,724 in 2006, US\$ 13,639 in 2005 (Human Development Report, 2009; Ministry of Economy and Planning, 2007), and US\$ 8140 in 2000' (The World Bank, 2011). An updated economic report showed that in 2010, SA had 'a high human development index (0.75), based on which the country was ranked 55 out of 194 countries' (Human Development Report, 2010).

As of 2019, SA's GDP per capita stood at US\$ 20912, while its rate of inflation was 2.46%. However, although GDP grew at 0.33%, the country's public debt stood at 18.98% of the GDP. SA is one of the largest economies in the region with a national budget of SR1020 billion (US\$272billion) as of 2020. Yet, the country faced a budget deficit of SR367 billion in 2015 and SR297 billion in 2016, SR174 in 2018, and SR187 billion in 2020 (Rahman and Salam, 2021).

Further, the per capita income has dropped to US\$ 20,122 as a result of unpredicted economic crises in 2016 (Ministry of Health, Health Statistical Year Book 2016). In 2010, the population of SA markedly increased as the price of oil increased to more than US\$ 100 per barrel. Therefore, although a large part of the SA budget was spent on innovative and dynamic projects, intensive scholarship, increasing government employee salaries and housing projects, these projects could not meet the demand of the increasing population. The increase in population may be viewed as a positive indicator for any country, but it was unexpected and not planned for in SA. In 2015, as a result of poor planning, SA experienced an economic collapse due to the drop in oil prices. At that point, oil revenues were no longer sufficient to pay the salaries of employees and retirees, in addition to maintenance and operation. Moreover, the unemployment rate exceeded 12%, which was equivalent to more than 1 million unemployed Saudis due to the large number of expatriates. Furthermore, the private sector was greatly affected by the lack of purchasing power. To solve these economic crises,

the government rolled out the ambitious 2030 vision that covers various aspects, including fighting corruption at all levels, developing governmental bodies by reducing waste and improving efficiency, imposing value-added tax and government support for many services and withdrawing products. Thus, instead of depending on oil exports, SA attempted to diversify its economy. Consequently, the per capita income was predicted to rise, and this was expected to positively impact various public services, including healthcare.

1.3.4   Healthcare Financing and Expenditure

Compared to other countries in the Gulf Cooperation Council (GCC), the general government expenditure on healthcare in SA was the highest, and it increased from 67.8% in 1995 to 78.9% in 2008. Although the private healthcare sector accounted for the highest expenditure in Qatar (37.8%), the private healthcare sector in SA followed closely by accounting for 32.2% of the total expenditure in 1995. This percentage dropped to 21.1% in 2008, when SA was ranked last among the GCC countries. In 1995, the SA government's per capita expenditure on health was the lowest among the GCC countries (US$ 247). Although this amount increased to US$ 608 in 2008, it was still ranked fifth. Additionally, the private health insurance expenditure in SA increased from 13.6% in 1995 to 36.7% in 2008 (which was the highest among the GCC countries), but the out-of-pocket expenditure of all GCC countries continued to decrease from 1995 to 2008. The least decrease was observed in SA, where it decreased from 47.5% in 1995 to 28.4% in 2008 (Alkhamis et al., 2013).

Government expenditure on the MOH reached US$ 24 billion in 2018 (Ministry of Health, Health Statistical Year Book 2018) and US$ 46.66 billion in 2020 (Rahman and Salam, 2021). It increased from 2.8% of the total governmental budget in 1970 (Health System Profile, 2011) to 6% in 2005, 6.2% in 2009 (Ministry of Health, Health Statistical Year Book 2009), 7.01% in 2016 (Ministry of Health, Health Statistical Year Book 2016), and 9.2% in 2018 (Ministry of Health, Health Statistical Year Book 2018).

1.3.5   New Strategies Specific to Healthcare

Saudi Vision 2030 maps the future of economic and social reform in SA, including economic diversification, domestic or foreign investment in the private sector and increased exports and job opportunities for Saudis. In addition, the National Transformation Program 2020 is a component of Saudi Vision 2030 that mainly aims to reform and restructure healthcare services by privatizing the healthcare sector, creating public-private partnerships, procuring major infrastructure such as hospitals in addition to developing new domestic healthcare programs, and promoting foreign investment in healthcare. Accordingly, the expected expenditure of the MOH will exceed SR 23 billion prior to 2020 (Almasoud, 2016).

1.3.6   Challenges for Healthcare Reform

The SA healthcare system still presents several challenges, irrespective of the reform measures taken by the MOH. These include challenges associated with the workforce, financing and expenditure, changing patterns of diseases, accessibility to healthcare services, introduction of the cooperative health insurance scheme, privatization of public hospitals, pilgrimage (hajj) season, utilisation of electronic health (e-health) strategies, and the development of a national system for healthcare information (Almalki et al., 2011).

1.3.6.1   Healthcare Workforce

According to the MOH, the total healthcare workforce in 2016, inclusive of all sectors, was approximately 402,938, with almost half of the workforce (205,023 [50.8%]) providing services for the MOH. Saudis represent only 43.5% of the total healthcare workforce: 22.3% are physicians and 44.9% are nurses. In the MOH, Saudis represent about 63% of the healthcare workforce: 33.4% of these are physicians and 57.6% are nurses (Ministry of Health, Health Statistical Year Book 2016).

Although policies to reform the SA healthcare system and attract more Saudis into the medical and healthcare professions have been adopted, there is still a lack of Saudi nationals in the SA healthcare system, particularly in certain specialties. Expatriates constitute the majority of the workforce and this has created instability (World Health Organization, Saudi Arabia 2010). Previous reports state that the number of physicians and nurses in SA in 2010 was 16 and 36, respectively, per 10,000 individuals. In comparison, Bahrain had 30 physicians and 58 nurses per 10,000 individuals; Kuwait, 18 and 37 per 10,000 individuals; Japan, 12 and 95 per 10,000 individuals; Canada, 19 and 100 per 10,000 individuals; France, 37 and 81 per 10,000 individuals; and the US, 27 and 98 per 10,000 individuals (Word Health Organization, Geneva 2010).

Due to the considerable efforts made by the government to teach and train Saudis in the healthcare profession, in 2016, the number of physicians and nurses in SA increased to 28.3 and 57, respectively, per 10,000 individuals (Ministry of Health, Health Statistical Year Book 2016). The successful implementation of the ambitious Saudi Vision 2030 will undoubtedly have a positive impact on the workforce shortage that primarily affects nursing specialties.

1.3.6.2   Health Insurance in SA

Due to the increasing population and an urgent need for healthcare, the free services offered present a burden to the government and may lead to cost pressure (Walston et al., 2008). Therefore, the government established the Council for Cooperative Health Insurance in 1999 to tackle this challenge. The main role of this council was to introduce, regulate and supervise a health insurance strategy for the Saudi healthcare market (Almalki et al., 2011). Moreover, a cooperative health insurance plan is being tried out in the private sector for employees and their families. In addition, government agencies are introducing health insurance schemes for their employees and plan to

implement similar schemes for pilgrims (Alsharif, 2008). Plans are also being developed to privatize government-owned healthcare centres (Walston et al., 2008).

1.3.6.3   Privatization of Public Hospitals

Several previous reports have indicated that privatization can help reform the healthcare system by improving its effectiveness and expertise (Al-Egtisadia Daily, 2009; Saati, 2003). Accordingly, the government has passed the necessary legislation to enable this transition (Walston et al., 2008). If privatization succeeds, the decision-making process will be quicker, healthcare expenditure will decrease, innovative financial sources for the MOH will be identified, and overall healthcare services will be upgraded (Saati, 2003). However, failure to adequately control and regulate such a privatized healthcare sector will negatively impact both hospitals and PHC centres. For instance, privatized hospitals will compete for patients, even those who might no longer require clinical care. Moreover, patients with health coverage may choose specialized hospitals rather than PHC or community hospitals, and private hospitals will be incentivized to shift non-refundable costs back to public PHC. These effects may place a financial burden on the government. Furthermore, if public hospitals do not show improvement at all levels, they might soon encounter a powerful profit-seeking competitor (Walston et al., 2008).

In the shift to privatization, private bodies are likely to focus their activities within cities and towns, and may thus neglect people living in rural regions. Hence, it is vital that the government introduces healthcare policies that maintain equity in healthcare provision between urban and rural areas (Walston et al., 2008). Additionally, the government needs to control the healthcare market to avoid increases in healthcare expenditure. Some studies were conducted in US, China and India which showed that privatization has several risks that must be carefully studied. The conversion of public sector to private sector insurance, or the expansion of private insurance through enhanced participation by corporate entrepreneurs, might provide rich people additional options without harming the public health system. But this is not the case for poor and vulnerable groups, such as older and disabled persons. Those who reliant on poor quality and often expensive private care because of the low allocation of funds and inadequacies of public healthcare. This often generates additional co-payments and more barriers rather than reducing out-of-pocket expenditures and improve access to needed services (Alvarez et al., 2011; Blumenthal and Hsiao, 2005; Dreze and Sen, 2002; Gill et al., 2005; Kritzer, 2000). Therefore, this might add more pressure on the government to initiate programs for these groups which cause more administrative costs, such as the case in US (Catlin et al., 2007).

1.3.6.4   Accessibility to Healthcare Services

The current MOH statistics show that there is inequitable distribution of healthcare services and healthcare professionals across various areas of SA (Ministry of Health, Health Statistical Year Book 2009). As a result, patients living in certain regions need to wait for a long time for healthcare services

and facilities (Walston et al., 2008). Some patients are severely impacted by this long wait time, including the elderly and patients with special needs (Al-Egtisadia Daily, 2009). In particular, people living in border and remote regions do not have proper access to healthcare facilities (Almalki et al., 2011).

To improve accessibility to healthcare services, healthcare facilities, and healthcare professionals, as well as transport to services and providers, these services should be distributed equitably (Al-Egtisadia Daily, 2009; Al-Yousuf et al., 2002). The lack of equitable distribution of healthcare services may lead to patients visiting the emergency department (ED) rather than PHC centres, and this results in crowding at EDs.

1.3.6.5   Patterns of Diseases

The alteration in disease patterns between communicable and noncommunicable diseases in SA is considered as a major challenge. Hence, the MOH should develop policies that take into account these alterations while focusing on preventative care to reduce the prevalence of chronic diseases (Jannadi et al., 2008). There has been a marked increase in chronic diseases such as diabetes, hypertension, heart diseases, cancer, genetic blood disorders and childhood obesity (Al-Qurashi et al., 2008; Al-Turki, 2000; Word Health Organization, Geneva 2010). The treatment of chronic illnesses is costly and might be ineffective (Al-Qurashi et al., 2008). For example, the treatment of diabetes costs the SA government approximately SR 7 billion (US$ 1.87 billion) each year (Ministry of Health, 2007).

1.3.6.6   E-health and National Health Information Systems

Although e-health and electronic information systems are used in some SA hospitals and institutes such as King Faisal Specialist Hospital and Research Centre, National Guard Health Affairs, Medical Services of the Army Forces, and University Hospitals, they still present problems for the MOH. Importantly, there is no information e-system that integrates private and public hospitals and organizations (Altuwaijri, 2008). Statistics show that SR 4 billion (US$ 1.1 billion) was allocated by the MOH to run a four-year development program (2008–11) in order to upgrade e-health services in the public sector (Qurban and Austria, 2008).

Conferences on e-health that discuss its significance in improving the delivery of healthcare and associated polices and strategies, such as that held by the Saudi Association for Health Information (Saudi e-health conference, 2008), will help achieve the optimum utilisation of e-health services in the public healthcare sector, facilitate access to data (particularly for the ED) among researchers seeking to improve the MOH, and create polices that aim to reduce non-urgent visits to the ED.

1.3.6.7   Pilgrimage (Hajj) Season

SA hosts 2 million pilgrims annually, and this presents a serious challenge. During the 2016 season, there were 1.9 million pilgrims, 71% of whom arrived from foreign countries. Preventive

and curative care services are provided for all pilgrims, regardless their nationality. In fact, statistics show that out of 1,312,594 pilgrims in 2016, 22% were administered chemoprophylaxis and 25.4% were vaccinated against poliomyelitis. Moreover, 597,684 (32%) pilgrims visited the emergency and outpatient clinics of hospitals and healthcare centres in 2016, and 3% of these pilgrims required emergency services (Ministry of Health, Health Statistical Year Book 2016). Pilgrims are not charged for these services, and this affects the healthcare budget (Almalki et al., 2011). Thus, adequate planning of pilgrimages, especially with regard to healthcare services, is important.

As ED utilisation by non-urgent cases is the focus of this study, in the next section, I will discuss the history of the ED, define crowding by non-urgent visits, and describe the issues caused by this. Moreover, I will present the drawbacks of ED crowding (EDC) and strategies to overcome this problem.

1.4 Introduction to Emergency Services

In the preceding sections, I provided a brief overview of the healthcare system in SA. As the healthcare system is undergoing reform, particular attention is being paid to improving emergency hospital-based services in SA. My research for my Master's degree highlighted the problems of overcrowding in EDs and inappropriate ED utilisation (mainly as a result of the presentation of non-urgent cases to the ED). In three major MOH general hospitals in Jeddah City, SA, patients frequently visited the ED for non-urgent health problems—i.e. the MOH hospitals were overutilised by PC cases. It is possible that the high percentage (53.0% of 300 cases) of non-urgent ED visits in this study might be due to ignorance on the part of patients about what constitutes an emergency case, or the lack of a hospital policy that discourages non-urgent visits. It is also possible that the hospital administration is afraid of being sued by patients for refusal to provide healthcare services, as this may consequently tarnish the reputation of the hospital (Dawoud et al., 2016).

Overcrowding in the ED is not uncommon and has been cited as a cause for concern in other nations too (Eitel et al., 2010; Institute of Medicine, 2006). Pines et al. (2011) indicated in their review that EDC is a global issue, and interventions should be considered to resolve this issue. Countries such as Australia, Canada, Denmark, Finland, France, Hong Kong, Italy, Netherlands, Spain (Catalonia), Sweden and the UK, have reported various interventions and viewpoints for reducing EDC in non-urgent cases. Their review provided insights into the causes and solutions of crowding in the US based on the experience of other countries. As the SA healthcare system is similar to that of other countries, comparisons with policy developments in these countries are relevant when considering issues such as utilisation of ED and inappropriate usage of ED services. In order to better understand this issue in the context of SA, I would like to focus my research on the origin of the ED and the factors surrounding its use.

1.4.1 History of the Emergency Department

Public healthcare, a specialty of emergency medicine (EM), was founded in the 1970s in response to the need for improved access to care among patients. Indeed, the topic of access, particularly for low-income populations, encompasses much of the research performed in EM. Prior to the 1980s, traditional and federal finance enhancement through Hill Burton funding enabled hospitals to provide charity care (Weissman, 1996) to cover ED usage, but in most jurisdictions, ED financing has become an integral part of the services now provided in hospitals.

The original emergency rooms were established in response to patient needs. At that time, individuals without PC physicians who presented to the hospital in a severe condition would be evaluated by the nurse in-charge and, if necessary, by the on-call physician as well. Early EDs were primarily staffed by nurses, rotating residents from various specialties and trained physicians (Krome, 1997).

The development of the EM specialty was mostly consumer-driven, as the volume of patients exceeded the available staff, who were all busy with other work. Therefore, small groups of physicians began providing full-time coverage of EDs as attending physicians dedicated to providing emergency care: the Pontiac Plan (a plan to staff an emergency room for a few shifts each month) and Alexandria Plan (full-time ED coverage) are classic examples. These informal groups soon united to define the scope of EM, develop curriculum and board certification, and subsequently, help EM attain specialty status. This new specialty grew gradually and was very successful from the perspective of both hospitals and EM physician groups (Krome, 1997).

EM has developed as a specialty and as a unique discipline with its own body of knowledge over the last 40 years in the US (Schneider et al., 2010). However, major changes in the financing and delivery of healthcare occurred in the 1980s due to the increasing rates of uninsured patients (Nadel, 1993). Over the same period, there has been a sharp increase in the number of ED visits: between 1992 and 2002, ED use increased by 23%, from 89.8 million to 110 million visits. It was accompanied by a reduction in the number of US EDs and longer length of stay (LOS) for ED patients. This subsequently led to ED overcrowding, which was highlighted as a major problem by the Institute of Medicine in a 2006 IOM report. The growing use of the ED is often attributed to visits by individuals who lack access to primary healthcare or have no health insurance (Washington et al., 2002).

1.4.2 Definition of Emergency Department Crowding

EDC is defined as a 'situation in which the demand for emergency services exceeds the ability of a department to provide quality care within acceptable time frames' (Canadian Association of Emergency Physicians and the National Emergency Nurses Affiliation, 2003). Similarly, the American College of Emergency Physicians describes EDC as 'a situation in which the identified need for emergency services outstrips available resources in that ED'. This situation occurs in

hospital EDs when the number of patients increase to an extent that the staff cannot provide optimum service, there is a lack of ED treatment beds, and the wait times exceed the reasonable period set in the guidelines. Crowding typically results in patients being monitored in non-treatment areas and waiting for either ED treatment beds or inpatient beds, or waiting to be discharged (Bradley, 2005).

Closely linked to the concept of EDC is the concept of inappropriate usage of ED services. Based on the time pattern of symptom onset, appropriate cases are defined as patients who visited the ED for a sudden health problem; inappropriate cases are defined as patients who visited the ED for a long-term problem; and hybrid cases are defined as patients who visited the ED for a chronic problem that had suddenly re-emerged or for a chronic problem that had worsened in the last few hours (Porro et al., 2013). These definitions have been adapted from the definitions provided by previous Italian and international studies on this topic. Based on these definitions, a case is not considered as urgent when 'he/she has no active symptoms or the symptoms were recent and minor, or there is no feeling of emergency and he/she desires a check-up, a prescription refill, or a return-to-work release'. Cases that did not meet these criteria were considered as urgent (Bianco et al., 2003).

The MOH hospitals of SA follow the Canadian national definition with regard to the degree of emergency and waiting time, which have been adopted from the Canadian Triage and Acuity Scale (CTAS). The Canadian classification assigns patients to five groups, as shown below.

Table 2. Waiting Time of ED Patients According to CTAS

No.	Emergency Degree	Action To Be Taken
CTAS I	Resuscitation	Patients need to be seen by a physician immediately.
CTAS II	Emergent	Patients need to be seen by a physician within 15 min.
CTAS III	Urgent	Patients need to be seen by a physician within 30 min.
CTAS VI	Semi-urgent	Patients need to be seen by a physician within 60 min.
CTAS V	Non-urgent	Patients need to be seen by a physician within 120 min or referred to other areas of the hospital or healthcare system.

Based on the classification in Table 2, my MSc research concluded that a greater proportion of non-urgent cases at the ED is associated with greater crowding, as well as bed shortage, long waiting time and wastage of resources (Dawoud et al., 2016).

1.4.3 Drawbacks of Emergency Department Crowding

In the USA, ED inefficiencies and delays result in approximately 4 million patients walking away from healthcare centres each year. Unsurprisingly, the Joint Commission stated that the ED is the most common site for sentinel events in the hospital due to the wait times and delays in care (The Joint Commission, 2002). Within the context of SA, I found that overcrowding was the main reason

why 26.0% of 300 patients left the ED without being seen by a doctor or receiving any treatment in Jeddah, SA (Dawoud et al., 2016).

Timeliness of care is one of the most relevant factors associated with patient satisfaction (Emergency Department Pulse Report, 2008). The time required to see a physician (door-to-physician time) exhibits the best correlation with EDC, among various other factors. The timely movement of patients to patient care areas for evaluation makes the patient believe that the wait time is acceptable (Boudreaux et al., 2004; Matters, 2006). As the time from arrival to physician evaluation increases, the rate of patients leaving without being seen also substantially increases (Goodacre and Webster, 2005; Patel and Vinson, 2005).

The current literature indicates that EDC has an impact on patient safety, and demonstrates relationships between crowding and negative patient-oriented outcomes, including poor satisfaction, delays in antibiotic use for diseases such as pneumonia, delays in pain medication use for acute pain conditions, and higher rates of medical errors and complications (Pines and Hollander, 2008). In fact, patient safety is under threat from overcrowded EDs due to the delay in the provision of care, intensity of decision making, pressure to move patients quickly through the system, and provision of care in less-than-desirable places such as hallways and waiting areas (Canadian Association of Emergency Physicians Working Group on the Future of Emergency Medicine in Canada, 2002; Innes, 2002).

A growing number of patients, changing demographics, and altered patient expectations also contribute to the current problem of overcrowding in EDs. In fact, the problem has reached crisis levels in several countries, with significant implications for patient safety, quality of care, staff burnout, and patient and staff satisfaction. However, there is no single, clear cause of overcrowding, or a simple means of addressing the problem. It is unlikely to be resolved quickly, and long-term strategies need to be developed. In this regard, it is necessary to promote policy changes that support not only the ED, but also the wider system within which it functions (Richardson et al., 2005).

Access to emergency services by non-urgent patients remains an unresolved problem that burdens healthcare services in all countries (Bianco et al., 2003). Several strategies to tackle this have been described in the literature, but there is a dearth of research on what strategies are effective in reducing EDC. Identifying the relationships between administrative interventions is difficult because the interventions may overlap, or may be implemented as a bundle rather than individually (Silka et al., 2001). Chapter 2 discuss more about different factors that affect patients' attendance at EDs for PC treatable conditions. It also provides successful interventions have been implemented in countries across the globe to improve access to healthcare.

1.4.4   Strategies to Deal with Overutilisation of the ED

Investigators have suggested several solutions to help resolve the issue of EDC, such as implementing the input-throughput-output conceptual model of EDC (Asplin et al., 2003), providing

more resources to the ED, managing demand, conducting operations research (Hoot and Aronsky, 2008), applying the lean thinking concept (Holden, 2011), establishing clinical decision units (Roberts et al., 2010), and creating units to observe patients with chest pain (Martinez et al., 2001) and areas where patients can be rapidly assessed (Bullard et al., 2012). Lean healthcare thinking is effective in the redesign of optimal pathways, and can contribute to the inclusion of value steps and omission of nonvalue steps (Joosten et al., 2009). Another strategy involves the implementation of a four-hour target to reduce LOS in the ED (Banerjee et al., 2008; Horwitz et al., 2010). Despite these efforts, very little has been achieved to improve the quality of services in the ED and patient flow in the ED (Eitel et al., 2010).

Arjun et al. have proposed various strategies for the improvement of ED patient flow, including floorplan modification, improvement of in-patient discharge time, human resource adjustments, inner role adjustment, and reduction in patient waiting time by changing treatment procedures (Arjun et al., 2015). Furthermore, other methods have been suggested based on the fast track concept, such as using functional principles to separate patients into streams according to complexity rather than acuity (Ieraci et al., 2008), separating high- and low-variability patients to improve throughput and reduce LOS in the ED (Arya et al., 2013), and using an early senior medical assessment and streaming model of care (Asha and Ajami, 2013). A study conducted in the US by Sanchez et al. reported that the implementation of fast-track services had a positive impact, during the first stage, on the reduction of waiting time and LOS by 50% and 9.79%, respectively, in 75,000 patients. However, the second stage of the study noted an increased proportion of patients visiting the emergency (by 4.43%) (Sanchez et al., 2006).

Wiler et al. conducted a review of optimum utilisation of ED front-end operations and claimed that there is no clear tool thus far to measure the optimal utilisation of fast-track clinics or services (Wiler et al., 2010). As these statistics are not available in the context of SA, I will focus on fast-track applications in the present study, given that it is a predictor of EDC.

To overcome EDC, we also need to obtain insights into the importance of primary healthcare centres (PHCCs) and their services. Therefore, the role of PHC will be illustrated in the next few paragraphs.

1.5   Primary Healthcare and its Role

PHC, as a concept and strategy for providing community-based healthcare services, has been accepted and adopted by many countries, particularly in the GCC. The GCC countries designed their healthcare systems such that first-contact comprehensive services are provided to all people through a network of PHCCs that serve defined catchment areas according to residence (Al- Doghaither and Saedd, 2000). PHCCs have an important role in providing basic healthcare services. If they fail to provide satisfactory services to patients, it will lead to adverse patient behaviour towards the overall healthcare system (Shah et al., 1996).

Healthcare in many developed countries is considered as a complex system based on a mix of both public and private players. Generally, PC providers are the gatekeepers of the system, as they are initially consulted by patients and provide referrals to specialists. Thus, they play a critical role in the healthcare system, particularly in major medical centres with many specialists (such as those found in rural areas). PC is also supported by mid-level providers such as physician assistants and nurses. In the state of New York, both types of mid-level practitioners can see patients independently (although they must practice with a physician) and can prescribe medications (Continelli et al., 2010). To date, no system in SA mandates that citizens be registered in a PHCC—i.e. it is an option, but is not necessary.

Several research groups have studied the causes of non-urgent use of EDs, and one reason that emerged was difficulty in accessing PC services. Although some patients have a tendency to seek medical help from PC services, the likelihood of not receiving an appointment for PC within a short time is the major cause for inappropriate use of EDs. A study conducted in Jeddah, SA, states that of 208 patients who visited the ED, 79.8% experienced difficulty in receiving an appointment to see a specialist doctor before the ED visit (Dawoud et al., 2016).

Another factor is the difficulty involved in finding time to visit PHCCs, whose appointment hours are usually on working days. Finally, some patients have no access to PC services (Lega and Mengoni, 2008). However, an increasing number of clinical entities require treatment that is 'on the clock', with the outcomes directly linked to the timeliness of care (Bernstein et al., 2008; Khot et al., 2007).

Individuals with a PC physician show much lower utilisation of specialists and emergency rooms (Continelli et al., 2010). Further, continuity of care (using the same PC source over time) is associated with greater satisfaction, better compliance, and lower hospitalization and emergency room use (Freeman and Hjortdahl, 1997; Mainous 3rd and Gill, 1998), even after controlling for Medicaid eligibility (Rosenblatt et al., 2000).

Although general practice is considered as a partnership between a patient and personal doctor working single-handedly, the increasing complexity of medical care in recent decades has favoured the emergence of PHC teams (Van Well, 1994). At present, in Spain, this new strategy has been found to be more effective than general practice involving a single physician. With this system, professionals have a greater degree of job satisfaction, users are more satisfied, and there has been progress in the quality of service (Goñi, 1999).

The mission of PC in reducing ED utilisation has also been thoroughly discussed in the UK. Some of the proposed suggestions include the identification and subsequent re-referral of PC patients to the PC setting and improvement of advanced nurse practitioner roles and nurse-led clinics (Bache, 2000; Barr et al., 2000; Crux, 1997). In addition, the inclusion of PC providers either in or adjacent

to emergency care facilities has also been carefully considered (McLauchlan and Harris, 1998; Rajpar et al., 2000; Robertson-Steel, 1998).

In SA, the MOH offers PHC services through a network of healthcare centres over the country. Over the past 20 years, the government has supported new projects to ensure that healthcare services are accessible to all people at all levels of care—primary, secondary and tertiary. However, EDC is still a challenge to the MOH, especially at referral hospitals. Many patients prefer directly visiting tertiary hospitals instead of PHCCs and community hospitals, based on the assumption that they will receive better care at the tertiary hospitals (Pines et al., 2011).

Unfortunately, a little over half of the patients (53.0% of 300) with non-urgent cases in Jeddah, SA, visited the ED, even though they knew that they could be treated at PHCCs. The main reasons cited by the patients were limited services and resources (50.0% of 162 patients) and limited working hours (63.8% of 163 patients) at PHCCs, and mistrust of healthcare centres (42.4% of 66 patients). Moreover, ED patients (30.6% of 268) reported that they were dissatisfied with the treatment provided, their diagnosis was not effective, the healthcare centres seemed to lack knowledge, and the medical staff at PHCCs lacked experience (Dawoud et al., 2016). Consequently, the MOH faces a great challenge in terms of improving their management and organization. Hence, strategies for professional evolution that can enhance staff knowledge and skills are required to improve the quality of its services (AL-Ahmadi and Roland, 2005).

1.5.1   New Reforms in Primary Healthcare in Saudi Arabia

As discussed earlier, SA has implemented new strategies (e.g. Saudi Vision 2030) to fill the gaps in the current healthcare system by reforming PHC services for 2010–2020. The focus of the reforms is on PHC structure, infrastructure, financing, management and leadership (Ministry of Health, Strategic Plan 2010). Further, the purpose of the new strategy was to improve the quality of healthcare services, reduce non-urgent visits to the ED, and meet the needs of the growing population. In addition, the new strategy aimed to establish an accurate database to integrate PHCCs, as well as strengthen communication between primary and other levels of healthcare, such as secondary and tertiary services, and improve the referral process. The strategy also includes advancement of the PHC workforce through education and training. However, since the launch of these healthcare strategies, there has been no evidence to demonstrate the impact of such reforms. To assess the success of these plans, the MOH needs to review the results of its implementation. It is also important to review the literature on gaps in the current healthcare systems and policies to develop effective interventions (Al Asmri et al., 2020) (3.3).

In chapter 2, I discuss the different factors that affect the utilisation of healthcare systems in different countries as well as some interventions to improve access to PC and EDs.

1.6 Study Rationale

There is a clear need to have a better understanding of the utilisation of ED services and to identify factors that may affect the utilisation of EDs and PHCCs in SA. Research into these topics can help government healthcare services to achieve optimum utilisation of its resources, to reduce EDC and to improve PHCC access. The findings of such research could also provide insights into the healthcare system and disease burden, and could support the discussion on areas that need further work as part of the ongoing developments in the healthcare system in SA.

1.7 Scope and Objectives

This PhD thesis develops on the work that I carried out for my MSc thesis, which concluded that emergency services at MOH hospitals in Jeddah were over-utilised and received a high proportion of non-urgent cases. My previous thesis revealed that a significantly high proportion of patients without emergencies thought the ED was the first place to consult when they experienced symptoms and had not attempted to see a doctor at an outpatient clinic or PC services prior to visiting the ED. Such patients over-utilise the ED, as they visited the ED three to four times a year, in general, and at least six times in one year for non-urgent cases.

Based on my findings and my assessment of the problems faced by EDs in SA, in this thesis, I am setting out to develop a better understanding of the factors that impact ED utilisation. I will be focusing on patient-related factors so that I can develop a better understanding of how these factors impact the choice of services. These investigations are relevant for SA as it seeks to reconfigure and improve its healthcare systems, especially as it aims to reduce pressure on EDs.

1.7.1 Research Objectives

1. To examine the characteristics of patients presenting at PHCCs and their knowledge of, behaviour to and satisfaction with PHCCs
2. To examine the characteristics of patients presenting with non-urgent health problems in the ED of King Fahd Hospital and their knowledge of, behaviour to and satisfaction with PHCCs
3. To examine whether self-reported knowledge of, behaviour to and satisfaction with PHCCs are associated with the participants' choice of healthcare service

The main research hypothesis is that patients presenting with non-urgent health problems at EDs will have poorer knowledge of, behaviour to and satisfaction with PHCCs than patients presenting at PHCCs.

1.7.2 Research Questions

1. What percentage of patients visiting the King Fahd Hospital ED require non-urgent care?

2. Are there any differences in knowledge of, behaviour to and satisfaction with PHCCs between patients visiting PHCCs and those visiting the ED of King Fahd Hospital for non-urgent care?

3. Are there any differences in other factors (e.g. demographics and health conditions) between patients visiting PHCCs and those visiting the ED of King Fahd Hospital for non-urgent care?

4. Does knowledge of, behaviour to and satisfaction with PHCCs affect participants' choice of healthcare service?

1.8   Overview of Dissertation

This cross-sectional study was conducted on patients who consulted King Fahd General Hospital (KFGH) hospital and three of its associated PHCCs in Jeddah, SA, namely Al-Hamra, Al-Safa and Al-Nahda, with the aim of identifying the factors that may affect the utilisation of EDs and PHCCs. The objectives were developed to understand the utilisation of emergency services at the above-mentioned hospital and PHCCs; identify the specific factors related to patient characteristics and their knowledge of, behaviour to and satisfaction with PHCCs in patients presenting at the ED and PHCCs; and determine whether these factors are associated with the participants' choice of healthcare service.

Chapter 1 has discussed the context of this study and its rationale. Chapter 2 is a systematic review of the scale of ED overutilisation and identification of the factors that contribute to ED overutilisation such as patient's characteristics, knowledge, behaviour and satisfaction. The review also covers interventions to improve access to healthcare that have been evaluated in other countries.

Chapter 3 describes the research methods of this study, including ethical considerations such as obtaining the informed consent of the patients before the interview, ensuring the confidentiality of their data and data sharing. In addition, the study setting, design and data collection methods are described. I have also described how the questionnaire was developed based on methods used in similar studies. Finally, the results of the pilot study are reported.

Chapter 4 presents the results of the analysis with the help of a series of tables and figures.

Chapter 5 reviews the thesis results in the context of wider research and highlights the possible research directions in the future. It also includes recommendations that policy makers and healthcare providers should consider when devising strategies to limit non-urgent ER use.

Chapter 6 presents a conclusion of the five chapters and explains the novelty of this research, along with the limitations of this study and some directions for further research.

Chapter 2

Systematic Review

2.1 Summary

This review aimed to systemically answer the three core research questions of this thesis, by synthesising 30 articles that assessed the factors associated with the patients' decision to access healthcare services.

Our literature review showed evidence for the overutilisation of EDs for non-urgent visits in different countries across the globe. Some of the studies represent the data for one cut-off year, while a few studies have reported the increase in overutilisation across 10 or 20 years and discussed the differences between each year. Further, other studies have demonstrated a decrease in overutilisation after implementation of mitigation strategies.

The findings of this review address many factors that affect patients' decision to visit the ED or PHCCs. Previous studies have largely focused on factors related to patient characteristics and patient behaviour, and few studies have examined how patients' knowledge about alternatives and PHCC services or patients' satisfaction with PHCCs is related to overutilisation of the ED. Some studies have discussed the most important contributory factors in depth, while others have merely mentioned them. However, no study so far has examined in depth the association of knowledge and satisfaction with the patients' decision to access healthcare services, particularly with regard to overutilisation of the ED.

This review also deliberated on some examples of effective research interventions applied by different countries that can possibly can be applied in SA too. The literature reveals four main types of interventions: increasing the number of appointments and/or opening hours, telephone triage, patients' referral from ED to other services, and improving the structure of PHCCs.

To improve the quality and efficiency of healthcare services across SA, it is important to understand the factors that affect patients' decision to access healthcare from four different aspects, namely, characteristics, behaviour, knowledge and satisfaction. Therefore, these factors form of the focus of this literature review.

2.2 Research aims

The proposed systematic review addresses three aims, as listed below.

1. To evaluate the scale of ED overutilisation due to non-urgent visits across the globe, with a focus on countries with similar healthcare systems to SA such as the US and France

2. To identify factors that contribute to ED overutilisation due to non-urgent visits, for example, patient's characteristics, knowledge of healthcare services provided, behaviour toward healthcare access and satisfaction with PC services

3. To identify examples of effective improvement strategies that have been evaluated in other countries and are possibly transferable to SA

2.3 Methods

2.3.1 Search Strategy

Systematic searches were conducted to identify studies that had analysed the overutilisation of EDs, its contributory factors and consequences across four bibliographic databases: Medline, Embase, Cochrane and CINAHL. The search strategy was developed for each electronic database according to the search structure and subject headings. The main search terms (from MeSH) used in the Medline and Embase databases are provided in Table 3. We also included other articles from Cochrane and CINAHL. The published reviews were screened based on the inclusion and exclusion criteria.

Table 3. Search Terms (from MeSH) Used for all the Databases

No	Search Terms
1	Emergency department.mp. or Emergency Service, Hospital/
2	(Inappropriate adj1 (use* or utilisation or utilization or visit* or visit* or hospitalisation* or hospitalization* or admission*)).tw.
3	(Suboptimal adj1 (use* or utilisation or utilization or visit* or visit* or hospitalisation* or hospitalization* or admission*)).tw.
4	(Non-optimal adj1 (use* or utilisation or utilization or visit* or visit* or hospitalisation* or hospitalization* or admission*)).tw.
5	(Non-urgent adj1 (use* or utilisation or utilization or visit* or visit* or hospitalisation* or hospitalization* or admission*)).tw.
6	(Nonurgent adj1 (use* or utilisation or utilization or visit* or visit* or hospitalisation* or hospitalization* or admission*)).tw.
7	(Avoidable adj1 (use* or utilisation or utilization or visit* or visit* or hospitalisation* or hospitalization* or admission*)).tw.
8	(Preventable adj1 (use* or utilisation or utilization or visit* or visit* or hospitalisation* or hospitalization* or admission*)).tw.
9	(Unnecessary adj1 (use* or utilisation or utilization or visit* or visit* or hospitalisation* or hospitalization* or admission*)).tw.
10	or/2-9
11	The final search used for all of the databases was 1 and 10

2.3.2 Eligibility Criteria

Empirical studies that focused on ED overutilisation, and associated factors were included. The reports and articles included were peer-reviewed, written in English, and published between 2010 and January 2020. I decided to include studies published from 2010 onwards because the health care systems are rapidly reformed and therefore some of the findings from earlier studies in relation to ED overutilization due to non-urgent case might not be informative for improving the health care systems at present. Empirical studies and systematic reviews that used quantitative, quantitative or mixed methods were included. The study populations were adult patients or healthcare providers. Reviews of healthcare records reporting data on ED overutilisation were also included. The setting was EDs in any country. We excluded studies which targeted people with specific diseases who presented at the ED and/ or PHCC and those focusing on transfer of patients from the ED to other departments. We also excluded studies in which data were collected from ambulance services, paediatric studies and case studies. Articles not published in English and from grey literature sources were also excluded.

2.3.3 Data Screening and Extraction

The results of the searches were exported into Endnote library. After removal of duplicates, a two-stage selection process was followed. In the first stage, the titles and abstracts were screened for relevance. In the second stage, the full texts of the studies that were ranked as relevant in the first stage were screened based on the eligibility criteria. Each paper was independently appraised by two reviewers (A.E. and M.P.) to check if they met the eligibility criteria. The study selection process and the reasons for exclusion are provided in Figure 3.

The data were then extracted from each of the articles and organised into a summary table for comparison (Tables 5 and 6). The table includes items for study characteristics, participant characteristics, main outcomes and results of the quality assessment of the studies with the mixed-methods appraisal tool (MMAT) (Table 7).

2.3.4 Critical Appraisal of the Included Studies

MMAT was applied to each of the 30 studies included in the analysis. Out of the five MMAT checklists, the quantitative non-randomized checklist was used for the 30 studies. MMAT was selected as the quality assessment tool because it enables a standardised appraisal of both qualitative and quantitative studies (HONG et al., 2018). However, since it does not include the date or place of publication for each study, it posed limitations for the purposes of this review. The date and place of publication are important because they impact the applicability of the findings to the current characteristics of healthcare systems, which have changed significantly following reforms in the past decade, especially in SA. Hence, the MMAT checklist was modified to assess the publication details of each study. Each study was classified as high, medium or low quality, according to the five key criteria. For each criterion that was met, a study was awarded one point: if the study met all five MMAT criteria, it was ranked as high quality; if it met three or four of the criteria, it was ranked as medium quality; and if it met one or two criteria, it was ranked as low quality (Vusio et al., 2020). These five key criteria were as follows:

1. Participants were representative of the target population.

2. Measurements were appropriate in terms of both the outcome and intervention (if applicable).

3. The outcome data were complete (that is, the response rate was 70% or higher at baseline).

4. The control was adequate for any confounding factors in design and analysis.

5. The research procedure/intervention was administered as intended during the study period.

2.3.5 Data Synthesis

Only a small fraction of the studies (five studies in total) included in the systematic review had provided amenable data on the prevalence of non-urgent use of ED. These five studies had major methodological variations which would make pooling not particularly meaningful. These variations include different definitions/criteria for non-urgent use, sample selection procedures, sample size, and data collection timeframes. In a large-scale meta-analysis, these variations could be modeled as moderators for example in meta-regressions. However, as only 5 studies reported amenable data in this systematic review, such an approach is not feasible. Similarly, different intervention designs were included in the review such as controlled study designs and observational studies which either did not report similar 'effectiveness' outcomes of interest or reported on feasibility and acceptability outcomes. After taking into consideration the above limitations, we anticipated that the heterogeneity of the research designs and outcomes in the included studies would make it difficult to conduct a meta-analysis. Therefore, this systematic review uses a narrative synthesis. The studies were categorized by types of outcomes, that is, estimates of ED utilisation, contributory factors, and improvement strategies (Table 6).

Figure 3. Preferred Reporting Items of Systematic Reviews and Meta-Analyses (PRISMA)

Identification	# of records identified through database searching (n = 2,727) Medline: 818 Embase: 1076 CINHAL 504 Cochran 329

# of additional records identified through other sources (n = 0)

# of records after removal of duplicates (n = 2,670)

Screening

# of title and abstract records screened (n = 2,670)

# of records excluded
1. Articles were not related directly to our topic
2. Articles with data collected in an ambulance
3. Articles about specific diseases like heart diseases
(n = 2614)

Eligibility

# of full-text articles assessed for eligibility (n = 56)

# of full-text articles excluded
1. Articles before 2010
2. Articles focused on paediatrics
(n = 26)

Included

# of studies included in quantitative synthesis (meta-analysis) (n = 30)

2.4   Results

The PRISMA flowchart in Figure 3 displays the search results from four different electronic databases, the selection process and the reasons for exclusion. In the first stage, the number of articles retrieved was 818 from Medline (Ovid), 1076 from Embase (Ovid), 504 from CINHAL and 329 from Cochran. All the retrieved articles (n = 2,727) were checked for duplicates, and 57 articles were removed. The titles and abstracts of the remaining 2,670 articles were assessed, and 2614 studies that did not meet the inclusion criteria were excluded. In the second stage, the 56 remaining studies were selected for full-text appraisal. A total of 30 studies were finally included and summarized in this review.

2.4.1   Characteristics of the Studies

The characteristics of the 30 studies included in this review are shown in Table 5. The studies were from various countries: eight studies from the US (Burns, 2017; Chen et al., 2015; D'Avolio et al., 2013; Kim et al., 2015; Lines et al., 2019; Rowe, 2020; Schumacher et al., 2013; Uscher-Pines et al., 2013); five studies from Italy (Barbadoro et al., 2015; Buja et al., 2014; Di Mauro et al., 2019; Lippi Bruni et al., 2016; Scapinello et al., 2016); four studies from the UK (Cowling et al., 2018; O'Cathain et al., 2016; Verhaegh et al., 2019; Whittaker et al., 2016); two studies from the Netherlands (A. J. P. Boeke et al., 2010; Cross et al., 2017); and one study each from SA (Alyasin and Douglas, 2014), Sweden (Backman et al., 2010), Canada (Hwang et al., 2012), Belgium (Philips et al., 2010), South Africa (Adeniji and Mabuza, 2018), Hong Kong (Fung et al., 2015), China (Jiang et al., 2020), France (Naouri et al., 2020), Iran (Bahadori et al., 2020), Portugal (Almeida and Vales, 2020), and Japan (Miyazawa et al., 2019). Nineteen of the studies used quantitative methods such as surveys (Alyasin and Douglas, 2014; Backman et al., 2010; Fung et al., 2015; Jiang et al., 2020; Naouri et al., 2020; Scapinello et al., 2016), health record databases (Almeida and Vales, 2020; Bradley et al., 2012; Buja et al., 2014; Hwang et al., 2012; Kim et al., 2015; Lines et al., 2019; Rowe, 2020; Whittaker et al., 2016), combination of health record databases and surveys (Barbadoro et al., 2015; Cowling et al., 2018), and experimental/intervention analysis (Adeniji and Mabuza, 2018; A. J. P. Boeke et al., 2010; Cross et al., 2017; Lippi Bruni et al., 2016). Ten studies used mixed methods such as interviews/note sheet (D'Avolio et al., 2013; Miyazawa et al., 2019; O'Cathain et al., 2016; Philips et al., 2010; Schumacher et al., 2013; Verhaegh et al., 2019), and combined interviews/note sheet and health record databases(Chen et al., 2015). Three papers were systematic reviews (Burns, 2017; Di Mauro et al., 2019; Uscher-Pines et al., 2013) that used different methods (quantitative, qualitative or mixed methods). Only one article used a qualitative method in the form of semi-structured interviews (Bahadori et al., 2020). Twenty-one of the studies were conducted in EDs only (Almeida and Vales, 2020; Alyasin and Douglas, 2014; Bahadori et al., 2020; Barbadoro et al., 2015; A. J. P. Boeke et al., 2010; Buja et al., 2014; Burns, 2017; Chen et al., 2015; Cross et al., 2017; D'Avolio et al., 2013; Di Mauro et al., 2019; Jiang et al., 2020; Kim et al., 2015; Lines et al., 2019; Miyazawa et al., 2019; Naouri et al., 2020; O'Cathain et al., 2016; Rowe, 2020; Schumacher et al.,

2013; Uscher-Pines et al., 2013; Verhaegh et al., 2019). Further, some studies were conducted only at PHCCs (Adeniji and Mabuza, 2018; Cowling et al., 2018; Fung et al., 2015; Lippi Bruni et al., 2016; Scapinello et al., 2016), and others included both EDs and PHCCs (Backman et al., 2010; Hwang et al., 2012; Philips et al., 2010; Whittaker et al., 2016).

2.4.2   Quality of the Included Studies

The 30 studies included in this review have been subjected to quality appraisal with the MMAT tool. As mentioned earlier, there were 19 quantitative, 10 mixed methods and 1 qualitative study. Of the quantitative studies, two were randomized controlled trials and two were non-randomized trials. Most of the included studies (24 studies) were ranked as high quality (as they met all five criteria), and the remaining six studies were ranked as medium (because they met four of the criteria). Table 7 shows the details of the quality assessment of each study.

2.4.3   Synthesis of Results

The reviewed literature confirmed that non-urgent admission to the ED is a prevalent phenomenon in SA and other countries across the world. The percentage of non-urgent visitors to EDs varied between countries, and this was probably related to differences in system-related variations or improvement strategies introduced between countries. Several aspects of ED overutilisation need to be considered in order to assess how new and improved interventions can overcome the challenges faced by EDs, and the manner in which this can facilitate patient flow. The following sections will explain the factors that lead to non-urgent use of ED in different countries, as well the interventions implemented.

2.4.3.1   ED Overutilisation across the Globe

Out of the 30 articles included, 5 studies reported the percentage of inappropriate and non-urgent usage of ED in their results; in the included articles, the terms 'inappropriate' and 'non-urgent' are used interchangeably (Alyasin and Douglas, 2014; Kim et al., 2015; Schumacher et al., 2013; Verhaegh et al., 2019; Whittaker et al., 2016). Other studies mentioned the percentage of non-urgent usage of ED from previous published work (A. J. P. Boeke et al., 2010; Buja et al., 2014; Fung et al., 2015; Hwang et al., 2012; Lippi Bruni et al., 2016). The percentage of inappropriate ED visits varied from 20% to 76.8% (median, 57%; mean, 55.9%). Italy reported the lowest percentage, and SA reported the highest percentage of inappropriate ED visits. Some studies included in this review reported the increase in the percentage of non-urgent visits. For example, D'Avolio et al. (2013) showed that non-urgent visits increased by 23.1% between 1997 and 2007, while another study (Rowe, 2020) reported that the percentage increased by 65.2% between 1990 and 2007. Both these studies were conducted in the US. Non-urgent ED visits was also reported in China (Jiang et al., 2020) (between 32% and 50%), France (Naouri et al., 2020) (between 20% and 40%), and Europe (Di Mauro et al., 2019) (40.9% in 2014).

2.4.3.2   Factors Contributing to ED Overutilisation

The studies selected for this research discussed the main factors that influenced patients' decision to visit ED or PC facilities with non-urgent problems. In order to conceptualise the factors which contribute to overutilisation, I divided the factors into four groups: patient characteristics, knowledge, behaviour and satisfaction. The factors for each study based on this categorisation are summarised in Table 6. Most of the articles discussed more than one group of factors, for example, some articles discussed factors related to both patient characteristics and patient behaviour or satisfaction.

2.4.3.2.1   Patient Characteristics

Different patient characteristics are discussed in this section, such as age, gender, marital status, employment status, insurance coverage, level of education and/or number of family numbers. Twenty-two of the reviewed studies discussed the characteristics of the patients who attended one or both facilities (Almeida and Vales, 2020; Alyasin and Douglas, 2014; Backman et al., 2010; Barbadoro et al., 2015; A. J. P. Boeke et al., 2010; Buja et al., 2014; Burns, 2017; Chen et al., 2015; D'Avolio et al., 2013; Di Mauro et al., 2019; Fung et al., 2015; Hwang et al., 2012; Jiang et al., 2020; Kim et al., 2015; Lines et al., 2019; Lippi Bruni et al., 2016; Naouri et al., 2020; Philips et al., 2010; Rowe, 2020; Scapinello et al., 2016; Schumacher et al., 2013; Uscher-Pines et al., 2013). Some of them discussed the patients' characteristics in detail, while others only mentioned a few characteristics.

2.4.3.2.1.1   Education and Income

Education is an important factor that associated with non-urgent use of ED. The higher the level of education of the patient, the more knowledgeable she/he is about where to go for treatment. In a study of 350 patients in SA in 2014, Alyasin et al. reported that people with a lower education level had a higher likelihood of inappropriate ED visitation. In their study, 70.1% of the patients had a high school degree or a lower degree and only 27.7% had higher degrees (Alyasin and Douglas, 2014). Similarly, another study of 545 patients conducted by Jiang et al. in 2020 showed that a higher number of individuals with low education level presented to the ED with non-urgent complaints (62.02% with a high school or lower degree and 37.98% with a college or higher degree) (Jiang et al., 2020).

Income has been linked with the level of education: a greater level of education is associated with increased income, which consequently affects the choice of care (Jiang et al., 2020). A study conducted by Kim et al. (2015) on patients who visited the ED in 2015 showed that most of the non-urgent patients who visited the ED were from low-income groups. Similarly, in the systematic review of Uscher-Pines et al. (2013), two of the included articles reported that individuals with low income were more likely to make non-urgent ED visits. Moreover, some researches argued that a high percentage of individuals who inappropriately visited EDs were not employed; 76.19% (Barbadoro

et al., 2015) and 41% (Schumacher et al., 2013). The lack of employment might indicate that the ED saw patients from younger age groups, as discussed below.

2.4.3.2.1.2 Age

Several studies have found that young patients comprise a higher proportion of non-urgent patients presenting to the ED. Among the 30 studies that were included in this research, 14 found that younger patients (18 to 40 years) accounted for the majority of non-urgent ED visits (Almeida and Vales, 2020; Barbadoro et al., 2015; A. J. Boeke et al., 2010; Buja et al., 2014; Chen et al., 2015; Fung et al., 2015; Hwang et al., 2012; Lines et al., 2019; Naouri et al., 2020; Philips et al., 2010; Scapinello et al., 2016; Schumacher et al., 2013; Uscher-Pines et al., 2013). In contrast, the number of PHC visits appears to increase with age.

The reasons for the increased utilisation of ED services among younger age groups are complex. Some studies have suggested that parental concern for young patients and the influence of parents on young adults may play a role. For example, in Alyasin and Douglas (2014), 50.6% of the patients who attended EDs in SA reported that their decision to seek care was influenced by family members. A similar finding was reported by Philips et al. (2010) in a Belgium study: 86.6% of the patients who attended EDs stated that their decision to visit the ED was influenced by a family member. Similarly, Schumacher et al. (2013) reported that 32% of patients in the US visited EDs for non-urgent conditions because of the influence of family or friends. The variation in these percentages between different studies might be attributable to cultural differences, but the underlying reason seems to be common, that is the influence of family or friends in the decision to visit the ED.

2.4.3.2.1.3 Gender

There was no agreement between articles with regard to the effect of gender on ED overutilisation. Seven articles claimed that men were more likely than women to visit the ED for non-urgent concerns (Barbadoro et al., 2015; Buja et al., 2014; Hwang et al., 2012; Kim et al., 2015; Lippi Bruni et al., 2016; Philips et al., 2010; Uscher-Pines et al., 2013), while eight articles reported an opposite trend (that is, women were more likely than men to visit the ED for non-urgent cases) (Almeida and Vales, 2020; Alyasin and Douglas, 2014; Chen et al., 2015; D'Avolio et al., 2013; Jiang et al., 2020; Naouri et al., 2020; Schumacher et al., 2013; Uscher-Pines et al., 2013). However, the range of percentages quoted is very small, range between 2-5%.

2.4.3.2.1.4 Insurance

We found that in seven studies, patients with no insurance would use the ED as the first option for non-urgent visits (Chen et al., 2015; Kim et al., 2015; Lines et al., 2019; Naouri et al., 2020; Philips et al., 2010; Rowe, 2020; Schumacher et al., 2013). Some researchers have argued that patients with private insurance are less likely to utilise the ED for non-urgent reasons than patients with public insurance (Chen et al., 2015; Lines et al., 2019). Similarly, Lines et al. also found that

patients with private insurance were less likely to visit the ED without first consulting with a PC provider (Lines et al., 2019). However, Naouri et al. (2020) reported that 86.7% of ED visitors with non-urgent cases had public health insurance but still visited the ED. These inconsistent findings are also reflected in the systematic review by Pines et al. (Uscher-Pines et al., 2013): two of the included articles mentioned that uninsured patients were more likely to make non urgent visits to ED (Campbell et al., 1998; Shesser et al., 1991), while two others confirmed the opposite trend, that is, the uninsured were less likely to have non-urgent ED visits (Cunningham et al., 1995; Rubin and Bonnin, 1995).

2.4.3.2.1.5   Health Status

Another important factor identified by ten of the studies was prior health status. The majority of the patients who attended the ED with non-urgent cases had no chronic diseases (Barbadoro et al., 2015; A. J. Boeke et al., 2010; Jiang et al., 2020), had a lower comorbidity burden (Hwang et al., 2012) but had poor health (Uscher-Pines et al., 2013), and clinical problems of a longer duration (Barbadoro et al., 2015). In contrast, Schumacher et al. reported that 69% of patients who attended the ED for non-urgent cases in the US had with one or more chronic diseases (Schumacher et al., 2013).

Unlike Schumacher et al., Fung et al. (2015) reported that having a chronic disease that requires regular medication is one of the factors that drives patients to have a regular PC physician in Hong Kong. The reasons for these inconsistent findings across studies could be attributable to differences in the healthcare systems between countries in terms of how they manage patients with chronic diseases and provide diverse services such as curative and preventive care. Accordingly, some researchers have argued that ED patients were hospitalized more frequently than PC patients due to the absence of regular care providers (Backman et al., 2010; Schumacher et al., 2013). This is because accessibility to a regular care provider can ensure that the condition of patients with chronic disease is under control (Fung et al., 2015).

2.4.3.2.1.6   Timings/Shifts/Opening Hours

Five articles included in this review discussed access to ED based on the impact of opening hours of PC centres. Researchers have measured the percentage of non-urgent visits that occur during day and evening shifts and found that a high proportion of non-urgent visits occurred during the day (08:00 to 16:00 or 20:00) (Almeida and Vales, 2020; Buja et al., 2014). For instance, Alyasin and Douglas (2014) reported that over half of their patients arrived during the day, and Naouri et al. (2020) also showed that 74% of patients with non-urgent cases visited during the day. In addition, the study conducted by Miyazawa et al. (2019) indicated that 63.6% of visits to the ED during the day (08:00 to 17:30) were inappropriate. The policy at the hospital where they conducted the study was that patients who visited ED during the daytime hours get consulted by a general medicine

practitioner. The remaining 36.4% who visited between 17.30 and 22:00 (when out-of-hours clinics are open) were attended to by ED doctors.

2.4.3.2.2 Knowledge

Nine articles described factors related to patients' knowledge about different services provided by PC facilities (Bahadori et al., 2020; Barbadoro et al., 2015; Jiang et al., 2020; Miyazawa et al., 2019; Naouri et al., 2020; O'Cathain et al., 2016; Philips et al., 2010; Uscher-Pines et al., 2013; Verhaegh et al., 2019), such as patients' awareness about PC clinics, opening hours, GP on-call service and other services provided. In the following section, I will describe the factors related to knowledge.

2.4.3.2.2.1 Knowledge about Alternatives

Only two articles out of eight reported that the majority of the patients, that is, 85.5% in one study (Barbadoro et al., 2015) and 50% in the other (Miyazawa et al., 2019), were knowledgeable about the opening hours of PHCCs or other clinics. Five articles mentioned that patients were worried about which department to visit for their condition (Jiang et al., 2020; Naouri et al., 2020; Northington et al., 2005; O'Cathain et al., 2016; Philips et al., 2010). Another study reported that the lack of knowledge about out-of-hours clinics and GP on-call services caused 60.3% of patients to visit the ED (Philips et al., 2010). However, Bahadori et al. (2020) indicated that being knowledgeable about services other than EDs and PHC working hours does not seem to result in a reduction in inappropriate ED visits. They pointed out that both of the following are important; an awareness in patients about whether their condition was urgent and also an awareness of the main duties of clinics that provide care to non-urgent cases.

2.4.3.2.3 Behaviour

Twenty-seven articles discussed factors related to patients' behaviours which affect inappropriate use of ED services (Almeida and Vales, 2020; Alyasin and Douglas, 2014; Backman et al., 2010; Bahadori et al., 2020; Barbadoro et al., 2015; Buja et al., 2014; Burns, 2017; Chen et al., 2015; Cross et al., 2017; D'Avolio et al., 2013; Di Mauro et al., 2019; Fung et al., 2015; Hwang et al., 2012; Jiang et al., 2020; Kim et al., 2015; Lines et al., 2019; Lippi Bruni et al., 2016; Miyazawa et al., 2019; Naouri et al., 2020; O'Cathain et al., 2016; Philips et al., 2010; Rowe, 2020; Scapinello et al., 2016; Schumacher et al., 2013; Uscher-Pines et al., 2013; Verhaegh et al., 2019; Whittaker et al., 2016). The lack of a regular PC provider was identified as a reason why some patients use the ED to access healthcare services. In fact, some patients reported regularly using the ED as their main healthcare provision centre. Some of the reasons cited for inappropriate utilisation of EDs included convenience, better round-the-clock access, availability of skilled personnel and better access to diagnostic tests. Length of symptoms, patients' self-rated health condition (that is, whether they think their case is urgent), distance to healthcare centres and time to access services were also important factors that influenced ED utilisation.

2.4.3.2.3.1   Cultural Norms and Personality

The beliefs, emotions and response patterns of patients have been found to influence their healthcare behaviour (Uscher-Pines et al., 2013), and patients who frequently visit EDs for non-urgent cases seem to have similar beliefs. There is some evidence to suggest that frequent ED visitors for non-urgent cases usually have no regular PC provider (PCP) (Buja et al., 2014; Philips et al., 2010). For example, Alyasin and Douglas showed that 95.1% of ED visitors did not have contact with a PCP before visiting the ED, and 86.9% (n = 304) did not have a regular PCP (Alyasin and Douglas, 2014). In agreement with these findings, another study showed that individuals with a regular PCP were 50% less likely to have visited emergency service centres or have been hospitalized, and those without a PCP provider were more likely to visit an ED (Fung et al., 2015). On the other hand, O'Cathain et al. (2016) reported that over 70% of ED patients were able to see a GP within 48 h but still visited the ED because they did not want to wait.

The relationship between PC availability and utilisation of ED is complex. Some studies have suggested that most people use EDs as a gateway to access healthcare by themselves without referrals (Alyasin and Douglas, 2014; Miyazawa et al., 2019; Scapinello et al., 2016). They showed that this group of patients, even though they had an option to access PC or other healthcare clinics, still preferred ED services over these other services (D'Avolio et al., 2013; Scapinello et al., 2016). A study showed that only 8.7% of patients were referred to ED for additional care, and most patients attended the ED for non-urgent reasons without referrals (Scapinello et al., 2016). Schumacher et al. (2013) also showed that patients who sought non-urgent care at EDs were usually unable to access a doctor's office on time. Accordingly, many patients who visited the ED with symptoms had been experiencing the symptoms for more than 24 h and even up to several days in some cases (Alyasin and Douglas, 2014; Naouri et al., 2020). Table 4 summarises some of the reasons why patients choose the ED over PC services.

Table 4. Reasons for Patients' Inappropriate Use of ED Services

2. (Alyasin and Douglas, 2014) 25. (Philips et al., 2010) 27. (Schumacher et al., 2013) 4.2 (Bahadori et al., 2020)	Convenience, ease of access (round-the-clock services) on the same day and without an appointment
2. (Alyasin and Douglas, 2014) 4.2 (Bahadori et al., 2020) 10.2 (Miyazawa et al., 2019)	Access to investigations such as blood tests and X-rays
25. (Philips et al., 2010) 10.2 (Miyazawa et al., 2019)	Competence of personnel or desire for treatment by a specialist
10. (Burns, 2017) 27. (Schumacher et al., 2013) 31. (Uscher-Pines et al., 2013) 1.2 (Jiang et al., 2020) 4.2 (Bahadori et al., 2020) 10.2 Miyazawa A. et al	Belief that their case was so serious that they could not wait for other services and had to visit the ED
10. (Burns, 2017) 25. Philips H. et al	Proximity to the ED
27. (Schumacher et al., 2013) 4.2 (Bahadori et al., 2020) 10.2 (Miyazawa et al., 2019)	An environment where patients feel like they get better care and higher priority for hospitalisation or referral to other departments
3. (Backman et al., 2010) 2.2 (Naouri et al., 2020) 4.2 (Bahadori et al., 2020)	Free services at EDs
2. (Alyasin and Douglas, 2014) 4.2 (Bahadori et al., 2020)	Overcrowding in other departments such as outpatient clinics
10.2 (Miyazawa et al., 2019)	Inability to take time off from school or work during the day
37. (O'Cathain et al., 2016)	The absence of good structure (unavailability of continuity of care for patients after discharge from the ED) for the integration of ED and other services, such as community beds, community nursing, mental health services and social services, as well as poor access to other services such PC and out-of-hours clinics in a timely manner

2.4.3.2.4 Satisfaction

Fourteen articles discussed patients' satisfaction with PC services (Alyasin and Douglas, 2014; A. J. Boeke et al., 2010; Burns, 2017; Cowling et al., 2018; Cross et al., 2017; D'Avolio et al., 2013; Jiang et al., 2020; Lines et al., 2019; Miyazawa et al., 2019; Naouri et al., 2020; O'Cathain et al., 2016; Philips et al., 2010; Uscher-Pines et al., 2013; Verhaegh et al., 2019). In these articles, patients shared their opinion about different services provided by PC centres with regard to their opening hours, appointment system and diagnostic tests. Some articles also discussed physician practice, communication, cultural barriers and continuity of care.

2.4.3.2.4.1 Primary Care Service and Satisfaction

Poor access to other healthcare facilities or not receiving the treatment needed in a timely manner leads to inappropriate use of ED services, as patients' behaviour with regard to choosing which healthcare service to access is based on their previous experiences. Based on this finding, Alyasin and Douglas suggested that ED users were likely to be the least satisfied with PC services. They also reported that patients who visited the ED were mostly neutral towards (40.6%, n = 142) or dissatisfied (31.1%, n = 109) with PHCC services, while 44.6% felt that the ED provides better care than other healthcare services (Alyasin and Douglas, 2014). This was confirmed by Redstone et al., who reported that 60% of ED patients with non-urgent conditions felt that the ED was more convenient than their PCP (Redstone et al., 2008).

One of the main reasons for dissatisfaction with PC services is difficulty with making appointments. The patients of one study mentioned that they had to wait several weeks and, in some cases, up to one month to be seen by a PC physician (Alyasin and Douglas, 2014; Behr and Diaz, 2016; Brim, 2008; D'Avolio et al., 2013; Doran et al., 2014; Jiang et al., 2020; Lines et al., 2019; Milbrett and Halm, 2009; Naouri et al., 2020). Some of the more specific issues related to making appointments were poor telephone communication, long phone queues, not receiving return calls, frustration with the appointment system, long waiting lists and restricted opening hours (Alyasin and Douglas, 2014; D'Avolio et al., 2013). Additionally, three articles reported the lack of diagnostic facilities at PC centres as one of the factors driving the inappropriate use of ED services (up to 70%, as reported by Miyazawa et al.) (Jiang et al., 2020; Lines et al., 2019; Miyazawa et al., 2019). Some of the other reported factors are poor satisfaction with PHCC physicians' diagnostic and referral practices, inappropriate prescription patterns, poor communication and cultural barriers (like language), poor continuity of care, and unavailability of doctors or consultations with a physician other than the one booked (D'Avolio et al., 2013; Naouri et al., 2020; Philips et al., 2010).

2.4.3.2.4.2 Previous Healthcare Experiences

Familiarity with healthcare systems based on prior experience may exert a large influence on ED usage. In this regard, Alyasin and Douglas noted that patients who regularly visit the ED become frequent users. For example, of the 350 patients in their study, half of them visited the ED more than three times a year, with 24.3% of them visiting the ED more than five times in a year (Alyasin and Douglas, 2014). Philips et al. also suggested that patients who are not registered with PC centres tend to return to the ED for non-urgent conditions (Philips et al., 2010). In contrast, D'Avolio et al. (2013) reported that the majority of the participants who visited EDs did have a regular PCP. The authors suggested that these patients might not have fully experienced the PC services and used EDs for referrals to other facilities or departments. They also pointed out that patients often misunderstood the urgency of their condition and felt that they needed to be seen immediately, and this drove them to seek care in the ED. As discussed in the knowledge section above, patients need to be educated about the urgency of their condition and when/where to seek healthcare.

2.4.3.3 Interventions to Reduce ED Utilisation

Seven articles in this review have discussed interventions to improve access to PHC services and patients' satisfaction with both PHC and ED services as means of reducing the utilisation of EDs for non-urgent cases. Most of these studies described the development and pilot/small-scale evaluation of interventions (Adeniji and Mabuza, 2018; A. J. Boeke et al., 2010; Cross et al., 2017; Kim et al., 2015; Lines et al., 2019; Lippi Bruni et al., 2016), and only one paper described a country-wide evaluation of an intervention (Cowling et al., 2018).

2.4.3.3.1.1 Appointments and Opening Hours of PHCCs

Some previously published studies discussed below suggested that extending the opening hours of PC centres may reduce inappropriate use of EDs. In 2016, the opening hours of PHC facilities in the Emilia-Romagna Region of Italy were extended in order to ensure a daily coverage of up to 12 h, and this led to a 10% to 15% decrease in potentially inappropriate ED visits (Lippi Bruni et al., 2016). Alternatively, Cowling et al. (2018) mentioned that improving the experience of making appointments with GPs without extending the hours of service (implemented from 2011 to 2014) led to an increase in satisfaction and reduction in the rate of inappropriate ED utilisation.

2.4.3.3.1.2 Telephone Triage

In 2018, Cape Town (Adeniji et al.) implemented a telephone triage system to tackle the increase in non-urgent visits in their EDs. Patient were offered a telephone consultation to determine if they needed face-to-face care and were directed to alternative providers if appropriate. However, there are no reported findings for whether this reduced ED utilisation (Adeniji and Mabuza, 2018).

2.4.3.3.1.3   Patients' Referral from the ED to PHCC Services

Another promising intervention is to refer patients who visit the ED to PC centres, so as to improve their knowledge about other healthcare services and decrease their likelihood of choosing the ED for non-urgent care in the future. Studies have shown that this strategy improves satisfaction with these services among patients (A. J. Boeke et al., 2010; Cross et al., 2017; Kim et al., 2015). For example, A. J. Boeke et al. (2010) showed that patients with non-urgent conditions who received this intervention were successfully transferred to GP care. As a result of this intervention, there was an increase in the percentage of patients who were treated within 20 min in the ED (from 20.1% to 55.8%), as well as an increase in the percentage of patients who received treatment within 1 h (from 57% to 80.1%). Follow-up of these patients showed that they were more satisfied with the new care method in terms of reception, treatment provided by the nurses, treatment provided by the doctor, emotional support, autonomy, information, access and aftercare.

2.4.3.3.1.4   Improving the Structure of PHCCs

Another research (Lines et al., 2019) focused on investments in primary workforce capacity building, including programmes to recruit and train more physicians, nurses and behavioural healthcare providers for PHCCs. This intervention could enable the care of more new patients without affecting the quality of the healthcare services provided.

Table 5. Summary of the Included Studies

References	Country	Study Design/Data Collection Methods	Aim/Objectives	Sample Size	Sample Description and Setting	% of non-urgent usage
(Alyasin and Douglas, 2014)	SA	Cross-sectional survey	To examine the reasons for non-urgent visits to a Saudi ED and factors associated with patient perceptions of urgency.	350 patients	Non-urgent adult patients who attended a large tertiary government hospital ED in Riyadh, Saudi Arabia, triaged as CTAS level IV or V.	76.8%
(Backman et al., 2010)	Sweden	Prospective cohort study	To describe and to analyse factors influencing subsequent healthcare contacts within 30 days following a non-urgent ED visit or an unscheduled PC visit.	323 PC patients/404 physicians, 105 ED patients/124 physicians	(Stockholm study) Included low-risk patients aged 20–80 years who had contacted one of the eight PC centres within the previous 24 h, or had gone directly to the ED without a written referral from a general practitioner. Excluded patients who were suffering from dementia or were under the influence of alcohol. The physicians were asked to complete a self-administered questionnaire about their assessment regarding the appropriateness of the patient's level of care and the medical risk of any delay before the examination.	NA

References	Country	Study Design/Data Collection Methods	Aim/Objectives	Sample Size	Sample Description and Setting	% of non-urgent usage
(Barbadoro et al., 2015)	Italy	Analysis of an administrative database for hospital readmission and a closed-ended survey.	To evaluate socio-economic factors associated with poor PC utilisation by studying two specific subjects: the hospital readmission rate and the use of the ED for non-urgent visits	26,627 patients from database, 504 patients surveyed	A sample of patients aged ≥18 years enrolled at the ED of the 900-bed teaching hospital of Ancona, Italy	NA
(A. J. Boeke et al., 2010)	Amsterdam	A before and after comparative study	To determine whether a new care method consisting of the involvement of a GP during the day with the staff of the accident and emergency department of an academic city hospital and application of the Netherland's triage system by a practice nurse is more effective than usual care	1527 patients	Patients attending the ED of VU University Medical Center without a referral, those arriving by ambulance, or those who were mentally impaired on weekdays	70%
(Buja et al., 2014)	Italy	Secondary data/Hospital-recorded linkage database	To analyse the characteristics of accident and emergency department (A and E) access, process management and outcome after grouping patients by their citizenship	35,541 patients	Adult patients (18–65 years) accessing the A and E of a local public healthcare agency in north-east Italy	48%
(Burns, 2017)	USA	Systematic review	To identify factors that frequent users state as their reasons for using an emergency department	9 articles	Systematic review searched for in CINAHL Plus and PubMed of studies that met the inclusion criteria	

References	Country	Study Design/Data Collection Methods	Aim/Objectives	Sample Size	Sample Description and Setting	% of non-urgent usage
(Chen et al., 2015)	USA	Secondary data/ORS database	To estimate correlations between (1) Travel distances and observable sociodemographic characteristics and (2) Measures of non-urgent ED use or frequent non-urgent ED use.	6,592,501 patient visits	All ED visits for all age groups in South Carolina between 2005 and 2010	
(D'Avolio et al., 2013)	USA	Mixed-method descriptive design	To understand why older adults with non-urgent illnesses utilise the ED and their experiences in accessing PC	62 patients	Older adults (65–90 years) who presented to an inner city ED for non-urgent care	Increase in non-urgent visits by 23.1% between 1997 and 2007
(Hwang et al., 2012)	Canada	Retrospective cohort design/Database access	To explore the impact of free clinic (which serves patients not served by Medicaid or Medicare and do not have private health insurance) enrolment on the pattern of ED visits	99,576 visits by 52,010 patients	Uninsured patients aged 18 and above who sought care at three Virginia communities, comprising a total of five hospitals' EDs and four free clinics	75%
(Kim et al., 2015)	USA	Descriptive/Hospitals' database	To assess whether the Emergency Department–Primary Care Connect initiative of the Primary Care Coalition successfully	10,761 patients	Uninsured adults with low income and without a PC provider who visited the ED	50%

References	Country	Study Design/Data Collection Methods	Aim/Objectives	Sample Size	Sample Description and Setting	% of non-urgent usage
			linked low-income uninsured patients who visited the ED to a PC provider, initiating the establishment of a medical home and resulting in fewer subsequent visits to the ED		at any of the five hospitals in the county, and whose visits could have been avoided	
(Lippi Bruni et al., 2016)	Italy	Experimental/Intervention	To test whether extending the opening hours of practices to up to 12 h/day reduces the inappropriate utilisation of emergency services	NA	All PC physicians working in the Emilia-Romagna Region during the period 2008–2010	20%
(Philips et al., 2010)	Belgium	Semi-structured surveys	To quantify socio-economic determinants for choosing the general practitioner (GP) on call or the ED	640 patients visited the GP, 971 patients visited the ED	All patients who visited EDs or used the services of the on-call GP on weekends during the study period	
(Schumacher et al., 2013)	USA	Observational, cross-sectional study design	To examine the relationship between health literacy, access to PC and reasons for ED use among adults presenting for emergency care	518 patients	Adults ≥18 years of age presenting to an ED at an academic medical centre in an urban community	75%
(Uscher-Pines et al., 2013)	USA	Systematic review	To understand the factors influencing an individual's decision to visit an ED for a non-urgent condition	26 articles	Systematic review conducted between 1990 to January 2011 of studies that met the inclusion criteria	30%

References	Country	Study Design/Data Collection Methods	Aim/Objectives	Sample Size	Sample Description and Setting	% of non-urgent usage
(Adeniji and Mabuza, 2018)	South Africa	Review/Suggestion for an intervention	To provide a feasible solution (telephone triage) for a time-critical situation in healthcare delivery in South Africa	NA	NA	
(O'Cathain et al., 2016)	England	Mixed methods design/Ethnographic residual analysis	To identify factors affecting variation in avoidable emergency admissions that are not usually identified in statistical regression.	82 providers	Providers of a range of health and social services in emergency and urgent care system.	
(Cowling et al., 2018)	UK	Cross-sectional survey/HES database access	To assess the relationship of all A&E visits and emergency admissions in England with three measures of patient experience using the general practice patient survey (GPPS)	2 912 535 respondents from 8124 general practices	Patients aged at least 18 years old who have valid NHS numbers and have been registered with an English general practice continuously for the last 6 months	
(Cross et al., 2017)	Amsterdam	Experimental/Intervention	To find a solution to the high number of non-urgent visits to the ED, which presented a significant risk to patients and clinicians within the ED	NA	Non-urgent patients in the Sunshine Coast community who call the Queensland Ambulance Service (QAS) for assistance	
(Fung et al., 2015)	Hong Kong	Cross-sectional/Telephonic structured survey	To evaluate healthcare service utilisation rates, in particular, hospital emergency and secondary specialist services, among people who used different PC doctors in Hong Kong	3,148 patients	Adult patients who visited different PC centres in Hong Kong during the study period	57%

References	Country	Study Design/Data Collection Methods	Aim/Objectives	Sample Size	Sample Description and Setting	% of non-urgent usage
(Scapinello et al., 2016)	Italy	Retrospective study	To characterize patients sent from out-of-hours (OOH) service to the ED and to identify the most relevant predictors of referral to the ED	5217 patients	Patients between 18 and 65 years who contacted the OOH service, defined as any ambulatory visit, home (or nursing home) visit, or telephone consultation (made only by OOH physicians)	
(Whittaker et al., 2016)	UK	Analytical/Difference-in-differences analysis	To show evidence that improving access to PC by providing additional appointments outside of routine working hours reduces demand at emergency departments	56 PC practices with extended access (346,024 patients) and 469 PC practices with routine access (2,596,330 patients) vs. ED visits	Patients who used PC services or ED services across Greater Manchester during the study period	26.4% reduction in patient-initiated referrals to the ED
(Jiang et al., 2020)	China	Cross-sectional study/Survey	To explore the reasons for non-urgent ED presentations and identify individual characteristics that influence patients' ED use patterns in mainland China	545 patients	All patients who visited the ED of West China Hospital of Sichuan University with non-urgent conditions during the study period	32% to 50%

References	Country	Study Design/Data Collection Methods	Aim/Objectives	Sample Size	Sample Description and Setting	% of non-urgent usage
(Naouri et al., 2020)	France	Cross-sectional study/Survey	To explore the socioeconomic and territorial factors (i.e. territorial healthcare access) associated with inappropriate ED use based on data from a national survey of French EDs	29,407 patients	Patients ≥15 years old who had presented to an ED in France (excluding overseas territories), with the exception of patients with missing data for all three main measures of ED use appropriateness: caring physician's appreciation of appropriateness (numeric scale), caring physician's appreciation of whether or not the patient could have been managed by a general practitioner, and ED resource utilisation	20% to 40%
(Rowe, 2020)	USA	Analytical/Ecologic case study analysis	To compare and explain the geographic variance in Maryland's potentially preventable ED visit (PPV) rates for the total and uninsured populations	4 million ED visits	All patients who visited the EDs of Maryland, USA (data were collected by accessing three public data sources: ZCTA, Health Resources and Services Administration, and Census)	Increased by 65.2% between 1990 and 2007
(Bahadori et al., 2020)	Iran	Qualitative descriptive study	To explore the causes and consequences of non-urgent visits to emergency departments in	11 healthcare providers	Healthcare providers including eight nurses, two emergency medicine specialists and one emergency medicine resident working in the ED of one of the	

References	Country	Study Design/Data Collection Methods	Aim/Objectives	Sample Size	Sample Description and Setting	% of non-urgent usage
			Iran and suggest solutions from the healthcare providers' viewpoint		largest hospitals in Tehran, a territorial, military, and teaching hospital.	
(Di Mauro et al., 2019)	Italy	Systematic review	To examine if and how case management (a collaborative approach used to assess, plan, facilitate and coordinate healthcare services) programs are implemented to reduce the number of frequent user visits to the ED	14 articles	Systematic review covering the period between 2008 and December 2018 of studies that met the inclusion criteria	
(Verhaegh et al., 2019)	UK	Prospective, mixed-method observational and qualitative study	To evaluate the opinions of patients, their caregivers, ED physicians, and general practitioners on the preventability of an ED visit	200 cases	Patients ≥70 years of age who visited the ED in the Netherlands in the study period	31.2%
(Almeida and Vales, 2020)	Portugal	Analytical/Database access	To assess whether the specific PHC reforms adopted in Portugal this century, and in particular the creation of family health units (FHUs), had an impact on one of its stated objectives, which is the reduction of inappropriate utilisation of emergency services	117,391 visits to the EDs	All patients' visits registered in patient-level data from two non-urban hospitals in Portugal	

References	Country	Study Design/Data Collection Methods	Aim/Objectives	Sample Size	Sample Description and Setting	% of non-urgent usage
(Lines et al., 2019)	Massachus etts	Retrospective, observational, secondary data analysis	To identify the characteristics of insured Massachusetts residents associated with ED use for PC-treatable conditions, and compare such use for public versus private insurance	2,269,475 visits	Patients under the age of 65 who accessed the ED for conditions that could be treated by PC	
(Miyazawa et al., 2019)	Japan	Observational study and survey	To identify factors related to inappropriate ED use by comparing patients who sought medical care during regular consultation hours with those who visited EDs for out-of-hours care	231 patients	Adult ambulatory patients who visited the ED of Tsukuba Medical Center Hospital, Japan, between 17:30 and 22:00 on weekday evenings and patients who had an initial consultation with the department of general medicine during regular consultation hours on a weekday	

Table 6. Factors, Consequences and Interventions

References	Factors associated with ED overutilisation				Consequences of non-urgent attendance	Interventions to reduce non-urgent visits/Recommendations
	Characteristics	Knowledge	behaviour	Satisfaction		
(Alyasin and Douglas, 2014)	- Higher percentage of patients (54.6%, n = 191) arrived during the day (08:00–16:00) - Higher percentage of patients who attended the ED were married, female, and >60 years, and had lower levels of education	NA	- No regular primary healthcare provider (86.9%) - Use of the ED as a gateway to access healthcare (52.9%) - Regular ED visits for PHCC-treatable conditions (half of the patients visited the ED more than three times past year and 24.3% visited more than five times). - No contact with a PC provider before arriving at the ED (95.1%) - Duration of symptoms for more than 24 h in most ED visitors, with 34% having symptoms for up to one week - Decision influenced by family (50.6%)	Mostly neutral (40.6%; n = 142) or dissatisfied (31.1%; n = 109) with PHCC services for the following reasons: - Provision of better care by the ED than other healthcare services (44.6%) - Poor satisfaction with PHCC physician's diagnostic and referral practices, poor communication and cultural barriers - Difficulty in obtaining an appointment on the same day with the local PHCC: 1. frustration with the appointment system 2. poor telephone communication 3. long waiting lists	- Nursing and healthcare workforce shortages - Long waiting times	Recommendations: - Policy initiatives to improve access to and satisfaction with PHC services - Future emergency nursing research in this area to develop evidence-based interventions to reduce non-urgent use

			- Desire to receive care on the same day without an appointment (62.6%) - Decision based on convenience and access to round-the-clock medical care at the ED (62.6%) - Decision based on access to investigations such as blood tests and X-rays (37.4%)	4. restricted opening hours		
(Backman et al., 2010)	- Paediatric patients were more common among the PC visitors	NA	- More frequent hospitalization of ED patients than PC patients within the past 2 years - Shorter symptom duration before presenting at the ED - Probability of another ED visit higher in patients with a free care card and regular monitoring for chronic disease	NA	NA	Recommendation: To improve the flow of patients through the healthcare system and prevent unnecessary and unscheduled contact, it is important to provide information on how to contact healthcare services after an ED or PC visit, at the time of the visit.
(Barbadoro et al., 2015)	Higher non-urgent ED visits were noted in the following demographics: - Males	- 85.5% of the patients were knowledgeable about opening hours.	58.33% had independently decided to visit the ED (self-referral) or were	NA	NA	Recommendations: - Improving the continuity of care for the elderly

	- Unemployed individuals (76.19%) - Those without chronic diseases (50%) - Younger individuals - Patients with clinical problems of longer duration		influenced by relatives or friends.			- Early/automatic identification of patients at high risk of readmission, at the time of hospital admission and through the utilisation of administrative data
(A. J. Boeke et al., 2010)	Higher non-urgent ED visits were noted in the following demographics: - Those aged 25–44 years - Those with higher than intermediate education - Those without chronic diseases	NA	NA	- In the usual care method, 20.1% of all accident and emergency department patients had been treated within 20 min, and 57% had been treated within 1 h. In the new care method, 55.8% of all accident and emergency department patients received treatment within 20 min, and 80.1% received treatment within 1 h. - Patients were significantly more satisfied with the new methods in terms of reception, treatment provided by the nurses and doctors,	NA	Intervention: -A patient who checks in at the reception desk is immediately directed to the triage nurse, who directs the patient to either the GP or the accident and emergency department physician, according to Netherland's Triage System.

66

				emotional support, autonomy, information, access and aftercare.		
(Buja et al., 2014) 34,359	Non-urgent ED visits were higher in the following demographics: - Males - Patients with a mean age of 41.29 years - Italian nationals (84.85%) Most ED visitors arrived between 8:00 and 16:00 hours	NA	- Patients generally visited ED without having consulted a doctor first.	NA	- Using the ED for non-urgent visits is costly.	Recommendations: - Educate the whole population, including foreigners, to use the services of ED departments properly (A television advertising campaign is now underway in Italy to urge people to use this emergency service appropriately). - Offer people an alternative solution that is as convenient and accessible as the ED (an experiment is underway in Italy in which family physicians join forces to provide round-the-clock service, 7 days a week, to take care of non-urgent healthcare needs for all citizen groups).
(Burns, 2017)	- Majority of the frequent ED visitors arrived during the evening shift or the night shift	NA	- Frequent users experiencing a medical issue believed their case was serious enough to present at the ED.	- Patients were dissatisfied with limited access to other healthcare alternatives specially PCs.	NA	Recommendations: - Create educational programs for frequent ED visitors. - Using PC physician offices and clinics, frequent ED visitors could be provided information about the

67

			- Majority of the participants lived within walking distance of an ED. - Patients mentioned that they did not have to wait for an appointment at the ED.			differences between medical conditions that warrant a visit to the ED and those that may be more appropriate for a clinic or PC physician. - Develop a home program to identify those at risk for admission to the hospital and those who can receive care in their own homes. - Expand hours to include time periods and days not currently captured by the clinics and PC offices. This may improve access and reduce overcrowding of EDs. - Establish clinics near ED that operate for longer hours.
(Chen et al., 2015)	Inappropriate ED utilisation was observed in patients of - younger age - female sex - lower socioeconomic status These patients also lived in poorer counties	NA	- Patients with private insurance were less likely to choose the ED than non-insured patients or those with public insurance. - Patients for whom it was convenient (as measured by travel distances) to visit the ED were also more likely to	NA	Areas without PC clinics at the community health centre had a higher number of ED visits than those with such clinics [37].	NA

			visit for PC-treatable conditions.			
(D'Avolio et al., 2013)	Majority of the non-urgent ED visitors were - female - older - Black	NA	- Majority of ED visitors had a regular source of PC	Reasons for dissatisfaction with PC - Appointments needed to be scheduled several weeks to months in advance - Difficulties with the automated phone programs, such as confusing automated messages, long phone queues, and leaving voice messages and not receiving return calls - Healthcare system problems, such as non-functioning systems, unavailability of doctors or consultation with a physician other than the one booked	- Decreased quality of life and sleep difficulties as a result of poorly managed pain - Increase in anxiety, depression, and disabilities - Decrease in patient satisfaction with the healthcare system	NA
(Hwang et al., 2012)	Potentially avoidable ED visits were significantly higher among	NA	- Free clinic users were less likely to use the ED.	NA	NA	Recommendation: Increase recruitment efforts for mental health and dental care volunteers at free clinics.

	- Younger people (18–24 years) - People with lower comorbidity burden - Males - African Americans					
(Kim et al., 2015)	Patients who visited the ED for inappropriate reasons were - from low-income groups - not insured - aged 40–59 years - male	NA	When ED visitors were referred to a clinic (PC) and became familiar with the clinic, they were less likely to choose the ED to access healthcare for non-urgent cases.	NA	NA	Interventions: Patients had their names, dates of birth, and dates of ED service matched across the hospital, clinic, and patient navigator records. Those patients who had attended the ED for non-urgent cases and been transferred to a clinic by an ED provider were contacted after the referral during subsequent visits to the clinic.
(Lippi Bruni et al., 2016)	Males contributed more to inappropriate ED visits		Drop in potentially in appropriate ED visits ranged from 10% and 15%.			Intervention: Extended opening hours in the Emilia-Romagna Region in order to ensure daily coverage of up to 12 h and, thereby, reduce inappropriate ED attendance.
(Philips et al., 2010)	These patient groups were more likely to visit the ED: - Men	- 60.3% of patients who attended the ED were not knowledgeable	- Patients who were not registered with a GP used	Patients reported that they do not prefer PC because	NA	Recommendation: - Inform young people about the availability of GPs for out-of-

	- Individuals with an average age of 32.2 years - Those without insurance	about out-of-hours GP services. - Patients were not knowledgeable about on-call GP services.	the ED and tended to return to the ED. - 63.8% of patients reported going to the ED on their own or based on the suggestion of family members, without any referral or suggestion by a medical provider. - The main reasons mentioned by the patients to seek the ED over a GP were ○ Accessibility ○ Competence of personnel ○ Proximity ○ Round-the-clock accessibility ○ Walk-in consultation without the need for an appointment	they were not provided with a family doctor.		hours care and redirect patient streams, without diminishing quality of care.
(Schumacher et al., 2013)	The following characteristics were observed in non-urgent ED cases: - Mean age was 41 years - Majority were female	NA	Reasons for non-urgent ED attendance were as follows: - The majority of the patients believed they had an emergency that warranted an ED visit.	NA	NA	Recommendations: - Improve communication with patients on why PC is beneficial to them.

	- 34% had limited health literacy - 69% had one or more chronic diseases - 41% were not employed - 37% were not insured		- They did not consult a doctor or clinic on time. - They preferred the ED environment and felt like they received better care at the ED, which already had their records. - Ease of access to the ED - Walk-in consultation without the need for an appointment - Advice by family or friends			- Provide on-site payment options for patients whose presenting conditions are deemed non-urgent.
(Uscher-Pines et al., 2013)	The main factors associated with non-urgent ED visits were: - Younger age - Race (Black individuals were found to be more likely to make inappropriate ED visits) - Gender (women were more likely than men to have a non-urgent visit) (however, this finding was not	- Lack of knowledge about alternatives drove 76% of non-urgent ED users to choose the ED because they felt they would receive better care there.	- The majority of the patients (>80%) felt that their condition was urgent and they could not wait for treatment.	Reasons why patients do not seek PC providers for non-urgent cases: - Ease of accessing ED services - Convenience of accessing ED services - Poor access to a regular physician or healthcare - Limited access to physicians on weekends - Inability to get an appointment at a clinic	NA	NA

consistent across the included studies) - Lower income - Insurance (uninsured patients were more likely to use the ED for non-urgent visits) (however, this finding was inconsistent across the included studies) - Poor health status				- Dissatisfaction with their regular care provider		
(Adeniji and Mabuza, 2018)	NA	NA	NA	NA	NA	Intervention: Cape town implemented a telephone triage system to tackle the increase in non-urgent visits at their EDs. - They assessed the patients through a phone line, and advised them on what to do in cases where face-to-face care was not required. Otherwise, the patients were guided to other services. - During the assessment, the patients answered some questions about their health status and filled out a checklist containing

						questions about their health and symptoms.
(O'Cathain et al., 2016)	NA	Factors before ED admission: - Perceived poor accessibility to general practice (lack the knowledge of out-of-hours service was associated with higher emergency admission rates)	Factors during the ED visits: - Over 70% of all patients reported that they were able to see a GP in 48 h.	Factors after the ED visit: Patients' described the availability and actions of continuity of care services differed by case in terms of the complexity of the emergency and urgent care system, the schemes focused on facilitating discharge from emergency departments, the availability of resources and the level of integration between services	Factors during the ED visit: - Patients described how management within emergency departments varied by case in terms of availability of senior review. - Inexperienced doctors ordered multiple diagnostic tests so that patients had to wait a long time for the results. While patients waited for diagnostics, there was a risk of breaching the 'four-hour target' for waiting in an ED.	Recommendation: Discharge from EDs could be facilitated by timely access to services such as community beds, community nursing, mental health services and social services, especially out of the normal working hours of clinics.
(Cowling et al., 2018)	NA	NA	NA	- There was a significantly high association between reducing the numbers of ED visits and improving the experience of making appointments with a GP without extending the hours of service.	NA	NA

74

(Cross et al., 2017)	NA	NA	- 25% reduction in ED visits by Category 5 (non-urgent) patients - 30-min reduction in median case time for QAS - 500% increase in patients transported to GPs by QAS in comparison with the previous year's figures.	- >90% of the patients had a positive experience with Tier 1 GPs and Tier 2 Clinics after they were transferred	NA	Intervention: QAS patients are the primary target of the project, and clinical pathways have been developed to identify patients treatable by GPs rather than the ED. GPs are identified as either Tier 1 or Tier 2, and suitable patients are referred to or transported to one of these clinics rather than an ED. QAS first attempts transport patients to a Tier 1 GP, where one exists, and if unsuccessful, then QAS transports the patients to a Tier 2 clinic in the area. Tier 2 clinics have been contracted by the hospital (through a rigorous selection process) to accept these additional patients and have KPIs that must be met. Data are collected from QAS, Tier 2 GPs, the hospital and patients (through a post-care survey).
(Fung et al., 2015)	Factors associated with having a regular PC doctor: - Age 25–64 years - Married	NA	- 67.0% of patients with a regular family doctor had consulted their own family doctors for their last illness.	NA	NA	NA

	- Higher monthly income - Chronic diseases that need regular medication - Good health status		- The regular family doctor group had the lowest monthly illness rate (0.51); a minority (1.2% in 4 weeks) of this group needed in-hospital treatment; and 90% of the medical services were provided by PC. - Patients with a regular family doctor were 50% less likely than others to have visited the emergency service or have been hospitalized. - Patients with no regular doctor were significantly less likely to consult but more likely than others to visit emergency services (9.6%).			
(Scapinello et al., 2016)	Referrals from primary service to the ED were significantly more frequent in - Patients less than 18 years old and those more than 65 years old	NA	- Only 8.7% of the patients accessing out-of-hours services were referred to EDs. - Most patients (5511) chose to visit the ED for	NA	NA	Recommendation: Out-of-hours services that refer patients with more complications to an ED can help avoid inappropriate utilisation of EDs.

	- Patients with cardio-vascular diseases, traumas or gastrointestinal conditions		after-hours services without referrals.			
(Whittaker et al., 2016)	NA	NA	- There was a 26.4% relative reduction in patient-initiated referrals to emergency departments for minor problems. - There was an insignificant relative reduction of 3.1% in total emergency department use.	NA	There was a 26.6% relative reduction in healthcare costs	Intervention: - Additional appointments were provided by the intervention during the extended opening hours (152 appointments per 1,000 individuals). - The number of additional appointments varied between the intervention practices, from 10/1,000 monthly to 40/1,000 monthly. - In total, 65.1% (33,519/51,465) additional appointments were used.
(Jiang et al., 2020)	Most patients who visited the ED were: - in the age group 19–44 years - female - not married - unemployed - high school/lower-level graduates	- Patients reported that they visited the ED because they did not know which out-patient department was suitable for their condition.	Patients tended to visit the ED when: - They had symptoms for more than 72 h (42.94%) - They had one or more prior non-urgent ED visits (47.7%)	These were the reasons cited for visiting the ED: - Absence of radiology or laboratory tests in PC settings, difficulty in making out-patient appointments in busy general hospitals or absence of certain services	NA	NA

	- from lower-income groups - not diagnosed with chronic diseases		- They self-rated their emergency level as urgent and treatment was needed	(such as venous transfusion) in out-patient departments - Poor access to alternative services		
(Naouri et al., 2020)	Patients who visited the ED had the following characteristics: - Young age - Female sex - Public health insurance cover (87.5%) - Consultation during the typical outpatient care hours (08:00–20:00 hours) (74%)	- Anxiety about knowing where to consult and the possibility of seeing a doctor after working hours.	Factors affecting ED attendance: - Not having to pay for care when it is not an urgent case - Having had symptoms for several days - Poor or no supplementary health coverage	The following reasons were cited for visiting the ED: - Long waiting time to obtain an appointment with their GP - Lack of availability of the GP	NA	Recommendations: - Public awareness about unscheduled care services as well as public policies could be improved. - Opening hours of PC centres could be extended to the evenings and weekends.
(Rowe, 2020)	24% non-urgent ED visits in 2008 and 23% in 2009 were made by those without insurance	NA	About 2 million ED visits that did not result in hospital admission occurred annually in 2008 and 2009 in Maryland.	NA	NA	NA
(Bahadori et al., 2020)	NA	- Lack of knowledge and awareness about the definition of urgent conditions	Reasons for visiting the ED: - Provision of healthcare services all day on all days of the week	NA	- Patients' and employees' dissatisfaction - Increase in medical errors - Disruption of care provided to urgent and semi-urgent patients	Recommendations: 1. Regulatory plans - Giving authority to the triage nurses and EMSs

		- Lack of awareness about the main duties of clinics in providing care to non-urgent patients	- Provision of rapid care at EDs - Access to all diagnostic facilities - Availability of skilled personnel in EDs - Higher priority in EDs for hospitalisation or referrals to other departments - Having a relationship with workers at the hospital - Overestimating the urgency of conditions - free services provided by EDs - Inappropriate referrals - Overcrowding in other departments such as outpatient clinics	because of the increase in non-urgent patients - Unreasonable expectations with regard to receiving elective care - Financial burden - Overcrowding and increase in ED staff workload - Fatigue and burnout among ED employees - Reduction in staff efficiency and effectiveness - Conflict and violence between staff and patients	- Creating a culture of accountability among physicians for referring and admitting patients to EDs - Effective monitoring and evaluation of healthcare centres - Setting rules and regulations to prevent non-urgent visits 2. Awareness-raising plans - Increasing public and patients' awareness such as through schools, social networks, mass media, and EDs as well - Increasing non-ED physicians' awareness 3. Reforms in payment mechanisms - Developing an appropriate payment system such that patients are required to pay 30% to 40% of the total cost for non-urgent visits 4. Organisational arrangements - Setting up 24-h and mobile clinics - Improving the quality of care in other healthcare facilities

						- Strengthening para-clinical departments so that they can perform all diagnostic procedures - Strengthening the referral system
(Di Mauro et al., 2019)	The majority of non-urgent ED visits were males with mean age of 46 years	NA	- Regular ED visits for PHCC-treatable conditions (≥5 times a year and ≥3 times in 6 months).	NA	NA	Intervention: - The importance of telephone calls with patients is reported by the included studies to reduce inappropriate attendance to ED. It provides a constant presence as it enables an immediate access to the National Health System in case of emergency. - Implementation of nurse training programs, as a clear communication and the roles of nurses affected the frequency of ED visits.
(Verhaegh et al., 2019)	NA	Lack of knowledge about alternatives increased the ED attendance.	- 31.2% of ED visits were preventable, and more attendance were during office hours as compared to after office hours (34.4% vs. 19.0%).	- GPs delay in treatment made patients to visit the ED (10/37). - Low communication between GPs and specialists increased	Unavailability of appointments with a specialist on time, caused GPs to transfer patients to the ED (19/65).	NA

			- Patients called the ambulance instead of the GP (5/65).	patients' visits to the ED (12/72).		
(Almeida and Vales, 2020)	Non-urgent visits were significantly more common among: - Younger patients - Women - Patients who visited during the day	NA	Patients without assigned family physician were significantly have higher inappropriate utilization of EDs than patients with assigned family physician.	NA	Non-urgent visits increase the costs of EDs.	Recommendation: - Assigning family physicians could ensure more appropriate use of the ED.
(Lines et al., 2019)	- There was no difference between privately insured patients and publicly insured patients with regard to the prevalence of asthma, disability, diabetes, obesity - Neurological/developmental disorders were higher in patients with public insurance - Most visitors with private insurance were 45–64 years old, while those with public insurance were 1–17 years old.	NA	- Privately insured patients visited the ED less frequently than publicly insured patients - Privately insured patients were more likely to seek PC and would not go to the ED without a PC visit.	Dissatisfaction with PC was caused by: - Unavailability of appointments - Limited access hours - Unavailability of diagnostic machines and specialty care	NA	Interventions: - Increase in the capacity of PC centres to treat more new patients - Investments in primary workforce capacity building, including programs to recruit and train more physicians, nurses and behavioural healthcare providers for community healthcare centres

	- The average age of all the included patients was 32 years.					
(Miyazawa et al., 2019)	NA	- Half of the non-urgent ED visitors who consulted the ED after working hours were aware of an out-of-hours PC clinic provided by a municipal or local medical association.	The following behavioural factors affected inappropriate ED utilisation: - Desire to be cured quickly - Need for a doctor's opinion - Need for laboratory tests - Wanting to know whether the condition was serious - Desire for treatment by a specialist - Inability to take time off from school or work during the day - Previous ED visits - Symptoms for 24 h or more	- Unavailability of laboratory tests and x-ray facilities at different out-of-hours clinics led 70% of the patients to access the ED for inappropriate reasons.	NA	NA

Table 7. Quality Assessment According to MMAT Version 2018

1. Qualitative Studies

Reference	Screening Questions							Quality of the Study
	S1	**S2**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	
(Bahadori et al., 2020)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High

2. Quantitative Randomized Controlled Trials

Reference	Screening Questions							Quality of the Study
	S1	**S2**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	
(A. J. Boeke et al., 2010)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Lippi Bruni et al., 2016)	Yes	Yes	Yes	Not sure	Yes	Yes	Yes	Medium

3. Quantitative Non-randomized Studies

Reference	Screening Questions							Quality of the Study
	S1	**S2**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**	
(Adeniji and Mabuza, 2018)	Yes	Yes	Yes	No	Yes	Yes	Yes	Medium
(Cross et al., 2017)	Yes	Yes	Yes	Yes	Not sure	Yes	Yes	Medium

4. Quantitative Descriptive Studies

Reference	Screening Questions							Quality of the Study
	S1	**S2**	**4.1**	**4.2**	**4.3**	**4.4**	**4.5**	
(Alyasin and Douglas, 2014)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Backman et al., 2010)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Fung et al., 2015)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Scapinello et al., 2016)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Jiang et al., 2020)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Naouri et al., 2020)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Buja et al., 2014)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High

Reference	S1	S2	5.1	5.2	5.3	5.4	5.5	Quality of the Study
(Hwang et al., 2012)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Kim et al., 2015)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Whittaker et al., 2016)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Rowe, 2020)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Almeida and Vales, 2020)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Lines et al., 2019)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Barbadoro et al., 2015)	Yes	Yes	Yes	Yes	Yes	No	Yes	Medium
(Cowling et al., 2018)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High

5. Mixed Methods Studies

Reference	Screening Questions							Quality of the Study
	S1	S2	5.1	5.2	5.3	5.4	5.5	
(D'Avolio et al., 2013)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Philips et al., 2010)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Schumacher et al., 2013)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(O'Cathain et al., 2016)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Verhaegh et al., 2019)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Miyazawa et al., 2019)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Chen et al., 2015)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Burns, 2017)	Yes	Yes	Yes	Yes	Yes	Yes	No	Medium
(Uscher-Pines et al., 2013)	Yes	Yes	Yes	Yes	Yes	Yes	No	Medium
(Di Mauro et al., 2019)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High

2.5   Conclusion

Systematic searches were conducted across four bibliographic databases according to the search structure and subject headings. The published reviews between 2010 and January 2020 were screened based on the inclusion and exclusion criteria. After removal of duplicates, titles and abstracts were screened for relevance in the first stage and the full texts of the relevant studies were screened based on the eligibility criteria in the second stage. Quality assessment using MMAT was applied to each of the studies included in the analysis. This literature systemically reviewed 30 articles (using PRISMA and summary tables) that showed some evidence for EDs' overutilisation for non-urgent visits in different countries across the globe according to the study aims. Factors related to patient characteristics, behaviour, knowledge about alternatives of PHCC services, or patients' satisfaction with PHCCs have been addressed as influence of patients' decision to visit the ED or PHCCs. In addition, this review identified some examples of effective interventions applied by different countries that can possibly be applied in SA to reduce non-urgent ED attendance. Understanding the factors that affect patients' decision to access healthcare is important to be able to improve the quality and efficiency of healthcare services across SA.

Chapter 3

Methodology

3.1 Summary

Chapter 3 describes the methodological approaches used in this study to collect the data and answer the research questions. This includes the research design, population and sampling, development of the instrument, data collection procedures, and data analysis method. The reliability and validity of this research were also assessed.

The data were collected in July 2019 via a semi-structured questionnaire that was designed to collect demographic data and identify the factors that influenced the utilisation of ED and PHC services, based on variables such as patient characteristics, and their knowledge of, behaviour towards and satisfaction with PHC services.

Chapters 1 and 2 described the history of the ED and how it has been used over the years, the current structure of the SA healthcare system, and the challenges facing it. In addition, these chapters presented a comparison with healthcare systems in other countries and their interventions to tackle increasing utilisation of the ED for non-urgent visits. The SA healthcare system has been undergoing various changes in its healthcare policies and reforms. With the aid of the literature review, the researcher's aim was to better understand why the SA healthcare system still faces the issue of inappropriate utilisation of the ED even after the introduction of reforms. The present study uses face-to-face interviews with a semi-structured questionnaire, as it was considered as the best method to answer the research questions. In addition, the study data include observations made by the researcher during the interviews and administrative data that were collected from the included healthcare services.

3.2 Study Design

Fink (2017) defines surveys as a 'method for collecting data about individuals' feelings, beliefs, knowledge, and behaviour' (p. 2). Surveys are one of the most commonly used methods in the literature and can be conducted in various ways, such as by mail, telephone, fax, the internet and personal interviews (Fink, 2017; Sue and Ritter, 2012). For this study, an anonymous cross-sectional semi-structured survey was used to collect data from the participants. The survey was conducted via a face-to-face interview to ensure a high response rate in a timely manner.

Another purpose of using the survey approach is to generalise the findings from the study sample to the entire population (Cohen et al., 2013; Creswell, 2014). Thus, the inferences drawn from this

study regarding patients' knowledge about, behaviour towards and satisfaction with MOH services can be generalised to all patients who use these services in SA.

Research studies can use a longitudinal or cross-sectional design: longitudinal studies are conducted several times with the same or different participants over a certain period (e.g. weeks, months or years), while cross-sectional studies investigate the target population only once within a specific period (Cohen et al., 2013). The cross-sectional design was chosen in this research to limit its time and cost, as a longitudinal design entails higher cost and time.

In order to gain a better understanding of patient's choices I collected notes based on observations of patients who were being interviewed – some of these observations were incorporated in my analyses of the questionnaires (see observation section).

3.3 Questionnaire Development

We developed two questionnaires for this study. The questions were developed by reviewing the international literature on factors that influence PHCC and ED utilisation (Alyasin and Douglas, 2014; Philips et al., 2010; Porro et al., 2013; Safran et al., 1998) and factors that affect patients' satisfaction with PC services (PC sati. survey). In addition, the questionnaire was designed to understand patients' knowledge about PHC and ED services. This component of the questionnaire was developed by the researcher based on her knowledge of Saudi society and her MSc research. The questions were modified for use in the Saudi context and to answer the objectives listed in chapter 1. The questionnaires were translated into Arabic from English independently by Frequency Company and me. I then compared both sets of translated questionnaires and modified the Arabic text after discussion with the company. We identified only minor differences between these two independent translations. Before their use in the main study, we conducted a pilot study with the questionnaires on four employees of Frequency Company. Next, the questionnaires were piloted on a larger scale with 60 patients (see pilot section).

The questionnaires for both groups (those attending the ED and PHCCs) were similar but had minor differences. Both questionnaires comprised four sections: demographic questions, questions to measure patients' knowledge about PHCCs, questions about what factors determine whether the patients visit a PHC or ED (behaviour), and questions about patients' satisfaction with PHCC services for patients who visited both PHCCs and EDs (that is, those who have been registered with a PHCC and experienced the services).

The PHCC questionnaire contained 46 questions, and the ED questionnaire contained 48 questions. Two additional questions were included for patients visiting the ED to ascertain why they chose the ED: for example, 'If you knew that a PHCC could deal with your case for this visit, would you come to the ED?' and 'Do you have a pre-file in this hospital?' Some questions were ordered differently in the questionnaires because some ED visitors may not have been registered in a PHCC

and we needed to determine this (because within the Saudi healthcare system, prior registration with a PHC is essential for patients to use this service).

Most of the questions were binary-choice questions. Some questions were open-ended and allowed respondents to elaborate on their responses. Responses to questions in the satisfaction section were based as a Likert scale from 1 to 5 (see appendix 1).

3.4   Measures

On reviewing the previous literature on the factors that affect patients' decision to utilise different healthcare services, the researcher found that there are different perspectives about the factors affecting patients' decision. No published research has examined these factors from more than two perspectives in detail. Accordingly, the researcher built the questionnaire so as to be able to measure these factors from all these aspects, namely, patient characteristics, and their knowledge of, behaviour towards and satisfaction with PHC services.

3.4.1   Demographic Characteristics

Demographic data were reported by most of the studies included in the systematic review (table 6). The demographic characteristics included age, gender, educational background, employment status and marital status. The day, time and reason for seeking healthcare were also recorded by most studies. These questions are listed in the questionnaires in part A (demographic) in appendix 1.

These data collected from the questionnaires have been compared with the administrative data. Comparisons were made between groups that consulted EDs or PHCCs.

3.4.2   Health Status, Common Healthcare Practices and Reasons for Consultation

Patient behaviour is affected by cultural, economic and societal factors and differs between countries. Understanding these factors is crucial for any country that wants to implement interventions to improve access to healthcare. Other researchers have discussed some of these factors (Alyasin and Douglas, 2014; Philips et al., 2010).

The questions in the present survey sought information about health status, such as the presence of chronic diseases and mental health conditions. The patients were asked questions about their regular primary healthcare provider, where they usually go for healthcare, how many times they visited an ED or PHCC during the past year, and whether ED visitors had contacted a PHCC provider for the problem before visiting the ED. The questionnaire also investigated why patients chose to visit the ED or PHCC for their health problem, the duration of their symptoms, and who was involved in the decision to consult either service. These questions are listed in the questionnaires in part B (behaviour) in appendix 1.

The researcher also wanted to understand the behaviour of patients with regard to accessing the healthcare provider and what factors significantly affected the patients' decision.

3.4.3 Patients' Knowledge About PHCC Services

This section measured patients' knowledge and awareness about the different clinics available at all PHCCs, such as clinics for treating chronic diseases, dental health clinics, childhood clinics and dressing clinics. It also sought to ascertain patients' knowledge about the different services provided such as online appointment and phone triage. Additionally, knowledge about opening hours and out-of-hours service was also measured. No other research has measured knowledge-related factors in this context, so the researcher developed these questions by herself and tested their reliability and validity. These questions are listed in the questionnaires in part C (knowledge) in appendix 1.

3.4.4 Patients' Satisfaction with PHCC Services

There are no published studies that measure the relationship between satisfaction with PHCCs and non-urgent ED visitation. As discussed in chapter 1, PHC is the foundation of the healthcare system and plays an important role as a gatekeeper to other healthcare services in many countries. Therefore, dissatisfaction or satisfaction with the basic services provided by PHC may influence patients' decision to present to the ED with non-urgent cases.

Accordingly, our research sought to measure patients' satisfaction with PHCC services from ten different perspectives, namely, satisfaction with PHCC access, contextual knowledge, integration, communication, physical examination, interpersonal treatment, trust, convenience, preventive counselling and continuity of care. Each category contains different questions to evaluate all aspects of the services provided. These categories are described in detail in the questionnaire attached in the appendix, and Table 8 below summarises the categories. Similar to this study, Safran and colleagues also measured the performance of PHCCs with the help of the Primary Care Assessment Survey (PCAS) (Safran et al., 1998). The PCAS has excellent measurement properties, and performs consistently well across varied segments of the adult population. Their survey also asks questions about patients' financial means. However, these questions were not included in our study because all services provided by the MOH are free of charge in SA. These questions are listed in the questionnaires in part D (satisfaction) in appendix 1.

Table 8. Meaning for Satisfaction Categories

Satisfaction with PHCC access	The ability to have easy contact with the centre and to communicate with the healthcare provider, and the convenience of accessing the centre
Contextual knowledge	Knowledge of patients' history and what might worry them
Integration	Integration between PHCCs and other levels of providers, such as tertiary centres, to facilitate data exchange
Communication	Understanding all the symptoms of the patients and giving them enough time and attention
Physical examination	Thoroughness of patients' examination and medication, and improvement of patients' health
Interpersonal treatment	Friendliness, care and respectfulness of the healthcare providers and other staff
Trust	Patients' trust in healthcare providers and how satisfied they are with their experience
Convenience	Provision of adequate space for patients and hygiene at the centre
Preventive counselling	Counselling by physicians about habits such as smoking, diet and exercise
Continuity of care	Frequency of visits with PC physicians and availability of the same doctor at each visit

3.5   Study Setting

This study was implemented in Jeddah City, SA, at the ED of KFGH and three of its affiliated PHCCs. KFGH is one of the largest general tertiary hospitals run by the MOH, and contains 711 beds. It has 13 affiliated PHCCs. Located in the north of Jeddah, KFGH is one of the oldest and most crowded hospitals in Jeddah. The three PHCCs were selected based on their distribution in different neighbourhoods. The three centres are located in the north of Jeddah city, and information about their opening hours and whether reforms were introduced are presented in Figure 4. The results of this study can be generalised to other services under MOH but not to other governmental ministries. As the researcher discussed in chapter 1 MOH accounts for 60% of the overall services in SA. I also did not conduct a multi-centre study because of feasibility and practicality issues.

Figure 4. Opening Hours and Reforms of PHCCs
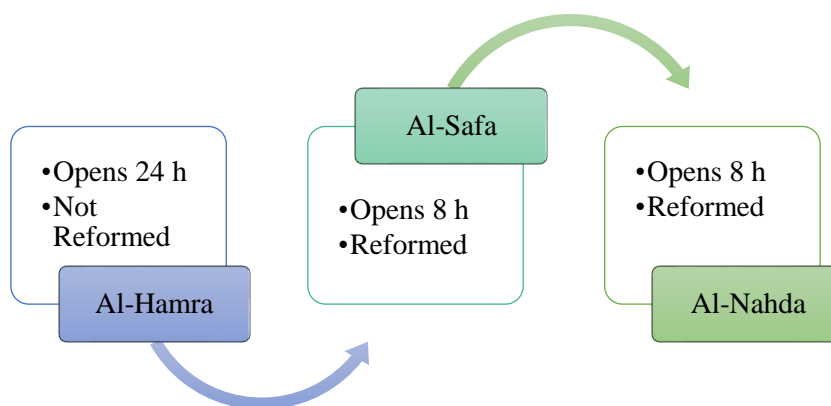
3.6 Data Collection

3.6.1 Data Collection at PHCCs

The data were collected from July to August 2019 at the three PHCCs during their opening hours. Patients were interviewed with the structured questionnaire based on previous studies and modified for this study (described in detail in section 3.3., questionnaire development). The patients were selected randomly for the interview after their consultations with their medical provider. Each patient who entered the centre was directed by the reception to a waiting area. We approached the patients, explained the research objectives and sought their consent. If the patients agreed to participate, we asked them to return to the waiting area when they finished their consultation. They were then interviewed individually in a private office within the centre.

3.6.2 Data Collection at the ED

All patients presenting at the ED were screened by the nurses to identify non-urgent cases. Randomly selected non-urgent patients were interviewed with a structured questionnaire. This questionnaire was similar to the questionnaire that was used for the PHCCs, with the exception of some questions that were tailored for the ED (as described in section 3.3.). Data collection was carried out in the same period, between July and August 2019. Data collection was carried out in two shifts—day and evening. Data were collected during both shifts so as to enable the comparison of patients who visited the ED when all PHCCs were open (day shift) and those who visited when most PHCCs were closed (evening shift). The difference in satisfaction towards PHCC services between patients attended during the two shifts were not considered as there was no major difference between them. The patients were interviewed after their examination by the treating physician. When each patient entered the ED, we explained the research concept and aims to them. If they consented to participate, we asked them to wait after their examination for the interview in a private area within the ED.

91

Data in both ED and PHCC were collected during summer season in Jeddah city. The weather in Jeddah city is usually warm (average of 35°C) during the year except for two months (January to March) the weather is cool (average of 23 °C). According to this weather there is no seasonality of diseases such as flu except for Hajj season. Most people go to Hajj they get the vaccines needed to not get infected. Therefore, there is no bias in collecting the data during the study period.

3.6.3   Collection of Supplemental Data

The data that we collected using the questionnaires were supplemented by anonymised routinely collected data from the IT departments of the ED and PHCC services. These routinely collected data included basic demographic characteristic of the patients, including sex, age and nationality. Moreover, for the ED visitors, data on the level of urgency are also recorded. Routinely collected data were available for four months, from May to August 2019, which coincided with the data collection period for the questionnaires. The researcher collected these data in order to understand the utilisation of the ED and PHCC by all patients during the period of data collection. This would allow us to compare the questionnaire sample with patients visiting the PHCCs and ED with regard to demographic characteristics (see result chapter 4.3.1).

3.6.4   Observation

The purpose of observation in some studies is to provide a deeper understanding of the situation and serve as an additional source of evidence to supplement information obtained in face-to-face interviews. By indirectly observing some of the patients who were being interviewed, I was able to get a better understanding of the factors that influenced their choice of services. Indirect observation can be used to 'analyse textual material generated either indirectly from transcriptions of audio recordings of verbal behavior in natural settings (e.g., conversation, group discussions) or directly from narratives (e.g., letters of complaint, tweets, forum posts). It may also feature seemingly unobtrusive objects that can provide relevant insights into daily routines'(Anguera et al., 2018). This part of the study was conducted by me between July and August 2019. My observations helped me to gain a clearer picture of the patient flows in the ED and PHCCs and aided me in the interpretation of the results. Information about the activity and layout of the ED was developed using process mapping (A4), flow chart (Figure 5 and 6) and bullet points to visually present the voice of the process (A4). The observations made during the study are described in the results presented in chapter 4.

3.7   Data Collectors

Eight research assistants were trained to collect the data and interview the patients by the researcher. The training took place over a week, and each interviewer was trained well to answer any questions that the patients may ask. The research assistants were employed by Frequency Company in SA—a private commercial organisation which provides data collection services for quantitative

and qualitative research. The interviewers collected the data using questionnaires developed by the principal investigator for this study. Once the interviews were completed, the data were uploaded to the company's secure servers. The information was password protected and was only accessible to the principal investigator and her supervisors. Saudi law on data protection does not include a provision that the data must only be held in SA. This means that the researcher was able to bring the data to the UK for analysis (see attached ethical approval from the Ministry of Health, SA, Appendix 2).

3.8 Translation

Language barrier is one of the important reasons why participants withdraw from a research (Frandsen-Thorlacius et al., 2009). The Arabic language is the mother tongue in SA. As this study was conducted in SA, we had to translate the questionnaires to Arabic so that they were clear and understandable for the participants.

The translators of the questionnaires were native Arabic speakers who were fluent in English. They had high-level writing skills in both languages and were familiar with the process of developing questionnaires. We followed Brislin (1986) back-translation method, with two translators involved in the process. The first translator was the researcher of this study, and the second translator was Frequency Company. Both translators worked independently to translate the English version of the questionnaires into Arabic. Then, an expert in both languages from Frequency Company, along with me, compared the translated versions and found no significant differences. A pilot study was then conducted to test the questionnaires and their translated versions.

3.9 Piloting and Language Check

Before the main study was started, we assessed the validity of the study and our procedures for identifying patients and obtaining their consent. We piloted the study on 30 ED patients and 30 PHCC patients. Based on the findings of the pilot, minor modifications were made to the questionnaires. The number of questions and the content remained the same, but we altered the order of questions, specifically the questions related to whether the patient was registered with a PHCC. If a patient visiting the ED was not registered with a PHCC, it would be inappropriate to ask questions about their view of PHCCs. Further, we edited three questions so that they could be more clearly understood in Arabic. Provision was also made for the interviewer to explain in more detail questions that the patient may not understand well. Each interviewer was trained well for each question, and the researcher examined them before the start of the research.

3.10 Study Population

The population of a study refers to all units that are suitable based on the study aim and that share similar characteristics, including individuals, shops, cars, drugs, etc. (Hair et al., 2019). The target population of this study was selected based on the following criteria.

3.10.1 Inclusion Criteria

This study included adult patients over 18 years of age who visited the ED with non-urgent cases classified as IV or V according to the Canadian classification used by the MOH in SA, and adult patients visiting the PHCCs.

3.10.2 Exclusion Criteria

This study excluded pregnant women, patients visiting the ED with a referral from PHCCs, patients under 18 years of age, illiterate patients, and patients who did not live in Jeddah and were tourists.

3.11 Sampling

A study sample is selected using probability or non-probability sampling approaches (Sue and Ritter, 2012). With the probability approach, the sample is selected randomly, and each unit in the population has a known probability of being chosen (Bryman, 2016; Creswell, 2014). Cohen et al. (2013) and Hair et al. (2019) stated that this approach is more likely to yield a representative sample, the findings of which can be generalised to a population with the same characteristics and nature. In contrast, non-probability approaches, Sekaran and Bougie (2016) opined that each unit does not have a known probability of being chosen and the findings cannot be generalised. The non-probability approach is mainly used in qualitative methods and is not suitable for this research.

Some researchers declared that several factors need to be considered when selecting a sampling method, such as the nature of the research, available resources, the aim of the research, and time and cost limitations (Hair et al., 2019). Accordingly, a simple random sample based on probability sampling was chosen for our study in order to avoid any selection bias.

Based on the nature of this research, the researcher decided to sample the visits made to each service. For ED, around 7000 visits were made per month, and for each centre, 2000 to 5000 visits were made per month. This is evident from the administrative data collected and presented in chapter 4. Based on these numbers, the total population was estimated as 22,000.

3.12 Sample Size

Because this is the first study of its kind in Jeddah, SA, I could not reliably calculate using statistical methods the minimum number of patients required to detect differences between patients in the ED and PHCCs. However, I discussed the choice of method for sample size calculation with statistician and research analyst Kalvin Mesias Balucanag, head of KJE Consultancy. If the non-urgent of patients' attendance rate for the ED is assumed to be 30% and that for PHCCs is assumed to be 10%, this would yield an odds ratio of 4.43 for the difference in dissatisfaction rate between the two groups. Assuming an alpha error probability of 0.05 and a power of 90%, a total sample of 110 would be sufficient. Because I expected large differences between the two groups of participants,

I believed that if I randomly surveyed a minimum of 150 participants in each group (ED and PHCC), I would have sufficient power to detect differences in behaviour, satisfaction and characteristics between the groups.

Sample size can be calculated based on a mathematical formula in probability sampling studies (Cohen et al., 2013; Sue and Ritter, 2012). Accordingly, we used Krejcie and Morgan (1970) table and determined that with a 5% confidence interval at a 95% confidence level, the sample size should be 377 patients.

Based on the above calculations, a sample of 410 patients who completed the interviews were included in this study. The sample size exceeds the calculated sample sizes mentioned above.

3.13 Satisfaction Score

Satisfaction was classified into nine domains: access to healthcare (7 items), contextual knowledge of the patient (2 items), integration (2 items), communication (6 items), physical examination (3 items), interpersonal treatment (3 items), trust (4 items), convenience (6 items) and general satisfaction (2 items). Each of the items was scored on a Likert scale from 0 to 5, with 0 indicating that the question is not applicable to the patient, 1 indicating poor, 2 indicating acceptable, 3 indicating good, 4 indicating very good and 5 indicating excellent. The overall score was calculated by adding up the score for the 9 domains and converting it to a 100-point scale. These methods are described by Safran et al. (Safran et al., 1998) and have been used by other researchers too (Epstein et al., 2005; Glasgow et al., 2005).

3.14 Knowledge Score

We used the method described above to calculate an overall score for knowledge of services. We could not find any study that measured patients' knowledge about PHCC services or allied healthcare services. Based on my knowledge of the SA healthcare system and my own MSc thesis, I believe that lack of knowledge about PHCCs is a factor that affects the use of EDs. The development of PHCCs in SA is relatively recent (as described in my introductory chapter), so understanding patients' knowledge about alternatives to the ED may shed light on the utilisation of the ED. The scale we developed covered patients' knowledge about primary healthcare services such as available services, location, opening hours, and how to access them. We developed four questions to assess this knowledge:

- Do you know which clinics are available in this PHCC?

- Do you know that some PHCCs of the MOH are open for more than 8 h a day?

- Do you know the working hours of this PHCC?

- Do you know what services are provided by the PHCCs?

Two of these questions required a Yes/No binary response that was scored as 0 (No) and 1 (Yes). The other two questions had multiple-choice answers and were scored differently. The response to the question 'Do you know which clinics are available in this PHCC?' was assigned a maximum point of 1, with the five clinics assigned a score of 0.2 each. According to how many of the five clinics the patient was knowledgeable about, the total score was calculated. Similarly, a total score of 1 was assigned to the question 'Do you know which services are provided by the PHCCs?' As the PHCCs provide three services, an individual score of 0.3333 was assigned to each one. The points for the responses to all four questions were added to calculate the knowledge domain score, which was converted to a 100-point scale.

3.15 Reliability Test

Reliability refers to the accuracy and consistency of the data obtained in a study and its replicability (Joppe, 2000). To ensure reliability, we conducted the pilot study to make sure that the questions were legible to both the interviewers and the interviewees.

In order to assess the internal consistency of the items under knowledge and satisfaction, I calculated Cronbach's alpha. In medical research, Cronbach's alpha is essential for testing multiple-item measures of a concept (Tavakol and Dennick, 2011).

Table 9 below shows that most categories for which we used the 100-point scale had a Cronbach alpha value above 0.5, which means that questions within the same category are related to each other. This implies that most of the patients' answers—within the same category—were related to one other. The only exception was the Cronbach alpha value for 'trust', which was below 0.5. This could be attributable to the demographic characteristics of the study population. The study carried out by Safran et al. (Safran et al., 1998) used the same research questions for satisfaction in a large sample size of 7,204 patients and found that all the scales well exceeded the established standard for internal consistency reliability for group-level comparisons (0.7) (Nunnally and Bernstein, 1994).

The questions for the knowledge domain have not been tested by any other study as they were established by the researcher. However, questions in this domain have generally scored well on reliability (Habidin et al., 2015).

Table 9. Reliability Test for All Patients

Reliability Statistics		Valid N	Cronbach's Alpha	Number of Items
Knowledge		410	0.834	4
Satisfaction	PHCC access	297	0.505	7
	Contextual knowledge of the patient	297	0.878	2
	Integration	143	0.936	3
	Communication	297	0.903	6
	Physical examination	297	0.773	3
	Interpersonal treatment	297	0.882	3
	Trust	297	0.458	4
	Convenience	297	0.875	6

3.16 Validity Test

Validity refers to 'whether or not the operational definition of a variable actually reflects the meaning of the concept'. In other words, it is an attempt to generalise the treatment and outcomes to a broader context and determine whether the study measures what it intended to measure (Wainer and Braun, 1988). By using a combination of semi-structured interviews, administrative data and observations, I was able to triangulate the data and hence obtain a degree of validity to my findings. The developed questionnaires were also reviewed by the two supervisors (Aneez & Maria) of this research, who are experts in the field. This is called the face validity method (Bryman and Bell, 2015; Sekaran and Bougie, 2016).

Further analysis using communalities was conducted to assess the validity of the knowledge domain questions. As shown in Table 10, the results for the four components of the knowledge domain indicate good representation of the variable. The indicated amount of variance in each variable that is accounted for is at least greater than 0.3. This means that each question has enough strength to be included in the study (Howard and Forehand, 1962; Nunnally and Bernstein, 1994). The validity of the questions in the satisfaction domain has been tested by Safran et al. (1998) and was found to be high.

Table 10. Factor Analysis for Validation for all Patients

Communalities	Initial	Extraction
Do you know which clinics are available in this PHCC?	1.000	0.621[a]
Do you know that some PHCCs of the MOH are open for more than 8 h a day?	1.000	0.409
Do you know the working hours of this PHCC?	1.000	0.334
Do you know what services provided by the PHCCs?	1.000	0.454

Extraction method: principal component analysis

3.17 Data Analysis

Most primary data generated from this study are quantitative. All the statistical analyses in this study were performed using IBM Statistical Package for the Social Sciences (SPSS) version 23, SSPS Inc., Chicago, Ill, USA. Descriptive statistics was used to define the characteristics of the study variables by using counts and percentages for the categorical and nominal variables and means and standard deviations for continuous variables.

A reliability analysis was used with a model of alpha (Cronbach) to study the properties of the measurement scales and the items that compose the scales, as well as the average inter-item correlation for the knowledge and satisfaction domains. A validity test was performed to further analyse the representativeness of the knowledge-related variables.

The chi-square test was used to determine differences in categorical variables (related to characteristics, knowledge, behaviour and satisfaction) between the ED and PHCC groups. For continuous variables which were normally distributed, the mean and standard deviation were calculated and the independent *t*-test was used to assess differences between groups. Welch's *t*-test (Lakens, 2015) was used as an alternative test (for data with non-normal distribution) for determining the correlation between variables represented by mean and standard deviation. To correlate the domains represented by means and standard deviation, Pearson's correlation coefficient was used. Since the dependent variable (usage of ED and PHCC) was defined as a binary outcome, a binary logistic regression model (BLRM), with backward conditional elimination (entry criterion = 0.05; elimination criterion = 0.10) was used to identify significant predictors in the knowledge and satisfaction domains with 95% confidence intervals (Laerd). Lastly, a conventional p-value of <0.05 was set as the criterion to reject the null hypothesis.

For the analyses of free text responses, an initial set of codes to describe the data were developed. Once the codes were critically discussed within the research team, they were categorised into broad themes. Using this technique we were able to reach a consensus on the themes and codes. These questions are 13, 14, 21, 30 and 37 for the ED questionnaire, and 13, 14, 21, 23, and 34 for the PHCCs questionnaire.

With regard to the observation data, the map of patient flow was drawn on an A4 paper, and the patient process for ED and PHCC acceptance or rejection was translated into a flowchart that is presented in chapter 4.

3.18 Ethical Considerations

In order to ensure that the research fulfils the ethical requirements of our institution, an application was submitted to obtain approval from the University of Manchester Research Ethics Committee (UREC) and the Directorate of Health Affairs, Jeddah, SA. The supervisory team and the researcher reviewed the study protocol, information sheets, consent forms and topic guides. Participation in the study was voluntary. An informed consent form explaining the purpose of this study was included in the data sheet packet (see appendix 1). All study data were confidential and used for the purpose of the study only. Approval was granted on 2019 (Appendix 2).

3.18.1 Informed Consent

Prior to agreeing to participate, the participants were provided with information about all aspects of the research. They were also assured that they could withdraw from the study at any point, without having to provide a reason for doing so, and without their care being affected. Participants were also informed about access to their anonymised data by the researchers.

All participants provided their written consent, and if for any reason they were unable to do so, verbal consent was obtained and audio recorded. In circumstances where participants were unable to

read or write in Arabic, the consent form was read aloud either in Arabic or their preferred language by me or the interpreter present at the time. Any questions were answered once a verbal summary of the information was provided.

3.18.2 Confidentiality and Data Protection

The Good Clinical Practice guidelines were followed when collecting and storing research data. Confidentiality was maintained by anonymising all the transcribed data, including any notes from field work, and any information that could identify the participants was removed. Each participant was assigned a study code, and this was not associated with any information that could make the participant identifiable. The linked data (i.e. study IDs and names) were stored separately from the anonymised data. This information was stored electronically and was password protected, and only the researcher had access to it. Wherever possible, field notes made either during or after the interview were anonymised during transcription, and any information that could identify the participant was removed.

Hard copies of the filled questionnaire and field notes were stored securely in a locked filing cabinet in a locked room. Further, consent forms were stored separately in a locked filing cabinet. All data will be stored for five years. A lone worker training course was undertaken by the researcher and the interviewers.

Although participation in this doctoral research involved minimal risk of harm, this research study was designed so as to minimise the research burden for participants and to allow flexibility in the ways in which data were collected. The participants could choose between a face-to-face or telephone interview. If the participant was distressed at any time point during the interview, the researcher checked with the participant about whether they should pause or stop the interview.

3.18.3 Dissemination and Data Sharing

Anonymised data will be disseminated through the publication of the PhD thesis, papers in scientific journals and conference presentations. A summary of the findings will be sent to the MOH in SA, and articles/blogs about the findings will be published in local media. I will also share the findings with local physicians, hospital administrators and policymakers.

After publication, the anonymised data will be available to researchers if they wish to validate the research findings. The data will be stored for five years to allow other researchers to access the anonymised data.

3.19 Conclusion

This study was implemented in Jeddah City, SA, at the ED of KFGH and three of its affiliated PHCCs. Anonymous cross-sectional semi-structured survey was used to collect data from the participants via a face-to-face interview. Alternative data from both services and observation were also considered. According on reviewing the previous literature the researcher built the questionnaire so as to be able to measure the factors from the four perspectives. The data were collected from July to August 2019, included all patients presented at both services who were randomly selected. After one week of training for eight research assistants to interview patients, data were collected. Back-translation method was used to translate the questionnaires from English to Arabic. Before the main study was started, we assessed the validity and reliability of the questionnaires, piloting were performed on 60 patients (30 ED patients and 30 PHCC patients). According to the inclusion and exclusion criteria of sample collection, 410 patients were interviewed from both services. Likert scale was used to measure satisfaction score, and a similar method was created in this study for knowledge score. Reliability and validity were calculated using Cronbach's Alpha and Factor Analysis (communalities). Chi-square test, independent t-test, and Welch's t-test were used to determine differences in categorical and continuous variables between the ED and PHCC groups. Pearson's correlation coefficient was also used to correlate between the two domains (knowledge and satisfaction). Codes and themes were developed for free text and discussed within the research team. A map of patients flow for both services was drawn on an A4 paper and then translated into a flowchart. All participants provided their written consent and prior to agreeing to participate, the participants were provided with information about all aspects of the research.

Chapter 4

Results

4.1 Summary

In the previous chapter, I justified and discussed the research design and methods used to collect data for this research. The current chapter contains two different types of data—the first type was collected from the IT department of KFGH hospital and from three of its associated PHCCs. I will refer to these data as administrative data. The administrative data comprise the characteristics of patients who used both services (the ED and PHCCs). The purpose of analysing this set of data was to compare the actual visits with our sample, in order to ensure that our sample is representative of the actual situation at these centres.

The second type of data was collected from both services with the help of semi-structured questionnaires administered by the interviewers. The questionnaires were divided into four sections: characteristics, knowledge, behaviour and satisfaction. Patients' responses to these questions were compared based on whether they visited the ED (non-urgent cases) or the PHCCs. I analysed the factors that influenced patients with non-urgent conditions to seek care from the ED rather than PHCCs using univariable regression analyses. The statistically significant factors were then analysed using multivariable (binary) logistic regression analysis.

4.2 Administrative Data

4.2.1 Administrative Data from PHCCs

In order to assess the demographic data of patients who were registered in PHCCs run by the MOH, the researcher accessed data from their administrative systems. Table 11 below shows registered patients who visited the three different PHCCs (Al-Hamra, Al-Safa and Al-Nahda) between May and August (the period of study).

During the period from May to August 2019, a total of 36,162 patients visited the PHCCs. Table 11 presents the data for the patients according to age, sex and nationality. The table shows that the majority of patients attending the three clinics were Saudi nationals. This probably reflects the fact that non-Saudi patients are covered by private insurance. With regard to sex-based differences, the data show that more men than women visited all three PHCCs (Al-Hamra 56.0%, Al-Safa 51.2% and Al-Nahda 51.0% of the patients were men). With regard to age, more than one-third of those who attended all three PHCCs were between 18 and 45 years (Al-Hamra 41.4%, Al-Safa 41.3% and Al-Nahda 36.8%). Overall, Al-Nahda had the highest number of patients among the three PHCCs. It is one of the new centres that were built after Saudi Vision 2030 was adopted. It is located in one of the wealthier suburbs of Jeddah, and this probably explains why the patients interviewed at this centre had higher salaries.

Table 11. Administrative Data for Patients Registered with PHCCs of the MOH for the Period May to August 2019

Centres	Characteristics	May N (%)	June N (%)	July N (%)	August N (%)	All Months N (%)
	Sex					
	Male	1177 (58.9%)	722 (55.8%)	908 (52.7%)	426 (55.6%)	3233 (56.0%)
	Female	820 (41.1%)	571 (44.2%)	816 (47.3%)	340 (44.4%)	2547 (44.0%)
Al-Hamra	Nationality					
	Saudi	1433 (71.8%)	893 (69.0%)	1235 (71.6%)	555 (72.5%)	4116 (71.2%)
	Non-Saudi	564 (28.2%)	400(31.0%)	489 (28.4%)	211 (27.5%)	1664 (28.8%)
	Age (y)					
	Under 18	526 (26.3)	398 (30.8)	504 (29.2)	238 (31.1)	1666 (28.8)
	18–45	889 (44.5)	521 (40.3)	690 (40.0)	291 (38.0)	2391 (41.4)
	45–60	396 (19.8)	256 (19.8)	345 (20.0)	162 (21.1)	1159 (20.0)
	Older than 60	186 (9.3)	118 (9.1)	185 (10.7)	75 (9.8)	564 (9.8)
Total		1997	1293	1724	766	5780
	Sex					
	Male	2000 (48.0)	1542 (51.7)	1432 (53.6)	1325 (53.3)	6299 (51.2
	Female	2165 (52.0)	1442 (48.3)	1241 (46.4)	1161 (46.7)	6009 (48.8)
	Nationality					
Al-Safa	Saudi	3712 (89.1)	2624 (87.9)	2365 (88.5)	2165 (87.0)	10866 (88.3)
	Non-Saudi	453 (10.9)	360 (12.1)	308 (11.5)	321 (13.0)	1442 (11.7)
	Age (y)					
	Under 18	1156 (27.8)	633 (21.2)	432 (16.2)	519 (20.9)	2740 (22.3)
	18–45	1636 (39.3)	1204 (40.3)	1192 (44.6)	1051 (42.2)	5083 (41.3)
	45–60	885 (21.2)	651 (21.8)	618 (23.1)	572 (23.0)	2726 (22.1)
	Older than 60	488 (11.7)	496 (16.6)	431 (16.1)	344 (13.9)	1759 (14.3)
Total		4165	2984	2673	2486	12308
	Sex					
	Male	2384 (51.1)	2055 (50.6)	3195 (49.9)	1587 (53.9)	9221 (51.0)
	Female	2281 (48.9)	2004 (49.4)	3208 (50.1)	1360 (46.1)	8853 (49.0)
	Nationality					
	Saudi	3608 (77.3)	3230 (79.6)	4915 (76.8)	2258 (76.6)	14011 (77.5)
Al-Nahda	Non-Saudi	1057 (22.7)	829 (20.4)	1488 (23.2)	689 (23.4)	4063 (22.5)
	Age (y)					
	Under 18	1057 (22.7)	832 (20.4)	1294 (20.2)	628 (21.3)	3811 (21.2)
	18–45	1847 (39.6)	1582 (39.0)	2260 (35.3)	964 (32.7)	6653 (36.8)
	45–60	1124 (24.1)	993 (24.5)	1741 (27.2)	879 (29.8)	4737 (26.2)
	Older than 60	637 (13.6)	652 (16.1)	1108 (17.3)	476 (16.2)	2873 (15.7)
Total		4665	4059	6403	2947	18074

4.2.2 Administrative Data from the ED

I also assessed data from the administrative system of the ED at KFGH. Table 12 shows the data of the visiting patients according to sex, nationality and age between May and August 2019. All the patients who visited the ED (classified as urgent or non-urgent according to CTAS, see chapter 1) were included in this dataset.

The data in Table 12 shows that the majority of the patients who visited the KFGH ED between May and August were male (63.7%) and of Saudi nationality (69.7%). This probably reflects the fact that non-Saudi patients are covered by private insurance or might use the ED for more complicated cases. Further, one-fourth of them were in the age range of 41 to 60 years (27.4%). Analysis of the monthly visitation rate showed that the month of May had the highest number of patients.

Table 12. Administrative Data for Patients who used ED Services of the MOH between May and August 2019

Characteristics	May	June	July	August	All Months
	N (%)	N (%)	N (%)	N (%)	N (%)
Total	7,312	7,136	7,220	6,848	28,516
Sex					
Male	4612 (63.1)	4495 (63.0)	4635 (64.2)	4418 (64.5)	18160 (63.7)
Female	2678 (36.6)	2606 (36.5)	2557 (35.4)	2394 (35.0)	10235 (35.9)
Unknown	22 (0.3)	35 (0.5)	28 (0.4)	36 (0.5)	121 (0.4)
Nationality					
Saudi	5026 (68.7)	4938 (69.2)	5176 (71.7)	4723 (69.0)	19863 (69.7)
Non-Saudi	2270 (31.1)	2186 (30.6)	2031 (28.1)	2110 (30.8)	8597 (30.1)
Unknown	16 (0.2)	11 (0.2)	11 (0.2)	14 (0.2)	52 (0.2)
Age (y)					
Under 18	778 (10.7)	753 (10.6)	709 (9.8)	622 (9.1)	2862 (10.0)
18–23	759 (10.4)	719 (10.1)	723 (10.0)	694 (10.1)	2895 (10.2)
24–31	1261 (17.3)	1248 (17.5)	1336 (18.5)	1298 (19.0)	5143 (18.0)
32–40	1316 (18.0)	1286 (18.0)	1346 (18.7)	1228 (17.9)	5176 (18.2)
41–60	2011 (27.5)	1873 (26.2)	1982 (27.5)	1955 (28.6)	7821 (27.4)
Older than 60	1180 (16.1)	1255 (17.6)	1120 (15.5)	1049 (15.3)	4604 (16.2)

4.2.3　Administrative Data for Urgent and Non-Urgent ED cases

Table 13 shows the overall and monthly reports on ED visits categorised as CTAS I, CTAS II, CTAS III and CTAS IV, which are considered as urgent cases, and CTAS V and waiting, which are considered as non-urgent or PHCC-treatable cases (according to evaluation by the nurse and the researcher's observation).

Our analysis indicates that most of the cases managed by the hospital from May to August were non-urgent on average over the four-month study period (84.5%). When the cases were further classified as 'urgent', 'non-urgent' and 'waiting', the data show that the majority of the cases were classified as 'waiting' (56.5%). This large number of 'waiting' patients in the waiting areas were initially classified as 'non-urgent', since urgent cases are immediately admitted to the ED.

One of the aims of this study is to understand the factors that influence this high percentage of patients with non-urgent cases to seek the ED rather than PHCCs. We interviewed the patients who visited both the ED and the PHCCs using the structured questionnaire so that we could compare the factors that influenced the choice of healthcare service. The results of the interviews using the structured questionnaire are discussed below.

Table 13. Number and Percentage of Urgent and Non-urgent Cases at the ED of the MOH between May and August 2019

		Month			
Total	**All Months N (%)** 28,516	**May N (%)** 7312	**June N (%)** 7136	**July N (%)** 7220	**August N (%)** 6848
Non-Urgent	24096 (84.5%)	6248 (85.4%)	6085 (85.3%)	6094 (84.4%)	5669 (82.8%)
Urgent	4420 (15.5%)	1064 (14.6%)	1051 (14.7%)	1126 (15.6%)	1179 (17.2%)
Non-Urgent	7987 (28.0%)	2156 (29.5%)	2183 (30.6%)	1797 (24.9%)	1851 (27.0%)
Urgent	4420 (15.5%)	1064 (14.5%)	1051 (14.7%)	1126 (15.6%)	1179 (17.2%)
Waiting	16109 (56.5%)	4092 (56.0%)	3902 (54.7%)	4297 (59.5%)	3818 (55.8%)

In contrast to the above tables which contain the administrative data, the following tables have been constructed based on the responses to the two questionnaires used in this study. Each of the four sections (characteristics, knowledge, behaviour and satisfaction) of the questionnaires is discussed separately below. During the data collection using the questionnaires, we approached all patients attended the ED and PHCCs and most of them accepted to participate except two patients who attended the ED service. The managers and staff working in both services we collected the data from were so helpful in promoting this research which is showed in our high response rate of 99.5%.

4.3   Characteristics

This section contains a brief description of the patients' main characteristics, which are also presented in five tables. The characteristics include gender, income, educational level, health status and health insurance status. The tables display the numbers and percentages of the interviewed patients and patients' characteristics according to their choice of healthcare. These factors were analysed to identify the ones affecting patients' decision to access healthcare. Multivariable (binary) logistic regression models were used to identify the most significant factors.

4.3.1   Demographic Characteristics of ED and PHCC Visitors

Table 14 displays the demographic characteristics of all the patients who participated in the study.

The total number of patients interviewed for this study was 466, but 56 questionnaires were not completed. Most of the incomplete questionnaires were by PHCC visitors. These patients started the interview but had to leave because of other commitments. The demographic profiles show that 410 completed questionnaires were collected from the ED of KFGH and three of its associated PHCCs. The majority of the patients were interviewed during the weekdays of morning shifts.

More females than males visited the PHCCs, while an opposite trend was found for the ED. This contradicts the administrative data in Tables 11 and 12. One reason could be that the administrative sample included both urgent and non-urgent cases at the ED, while the questionnaire only covered non-urgent cases. However, the difference in percentages in regard to sex between administrative and questionnaires data is not statistically significant.

There was no difference in age groups between the administrative data and the questionnaire data. The majority of the patients who were interviewed using the structured questionnaire were married, had 3–6 family members, were below the age of 60 years, had lower education levels, were unemployed, and had a salary in the range of SR 5000 and SR 11000. All the patients interviewed were living in Jeddah and could access the PHCCs.

Table 14. Characteristics of Patients Consulting the ED and PHCCs

Demographics		Count	%
Total		410	100.0
Date	Week days	367	89.5
	Weekend	43	10.5
In which shift was the survey filled?	Morning	307	74.9
	Evening	103	25.1
Service	Emergency Department	200	48.8
	Primary Healthcare Centres	210	51.2
Healthcare organization	Al- Hamra'a	70	17.1
	Al- Safa 1	70	17.1
	Al- Nahdah	70	17.1
	King Fahd General Hospital	200	48.8
Gender	Female	201	49.0
	Male	209	51.0
Marital status	Married	299	72.9
	Not married	111	27.1
Age	18–23 years	45	11.0
	24–31 years	72	17.6
	32–40 years	100	24.4
	41–60 years	155	37.8
	Older than 60 years	38	9.3
Educational level	Lower than high school	77	18.8
	High school	140	34.1
	Diploma	58	14.1
	Bachelor/Higher education	135	32.9
What work do you do?	Not working	75	18.3
	I am a homemaker (housewife)	139	33.9
	I am working for myself (self-employed)	14	3.4
	I am working for the government	74	18.0
	I am working for a private company	108	26.3
Family income	SR 3,000–5,000	72	17.6
	SR 5,001–8,000	108	26.3
	SR 8,001–11,000	122	29.8
	SR 11,001–15,000	57	13.9
	More than SR 15,000	48	11.7
	The respondent did not want to provide this information	3	.7
Number of family members	1–2	30	7.3
	3–4	121	29.5
	5–6	167	40.7
	More than 6	90	22.0
	The respondent did not want to provide this information	2	.5

4.3.2   Comparison of ED and PHCC Patient Characteristics

Table 15 shows the differences in demographic characteristics between patients who visited the ED and PHCCs of the MOH.

Most patients were interviewed using the structured questionnaire during the weekdays. The only patients who were interviewed on the weekends were those who visited the ED, because the PHCCs were closed on the weekends. Most (ten) PHCCs affiliated with KFGH are open for 8 h, two are open for 16 h, and one is open for 24 h.

A significantly higher number of patients visited the PHCCs during the morning shift (67.4%), while the majority visited the ED during the evening shift (97.1%, $p < 0.001$). The ED had a significantly higher number of visitors in the evening shift both on the week days and weekends. If weekend visitors (morning, n = 24; evening, n = 19) are excluded from the analyses, the percentage decreases to 96.4%, which is still significantly higher. The purpose of eliminating weekend visitors is to measure the data during the hours in which PHCCs are open. The table shows that only three questionnaires were filled in at the PHCCs during out-of-hours services (16hs and 24h). In addition, 38% of the ED patients (out of 200) visited during the morning shift of weekdays, when all the PHCCs were open.

There was no significant sex-based difference, although a higher number of males visited the ED. The trend was reversed for PHCCs. There were significant differences with regard to marital status ($p = 0.001$), age ($p = 0.018$), education level ($p = 0.001$) and family income ($p < 0.001$). These data indicate that unmarried (single, divorced, widow/widower), younger (<40 years) patients with lower education (lower than a bachelor's degree) and income levels (<SR 11,000) were more likely to visit the ED for non-urgent conditions.

Number of family members and type of employment did not seem to affect the choice of healthcare service. However, the ED saw a high number of unemployed individuals (homemaker/housewife, n = 61; unemployed, n = 38) and patients who worked for private companies (n = 59). Unemployed patients accounted for 49.5% of the 200 non-urgent ED visitors, and 41.4% (n = 41) of the unemployed group visited the ED during the morning hours of weekdays. Of these 41 patients, 46.3% were registered at the PHCC in their neighbourhood, and the remaining patients were eligible to register too.

Table 15. Comparison of the Characteristics of Patients who Visited the ED and PHCCs

Characteristics		Total	Group		p-value
			PHCC	ED	
Total		410	210 (51.2%)	200 (48.8%)	-
Date	Weekdays	367	210 (57.2%)	157 (42.8%)	<0.001[a]
	Weekend	43	0 (0.0%)	43 (100.0%)	
Shift	Morning	307	207 (67.4%)	100 (32.6%)	<0.001[a]
	Evening	103	3 (2.9%)	100 (97.1%)	
Gender	Female	201	111 (55.2%)	90 (44.8%)	0.112
	Male	209	99 (47.4%)	110 (52.6%)	
Marital status	Married	299	171 (57.2%)	128 (42.8%)	0.001[a]
	Not Married	111	39 (35.1%)	72 (64.9%)	
Age	18–23 years	45	19 (42.2%)	26 (57.8%)	0.018[a]
	24–31 years	72	27 (37.5%)	45 (62.5%)	
	32–40 years	100	50 (50.0%)	50 (50.0%)	
	41–60 years	155	93 (60.0%)	62 (40.0%)	
	Older than 60 years	38	21 (55.3%)	17 (44.7%)	
Educational level	Less than high school	77	35 (45.5%)	42 (54.5%)	0.001[a]
	High school	140	61 (43.6%)	79 (56.4%)	
	Diploma	58	25 (43.1%)	33 (56.9%)	
	Bachelor's degree/Higher education	135	89 (65.9%)	46 (34.1%)	
What work do you do?	Not working	75	37 (49.3%)	38 (50.7%)	0.109
	I am a homemaker (Housewife)	139	78 (56.1%)	61 (43.9%)	
	I am working for myself (Self-employed)	14	11 (78.6%)	3 (21.4%)	
	I am working for the government	74	35 (47.3%)	39 (52.7%)	
	I am working for a private company	108	49 (45.4%)	59 (54.6%)	
Family income	SR 3,000–5,000	72	20 (27.8%)	52 (72.2%)	<0.001[a]
	SR 5,001–8,000	108	61 (56.5%)	47 (43.5%)	
	SR 8,001–11,000	122	56 (45.9%)	66 (54.1%)	
	SR 11,001–15,000	57	35 (61.4%)	22 (38.6%)	
	More than SR 15,000	48	36 (75.0%)	12 (25.0%)	
	The respondent did not want to provide this information	3	2 (66.7%)	1 (33.3%)	
Number of family members	1–2	30	14 (46.7%)	16 (53.3%)	0.130
	3–4	121	56 (46.3%)	65 (53.7%)	
	5–6	167	97 (58.1%)	70 (41.9%)	
	More than 6	90	43 (47.8%)	47 (52.2%)	
	The respondent did not want to provide this information	2	0 (0.0%)	2 (100.0%)	

[a]-significant using the chi-square test at a significance level of <0.05

As mentioned earlier, a high number of patients (n=108) working in private companies visited the ED and PHCCs of MOH rather than their insurance coverage. Private companies are required by law to provide health insurance for their employees. Therefore, we tried to understand whether having health insurance affected patients' decision to visit either healthcare service. We asked the patients about their health insurance and the provider of their insurance, if any, and the information is presented in Table 16 below.

There was no significant difference between patients with and without health insurance with regard to their choice of healthcare services, as shown in Table 16. A concerning finding was that 77.8% of the 410 patients reported that they lacked health insurance coverage. If we combine this with the information that 52.2% of the 410 patients were unemployed (not working and I am a homemaker, as shown in Table 14), the relationship between lack of health insurance and employment status is evident.

Of the 108 patients who worked for private companies (Table 14), only 38.0% (n = 41) reported that they were covered by private health insurance. This means that 62.0% (n = 67) were not provided health insurance by their company, even though it is mandated according to Saudi law. Of these patients, 20.4% (n = 22) who had private health insurance coverage visited the ED. The reasons why patients with health insurance seek ED services are discussed in the section on behaviour below.

Table 16. Proportion of Insured Patients who used ED and PHCC Services

Characteristics		Total	Group		p-value
			PHCC	ED	
Total		410	210 (51.2%)	200 (48.8%)	-
Do you have health insurance?	Yes	91	47 (51.6%)	44 (48.4%)	0.926
	No	319	163 (51.1%)	156 (48.9%)	
Who pays for your health insurance? (n = 91)	Insurance from a private company	58	31 (53.4%)	27 (46.6%)	0.106
	Individual insurance	4	0 (0.0%)	4 (100.0%)	
	Government insurance other than that provided by the MOH	29	16 (55.2%)	13 (44.8%)	

[a]-significant using the chi-square test at a significance level of <0.05

110

As patients' health status may be an important factor that affects their choice of healthcare provider, information about the health status of patients was also analysed (Table 17). In particular, we sought to understand whether patients with chronic health conditions would preferentially seek ED services.

Table 17 shows that over half (60.9%) of the population who availed of both ED and PHCC services had no chronic diseases, but there were significant differences in chronic health factors between the PHCC and ED patients (p < 0.001). Specifically, a significantly higher number of patients without chronic health complications visited the ED. In patients with chronic health problems, the majority had diabetes and hypertension, but there was no significant difference between the PHCC and ED visitors with regard to their specific health concerns (p > 0.05).

As discussed earlier in this chapter, younger patients (<40 years) were more likely to seek ED services. This may explain why a significantly higher number of patients without chronic conditions visited the ED (Table 17), as older patients are more likely to have chronic diseases.

Table 17. Comparison of Chronic Health Problems between ED and PHCC Visitors

		Total	Group		p-value
			PHCC	ED	
Total		410	210 (51.2%)	200 (48.8%)	-
Do you have any chronic health problems?	Yes	160	104 (65.0%)	56 (35.0%)	<0.001[a]
	No	250	106 (42.4%)	144 (57.6%)	
If the answer is yes, please specify the problem (n = 160)	Diabetes	86	63 (73.3%)	23 (26.7%)	-
	Blood Pressure	97	64 (66.0%)	33 (34.0%)	
	Cholesterol	21	15 (71.4%)	6 (28.6%)	
	Thyroid	16	11 (68.8%)	5 (31.3%)	
	Others	36	20 (55.6%)	16 (44.4%)	

[a]-significant using the chi-square test at a significance level <0.05

4.3.3 Identification of the Most Significant Patient Characteristics Associated with Their Healthcare Decision

The previous tables (Tables 15, 16 and 17) have shown the statistically significant factors that affect patients' choice of healthcare services. These factors were marital status, age, income, education level and presence of chronic diseases. These factors were entered in multivariable (binary) logistic regression to identify the factors with the highest significance (Table 18).

The factors that remained significantly associated with non-urgent ED utilisation were marital status ($p = 0.006$), education level (lower than high school, $p = 0.004$; high school, $p = 0.27$), family income ($p < 0.001$) and chronic health problems ($p < 0.001$). In particular, patients with a low level of education (high school education or lower) were two to three times more likely to present at the ED for non-urgent cases than patients with a university degree (OR = 1.87, 95% CI = 1.08–3.27 for high school education; OR = 2.66, 95% CI = 1.36–5.23 for lower than high school degree). Married participants were four times less likely to present to ED for non-urgent cases (OR = 0.492, 95% CI = 0.297–0.815). Additionally, those without chronic health problems were about three times more likely than those with chronic health problems to visit the ED for non-urgent reasons (OR = 0.324, 95% CI = 0.201–0.523). In summary, unmarried patients with lower education levels and without chronic health problems were most likely to avail of ED services for non-urgent conditions.

Table 18. Results of the Multivariable (binary) Logistic Regression Analyses of the Characteristics associated with Patients' Decision to Access ED and PHCC Services

Variables in the Equation		B	OR	95% CI for OR Lower	95% CI for OR Upper	p-value
Last Step[a]	Marital status (married)	-0.710	0.492	0.297	0.815	0.006[b]
	Education level					0.025[b]
	Education level (lower than high school)	0.979	2.663	1.356	5.230	0.004[b]
	Education level (high school)	0.628	1.874	1.075	3.269	0.027[b]
	Education level (diploma)	0.261	1.299	0.642	2.626	0.467
	Family income					<0.001[b]
	Family income (SR 3,000–5,000)	1.802	6.064	0.415	88.596	0.188
	Family income (SR 5,001–8,000)	0.704	2.021	0.142	28.731	0.603
	Family income (SR 8,001–11,000)	1.168	3.217	0.227	45.587	0.388
	Family income (SR 11,001–15,000)	0.670	1.955	0.133	28.754	0.625
	Family income (More than SR 15,000)	-0.180	0.835	0.055	12.611	0.896
	Do you have any chronic health problems? (Yes)	-1.127	0.324	0.201	0.523	<0.001[b]
	Constant	-0.462	0.630			0.735

Dependent Variable	Internal Value
PHCC	0
ED	1

[a]-Variable(s) entered in step 1: Marital status, Age, Education level, Family income, Presence of chronic health problems
[b]-Significant using the binary logistic regression model, with backward conditional elimination (entry criterion = 0.05, elimination criterion = 0.10)
-Reference for marital status is not married, for educational level is bachelor/higher education and for family income is the respondent did not want to provide this information.

4.4 Knowledge

Patients' knowledge about services and clinics provided by the PHCCs of the MOH could have a significant impact on their decision to access healthcare. In the following three tables, we analysed patients' knowledge about clinics, opening hours and additional services such as online appointments and phone triage. In order to quantify these factors, we scored patients' answers on a 100-point scale (described in chapter 3). As described in the characteristics section of the questionnaire before, we used univariable and multivariable logistic regressions to examine the relationship between the patients' knowledge of PHCC services and decision to access healthcare (ED or PHCCs).

4.4.1 Patients' Knowledge of the Services Provided by PHCCs

Descriptive data for patients' knowledge are shown in Table 19. PHCC visitors were more knowledgeable than ED visitors with regard to the different clinics and services that were available in PHCCs. In particular, there was a statistically significant difference between both groups with regard to their knowledge about out-of-hours services at PHCCs: 63.7% of ED visitors and 36.3% of PHCC visitors were not knowledgeable about these opening hours. Overall, only 32.1% of the 410 patients were knowledgeable about the out-of-hours services. Surprisingly, when we asked patients about the opening hours of the PHCC in their neighbourhood, 87.9% of the ED visitors did not have this information.

The high percentage of ED patients who lacked knowledge about PHCCs could be explained by the lack of continuity of care. Accordingly, the data show that 56.5% of the 200 ED patients were not registered in their neighbourhood PHCC. In addition, the lack of knowledge about PHCC services was associated to the younger age, lack of employment and lower education level in the ED group (as shown in Table 15).

Table 19. Comparison of Patients' Knowledge about PHCC Clinics between the PHCC and ED Groups

Knowledge (N = 410)			Total	Group PHCC	Group ED	p-value
Do you know which clinics are available in the PHCC?	General clinics		283	194 (68.6%)	89 (31.4%)	-
	Chronic diseases clinic		252	194 (77.0%)	58 (23.0%)	
	Healthy child clinic		261	180 (69.0%)	81 (31.0%)	
	Dental clinic		248	185 (74.6%)	63 (25.4%)	
	Bandaging clinic		191	150 (78.5%)	41 (21.5%)	
	Others	Obstetrics and gynaecology Clinic	9	4 (44.4%)	5 (55.6%)	
		Psychiatric clinic	1	1 (100.0%)	0 (0.0%)	
Do you know that some PHCCs of the MOH open for more than 8 h a day?	Yes		132	109 (82.6%)	23 (17.4%)	<0.001[a]
	No		278	101 (36.3%)	177 (63.7%)	
Do you know the working hours of the PHCC you are registered with/ or in your neighbourhood?	Yes		270	193 (71.5%)	77 (28.5%)	0.001[a]
	No		140	17 (12.1%)	123 (87.9%)	
Do you know what services are provided by the PHCCs?	Online appointments		266	192 (72.2%)	74 (27.8%)	-
	Reminders for children's vaccine		174	114 (65.5%)	60 (34.5%)	
	Phone triage		74	55 (74.3%)	19 (25.7%)	
	I don't know		18	11 (61.1%)	7 (38.9%)	

[a]-significant using the chi-square test at a significance level of <0.05

4.4.2 Knowledge Scores for Services Provided by PHCCs

Patients' knowledge scores for PHCC clinics, their services and working hours were calculated to compare the two groups (ED and PHCC). The method used for calculating the scores and converting the total score to a 100-point scale is described in chapter 3.

As shown in Table 20, there were significant differences ($p < 0.001$) between the knowledge scores of PHCC and ED patients according to Welch's t-test. The findings imply that PHCC patients (mean knowledge score = 68.30 ± 20.0) were significantly more knowledgeable about PHCC clinics, their services and working hours than ED patients (mean knowledge score = 25.90 ± 31.4). The overall knowledge score of the 410 patients visiting the PHCCs and EDs was below 50 (47.61 ± 33.7).

Table 20. Patients' Knowledge Scores for PHCC Clinics, Services and Working Hours

Knowledge (N = 410)	Total Mean ± SD	Group PHCC	Group ED	p-value
Do you know which clinics are available in this PHCC?	0.51 ± 0.3	0.72 ± 0.2	0.28 ± 0.3	<0.001[a]
Do you know that some PHCCs of the MOH are open for more than 8 h a day?	0.32 ± 0.5	0.52 ± 0.5	0.12 ± 0.3	<0.001[a]
Do you know the working hours of the PHCC you are registered with/ or in your neighbourhood?	0.66 ± 0.5	0.92 ± 0.3	0.39 ± 0.5	<0.001[a]
Do you know which services are provided by the PHCC centres?	0.42 ± 0.3	0.57 ± 0.3	0.25 ± 0.3	<0.001[a]
Knowledge	47.61 ± 33.7	68.30 ± 20.0	25.90 ± 31.4	<0.001[a]

[a]-significant using Welch's t-test at a significance level of <0.05

4.4.3 Identification of the Most Significant Knowledge Factors Associated with Patients' Healthcare Decision

The knowledge factors that were significantly associated with patients' decision to utilise the ED for non-urgent reasons were identified by univariable analysis (Table 19). These factors were then entered in multivariable (binary) logistic regression to identify the most significant factors associated with patients' healthcare decisions (Table 21).

The results showed that knowledge of a PHCC's clinics ($p < 0.001$), its operation for more than 8 h a day ($p = 0.008$) and its hours of operation ($p = 0.005$) were the most significant factors (Table 21). This implies that patients who did not have knowledge about the available clinics at the PHCC, the hours of operation of local PHCCs, and some PHCCs being open for more than 8 h a day were more likely to visit an ED for non-urgent conditions than patients who had this knowledge (OR = 0.009, 95% CI = 0.002–0.038 for clinics, OR = 0.345, 95% CI = 0.163–0.730 for working hours; OR = 0.442, 95% CI = 0.241–0.810 for working for more than 8 h a day).

Table 21. Results of the Multivariable (binary) Logistic Regression Analyses of Knowledge Variables associated with Patients' Decision to Access ED and PHCC Services

Variables in the Equation		B	OR	95% CI for OR		p-value
				Lower	**Upper**	
Last Step [a]	Do you know which clinics are available in this PHCC?	-4.694	0.009	0.002	0.038	<0.001[b]
	Do you know that some PHCCs of the MOH are open for more than 8 h a day?	-0.816	0.442	0.241	0.810	0.008[b]
	Do you know the working hours of the PHCC you are registered with/ or in your neighbourhood?	-1.063	0.345	0.163	0.730	0.005[b]
	Do you know which services are provided by the PHCCs?	0.964	2.623	0.912	7.541	0.073
	Constant	3.075	21.643			<0.001[b]

Dependent Variable	Internal Value
PHCC	0
ED	1

[a]-Variable(s) entered in step 1: Do you know which clinics are available in this PHCC? Do you know that some PHCCs of the MOH are open for more than 8 h a day? Do you know the working hours of the PHCC you are registered with? Do you know the working hours of the PHCC in your neighbourhood? Do you know which services are provided by the PHCCs?

[b]-Significant using the binary logistic regression model, with backward conditional elimination (entry criterion = 0.05, elimination criterion = 0.10)

4.5   Behaviour

In the previous two sections, I analysed the characteristics and knowledge factors that influenced patients' decision to utilise the ED or PHCCs. This section discusses how patients' behaviour towards the accessibility of healthcare services influence their decision. This section presents data on patients' use of both services in terms of how many times a year they used an ED or PHCC. It also explores whether the patients were influenced by friends or family, the duration of their symptoms and what other healthcare facilities they had access to. A key point of focus was understanding why patients who had insurance or were registered with a PHCC chose MOH services, especially an ED. Another key factor examined was patients' previous experience with a PHCC (e.g. if they ever left without treatment or being seen, if they received better services from EDs than PHCCs, and how long they had been registered with a PHCC). We used multivariable logistic regression models to examine the relationship between behaviour factors significantly associated with patients' decision to access healthcare (ED or PHCCs).

4.5.1   Patients' Behaviour towards ED Use

Of the 410 patients in the sample, there were a significantly higher number of visits (p < 0.001), such as every 1–2 months (96.7%, n = 29) and every 3–5 months (63.0%, n = 29), in the ED group than in the PHCC group (Table 22). Patients who visited the ED frequently did so for non-urgent reasons. Additionally, patients who presented to an ED one month ago (74.5%, n = 35) or three months ago (63.6%, n = 35) more frequently visited the ED for services compared to patients who presented to PHCCs (p < 0.001). Of 111 patients who had not visited an ED before, 83.8% were from the PHCC group (p < 0.001).

Out of 200 high-frequency ED patients, 42.5% did not have a hospital file and lacked access to other departments (thus, they accessed the hospital through the ED), while 58% admitted that they knew (either from previous experience or from family or friends) that the hospital would accept some PC cases for treatment in the ED (which influenced their decision to visit the ED). We asked the ED patients who were registered with the PHCCs (n = 87) whether they would have visited the ED had they known that the PHCC could also have addressed their issue. Surprisingly, 28.7% of the patients responded in the affirmative.

Table 22. Comparison of Patients' Frequency of ED Visits Between the ED and PHCC Groups

Behaviour		Total	Group		p-value
			PHCC	**ED**	
Total		410	210	200	-
How many times do you usually visit the MOH hospital's ED during the year?	Every one to two months	30	1 (3.3%)	29 (96.7%)	<0.001[a]
	Every three to five months	46	17 (37.0%)	29 (63.0%)	
	Six months to one year	79	32 (40.5%)	47 (59.5%)	
	Rarely	255	160 (62.7%)	95 (37.3%)	
When was the last time you presented to the MOH hospital's ED?	One day ago	9	1 (11.1%)	8 (88.9%)	<0.001[a]
	A month ago	47	12 (25.5%)	35 (74.5%)	
	Three months ago	55	20 (36.4%)	35 (63.6%)	
	Six months ago	50	21 (42.0%)	29 (58.0%)	
	A year ago	97	41 (42.3%)	56 (57.7%)	
	More than a year ago	41	22 (53.7%)	19 (46.3%)	
	Did not visit the ED before	111	93 (83.8%)	18 (16.2%)	

[a]-significant using the chi-square test at a significance level of <0.05

4.5.2 Factors Influencing Patients' Behaviour to Accessing ED and PHCC Services

For a better understanding of ED users' behaviour, I asked the patients about other healthcare options they had access to and what led them to choose the ED over other services. Notably, of the 200 ED patients, 22% had health insurance and 43.5% were registered with PHCCs (as discussed earlier).

Table 23 shows the factors that influenced patients' decision to visit the ED or PHCCs. Compared to the PHCC patients, a significantly higher number of ED patients (63.4%, n = 118; p < 0.001) used ED services because they were influenced by family or friends. As shown in Table 15, younger patients (<40 years) tended to use ED services for non-urgent reasons more than older patients. As this group might lack knowledge about the different clinics and services provided by PHCCs (as discussed in the knowledge section), they are probably more influenced by family and friends. With regard to symptom duration, a significantly higher number of patients with long-lasting symptoms (for more than a month) visited PHCCs (p < 0.001). Patients with long-lasting symptoms may have one or more chronic disease. Therefore, this finding concurs with the earlier finding from the characteristics section that patients are more likely to use PHCCs if they have a chronic disease (Table 17). Of the 200 patients who visited the ED with non-urgent conditions, 36.5% had experienced symptoms for at least 1 week to more than 1 month prior to their visit.

A total of 311 (75.8%) of the 410 patients reported they had options other than the healthcare service they chose, but there were no significant differences between the two groups with regard to access to other treatment options. Of the 200 patients who visited the ED, 75 (37.5%) reported that they could have visited the PHCC at which they were registered. Further, 52 (24.8%) of the 210 patients who utilised the PHCC said they could have visited the ED but preferred to access healthcare through the PHCC. Some ED patients reported that they could have visited KFGH clinics, but they would have had to wait for one to three months to get an appointment, and even as long as one year for doctors with higher specialities. Additionally, 31.7% of the 410 patients stated that they would not go to a pharmacy because they could receive free medication from the MOH services. Finally, 146 of the 410 patients admitted that they could have visited a private clinic/hospital (Table 23), and 58 (39.7%) of these were from the ED group. Of these 146 patients, 91 (62.3%) were covered by insurance. Out of the 58 patients in the ED group who could access private clinics/hospitals, 44 (75.9%) were insured but still chose the ED service (see Table 16). The reasons why they chose to use MOH services over other healthcare options that were covered by their insurance are presented in Table 24.

Table 23. Comparison of Factors Influencing Patients' Behaviour to Accessing the ED and PHCCs

Behaviour		Total	Group		p-value
			PHCC	ED	
Total		410	210	200	-
Did family or friends influence your decision to visit the healthcare facility you chose?	Yes	186	68 (36.6%)	118 (63.4%)	<0.001[a]
	No	224	142 (63.4%)	82 (36.6%)	
Since when have you been suffering from this problem?	Today	66	11 (16.7%)	55 (83.3%)	<0.001[a]
	From one to two days	135	65 (48.1%)	70 (51.9%)	
	From one week to a month	97	42 (43.3%)	55 (56.7%)	
	More than a month	105	87 (82.9%)	18 (17.1%)	
	I don't have any symptoms	7	5 (71.4%)	2 (28.6%)	
Do you have an option other than the ED when you are sick? Do you have an option other than the PHCC when you are sick?	Yes	311	159 (51.1%)	152 (48.9%)	0.946
	No	99	51 (51.5%)	48 (48.5%)	
If the answer is yes, what are your other options?	Primary healthcare centre/Emergency department	127	52 (40.9%)	75 (59.1%)	-
	Doctors' clinics in KFGH	82	46 (56.1%)	36 (43.9%)	
	Pharmacy	130	69 (53.1%)	61 (46.9%)	
	Herbal medication at home	42	24 (57.1%)	18 (42.9%)	
	Private hospitals or healthcare centres	146	88 (60.3%)	58 (39.7%)	
	Others	23	7 (30.4%)	16 (69.6%)	

[a]-significant using the chi-square test at a significance level of <0.05

4.5.3   Reasons Why Insured Patients Availed of ED or PHCC Services

As shown in Table 24, many patients reported having easier access to MOH services (80.2%, n=73) and greater trust in the MOH than other institutions (40.7%, n=37). The patients also mentioned that the locations of MOH facilities were easier to access, as there are 13 PHCCs associated with KFGH within a 10-min drive from one another. KFGH is located in Al-Tahlia, which is easily accessible for people in most parts of Jeddah city. The patients also noted that MOH services accept cases that other facilities may not accept, such as patients with health coverage at government hospitals not affiliated with the MOH. Such hospitals specialise in certain diseases, such as heart disease and cancer, and they may not treat PHC cases. Some patients mentioned that they trust the MOH more than other services in terms of the healthcare provided and doctors' experience. Patients with private health insurance coverage who used both MOH services, ED and HCCs, (68.1%, n = 62) admitted that they prefer MOH services because unlike services covered by insurance, it does not involve co-pay.

Table 24. Reasons Why Insured Patients Accessed MOH Services

Behaviour		Total	Group	
			PHCC	ED
If you have insurance, what is the reason for coming to this service? **N = 91**	MOH facilities are easier to access (location), process and easily available	73	46 (63.0%)	27 (37.0%)
	I trust MOH services more than I do other services	37	17 (45.9%)	20 (54.1%)
	Other services were closed	11	7 (63.6%)	4 (36.4%)
	MOH provides better services	10	3 (30.0%)	7 (70.0%)
	My insurance requirements have not yet been completed	7	0 (0.0%)	7 (100.0%)

123

4.5.4 Patients' Behaviour towards PHCC Use

Overall, 297 of the 410 patients reported that they were registered with PHCCs. All the patients who visited a PHCC (n = 210) were registered with one in their neighbourhood, whereas only 87 (43.5%) of the 200 ED patients who had non-urgent cases were registered. The date of registration and frequency of visits of the 297 patients were evaluated using chi-square analysis (Table 25). The results revealed significant differences (p = 0.002) in the registration period for patients in the PHCC and ED groups. Significant differences were also found in the frequency of visits to a PHCC (p < 0.001): a significantly higher proportion of PHCC patients visited a PHCC more frequently. Lastly, a significantly higher number of PHCC patients had visited a PHCC in the past month (82.6%, n = 114), three months ago (69.6%, n=55), and six months ago (60.0%, n = 24) compared to those who visited the ED (p < 0.001).

Table 25. Patients' Registration and Frequency of PHCC visits

Behaviour		Total	Group		p-value
			PHCC	ED	
Total		297	210	87	-
How long have you been registered with the PHCC?	One to six months	30	24 (80.0%)	6 (20.0%)	0.002[a]
	More than six months to two years	60	53 (88.3%)	7 (11.7%)	
	More than two years to four years	50	34 (68.0%)	16 (32.0%)	
	More than four years	157	99 (63.1%)	58 (36.9%)	
How many times do you usually visit the PHCC during the year?	Every one to two months	111	93 (83.8%)	18 (16.2%)	<0.001[a]
	Every three to five months	93	65 (69.9%)	28 (30.1%)	
	Six months to one year	63	42 (66.7%)	21 (33.3%)	
	Rarely	30	10 (33.3%)	20 (66.7%)	
When was the last time you presented to the PHCC?	One day ago	15	5 (33.3%)	10 (66.7%)	<0.001[a]
	A month ago	138	114 (82.6%)	24 (17.4%)	
	Three months ago	79	55 (69.6%)	24 (30.4%)	
	Six months ago	40	24 (60.0%)	16 (40.0%)	
	A year ago	25	12 (48.0%)	13 (52.0%)	

[a]-significant using the chi-square test at a significance level of <0.05

4.5.5   Patients' Experiences with PHCC Services that Affected Their Healthcare Decision

As shown in Table 26, a large proportion of patients (n = 262) had not left a PHCC without seeing a doctor or receiving treatment. Specifically, a significantly higher proportion never left a PHCC without treatment (73.3%, n = 192) compared to those who visited an ED (26.7%, n = 70) for the same reason (p = 0.008). A significantly higher number (76.5%, n = 208) of PHCC patients did not seek ED services before visiting a PHCC (p < 0.001). By contrast, 73.5% of 87 patients with non-urgent conditions visited an ED and did not seek the PHCC at which they were registered before visiting an ED. Their reasons for going to an ED before a PHCC included faster service and better doctors and care in the ED (the reasons are discussed in detail in Table 28).

Table 26. Comparison of Patients' Experiences with PHCC Services

Behaviour			Total	Group		p-value
				PHCC	ED	
Total			297	210	87	-
Have you ever left the PHCC without seeing a doctor or getting treatment?		Yes	35	18 (51.4%)	17 (48.6%)	0.008[a]
		No	262	192 (73.3%)	70 (26.7%)	
If the answer is yes, what was the reason for leaving?	Overcrowding		20	10 (50.0%)	10 (50.0%)	-
	Unavailability of doctors		19	7 (36.8%)	12 (63.2%)	
	Others		3	2 ()	1 ()	
Did you try to seek a doctor in the PHCC before visiting the ED?		Yes	25	2 (8.0%)	23 (92.0%)	<0.001[a]
Did you try to visit an ED of the MOH before visiting the PHCC?		No	272	208 (76.5%)	64 (23.5%)	
If you knew that a PHCC could deal with your case for this visit, would you still visit the ED?		Yes	25	0 (0.0%)	25 (100.0%)	-
		No	62	0 (0.0%)	62 (100.0%)	

[a]-significant using the chi-square test at a significance level of <0.05

4.5.6 Identification of Significant Behaviour Factors Associated with Patients' Healthcare Decision

Univariate analysis showed that the influence of family or friends, length of symptoms, previous use of PHCC services and previous experiences with PHCC services significantly affected patients' decision to consult the ED or PHCCs. Therefore, as described in the other section, these factors were included in a multivariable (binary) logistic regression analysis to identify the most significant factors associated with patients' decisions (Table 27).

Binary logistic regression analysis revealed that the intention to seek a doctor in the PHCC before visiting an ED and *vice versa* (OR = 90.54, 95% CI = 13.11–625.49, $p < 0.001$), and visiting an ED more than twice in a year (OR = 12.515% CI = 2.201–71.171, $p = 0.004$) were significant factors associated with non-urgent ED use. Thus, ED overcrowding could be a result of patients visiting an ED directly without considering a PHCC as their first option, even in non-urgent cases.

The significant factors identified in the characteristics and knowledge sections that could affect the significant factors identified in this section are shown in Table 27. Several factors, such as young age, low education level, low family income, lack of health insurance and lack of knowledge about the hours of operation and services of PHCCs can lead to patients considering the ED as their first healthcare option. Of the 87 ED patients who were registered with a PHCC, 71.3% (n=62) stated that they would not have visited an ED had they known that a PHCC could address their issue (Table 26)

Table 27. Results of the Multivariable (binary) Logistic Regression Analyses of Behaviour Variables Associated with Patients' Decision to Access ED or PHCC Services

Variables in the Equation	B	OR	95% CI for OR Lower	95% CI for OR Upper	p-value
How long have you been registered with the PHCC? (Five years and more)					0.008[b]
One to six months	-2.076	0.125	0.022	0.699	0.018[b]
More than six months to two years	-2.242	0.106	0.023	0.482	0.004[b]
More than two years to four years	-0.383	0.682	0.240	1.938	0.472
How many times do you usually visit the PHCC during the year? (Rarely)					0.001[b]
Every one to two months	-3.304	0.037	0.007	0.182	<0.001[b]
Every three to five months	-1.798	0.166	0.042	0.655	0.010[b]
Six months to one year	-2.672	0.069	0.015	0.309	<0.001[b]
Have you ever left the PHCC without seeing a doctor or getting treatment? (Yes)	1.325	3.762	1.013	13.975	0.048[b]
Did you try to seek a doctor in the PHCC before visiting the ED? Have you tried to visit an ED of the MOH before visiting the PHCC? (Yes)	4.506	90.547	13.107	625.495	<0.001[b]
Did family or friends influence your decision to visit the ED? Did family or friends influence your decision to visit the PHCC? (Yes)	0.790	2.204	0.944	5.147	0.068
Since when have you had this problem? (I do not have symptoms)					0.001[b]
Today	1.703	5.490	0.278	108.458	0.263
From one to two days	0.689	1.992	0.114	34.938	0.637
From one week to a month	0.037	1.038	0.056	19.089	0.980
More than a month	-2.133	0.118	0.005	3.026	0.197
When was the last time has you presented to the MOH hospital's ED? (Did not visit the ED before)					0.022[b]
One day ago	2.293	9.900	0.091	1075.345	0.338
A month ago	-0.102	0.903	0.078	10.401	0.935
Three months ago	1.569	4.801	0.634	36.345	0.129
Six months ago	2.527	12.515	2.201	71.171	0.004[b]
A year ago	1.871	6.493	1.542	27.337	0.011[b]
More than a year ago	2.087	8.063	1.627	39.950	0.011[b]
Constant	-1.210	0.298			0.419

(Left margin label spanning rows: "Last Step a")

Dependent Variable	Internal Value
PHCC	0
ED	1

[a]-Variable(s) entered in step 1: How long have you been registered with the PHCC? How many times do you usually visit the PHCC during the year? Q25, Have you ever left the PHCC without seeing a doctor or getting treatment? Did you try to seek a doctor in the PHCC before visiting the ED? Did you try to visit an ED of the MOH before visiting the PHCC? Did family or friends influence your decision to visit the ED? Did family or friends influence your decision to visit the PHCC? Since when have you had this problem? How many times do you usually visit the MOH hospital's ED during the year? When was the last time has you presented to the MOH hospital's ED?

[b]-Significant using the binary logistic regression model, with backward conditional elimination (entry criterion = 0.05, elimination criterion = 0.10)

4.6   Satisfaction

In the previous three sections, patients' characteristics, knowledge and behaviour were discussed. In this fourth key section, the significance of factors that impact patients' choice of healthcare facility

is discussed in terms of their satisfaction with services, that is, whether patients received better services from the ED than PHCCs. The satisfaction scores for PHCC services are calculated based on contextual knowledge of the patient, integration (between PHC and tertiary care), communication, physical examination, interpersonal treatment, trust, convenience and overall satisfaction. As explained in chapter 3, the scores for each variable were added and converted to a 100-point scale. I then used multivariable logistic regression to examine the relationship between the independent variables representing patients' satisfaction to determine which ones were significant in terms of patients' decision to access healthcare (ED or PHCCs).

As shown in Table 25, the majority of the patients who were registered in a PHCC had experience with their PHCC for at least one year and even up to five years or more. Accordingly, the researcher measured patients' satisfaction with the PHCC services as a factor that may affect patients' decision on where to access healthcare.

4.6.1 Reasons Why Patients Prefer the ED to PHCCs

Table 28 shows the responses of 297 patients who utilised both ED and PHCC services and were registered with a PHCC. Before measuring satisfaction, we asked the patients whether they received better services from the ED. Notably, significantly most patients who stated that the ED provided better services were those from the ED group: they stated that the ED was easier to access, and that it took longer to get appointments at a PHCC. In the knowledge section, the findings show that the ED patients lacked knowledge about some of the services provided by PHCCs, such as online appointments and phone triage; this might have affected their preference for the ED. Additionally, the patients mentioned that they trusted the ED doctors more and felt that they were more qualified; they also preferred being seen by a specialist rather than a family medicine doctor. Another key reason for visiting an ED was the PHCCs' limited hours of operation. As discussed in the knowledge section, most of the ED patients were not knowledgeable about the opening hours of PHCCs.

Table 28. Reasons Why Patients Prefer ED Services to PHCC Services

Satisfaction		Total	Group		p-value
			PHCC	ED	
	Yes	94	17 (18.1%)	77 (81.9%)	<0.001[a]

Do you get better services from the ED than the PHCC?	No	203	193 (95.1%)	10 (4.9%)
If the answer is yes, please specify why? (n = 94)	The ED is easier to access than PHCCs in terms of getting appointments and location	34	8 (23.5%)	26 (76.5%)
	ED doctors are more qualified than PHCC doctors	62	12 (19.4%)	50 (80.6%)
	I trust ED doctors more than I do PHCC doctors	48	8 (16.7%)	40 (83.3%)
	ED doctors are more knowledgeable about patients than PHCC doctors	35	3 (8.6%)	32 (91.4%)
	ED opening hours are more convenient than PHCC opening hours	37	4 (10.8%)	33 (89.2%)
	ED doctors provide better examination and treatment than PHCC doctors	15	0 (0.0%)	15 (100.0%)
	Others — Limited specialization in the PHCC	1	1 (100.0%)	0 (0.0%)
	Others — Limited resources in the PHCC	1	1 (100.0%)	0 (0.0%)
	Others — Facilities for the elderly in the ED	1	0 (0.0%)	1 (100.0%)

[a]-significant using the chi-square test at a significance level of <0.05

4.6.2 Comparison of Satisfaction Scores for PHCC Services between the ED and PHCC groups

As noted earlier, some patients were not satisfied with the services provided by PHCCs. Therefore, I wanted to understand the factors that drove patients to seek an ED for PHC-treatable conditions. Accordingly, the patients were asked to rank statements about PHCC services on a Likert scale of 1 to 5, with 1 indicating 'poor' and 5 indicating 'excellent' (some patients were not aware about some services in the integration section, so these scores (0) are missing for some patients).

Table 29 shows the comparison of scores for the nine categories of satisfaction between the PHCC and ED groups. The first category was access to PHCCs, and this category contained seven statements. For both groups, significantly the lowest satisfaction score was obtained for access with regard to the ability of patients to speak to their doctor on the phone when they had questions, needed medical advice, and wanted to obtain information via the telephone from the reception desk (PHCC = 0.86, ED = 1.91, p < 0.001). The PHCC patients were significantly more satisfied with regard to getting an appointment when they fell sick (PHCC = 4.10, ED = 3.72, p = 0.045), punctuality of appointments (PHCC = 4.20, ED = 3.85, p = 0.027), convenience of the centre's hours (PHCC = 4.45, ED = 3.60, p < 0.001) and location (PHCC = 4.70, ED = 4.29, p < 0.001).

The patients' contextual knowledge scores show that ED patients were significantly less satisfied than PHCC patients with regard to the PC physician's knowledge of their medical history (PHCC = 4.37, ED = 3.97, p = 0.001) and what worried them the most about their health (PHCC = 4.41, ED = 4.03, p = 0.001).

Under the integration category, PHCC patients reported that PHCC physicians did not help them with getting a referral for speciality care, and they were significantly less satisfied than ED patients in this regard (PHCC = 2.35, ED = 3.05, p = 0.040). Additionally, patients who utilised both services were not satisfied with the integration between their PHC provider and specialists in tertiary care. When they visited a specialist, they had to repeat their history due to a lack of proper case documentation. Importantly, specialists use different systems that do not allow access to PHC patients' files (PHCC = 1.39, ED = 1.94, p = 0.099).

With regard to communication between the patients and their PHC physician, the PHCC patients were significantly more satisfied than the ED patients, with the latter reporting that PHCC physicians did not always clearly explain their health problems or treatment (PHCC = 4.44, ED = 3.98, p < 0.001), talk about seeking further care (PHCC = 4.44, ED = 3.91, p < 0.001) or help them make decisions about their care (PHCC = 4.34, ED = 3.84, p < 0.001).

ED patients were also less satisfied with PHC physicians' examinations and the overall healthcare that they received (PHCC = 4.40, ED = 3.80 p < 0.001). They mentioned that specific medicines and

laboratory tests were sometimes unavailable, as a result of which they did not receive optimal treatment (PHCC = 4.35, ED = 3.97, p = 0.001).

ED patients were more satisfied with their interpersonal treatment than the other categories mentioned above, even though the PHCC patients were significantly more satisfied with regard to interpersonal treatment. Both patient groups reported that physicians and staff at PHCCs were patient, friendly, caring and respectful (PHCC = 4.53, ED = 4.20, p = 0.005).

Patients who utilised both services reported low levels of satisfaction in terms of trust. Both groups complained that PHCC physicians would not explain when a mistake was made in their treatment, but the scores in the ED group were significantly lower (PHCC = 1.50, ED = 2.56, p < 0.001). Additionally, ED patients were less satisfied with the PHCC doctors' qualifications than the PHCC patients (PHCC = 4.51, ED = 3.70 p < 0.001) and stated that they would like to have access to more specialised doctors.

In terms of convenience, the ED patients were significantly less satisfied than patients who visited a PHCC. The ED patients reported that there was inadequate space for patients and visitors in the PHCC waiting area (PHCC = 4.44, ED = 3.87 p < 0.001). The services and resources of the PHCC received the lowest satisfaction rating in both groups, with the score being significantly lower in the ED group (PHCC = 4.24, ED = 3.64, p < 0.001). As discussed in the access category, patients could not reach doctors when they called the centre and the receptionist did not always answer calls. The patients were also unhappy about unavailability of laboratory and x-ray services and some treatments at the PHCCs, as discussed in the physical examination category.

Table 29. Comparison of Patients' Satisfaction with PHCC Services for Each Variable

Satisfaction		Total	Group (Mean ± SD)		p-value
			PHCC	ED	
PHCC access	Ability to speak to your doctor by phone when you have a question/need medical advice	297	0.86 ± 1.8	1.91 ± 2.1	<0.001[b]
	Getting a medical appointment when sick	297	4.10 ± 1.5	3.72 ± 1.4	0.045[a]
	Obtaining information by telephone	297	0.93 ± 1.8	2.10 ± 1.9	<0.001[b]
	Punctuality of appointments	297	4.20 ± 1.2	3.85 ± 1.4	0.027[a]
	Convenience of centre's location	297	4.70 ± 0.6	4.29 ± 0.9	<0.001[b]
	Convenience of centre's hours	297	4.45 ± 0.9	3.60 ± 1.1	<0.001[b]
	In your opinion, the length of time you have to wait before receiving care from the staff	297	4.10 ± 1.0	3.90 ± 1.1	0.138
Contextual knowledge of the patient	Primary physician's knowledge of your medical history	297	4.37 ± 1.0	3.97 ± 1.0	0.001[a]
	Primary physician's knowledge about what worries you the most about your health	297	4.41 ± 0.9	4.03 ± 1.0	0.001[a]
Integration	Help regular doctor gave you in getting an appointment for specialty care	169	2.35 ± 2.3	3.05 ± 2.0	0.040[b]
	Communication with specialists or other doctors who saw you	145	1.39 ± 2.1	1.94 ± 1.9	0.099
	Understanding what specialists or other doctors said about you	145	1.55 ± 2.1	2.20 ± 2.1	0.068
Communication	Thoroughness of primary physician's questions about symptoms	297	4.45 ± 0.7	3.95 ± 1.1	<0.001[b]
	PHCC doctor's attention to what you say	297	4.50 ± 0.7	3.97 ± 1.1	<0.001[b]
	PHCC doctor's explanation of your health problems or treatments	297	4.44 ± 0.7	3.98 ± 1.0	<0.001[a]
	PHCC doctor's instructions about what symptoms to report and when to seek further care	297	4.44 ± 0.8	3.91 ± 1.1	<0.001[b]

	PHCC doctor's advice and help in making decisions about your care	297	4.34 ± 0.9	3.84 ± 1.1	<0.001[a]
	The length of time usually spent during your consultation with the PHCC doctor	297	4.47 ± 0.7	4.01 ± 1.1	<0.001[a]
Physical examination	Thoroughness of primary physician's physical examinations	297	4.40 ± 0.9	3.80 ± 1.2	<0.001[b]
	The healthcare you usually receive (e.g. drugs) from the PHCC	297	4.35 ± 0.8	3.97 ± 1.1	0.001[a]
	The improvement in your health condition after your last visit to the PHCC	297	4.46 ± 0.7	3.97 ± 1.0	<0.001[a]
Interpersonal treatment	Primary physician's patience, friendliness, care, and respectfulness	297	4.53 ± 0.7	4.20 ± 1.0	0.005[b]
	The manner you were received by the staff of the PHCC	297	4.54 ± 0.7	4.20 ± 1.0	0.001[a]
	The performance of the staff who attended to you at the PHCC	297	4.50 ± 0.7	4.14 ± 1.0	0.004[b]
Trust	Your satisfaction with the PHCC doctor's qualifications	297	4.51 ± 0.7	3.70 ± 1.1	<0.001[b]
	Your trust in the physician's judgments about your medical care	297	4.42 ± 0.7	3.71 ± 1.1	<0.001[b]
	My doctor would always tell me the truth about my health, even if there was bad news	297	4.41 ± 0.8	4.07 ± 1.0	0.003[a]
	If a mistake was made in my treatment, my doctor would try to explain it to me	297	1.50 ± 2.2	2.56 ± 2.0	<0.001[a]
Convenience	How adequate is the space provided for patients and visitors in the waiting area of the PHCC?	297	4.44 ± 0.7	3.87 ± 1.2	<0.001[b]

The seats provided for patients and visitors in the waiting area of the PHCC	297	4.46 ± 0.8	4.06 ± 1.2	0.005[b]
The neatness of the PHCC	297	4.51 ± 0.7	3.97 ± 1.0	<0.001[b]
The hygiene of the PHCC	297	4.60 ± 0.6	4.15 ± 1.0	<0.001[b]
In your opinion, the safety of the care you receive from the PHCC	297	4.63 ± 0.6	3.89 ± 1.0	<0.001[b]
The services and resources of the PHCC	297	4.24 ± 1.0	3.64 ± 1.1	<0.001[b]

[a]-significant using the independent t-test at a significance level of <0.05
[b]-significant using Welch's t-test at a significance level of <0.05

4.6.3 Patients' Overall Satisfaction with PHCC Services

Table 30 shows the total score for each category of satisfaction assessed on a 100-point scale (the methods are described in chapter 3).

The results reveal significant differences between the satisfaction scores of the PHCC and ED patients for most of the nine categories according to independent t-test and Welch's t-test at the 0.05 level, with the ED patients' general satisfaction ratings being significantly lower than those of the PHCC patients (PHCC = 84.29, ED = 69.89, p < 0.001). Similarly, the overall satisfaction for all categories was significantly lower in the ED group (PHCC = 76.87, ED = 71.38, p = 0.001). Table 31 shows that all 297 patients (from both groups who rated PHCC services) had a mean satisfaction score of 75.26 ± 11.5 (min = 6.67, max = 97.86) out of 100, which indicates that the majority received good healthcare services.

Table 30. Comparison of Total Scores for Each Satisfaction Category

Satisfaction		Total	Group		p-value
			PHCC	ED	
Satisfaction	PHCC access	297	66.68 ± 12.9	66.77 ± 16.1	0.962
	Contextual knowledge of the patient	297	87.86 ± 17.3	80.00 ± 19.4	0.001[a]
	Integration	172	42.90 ± 44.0	48.66 ± 36.2	0.352
	Communication	297	88.81 ± 11.5	78.85 ± 18.8	<0.001[b]
	Physical examination	297	88.06 ± 12.6	78.24 ± 19.2	<0.001[b]
	Interpersonal treatment	297	90.44 ± 12.7	83.52 ± 18.3	0.002[b]
	Trust	297	74.24 ± 15.6	70.23 ± 18.7	0.059
	Convenience	297	89.62 ± 10.4	78.58 ± 18.3	<0.001[b]
	General satisfaction	297	84.29 ± 15.5	69.89 ± 19.3	<0.001[b]
	Overall Satisfaction	297	76.87 ± 9.8	71.38 ± 14.3	0.001[b]

[a]-significant using the independent t-test at a significance level of <0.05

[b]-significant using Welch's t-test at a significance level of <0.05

Table 31. Mean Overall Satisfaction with PHCCs

Variables	N	Min	Max	Mean	SD
Overall Satisfaction	297	6.67	97.86	75.26	11.5

4.6.4 Preventive Counselling and its Association with Patients' Satisfaction with PHCCs

Table 32 shows a significant difference between both groups, with the majority of the ED patients reporting that PHCC physicians did not discuss health-related issues, such as smoking, seat belt use, diet, exercise and stress. Table 33 depicts the effect of preventive counselling on knowledge and satisfaction scores. The findings show that the patients who stated that their physician provided preventive counselling had significantly higher satisfaction and knowledge scores.

Table 32. Comparison of Preventive Counselling Between the PHCC and ED Groups

Satisfaction		Total	Group		p-value
			PHCC	ED	
Total		297	210 (70.7%)	87 (29.3%)	-
Preventive counselling	Yes	154	122 (79.2%)	32 (20.8%)	0.001[a]
	No	143	88 (61.5%)	55 (38.5%)	

[a]-significant using the chi-square test at a significance level of <0.05

Table 33. Association of Preventive Counselling with Knowledge and Satisfaction Scores

Domains		Total	Preventive counselling		p-value
			Yes	No	
Satisfaction	PHCC access	297	68.53 ± 11.8	64.74 ± 15.7	0.020[b]
	Contextual knowledge of the patient	297	89.16 ± 13.2	81.68 ± 21.9	0.001[b]
	Integration	172	52.16 ± 42.0	39.33 ± 39.9	0.042[a]
	Communication	297	88.70 ± 9.8	82.87 ± 18.2	0.001[b]
	Physical examination	297	87.71 ± 10.8	82.47 ± 19.0	0.004[b]
	Interpersonal treatment	297	90.48 ± 9.8	86.20 ± 18.6	0.015[b]
	Trust	297	75.68 ± 15.6	70.24 ± 17.3	0.005[a]
	Convenience	297	87.86 ± 11.9	84.80 ± 16.1	0.065
	General satisfaction	297	81.95 ± 15.6	78.04 ± 19.9	0.062

[a]-significant using the independent *t*-test at a significance level of <0.05

[b]-significant using Welch's *t*-test at a significance level of <0.05

4.6.5   Continuity of Care Provided by PHCCs

To evaluate continuity of care, I investigated whether patients were being seen regularly by the same physician. Most patients (67.7% of 297) reported that they saw a different physician at every visit, as shown in Table 34. As reported in earlier findings on the integration of care, patients were probably required to repeat their treatment history each time as they were appointed a different physician at each visit. This may have affected patients' satisfaction with the PHCC services. However, no patients can be prescribed medication, tested or treated without being seen by a physician to increase patient safety.

Table 34. Comparison of Continuity of Care between the PHCC and ED Groups

Satisfaction		Total	Group		p-value
			PHCC	ED	
Total		297	210	87	
How long has the primary physician you're seeing been your doctor?	Less than one year	51	34 (66.7%)	17 (33.3%)	0.009[a]
	More than one year	41	21 (51.2%)	20 (48.8%)	
	I am appointed a different doctor at each visit	201	153 (76.1%)	48 (23.9%)	
	It is my first visit	4	2 (50.0%)	2 (50.0%)	
How often do you see your primary physician (not an assistant or partner) for routine check-ups	Always	296	210 (70.9%)	86 (29.1%)	0.120
	The respondent did not know	1	0 (0.0%)	1 (100.0%)	
How often do you see your primary physician (not an assistant or partner) for appointments when sick	Always	296	210 (70.9%)	86 (29.1%)	0.120
	The respondent did not know	1	0 (0.0%)	1 (100.0%)	

[a]-significant using the chi-square test at a significance level of <0.05

4.6.6 Identification of the Most Significant Factors Affecting Patients' Satisfaction with PHCC services

As demonstrated in the univariate analyses above, in general, patients who accessed PHCC services were more satisfied with PHCC services than those who accessed ED services. The PHCC patients had knowledge about which facilities to approach when they felt sick, and they had a clear perception of ED and PHCC services. As described for the previous sections, the significant variables identified with univariate analyses were entered into a multivariable (binary) logistic regression model to determine which variables which remain significantly associated with patients' decision to access healthcare (ED or PHCCs).

As shown in Table 35, the most significant factor were better services provided by the ED than PHCCs (OR = 215.5, 95% CI = 47.8–970.8, p < 0.001). Further, unclear perceptions of both providers caused ED patients to report that PHCCs do not have speciality physicians. Higher satisfaction and convenience experienced with PHCC services might cause patients to approach PHCCs for their health problems.

However, ED patients reported that PHCCs lacked easily accessible facilities for vulnerable patients, including wheelchairs and comfortable waiting areas, and other facilities, such as x-ray departments. Patients also reported that preventive counselling was an important factor: when a physician discussed their health issues with them at length, they felt safer and considered the physician highly qualified.

Table 35. Results of Multivariable Logistic Regression Analyses on Satisfaction Factors Associated with Patients' Decision to Access ED and PHCC Services

Variables in the Equation		B	OR	95% CI for OR)		p-value
				Lower	Upper	
First Step[a]	PHCC access	0.041	1.042	0.997	1.089	0.065
	Contextual knowledge of the patient	-0.021	0.979	0.945	1.014	0.240
	Integration	-0.017	0.983	0.964	1.003	0.101
	Communication	-0.021	0.979	0.909	1.054	0.572
	Physical examination	-0.037	0.964	0.918	1.012	0.137
	Interpersonal treatment	0.052	1.053	0.982	1.128	0.145
	Trust	0.045	1.046	0.984	1.111	0.148
	Convenience	-0.064	0.938	0.868	1.014	0.105
	General satisfaction	-0.020	0.981	0.925	1.039	0.509
	Preventive counselling (Yes)	-1.936	0.144	0.030	0.705	0.017[b]
	Do you get better services from the ED than the PHCC? (Yes)	6.093	442.809	60.122	3261.388	<0.001[b]
	Constant	0.762	2.142			0.698
Last Step[a]	Convenience	-0.053	0.948	0.912	0.986	0.007[b]
	Preventive counselling (Yes)	-1.711	0.181	0.045	0.724	0.016[b]
	Do you get better services from the ED than the PHCC? (Yes)	5.373	215.518	47.844	970.809	<0.001[b]
	Constant	1.872	6.501			0.224

Dependent Variable	Internal Value
PHCC	0
ED	1

[a]-Variable(s) entered in step 1: PHCC access, Contextual knowledge of the patient, Integration, Communication, Physical examination, Interpersonal treatment, Trust, Convenience, General satisfaction, Preventive counselling, Do you get better services from the ED than the PHCC?

[b]-Significant using a binary logistic regression model, with backward conditional elimination (entry criterion = 0.05, elimination criterion = 0.10)

4.7 Identification of the Most Significant Factors of Characteristics, Knowledge, Behaviour and Satisfaction

This chapter has described the factors that influenced patients' choice of healthcare service. Table 36 shows the most significant factors identified from the domains characteristics, knowledge, behaviour and satisfaction. These factors were entered into a multivariable logistic regression model to determine which of these independent variables were the most significant with regard to patients' decision to access healthcare (ED or PHCCs).

According to the results, patients believed that they would receive better services in the ED than in PHCCs (OR = 155.91, 95% CI = 43.97–552.743, $p < 0.001$). This led them to access care from the ED rather than PHCCs, with the unintended consequences being unnecessary visits and overcrowding in ED departments. Our results also indicate that most patients did not try to seek care from a PHCC before visiting the ED (OR = 29.805, 95% CI = 2.972–298.95, $p = 0.004$).

Table 36. Results of the Multivariable (binary) Logistic Regression Analyses of Factors Associated with Patients' Decision to Access ED and PHCC Services

Variables in the Equation	B	Exp(B)	95% CI for Exp(B)		p-value
			Lower	Upper	
Characteristics					
Education level					0.011[b]
Education level (lower than high school)	2.298	9.955	1.796	55.165	0.009[b]
Education level (high school)	2.087	8.064	2.043	31.833	0.003[b]
Education level (diploma)	0.492	1.636	0.312	8.573	0.561
Do you have any chronic health problems? (Yes)	-1.121	0.326	0.099	1.074	0.065
Knowledge					
Do you know which clinics are available in this PHCC?	-3.074	0.046	0.003	0.776	0.033[b]
Do you know that some PHCCs of the MOH are open for more than 8 h a day? (Yes)	-1.110	0.329	0.103	1.050	0.061
Behaviour					
Did you try to consult a doctor in the PHCC visiting the ED? Did you try to visit an ED of the MOH before visiting the PHCC? (Yes)	3.395	29.805	2.972	298.946	0.004[b]
Satisfaction					
Convenience	-0.231	0.794	0.702	0.898	<0.001[b]
Preventive counselling (Yes)	-0.933	0.393	0.130	1.194	0.100
Do you get better services from the ED than the PHCC? (Yes)	5.049	155.905	43.974	552.743	<0.001[b]
Constant	4.543	94.015			0.010[b]

The label "Last Step[a]" spans the rows from Characteristics through Constant.

Dependent Variable	Internal Value
PHCC	0
ED	1

[a]-Variable(s) entered in step 1: Marital status, Education level, Do you have any chronic health problems? Do you know which clinics are available in this PHCC? Do you know that some PHCCs of the MOH are open for more than 8 h a day? Do you know the working hours of the PHCC you are registered with? Do you know the working hours of the PHCC in your neighbourhood? Did you try to consult a doctor in the PHCC before visiting the ED? Did you try to visit an ED of the MOH before visiting the PHCC? How many times do you usually visit the MOH hospital's ED during the year? When was the last time has you presented to an MOH hospital's ED? Convenience, Preventive counselling, Do you get better services from the ED than the PHCC?.

[b]-Significant using a binary logistic regression model, with backward conditional elimination (entry criterion = 0.05, elimination criterion = 0.10)

4.8 Correlation between Variables of Knowledge and Satisfaction

In order to explore the possibility of a relationship between knowledge and satisfaction, we used Pearson's correlation test to analyse the correlations between knowledge, PHCC access, contextual knowledge of the patient, integration, communication, physical examination, interpersonal treatment, trust and convenience.

Table 37 shows that the mean knowledge scores of the 410 patients was 47.61 ± 33.7 (min = 0, max = 100). The lowest mean satisfaction score for the 297 patients who used both PHCC and ED services was obtained for integration (45.08 ± 41.2; min = 0, max = 100), while the highest score was obtained for interpersonal treatment (88.42 ± 14.9; min = 0, max = 100).

Pearson correlation analysis of the relationship between knowledge and satisfaction factors is shown in Table 38. Knowledge was not found to correlate with satisfaction factors, with the exception of communication, which was found to be affected by knowledge. This is probably because patients are more likely to pose questions to their physicians when they are knowledgeable about their treatment and know when to seek healthcare. As expected, most of the other satisfaction factors are correlated with one other. For example, PHCC access was significantly correlated with contextual knowledge ($p < 0.001$), and contextual knowledge was significantly correlated with integration ($p < 0.001$) at the 0.01 level (two-tailed). Additionally, both PHCC access and contextual knowledge of the patients were found to be significantly correlated ($p < 0.001$) with contextual knowledge, communication, physical examination, interpersonal treatment, trust, convenience and general satisfaction. Significant correlation was also observed between integration and trust ($p = 0.010$), communication and physical examination ($p < 0.001$), interpersonal treatment and trust ($p < 0.001$), and convenience and general satisfaction ($p < 0.001$). Both communication and physical examination showed significant correlation ($p < 0.001$) with interpersonal treatment, trust, convenience and general satisfaction, Lastly, both interpersonal treatment and trust also showed significant correlation ($p < 0.001$) with convenience and general satisfaction factors at the 0.01 level (two-tailed).

Table 37. Mean Scores for Knowledge of and Satisfaction with PHCC Services

Domains		N	Min	Max	Mean	SD
Knowledge		410	0	100	47.61	33.7
Satisfaction	PHCC access	297	0	100	66.71	13.9
	Contextual knowledge of the patient	297	0	100	85.56	18.3
	Integration	172	0	100	45.08	41.2
	Communication	297	0	100	85.89	14.7
	Physical examination	297	0	100	85.19	15.5
	Interpersonal treatment	297	0	100	88.42	14.9
	Trust	297	0	100	73.06	16.6
	Convenience	297	0	100	86.39	14.1
	General satisfaction	297	20	100	80.07	17.9

Table 38. Pearson Correlation Analysis of Knowledge and Satisfaction Factors

Correlations		Knowledge	PHCC access	Contextual knowledge of the patient	Integration	Communication	Physical examination	Interpersonal treatment	Trust	Convenience
PHCC access	r	0.008								
	p-value	0.892								
	N	297								
Contextual knowledge of the patient	r	0.111	0.383**							
	p-value	0.057	<0.001							
	N	297	297							
Integration	r	0.033	0.129	0.152*						
	p-value	0.670	0.092	0.046						
	N	172	172	172						
Communication	r	0.116*	0.331**	0.633**	0.008					
	p-value	0.045	<0.001	<0.001	0.912					
	N	297	297	297	172					
Physical examination	r	0.091	0.343**	0.548**	-0.035	0.718**				
	p-value	0.116	<0.001	<0.001	0.645	<0.001				
	N	297	297	297	172	297				
Interpersonal treatment	r	0.063	0.242**	0.458**	0.000	0.670**	0.544**			
	p-value	0.277	<0.001	<0.001	0.996	<0.001	<0.001			
	N	297	297	297	172	297	297			
Trust	r	0.004	0.401**	0.487**	0.196*	0.593**	0.569**	0.484**		
	p-value	0.946	<0.001	<0.001	0.010	<0.001	<0.001	<0.001		
	N	297	297	297	172	297	297	297		
Convenience	r	0.096	0.318**	0.533**	-0.027	0.726**	0.679**	0.656**	0.521**	
	p-value	0.099	<0.001	<0.001	0.726	<0.001	<0.001	<0.001	<0.001	
	N	297	297	297	172	297	297	297	297	
General satisfaction	r	0.086	0.259**	0.519**	-0.010	0.660**	0.600**	0.609**	0.518**	0.709**
	p-value	0.140	<0.001	<0.001	0.899	<0.001	<0.001	<0.001	<0.001	<0.001
	N	297	297	297	172	297	297	297	297	297

**Correlation was significant at the 0.01 level (two-tailed)
*Correlation was significant at the 0.05 level (two-tailed)

4.9   Observation of the ED Process at KFGH

The researcher observed the ED patients' journey from entry to discharge to identify possible reasons why a high percentage patients attend ED with non-urgent cases (Figure 5). ED patients were classified into five categories according to the Canadian national classification. The researcher's focus was on CTAS V and some cases of CTAS IV (considered non-urgent by the nurse and/or doctors). According to KFGH hospital's policy, all non-urgent patients should be rejected during the first stage of triage, and if nurses are uncertain about patients' urgency levels during the initial triage, these could be rejected during the second stage of triage. If a patient is accepted into the second stage of triage, they will register their information at the ED reception desk. Then, a doctor will assess the patient and ask a nurse to transfer them to the waiting area if the case is semi-urgent or the ward if the case is urgent. Patients rejected in either the first or second stage of triage, will be directed to the nearest PHCC (Al-Hamra) if they require same-day treatment. If patients do not require same-day tretement, they will be asked to book an appointment with the PHCC they registered with.

The researcher observed the ED process from the following four different perspectives;

- o   Patients: Patients in the ED with non-urgent cases often lacked knowledge about the definition of urgency, and most of them did not know where to seek healthcare (lacked knowledge of the existence of PHCCs). Patients were also affected by cultural and family influences. They either claimed that their family had guided them to visit the ED, or a member of the family accompanied the patient and insisted to get the treatment from the ED. Some patients with health insurance visited the ED and reported that they knew (from their friends' or relatives' previous experiences) that KFGH had the best doctors and they wanted the best care.

- o   Staff communication & Training: During the observation, the researcher noticed that some staff had suboptimal communication skills to handle non-urgent patients. This occasionally led to improper conversations between nurses and patients and increased patients persistence to entering the ED. Some staff members also lacked the skills to follow the hospital's policies and procedures, leading them to admit cases which were certainly non-urgent. For example, if patients complained about transportation issues (i.e. they were unable to travel to a PHCC) because they were already in the ED or their parents or family members became angry, some staff members would accept them.

o ED Reform (following the release of vision 2030): The researcher conducted her master's research at KFGH in 2014. During that time, there was a first-track clinic that attracted a greater number of non-urgent patients inside the ED. The clinic was removed after the hospital's ED was reformed. In addition, although there was only one triage in 2014, the hospital changed its processes and added another triage to in an effort to reduce the number of non-urgent patients accessing the ED.

o Management & Policies: In 2014, the hospital lacked policies to reject non-urgent patients and instead accepted these patients into fast-track clinic. The hospital implemented a new policy to reduce non-urgent attendance by directing patients to PHCCs. Although the hospital ED has successfully implemented these procedures, there is no continuous review of the plans, and a high number of patients continue to access the ED with PC-treatable conditions.

Figure 5. Process of the ED at KFGH
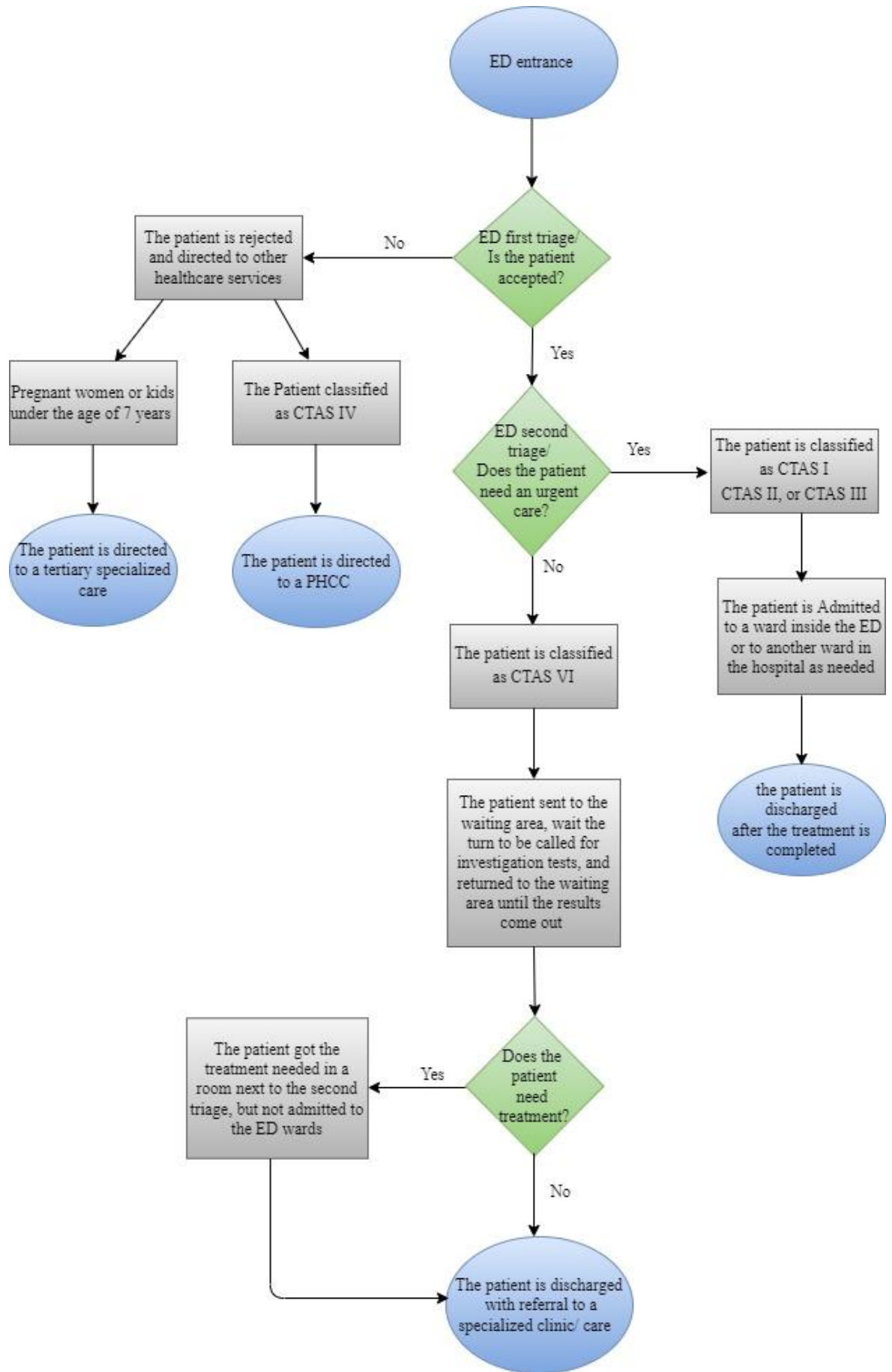
4.10 Observation of PHCCs Process

The researcher observed the PHC patients' journey in PHCCs to explore possible reasons why patients may prefer the ED compared to PHCCs ([Figure 6](#)). According to MOH's policy, all patients with no appointments should be rejected by PHCCS, and directed to book another visitat a later time. If a patient is accepted he/or she will be transferred to the waiting area near the clinic. Investigation tests will be ordered if needed which will be performed either in the PHCC or to another facility. Each PHCC should have a pharmacy and the treatment is provided in the centre.

The researcher observed PHCCs process from the following four different perspectives;

- o Patients: Some patients attended the PHCC with no appointments and insisted to see a physician. They claimed that they called and tried to book an appointment but there was no response. Other patients would access the PHCC just to get a referral to the ED even if their case was non urgent. The researcher noticed that some patients attended the PHCC to get a prescription and a free of charge medication even if they did not needed to. In addition, privately insured patients attended the PHCC to get a free service as no co-pay is needed.

- o Staff Communication & Training: During the observation, the researcher noticed that some PHCC staff lacked communication skills when rejecting patients without appointments. This occasionally led to improper conversations between nurses and patients and directed patients to the ED instead. Some staff members also lacked the skills to follow the PHCCs policies and procedures offering unclear explanations to patients who then attended ED instead of waiting for a future appointment with PHCC.

- o PHCC Reform (following the release of vision 2030): Two of the three PHCCs included in this study were reformed as discussed earlier. Investigation tests and x-ray services were introduced. A new electronic system was implemented to improve the PHCC access. Online consultation was also introduced using a phone application. Every citizen who lives in SA can freely benefit from this service. Moreover, a few PHCCs extended their working hours to 16 and 24.

- o Management & Policies: Although the MOH has successfully implemented the new services at PHCCs, the functionality of the new services are not monitored regularly. The researcher observed that because some laboratories and x-ray were not functioning, the PHCC physician had to transfer the patients to the ED. Moreover, the electronic system crashed several times, and the physician was unable to track the patients' medical history or update his/ or her information.

148

Figure 6. Process of PHCCs
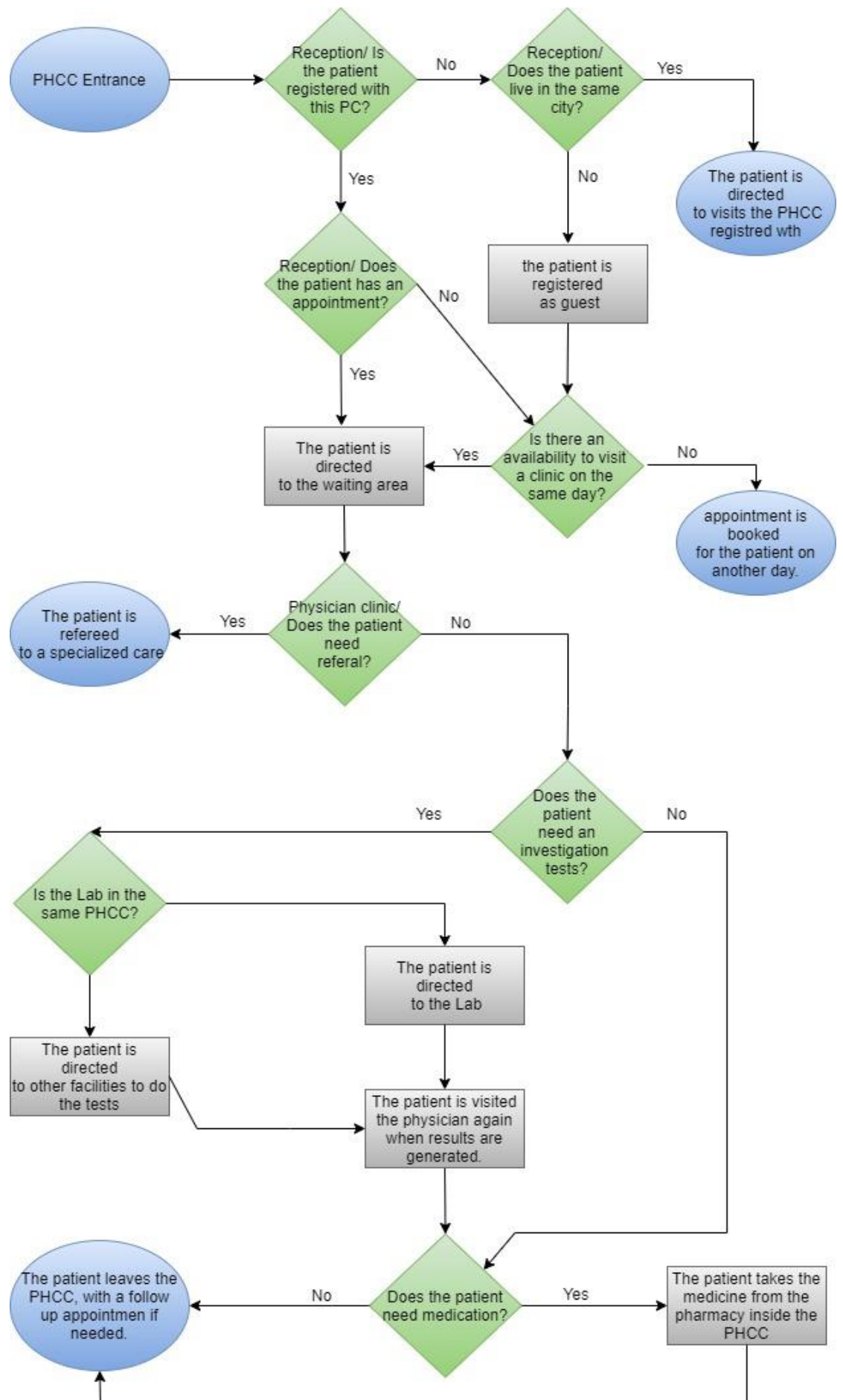
4.11 Conclusion

The total number of sample collected in this study was 410 adult patients, with males comprising 51.0% of the sample. A significantly higher proportion of patients with non-urgent cases who visited the ED in comparison to patients visited the PHCC were not married, younger, had lower education and had lower income. In addition, a significantly higher proportion of ED patients without emergencies did not have any chronic diseases. Most patients attended both services lacked health insurance, including some who worked for private sector companies. Non-urgent ED visitors were significantly less aware of the opening hours of PHCCs in their neighbourhood than PHCC visitors. Thus, most patients who visited the ED without emergencies thought the ED was the first place to consult when they experienced symptoms because they lacked knowledge about PHCCs and their services. Further, most of ED visitors were not registered with their local PHCC, and a significantly higher percentage of them reported that their decision to visit the ED without emergencies was influenced by family or friends. ED visitors also reported that they received better services at the ED than at PHCCs. These patients stated that it was difficult to get appointments at PHCCs, communicating with their PHCC physician was difficult, various investigation services were unavailable, there was a shortage of some medication, and they were appointed a different physician at each visit. Patients in both groups were more satisfied with PHCCs when their physician provided preventive counselling. Overall, the general satisfaction level of the PHCC visitors was higher than that of the ED visitors with regard to PHCC services.

Chapter 5

Discussion

5.1 Summary

In the previous chapter (chapter 4), the main findings derived from analysis of the data in the semi-structured questionnaire were presented, and observations were made to collect information about the voice of the process. In this chapter, the findings are explicated in relation to the published literature in order to answer the research questions and understand the contribution they make to the gaps in the literature.

This research was conducted to gain a better understanding of how common the non-urgent usage of ED services is and to investigate why patients in SA prefer to visit the ED, rather than the PHCC, for non-urgent conditions. To this end, patient characteristics, and their knowledge, behaviour and satisfaction with regard to healthcare services were examined to determine which factors may affect patients' decision to choose the ED or PHCCs. These factors include age; gender; marital status; education level; knowledge about services provided by PHCCs such as clinics and opening hours; the influence of family or friends; availability of PHCC services; and patients' satisfaction with PHCC access, integration, communication with other facilities, physical examination, treatment, trust and convenience. The findings showed that patients' awareness of urgency levels and when to seek the ED affected their decision to choose a healthcare.

5.2 Utilisation of ED

As discussed in chapters 1 and 2, inappropriate utilisation of ED is a global problem that can affect patient safety and waiting time at the ED, especially for patients who need urgent care. In addition, it can also lead to resource wastage, which increases the burden on the Saudi government (Siddiqui and Ogbeide, 2002).

The non-urgent consultation rates at EDs differ considerably across countries and range from 20% to 80% (Alyasin and Douglas, 2014; A. J. Boeke et al., 2010; Buja et al., 2014; Fung et al., 2015; Hwang et al., 2012; Kim et al., 2015; Lippi Bruni et al., 2016; Schumacher et al., 2013; Verhaegh et al., 2019). SA has the highest reported rate (76.8%) of non-urgent ED presentation (Alyasin and Douglas, 2014). Analysis of the administrative data obtained in the present study revealed that this percentage was 84.5%, which is higher than the previously reported rate. Similar to these findings, other studies in the Middle East have shown that the prevalence of inappropriate ED visits varies from 59.4% (Siddiqui and Ogbeide, 2002) to 88.7% (Shakhatreh et al., 2003).

Understanding the factors that lead to non-urgent ED visits is important from the perspective of designing interventions and policies to support appropriate use of ED and PHCC services. Some of the reported factors are the desire to receive care on the same day, availability of round-the-clock healthcare, accessibility to laboratory tests and other investigations, lack of knowledge about other healthcare services, low satisfaction with services provided by PHCCs (e.g. limited opening hours), and lack of trust in the treatment plans provided by PHCCs (Malmbrandt and Åhlström, 2013; Qureshi, 2010; Rehmani and Norain, 2007).

The following sections discuss in depth the reasons for and factors associated with non-urgent ED visits at KFGH in SA, Jeddah city.

5.3   Patients' Characteristics

Marital status, age, education level and income were identified as significant patient characteristics that affected their decision to visit the ED or PHCC. With regard to marital status, most patients who used both services were married, but married patients were significantly (p = 0.001) more likely to visit PHCCs. This is in line with a previously published study (Fung et al., 2015). Married patients probably visit PHCCs regularly because they need continuous care in terms of vaccination and other preventive services for their children (Al-Salihi et al., 2019) that are not provided at EDs. Thus, married patients may be more familiar with services provided by the PHCCs and, therefore, more likely to visit PHCCs for their healthcare needs.

The present findings showed that a significantly higher percentage of patients who attended the ED were younger (between the ages of 18 and 40 years, p = 0.018), as reported by other studies too (Barbadoro et al., 2015; A. J. Boeke et al., 2010; Buja et al., 2014; Chen et al., 2015; Hwang et al., 2012; Philips et al., 2010). Our findings also indicated that a significantly higher percentage (65.0%, p < 0.001) of patients with one or more chronic diseases visited PHCCs. Accordingly, previous studies have shown that most patients visiting the ED have no chronic diseases (Barbadoro et al., 2015; A. J. Boeke et al., 2010; Jiang et al., 2020). Chronic diseases are usually associated with life style or older age (Mcleod et al., 2019), so this might explain why the PHCC saw a lower percentage of younger patients too. In line with this, another study reported that chronic diseases are more prevalent among the elderly in SA who need regular healthcare (Saquib et al., 2017). Patients with chronic diseases need regular medication and investigations (almost monthly) that cannot be provided by the ED (Fung et al., 2015). This does not mean that ED patients are healthier than PHCC patients, but as explained by Uscher-Pines et al. (2013), it means that patients visiting the ED perceived their heath to be poorer than those visiting PHCCs. In this regard, Backman et al. (2010) argued that the health status of patients who have a regular healthcare provider is likely to be under control, even if they have chronic diseases.

My findings showed that a significantly higher number of ED visitors had lower income (SR 3,000–11,000, p < 0.001) and lower education level (high school or lower, p = 0.001) than those who visited PHCCs. This is in line with the findings of other studies (Alyasin and Douglas, 2014; Kim et al., 2015). Lower income is linked with lower education level, as suggested by Jiang et al. (2020). Another related finding was that unemployed patients represent over half of the patients in this study; this included patients who were not working (students or retirees) and homemakers. These findings together imply that younger ED patients with lower education and income levels, or no employment, have no regular healthcare provider and use the ED to access healthcare services. In this study, 56.5% (n = 113) of ED visitors were not registered with the PHCC in their neighbourhood, while all the PHCC visitors were registered. Thus, the absence of a regular healthcare provider may result in an increase in inappropriate usage of the ED, as reported in other studies too (Alyasin and Douglas, 2014; Backman et al., 2010; Philips et al., 2010).

In this study, there was no significant difference between ED and PHCC visitors with regard to health insurance. However, my findings revealed that 77.8% of the total patient population (that is, both ED and PHCC visitors) did not have health insurance, and 78% were from the ED group. This finding implies that the lack of health insurance may lead to inappropriate utilisation of the ED. Similar findings have been reported in other studies (Chen et al., 2015; Kim et al., 2015; Lines et al., 2019; Naouri et al., 2020; Philips et al., 2010; Rowe, 2020; Schumacher et al., 2013).

Of the 410 participants included in this study, 26.3% worked for private sector companies. These patients, by Saudi law, need to be covered by private health insurance. Surprisingly, 62% of the patients who worked for the private sector were not covered by private health insurance. Other studies (Chen et al., 2015; Lines et al., 2019) have shown that patients with private insurance are less likely to choose the ED than non-insured patients or those with public insurance. However, in this study, 22.0% of the patients who visited the ED had health insurance. The inappropriate utilisation of ED services by patients who have insurance is a burden on government healthcare services. Therefore, it is important to have strict regulations and policies in place to ensure businesses provide health insurance coverage for their employees. The reasons why patients chose MOH services (ED and PHCCs) even though they had health insurance are discussed in the behaviour section.

The multivariable regression analysis conducted in this study revealed that patients with lower education levels were most likely to use ED services for non-urgent conditions.

5.4 Patients' Knowledge

The previous section described how younger age and lower education level are significantly associated with non-urgent ED visits. These characteristics may be related to patients' knowledge about the urgency of their condition and when to seek healthcare, as well as the services provided by PHCCs. Accordingly, my findings showed that a significantly higher number of ED visitors than PHCC visitors were less knowledgeable about PHCC clinics, services and opening hours. With

regard to patients who had used both ED and PHCC services, they were least knowledgeable about out-of-hours care at PHCCs, followed by the services provided by PHCCs, and a significantly higher number of these patients were ED visitors. However, PHCC visitors who lack knowledge about out-of-hours care at PHCCs are still a concern, as they may choose to visit the ED during the evening and night shifts. The PHCC visitors in this study were significantly more knowledgeable than the ED visitors about the working hours of the PHCCs in their neighbourhood. This is in agreement with the findings of (Philips et al., 2010), who found that over half of the ED patients did not know which service to consult for out-of-hours care.

This study showed that a significantly higher number of patients visited the PHCCs during the morning shift, while a significantly higher number visited the ED during the evening shift. Among the ED visitors, 38% visited during the morning shift of weekdays, when all the PHCCs were open. This finding is in line with other studies (Almeida and Vales, 2020; Alyasin and Douglas, 2014; Buja et al., 2014).

In addition to vaccine service, the MOH provides two new services—phone triage and a phone application through which patients can book appointments for PHCCs and have an online consultation through text, voice call or video call. My data showed that in contrast to ED patients, most PHCC patients were knowledgeable about the new booking system and vaccine service. However, 82% of the patients who used both services were not knowledgeable about the phone triage service. The lack of such knowledge is likely to lead patients to visit the ED for non-urgent cases. Similar findings have been reported in other studies too (Jiang et al., 2020; Naouri et al., 2020; Northington et al., 2005; O'Cathain et al., 2016; Philips et al., 2010).

The multivariable regression analysis conducted in this study revealed that patients who lack knowledge about available clinics at PHCCs followed by opening hours were most likely to visit the ED for non-urgent conditions.

5.5 Patients' Behaviour

The previous section showed how non-urgent ED visitation was linked with lack of knowledge about PHCC services and out-of-hours care. Additionally, the findings indicated that 61.5% of ED visitors lacked knowledge about the opening hours of PHCCs in their neighbourhood. This lack of knowledge could affect patients' behaviour towards and utilisation of both services. My findings showed that ED patients who did not have a regular healthcare provider were significantly more likely to overutilise the ED service than patients with a PHC provider. These findings are supported by other studies (Alyasin and Douglas, 2014; Backman et al., 2010; Philips et al., 2010).

The present findings showed that 73.6% of ED patients who were registered with a PHCC still visited the ED directly without trying to seek a PHCC, while 99% of PHCC patients did not try to seek the ED before visiting the PHCC. In accordance with these findings, Alyasin and Douglas (2014) reported that 95% of Saudi patients accessed the ED without first trying to contact the PHCC

in their neighbourhood, and another study (Fung et al., 2015) reported that patients with a PHC provider were 50% less likely than those without a regular PHC provider to visit the ED with non-urgent conditions.

Most of the patients who visited the ED for non-urgent reasons had symptoms for two days to one week, and some of them had been experiencing symptoms for up to one month. A number of studies have described similar findings to ours, with some studies (Alyasin and Douglas, 2014; Jiang et al., 2020; Miyazawa et al., 2019; Naouri et al., 2020) reporting a symptom duration of 24 h to one week in ED visitors. Half of the PHCC visitors in this study had symptoms for up to one month. This can be explained by the previous finding that most PHCC visitors had chronic disease that required regular care.

In this study, a significantly higher percentage of ED patients than PHCC patients reported that they get better services at the ED than PHCCs. Some of the ED patients reported that they had the option of visiting the PHCC with which they were registered, but they preferred the ED. Further, some of the patients who visited the PHCCs stated that they had the option to visit the ED but preferred to access healthcare through the PHCC. These findings imply that inappropriate utilisation of the ED is lower among patients who are accustomed to using PHCCs for non-urgent cases. Accordingly, Kim et al. (2015) showed that when ED visitors with non-urgent conditions were transferred to a PHC service, they became familiar with the service and tended to not return to the ED for non-urgent conditions. Similarly, other studies have also shown that when patients are not familiar with healthcare providers other than the ED, they tend to seek ED care even for non-urgent reasons (Jiang et al., 2020; Naouri et al., 2020; Northington et al., 2005; O'Cathain et al., 2016; Philips et al., 2010).

Health and cultural behaviour may also play an important role in ED visitation. In this study, I found that a significantly high number of patients who visited the ED for non-urgent reasons had been influenced by their family or friends. From my knowledge of Saudi culture, families in SA have a big influence on their children's decisions even if they are adults. Usually, adults live in their parents' house or close by if they are married, and they still receive advice from their parents. The influence of family has also been described in the context of the US (Schumacher et al., 2013), where family and health-related behaviour play an important role in the choice of healthcare.

In this study, 28.7% of the patients who visited the ED reported that they preferred the ED even for cases that could be treated by the PHC provider, and 13.7% explained that the reason was the unavailability of physicians at PHCCs. This finding is in concordance with other published studies (Fung et al., 2015; O'Cathain et al., 2016). The health worries of the patients themselves and their families lead them to believe that they should not wait for an appointment at the PHCC and that their case is serious enough to warrant a visit to the ED (Bahadori et al., 2020; Burns, 2017; Jiang et al., 2020; Miyazawa et al., 2019; Schumacher et al., 2013; Uscher-Pines et al., 2013). These findings point to the need for better patient education that can help patients understand when their health

condition is urgent, when to seek ED care, and the services provided by alternative healthcare providers (such as PHCCs) and how to access it (Bahadori et al., 2020).

Patients in this study (who had used both ED and PHCC services) with a health insurance provider other than the MOH reasoned that their use of healthcare services was based on easier access and availability. Among the patients with private health insurance who used both services, 68.1% admitted that they prefer MOH services because there is no co-pay, which they must pay when using their insurance. The unavailability of policies to prevent such practices places more pressure on MOH hospitals and PHCCs.

Multivariable regression analysis of the above behaviour factors revealed that intention to seek a doctor in the PHCC before visiting an ED and *vice versa*, as well as visiting an ED more than twice through the year, were linked with an increased likelihood of non-urgent ED visits.

5.6   Patients' Satisfaction

The previous section showed that visiting the ED with no prior contact with a PHC provider and accessing the ED every more than twice a year indicate a significantly higher likelihood of non-urgent ED visits. In addition, the findings from the administrative data in this study showed that a high percentage (84.5%) of patients with non-urgent conditions sought ED services. These findings corroborate those of other published studies (Almalki et al., 2011; Johnson, 2012). According to these studies, although the Saudi government has been providing free PHC services to all citizens over the last few decades, non-urgent visits to the ED can still place pressure on tertiary care. Accordingly, I aimed to understand in depth the reasons why patients preferred the ED.

The most common reasons were easier access to the ED as no appointments were needed and the opening hours were longer. Over half of the ED patients also felt that that ED doctors are more qualified than PHCC doctors. Limited services, resources and a perceived lack of effective diagnosis at PHCCs were also reported as reasons for preferring the ED. Although the organization of PC services in SA has improved over the last few decades, as confirmed by the number of staff in most PHCCs, there are still several limitations such as staff turnover and shortage of resources.

No studies so far have measured patients' satisfaction with PHCCs among patients who used both ED and PHCC services as a way of understanding the reasons for non-urgent ED visits. This research is, therefore, the first to investigate this issue from the perspective of patients' satisfaction with PHCCs. The majority of the patients who answered the questions in the satisfaction section were registered with PHCCs for five years or more, so they had been able to form an opinion about PHCC services.

The overall satisfaction rate with PHCCs in our study (75.3%) among patients who used both services and were registered with PHCCs was similar to that of other studies carried out in SA, that is, 73.6% (Abdalla et al., 2005) and 77% (Almoajel et al., 2014) (7.3). These results are also in line

with other results reported in the UK (73% 8.3) (Croker et al., 2013) and in the US (72.2% 9.3) (Gruß et al., 2019).

Access

In our study, there was no significant difference in satisfaction ratings between the ED and PHCC groups. However, patients from both groups complained that at PHCCs, it was difficult to speak to a physician when they needed medical advice. The ED patients also reported that the ED is more accessible than PHCCs, as they can visit the ED at all hours and on all days of the week. Difficulties in booking PHCC appointments has been reported by many studies as a potential contributory factor to seeking ED care for non-urgent conditions. These issues include not being able to get appointments on the same day or within an acceptable amount of time, as well as a waiting time of up to two weeks. Additionally, long phone queues, poor telephone communication, long waiting lists and not receiving return calls made it difficult to change appointments when required. Overall, my findings corroborate those of other studies (Alyasin and Douglas, 2014; D'Avolio et al., 2013). As discussed in the knowledge section, the majority of ED patients lacked knowledge about the PHCCs' opening hours and services. This might explain why the ED patients were less satisfied with PHCCs and felt like they had poor access to the services.

In some cases, patients were unable to speak to the PHCC they were registered with (because their calls were not answered), and they drove to the PHCC without an appointment and insisted on seeing a physician. Such situations can add pressure on healthcare providers and affect patient assessment and examination.

Contextual knowledge and integration

Patients who visited the ED were significantly less satisfied than the PHCC patients with regard to the primary physician's knowledge of their medical history. As there is no clear written medical history of each patient in the system, the integration and transfer of patients' data for a referral from a PHCC may be difficult. Accordingly, our findings showed that there was no integration between PC services and tertiary care. This explains why patients were least satisfied with the integration aspect in both groups. A poorly written medical history of patients and lack of integration between healthcare services could mean that the PHCC physician does not have enough information about the patient's health. This is a recurrent issue in the literature that is associated with low levels of satisfaction with physicians' diagnostic and referral practices (Alyasin and Douglas, 2014). Bell et al. (2009) stated that lack of integration between PC and tertiary care can lead to poor outcome and even death in some cases.

Communication

Proper communication plays an important role in patients' experience and affects their decision to access a healthcare facility. My findings showed that PHCC visitors were significantly more satisfied than ED patients with regard to communication at the PHCCs. Both groups of patients were satisfied with physician's explanation, length of time spent and attention paid to their narration of their symptoms. However, the ED visitors complained that the PHCC physicians did not discuss further care with them or help them make decisions about their care. Other studies have argued that poor communication between physicians and patients leads to poorer health outcomes, especially in patients with lower education levels (such as the patients in my study). When patients are fully aware about alternatives and the potential risks of treatment and are involved in the decision-making process, their trust in and loyalty to the physician increases, along with their level of satisfaction. Till date, communication between physicians and patients is considered an issue that need continuous improvement (Bensing and Dronkers, 1992; DiMatteo, 1997; Marvel et al., 1999; Mazur and Hickam, 1997; McBride et al., 1994).

Physical examination

With regard to physical examination, too, the PHCC visitors were significantly more satisfied than the ED visitors, although both groups were satisfied with the physical examinations and the improvement in their health. However, both groups of patients complained about the unavailability of treatments (prescription drugs) and reduced effectiveness of the alternative medicines provided by the PHCCs. This is a common issue in SA that has also been highlighted by another study (Alqossayir et al., 2021), and a common reason why patients seek care at EDs. PHCCs provides free prescription, ED Patients in my study with lower income can't afford to buy their preferred treatment by themselves when they are not happy with the alternatives.

Interpersonal treatment

The patients who attended both services rated the physicians and staff as patient, friendly, caring and respectful and did not report any significant issues with regard to this variable.

Trust

There was no significant difference between the groups with regard to trust, but patients' perception of the competence of healthcare professionals at PHCCs was another main reason they sought ED services. The patients believed that doctors working at the ED were more qualified than those at the PHCCs. They felt that they received better care at the ED, as no speciality care available in the PHCCs. The patients also noted that if a mistake was made in their treatment, the PHCC physician would not explain it to them. In this regard, Platonova et al. (2008) suggested that trust and communication are linked, and the physician needs to communicate properly, invest time and effort to develop good relationships with their patients, and involve them in their treatment plan in order to

ensure the loyalty and satisfaction of patients. Strategies to facilitate such practices may help reduce the number of non-urgent ED visits and encourage patients to visit the PHCCs instead.

Convenience

Patients' satisfaction with access and physical examination was linked to their satisfaction with convenience. As observed for the other variables, ED patients were significantly less satisfied with regard to the convenience of PHCC services. As discussed in the access section, patients could not reach doctors when they called the centre and the receptionist did not always answer calls. The patients were also unhappy about the unavailability of investigations and certain treatments at the PHCCs, as acknowledged in the physical examination category. Inadequate space for patients and visitors in the PHCC waiting area and lack of special services for vulnerable patients, such as the disabled and elderly, were other concerns. The unavailability of such key services might lead more patients with non-urgent conditions to seek the ED. This finding is echoed by other studies too (Jiang et al., 2020; Lines et al., 2019; Miyazawa et al., 2019).

Even though two of the PHCCs where the interviews were conducted had introduced reforms, several limitations were observed by the researcher during the data collection. For example, the electronic system crashed several times, and the healthcare worker was unable to track the patients' files. These are serious issues, as poor documentation can lead to wrong diagnosis and treatment.

Preventive counselling and continuity of care

In this study, 48.1% of the patients who attended both services reported that the PHCC physician did not discuss with them factors that might affect their health, such as diet, exercise and stress. In this regard, the ED visitors were significantly less satisfied than the PHCC visitors, although both groups of patients admitted that this behaviour varied between physicians. This led to another concern, as 67.7% of the patients reported that they were appointed a different doctor at each PHCC visit. The lack of continuity of care in PHCCs has previously been reported as a factor that could lead to patient dissatisfaction (D'Avolio et al., 2013; Philips et al., 2010). As a result of poor documentation of patients' medical history and lack of continuity of care, patients are required to explain their health issues at each visit. This could affect diagnoses and treatment, especially in patients with lower education levels. Importantly, such practices lead to patients preferring the ED to access healthcare. According to the study by Fung et al. (2015), patients believed that the ED would provide them with swift hospitalisation or referrals to other departments of the hospital. Accordingly, in this study, too, some ED patients claimed that they accessed the ED in order to be referred to a specialist who would provide them with continual care during their treatment journey.

The multivariable regression analysis conducted in this study revealed that the tendency to favour ED services based on the belief that the ED provides better services is the most significant predictor of non-urgent ED utilisation.

Figure 7. Summary of Research Main Findings

Satisfaction

Difficulties of PHCCs' access

PC Contextual knowledge of the patient

Lack of ntegration between PHCC and ED

Weak communication of PC physician with patients

Attitude

Influnce of family or friends on patients decision

Patients with symptoms of two days to up one week

Knowledge

Lack the knowledge of PHCCs' clinics

Lack the knowledge of PHCCs' OOH opening service

Characteristics

Patients attend during evening shift

Young adult patients

Patients with no insurance

Non-urgent ED use

Unavailability of some physical examination eg . lab tests

Patients trust of ED doctors more than PC

Convenience/ lack of resources at PHCCs

Lack of preventive counselling and continuity of care

Frequent users attend ED every one to two months

intention to seek an ED before visiting a PHCC

Lack the knowledge of PHCCs' opening hours

Lack the knowledge of PHCCs' services

Patients with lower education level

Patients with lower income

Satisfaction

Attitude

Knowledge

Characteristics

My findings related to patient characteristics, knowledge, behaviour and satisfaction shed light on the factors that lead to overcrowding in the ED (Figure 7). In chapter 1, I argued that overcrowding is a common issue in emergency departments and has been addressed globally based on previous studies in the literature. In chapter 2, I conducted a literature review and highlighted that SA had the highest prevalence of non-urgent ED utilisation. Accordingly, it is crucial to provide insights into the consequences of ED overcrowding and interventions to reduce inappropriate utilisation of the ED.

5.7   Consequences

Overcrowding in EDs can lead to sub-optimal care of patients with urgent conditions. Furthermore, crowding at the ED can lead to poor patient selection at the triage and inadequate management of patients who present with acute conditions. In a previous study, I showed that 44.9% of 136 patients who had urgent conditions (Dawoud et al., 2016) reported that they did not receive the expected treatment; this indicates poor satisfaction with ED services. Additionally, the patients reported that lack of organization at the ED, lack of medical staff, slow response of the doctor to see patients, poor competence and behaviour of other care providers, and long waiting times of up to 3 h were factors that contributed to poor satisfaction with ED services. Other authors have also reported that waiting time at the ED has an important effect on patient satisfaction (Goldwag et al., 2002; Pilpel, 1996). Further, D'Avolio et al. (2013) suggested that poorly managed pain can cause suffering, decreased quality of life and sleep difficulties, as well as increase anxiety, depression and disabilities, all of which can decrease patient satisfaction with the healthcare system.

5.8   Interventions/Policies

One of the aims of Saudi Vision 2030 is to apply for international accreditations, such as that awarded by the Joint Commission International, for MOH services. To be able to do so, these services must be improved such that patients' satisfaction with EDs and PHCCs increases. This requires the design and implementation of interventions that can tackle the issues of these healthcare services, of which overcrowding at EDs is a significant one. Such interventions can be designed based on the significant factors associated with non-urgent ED utilisation identified in this study, namely, lower education levels, lack of knowledge about out-of-hours care at PHCCs, ED consultation without prior contact with the PHCCs, and the notion that the ED provides better services than PHCCs. Some interventions will take a long time (improving income levels and education of the populations). However some are amenable to the changes in the system - for example better information for patients on opening hours, insisting on PHCC being the first port of call and better publicity about the value of PHCC.

Services provided by EDs and PHCCs

The researcher discussed in chapter 1 that the Saudi healthcare system is undergoing reform, but the healthcare system still faces many challenges that need to be overcome. The implementation of new services, policies and procedures requires effective monitoring and evaluation by the government, as suggested by Bahadori et al. (2020). Additionally, the quality of care needs to be improved in other healthcare facilities rather than just the ED.

To start with, strict policies need to be implemented at the ED. For example, patients with non-urgent cases should not be allowed to access the ED without a referral, even those who have relatives working at the hospital. All non-urgent cases should be referred to the nearest PHCC or a PHCC in their neighbourhood so that they can familiarise themselves with the PHCC service, as suggested by some studies (A. J. Boeke et al., 2010; Cross et al., 2017; Kim et al., 2015). A. J. Boeke et al. (2010) suggested that patients who are referred to a PHCC should be followed up to make sure they were provided with the service they required, as this would increase their satisfaction with the PHCC service.

Because nurses play an important role in the admission and triage of patients' to the ED, Di Mauro et al. (2019) suggested that implementation of training programs for nurses and allied health providers (especially in communicating with patients) in EDs could play a role in reducing non-urgent access to the ED.

Telephone triage and a phone application to book appointments or get medical consultations have been implemented in SA. Telephone triage has been proposed as an effective solution to reduce non-urgent visits to the ED by many countries such as Denmark, Australia and UK (Ismail et al., 2013). Additionally, opening hours were extended to 24 h in one PHCC and 16 h in two other PHCCs associated with KFGH. Lippi Bruni et al. (2016) reported that extending the opening hours of PHCCs reduced non-urgent visits to the ED by 15%. Cowling et al. (2018) argued that extension of PHCC opening hours alone might not be effective. As discussed in the knowledge section, the majority of ED patients lacked awareness about such services. Therefore, educational programs to increase the awareness of the public regarding these services play an important role. Buja et al. (2014) suggested that a television advertising campaign may increase awareness. Another suggestion by Buja et al. (2014) was to increase awareness through schools, social networks and EDs. Moreover, educating the public about the definition of urgency, and when and where to seek healthcare, is important.

In some countries such as the UK, it is obligatory for all residents to be registered with the PHCC in their neighbourhood; this might increase patients' knowledge about PHCCs. However, in SA, there is no obligation for residents, of any age, to be registered with any healthcare provider. The implementation of such a policy may help patients become familiar with PHCCs services and use these services over ED services for non-urgent cases.

Some studies have suggested improving the quality of care in PHCCs (Bahadori et al., 2020; Cowling et al., 2018), for example, improving the appointment system, strengthening the referral system and making provisions for integration of healthcare services. In addition, providing tests and other investigations at PHCCs and ensuring their efficient functioning are important steps. Further, appointing more specialists in PHCCs, especially specialists for heart and kidney diseases, was suggested by the ED patients in this study.

One study reported that introducing walk-in clinics did not significantly reduce non-urgent ED utilisation in the UK (Cooke et al., 2005); in addition, this is a costly arrangement (Chalder et al., 2003). However, in Canada and the US, patients were more satisfied with practice-based (PHCCs) services because of their convenience and shorter waiting times (Health Services Utilization Research Committee, 1997). Accordingly, the introduction of walk-in services at PHCCs for semi-urgent cases as a primary service could be a lower cost solution for semi-urgent cases. However, this could not be done immediately but it might be part of the necessary improvements at PHCC.

Health insurance

In a developing country such as SA, there are still many challenges in the healthcare insurance sector. In 2002, there was a major change in insurance regulation: the Health Insurance Council, along with the Saudi government, introduced a new policy that made it mandatory for businesses to cover all people working in the private sector in two stages. In the first stage, all businesses with more than 500 employees were required to have private insurance with dependents also covered by the insurance. In the second stage, all businesses with more than 100 employees were mandatory have to provide private insurance. By 2009, all SA citizens working in the private sector were required to be covered by such private schemes (Hassan, 2007).

As part of Saudi Vision 2030, the Saudi government is working on policies to ensure that all citizens have private insurance coverage through the privatization of government healthcare services. Such a plan, along with co-insurance payment, will make a positive, significant change in the healthcare structure, for both patients and providers. This might improve the utilisation of healthcare services such as EDs and PHCCs and reduce the burden on the Saudi government, which would subsequently lead to an improvement in the services provided (Walston et al., 2008).

Findings from other studies have suggested that cost sharing decreases the use of appropriate and inappropriate healthcare services (Newhouse and The Insurance Experiment Group, 1993), essential medications (Roblin et al., 2005; Tamblyn et al., 2001) and preventive services (Redstone et al., 2008). However, such strategies could lead to worse health outcomes than healthcare plans that involve lower out-of-pocket demands. Despite this, some studies (Blustein, 1995; Hsu et al., 2006; Magid et al., 1997; Selby et al., 1996) show that elective services are reduced when ED care is subject to cost sharing, and this has not been associated with adverse outcomes. Thus, this might be a potential strategy that could be explored in SA too.

5.9   Contribution to research, policy and practice

Overall, the research presented in this thesis adds valuable insights on the factors that may drive patients to access the ED for PHCC-treatable conditions. My findings highlight the importance of improving patient awareness of what constitutes an urgent condition and when to seek help from the ED. Moreover, systemic factors such as the limited accessibility of PHCCs, unavailability of some services, and standards of care provided need to be improved by providing timely, competent and empathetic services by PHCCs. These are novel findings in the SA context, and I believe they provide evidence to support investments and efforts by the Saudi government and policy makers to improve appropriate use of the ED and PHCC.

This doctoral thesis also systematically investigated ED utilisation in SA in comparison with studies conducted across the globe in comparison to SA. No previous research has examined non urgent ED use by focusing collectively on four patient perspectives including characteristics, knowledge, behaviour and satisfaction, especially in SA. Hence, this research could be a useful guide for future research on the healthcare structure in SA and the factors associated with its utilisation.

Another important contribution of this thesis was to establish and validate the novel survey instrument that has not been used as a coherent tool before. This research employed survey items from various published studies in different cultures and modified it to fit the four evaluated patient perspectives in the context of SA. Furthermore, the developed instrument was translated into the language of the target population (Arabic). Two versions, Arabic and English, of this instrument are available for use by other researchers (see Appendices). Therefore, the developed survey can be replicated by future studies and validated with different technologies, users and cultural contexts.

The final core contribution of this thesis is that it provides an up to date overview of different examples of interventions and policies which have been implemented and assessed in other countries. The potential impact of the lack of such policies and the outcomes of not considering the issues presented have also been explained. Therefore, policy makers could use this research as a guide to identifying the gaps in the current healthcare system and finding solutions to close these gaps, especially as part of the current reforms in SA.

5.10 Strengths and Limitations

Some limitations of this doctoral thesis with regard to the systematic review as well as survey methods and results need to be addressed.

This research examined the utilisation of ED in different countries, identified its contributory factors and highlighted some interventions that might be applied in SA, based on findings published in previous literature. Such research is limited in the context of SA, and only one study included in the systematic review was performed in SA. More such studies are necessary to understand in depth the factors affecting the utilisation of ED and PHCC facilities in SA as most studies conducted outside SA might not be directly applicable to SA due to systemic variations. Moreover, a narrative synthesis of the available literature was conducted which considered collectively previous quantitative and qualitative studies. No meta-analysis of the quantitative studies was conducted because heterogeneous data were reported (or quantitative data were poor reported) regarding the prevalence of non-urgent ED utilisation and the factors associated with non-urgent ED utilisation which would make pooling very risky or impossible. Similarly, no meta-synthesis of the qualitative studies was conducted because this systematic review aimed to map the factors that are associated with non-urgent ED attendance. Rich context-specific qualitative evidence was missing and both quantitative and qualitative studies differed on the factors that they chose to examine in relation to with patients' decision to access healthcare services, according to the culture, values and wealth of a country. Moreover, time and resources meant that I had to focus on peer reviewed articles whereas I decided to exclude grey literature and articles published in languages other than English, Despite this, there are major challenges in synthesising published and unpublished studies so the value of unpublished literature in this context might have been extremely limited when this is considered with the existing variations that exist across different health care systems.

This research used a cross-sectional design, due to the limited time and resources available (as it is for a doctoral degree), therefore causal inferences cannot be made. A longitudinal study can measure changes in behaviour over time and allow causal relationships to be examined but this method is usually costly and time-consuming. The data were collected during the summer holiday, so relatives who live in other cities and were visiting their families might have used the KFGH ED because they were not registered with a local PHCC. To overcome this limitation, the researcher excluded visitors who did not live in Jeddah city.

This study targeted patients who visited a public hospital run by the MOH and three of its associated PHCCs. In SA, there are other government hospitals run by different ministries and each of them has its associated PHCCs. In addition, there are private hospitals and private PHCCs run by different organizations. The behaviour of patients at these facilities might be different from their behaviour at the MOH facilities. Hence, my findings cannot be generalised to government healthcare services other than MOH services and cannot be generalised to the private healthcare sector as well. However, as discussed in chapter 1, MOH services account for the highest number of hospitals, beds,

healthcare workers and PHCCs, and provide services to most citizens in SA. Therefore, the findings of this study can be generalized to most healthcare services run by the MOH in SA.

This thesis collected self-reported data which measured patients' characteristics, knowledge, behaviour and satisfaction. However, no data were obtained from the patient records contained in the hospital's electronic system. Although such data would be useful, the patient data contained in the records was low or non-existent because some of the ED patients did not have a file at the hospital. Despite this, I collected demographic data from both services and compared it to the demographic data of our sample to examine whether my sample was representative of the population attending to ED and PHCC services in SA. The sample design used was a simple randomised one, so that all patients had the same probability of being selected to avoid bias. In addition, the researcher observed the process at both the ED and PHCC facilities during data collection. As most international studies encountered similar data availability/access issues, they have mostly used self-reported data as I did. Moreover, although it would be particularly informative to examine the health outcomes of the participants.

A longitudinal design is required to measure health outcomes over time, which was not possible in this cross-sectional study. However, I feel confident that included most factors that have been discussed as important in the literature (see table 6 on chapter 2) that are associated with the patients' decision to seek treatment in ED for non-urgent cases compared to PHCCs.

Data were collected via semi-structured questionnaires through face-to-face interviews which measure patients' characteristics, knowledge, behaviour and satisfaction. I decided to use a questionnaire which can be administered within a short timeframe (about 15 min), because this study focused on patients directly before/after their consultations and therefore some of them were experiencing ill health-related symptoms during the study and might have been unable to handle longer questionnaires or in depth qualitative interviews. Additionally, not all of these patients were willing to provide their numbers for later interviews.

A final important limitation is that we did not consider the perspectives of the healthcare professionals in this study although the presence of the researcher during the data collection may have affected the behaviour of the healthcare providers and this is partly why we focused on collecting self-reported data by patients.

5.11 Recommendations for future research and practice improvements

The findings of this research lay the ground for further investigations and improvements in healthcare services provided by the MOH in SA that can be studied in the future. In addition, more research will be required after the reforms based on Saudi Vision 2030 for healthcare services in SA are implemented.

I suggest that further research be conducted with a longitudinal design to assess changes in patients' behaviour over time, especially with the introduction of new reforms in the Saudi healthcare system. Such a design will allow the inclusion of factors that could not be included in the present study, such as patients' health outcomes.

The Saudi government is working on plans to privatise the healthcare system run by the MOH. Therefore, the present findings can be followed up by measurement of the same factors in the private healthcare sector to assess differences between public and private services. Additionally, some of the interventions and policies suggested could also be applied in the private sector.

Further research could be considered to examine the factors included in this thesis by using other methods. For example, a qualitative approach with interviews and focus groups would be helpful to understand in depth patients' behaviour. This would be crucial in terms of implementing the appropriate policies and procedures for the reform. In addition, it is important to include the voice of the healthcare practitioners in order to understand the problems in this sector from their perspective.

The Saudi government had re-structured healthcare delivery systems to provide greater access to PC and to become more efficient, but only some PHCCs have implemented these changes. Therefore, examining the differences between PHCCs that have implemented these services and those which have not would be valuable approach to understand how sustainable and transferable improvements can be made across different PHCCs. Some of the variables that could be measured are the number of staff; investigations; crowding; availability of treatments, appointments and resources; and overall performance of each centre.

The Saudi government recently launched an application through which patients can book appointments and view their results, as well as get have online consultations. Testing the effectiveness of such new services and policies implemented that aimed to improve access to both services (ED & PHCCs), especially in light of the COVID-19 pandemic, is important.

5.12 Conclusion

This study was conducted to investigate the factors that affect patients' decision to access healthcare. The researcher examined these factors from four different perspectives based on the literature in this field: patient characteristics, knowledge, behaviour and satisfaction. This study was conducted at KFGH and three of its associated PHCCs in SA, Jeddah. It is a cross-sectional study in which the data were collected through a structured questionnaire administered via interviews as well as administrative data. Observation of the process of both services was also considered to validate the results. The questionnaires were developed by the researcher by reviewing previously published literature. Two questionnaires were developed, one for each service (ED and PHCCs), and both of them were available in English and Arabic. All the questions have been evaluated for reliability and validity based on measurements of Cronbach's alpha and communalities. Additionally, the questionnaires have been reviewed by two experts in the field. The data were analysed using SPSS and by creating a flow chart (for the observation-derived data).

The emergency services at the MOH hospital in Jeddah were overutilised as there was a high percentage of non-urgent cases. Patients' usage of ED services was higher during the evening shift compared to the usage of PHCC services. Singlehood, younger age, absence of chronic diseases, lower income and lower education level were significantly associated with non-urgent ED use. Most ED visitors lacked health insurance. Patients covered by health insurance who still sought treatment to ED services stated that they did so because of the ease of access to the ED with no appointment, the provision of free services and trust in MOH services over private services. The majority of the ED visitors lacked knowledge about PHCC clinics and services provided, while a significantly higher number of PHCC visitors were knowledgeable about the opening hours of PHCCs and out-of-hours care.

ED visitors used the ED services for non-urgent cases more than the PHCC visitors did, with the symptom duration being two days or more. A significantly higher proportion of ED patients visited the ED at least twice a year even though they had other options such as PHCCs and private clinics. Additionally, a considerable proportion of ED patients without emergencies had not attempted to use the PHCCs or other clinics before visiting the ED, and the majority of them were not registered with the PHCCs. A significantly high proportion of ED patients who visited for non-urgent cases were influenced by their family or friends. ED patients who were not familiar with PHCC services were less satisfied with PHCC services. Some of the reasons cited for dissatisfaction by the ED visitors was poor communication with the centres when they needed to book appointments or contact their PC physician, limited opening hours of PHCCs and a higher degree of convenience with EDs. Additionally, they reported that access to facilities such as laboratories and x-ray departments was easier through the ED. ED visitors were also more satisfied with the interpersonal treatment provided by ED doctors and felt that the ED doctors were more qualified and trustable. Patients were less satisfied about the continuity of care at PHCCs, as most of them were appointed a different doctor at

each visit. Finally, patients who received preventive counselling were more satisfied with the PHCC services.

In general, patients without emergencies who visited the ED thought that the ED was the first place to consult when they experienced symptoms and were more satisfied with ED services than with PHCC services. Based on these findings, policy makers and healthcare providers should focus on improving the quality of PHCC and promoting the integration of services at various levels. Additionally, the development of walk-in services and a health insurance policy that is commensurate with the expectation of the general population would also help solve the issue of ED overcrowding. Finally, educating patients about ED use, improving their behaviour toward other healthcare options and developing campaigns to emphasize the negative impacts of non-urgent ED utilisation for the community may also be promising strategies.

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Appendix 1

5.13 ED Questionnaire

A) Demographic		
1) Gender	Male ( )	Female ( )

2) Marital status:-
    - Married
    - Single
    - Divorced
    - Widow/ Widower
	(1)
	 (2)
	 (3)
	 (4)	

3) Age
    - 18-23 years
    - 24-31 years
    - 32-40 years
    - 41-60 years
    - Older than 60 years
	(1)
	 (2)
	 (3)
	 (4)
	 (5)	

4) Educational level:-
    - Less than high school
    - high school
    - diploma
    - bachelor
    - higher education
	(1)
	 (2)
	 (3)
	 (4)
	 (5)	

5) What work do you do?
    - I am not working
    - I am a homemaker (Housewife)
    - I am working for myself (Self-employed)
    - I am working for the Government - Federal, State or Local Government
    - I am working for a private company
    - I am a student
    - Others ………………………..
	(1)
	 (2)
	 (3)
	 (4)
	 (5)
	 (6)	

6) Family income
    - 3,000-5,000 SR
    - 5,001-8,000 SR
    - 8,001-11,000 SR
    - 11,001-15,000 SR
    - 15,001-20,000 SR
    - Higher than 20,000 SR
	(1)
	 (2)
	 (3)
	 (4)
	 (5)
	 (6)	

7) Number of family member:
    - 1-2
    - 3-4
    - 5-6
    - 7-8
    - More than 8
	(1)
	 (2)
	 (3)
	 (4)
	 (5)	

8) Emergency level (CTAS):		
- Resuscitation	(1)	
- Emergent	(2)	
- Urgent	(3)	
- Semi Urgent	(4)	
- Non Urgent	(5)	
B) Behaviour		
9) Do you have a pre-file in this hospital?	Yes ( )	No ( )
10) What is the reason/illness for visiting the ED?		
11) Did family or friends influence your decision to visit the healthcare facility you chose?	Yes ( )	No ( )
12) Do you have health insurance? If the answer is yes please answer 13 & 14 following questions:	Yes ( )	No ( )
13) What is the side-funded health insurance?		
- Insurance from a private company	Yes ( )	No ( )
- Insurance of the National Guard Hospital	Yes ( )	No ( )
- Insurance of Military Hospital	Yes ( )	No ( )
- Insurance of King Abdul-Aziz Hospital	Yes ( )	No ( )
- Individuals insurance	Yes ( )	No ( )
- Other …………………………………….		
14) If you have insurance, what is the reason for coming to this ED?		
- MOH facilities are easier to access (location), process and easily available	Yes ( )	No ( )
- I trust MOH services more than I do other services	Yes ( )	No ( )
- Other services were closed	Yes ( )	No ( )
- MOH provides better services	Yes ( )	No ( )
- My insurance requirements have not yet been completed	Yes ( )	No ( )
- Other …………………………………….		
15) Since when have you been suffering from this problem?		
- Suddenly- arise today	(1)	
- From one to two days	(2)	
- From one to two weeks	(3)	
- Almost a month	(4)	
- More than a month	(5)	
16) Do you have any chronic health problems?	Yes ( )	No ( )
17) If the answer is yes please specify it:		
18) How many times do you usually visit the MOH hospital's ED during the year?		
- More than once during a month	(1)	
- Every one to two months	(2)	
- Every three to four months	(3)	
- Six months to one year	(4)	
- Rarely	(5)	
19) When was the last time presented to the MOH hospital's emergency?		
- One day before	(1)	
- A month ago	(2)	
- Three months ago	(3)	
- Six months ago	(4)	

- A year ago	(5)	
- Other ……………………………..		
20) Do you have an option other than the ED when you are sick?	Yes ( )	No ( )
21) If the answer is yes, what are your other options?		
- Telephone counselling	Yes ( )	No ( )
- Contact by Email	Yes ( )	No ( )
- Primary health care centres	Yes ( )	No ( )
- Visit doctors' clinics	Yes ( )	No ( )
- Go to the pharmacy	Yes ( )	No ( )
- Herbal medication at home	Yes ( )	No ( )
- Other …………………………………….		
B-a) Behaviour for patients registered with the PHCC		
22) Are you registered in the PHCC in your neighbourhood where you live? If the answer is yes, please answer questions 20 and 21;	Yes ( )	No ( )
23) Which PHCC are you registered for?		
24) How long have you been registered with the PHCC?		
- Recently/ less than one month	(1)	
- Two to six month	(2)	
- One year to two years	(3)	
- Three to five years	(4)	
- Five years and more	(5)	
25) How many times do you usually visit the PHCC during the year?		
- More than once during a month	Yes ( )	No ( )
- Every one to two months	Yes ( )	No ( )
- Every three to five months	Yes ( )	No ( )
- Six months to one year	Yes ( )	No ( )
- Rarely	Yes ( )	No ( )
26) When was the last time you presented to the PHCC?		
- One day before	(1)	
- A month ago	(2)	
- Three months ago	(3)	
- Six months ago	(4)	
- A year ago	(5)	
- Other …………………………….		
27) Did you try to seek a doctor in the PHCC before visiting the ED?	Yes ( )	No ( )
28) If you knew that a PHCC could deal with your case for this visit, would you still visit the ED?	Yes ( )	No ( )
29) Have you ever left the PHCC without seeing a doctor or getting treatment?	Yes ( )	No ( )
30) If the answer is yes what was the reason for leaving?		
- Overcrowding	Yes ( )	No ( )
- Unavailability of doctors	Yes ( )	No ( )
- Other …………………………………………….		
C) Knowledge		
31) Do you know which clinics are available in the PHCC?		
- General Clinic	Yes ( )	No ( )
- Chronic diseases Clinic	Yes ( )	No ( )

- Healthy Child Clinic		Yes ( )	No ( )
- Dental Clinic		Yes ( )	No ( )
- Bandaging Clinic		Yes ( )	No ( )
32) Do you know that some PHCCs of the MOH open for more than 8 h a day?		Yes ( )	No ( )
33) Do you know the working hours of the PHCC in your neighbourhood? If the answer is Yes, please answer the next question;		Yes ( )	No ( )
34) How many are the working hours of the PHCC you are registered with?			
35) Do you know what are the services provided by the PHCCs?			
- Online appointments		Yes ( )	No ( )
- Reminder of children's vaccine		Yes ( )	No ( )
- Phone triage		Yes ( )	No ( )

<div align="center">D) Satisfaction</div>

36) Do you get better services from the ED than the PHCC?	Yes ( )	No ( )
37) If the answer is yes please specify why?		
- The ED is easier to access than PHCCs in terms of getting appointments and location	Yes ( )	No ( )
- ED doctors are more qualified than PHCC doctors		
- I trust ED doctors more than I do PHCC doctors		
- ED doctors are more knowledgeable about patients than PHCC doctors		
- ED opening hours are more convenient than PHCC opening hours		
- ED doctors provide better examination and treatment than PHCC doctors		
Others ……………………………..		

Please rate the following, as 1 is Poor, 2 is Acceptable, 3 is Good, 4 is Very Good and 5 is Excellent

38) Satisfaction of PHCC access	1	2	3	4	5
A. Ability to speak to your doctor by phone when you have a question/need medical advice	( )	( )	( )	( )	( )
B. Getting a medical appointment when sick	( )	( )	( )	( )	( )
C. Obtaining information by telephone	( )	( )	( )	( )	( )
D. Punctuality of appointments	( )	( )	( )	( )	( )
E. Convenience of Centre's location	( )	( )	( )	( )	( )
F. Convenience of Centre's hours	( )	( )	( )	( )	( )
G. In your opinion, the length of time you have to wait before receiving care from the staff	( )	( )	( )	( )	( )
	( )	( )	( )	( )	( )

39) Satisfaction of contextual knowledge of the patient	1	2	3	4	5
A. Primary physician's knowledge of your medical history	( )	( )	( )	( )	( )
B. Primary physician's knowledge about what worries you the most about your health					

40) Satisfaction of integration	1	2	3	4	5
A. Help regular doctor gave you in getting an appointment for specialty care	( )	( )	( )	( )	( )
B. Communication with specialists or other doctors who saw you					
C. Understanding what specialists or other doctors said about you					

41) Satisfaction of communication	1	2	3	4	5
A. Thoroughness of primary physician's questions about symptoms,	( )	( )	( )	( )	( )
B. PHCC Doctor's attention to what you say	( )	( )	( )	( )	( )
C. PHCC Doctor's explanations of your health problems or treatments	( )	( )	( )	( )	( )
D. PHCC Doctor's instructions about symptoms to report and when to seek further care	( )	( )	( )	( )	( )
E. PHCC Doctor's advice and help in making decisions about your care	( )	( )	( )	( )	( )
	( )	( )	( )	( )	( )

	1	2	3	4	5
F. The length of time usually spent during your consultation with the PHCC doctor					
42) Satisfaction of physical examination	1	2	3	4	5
A. Thoroughness of primary physician's physical examinations	( )	( )	( )	( )	( )
B. The healthcare you receive (e.g. drugs) usually from the PHCC	( )	( )	( )	( )	( )
C. The improvement in your health condition after your last visit to the PHCC	( )	( )	( )	( )	( )
43) Satisfaction of interpersonal treatment	1	2	3	4	5
A. Primary physician's patience, friendliness, caring, and respect	( )	( )	( )	( )	( )
B. The manner of the staff that serving you in PHCC	( )	( )	( )	( )	( )
C. The performance of the staff who attended to you at the PHCC	( )	( )	( )	( )	( )
44) Satisfaction of trust	1	2	3	4	5
A. Your satisfaction with the PHCC doctor's qualifications	( )	( )	( )	( )	( )
B. Your trust in the physician's judgments about your medical care					
C. My doctor would always tell me the truth about my health, even if there was bad news					
D. If a mistake was made in my treatment, my doctor would try to explain to me					
45) Satisfaction of convenience	1	2	3	4	5
A. How adequate is the space provided for patients and visitors in the waiting area of the PHCC?	( )	( )	( )	( )	( )
B. The seats provided for patients and visitors in the waiting area of the PHCC	( )	( )	( )	( )	( )
C. The neatness of the PHCC	( )	( )	( )	( )	( )
D. The hygiene of the PHCC	( )	( )	( )	( )	( )
E. In your opinion, the safety of the care you receive from the PHCC	( )	( )	( )	( )	( )
F. The services and resources of the PHCC	( )	( )	( )	( )	( )
46) General satisfaction	1	2	3	4	5
Your general satisfaction with the PHCC					

47) Satisfaction of preventive counselling

A. Primary physician discusses the following with you: smoking, seat belt use, diet, exercise, stress.　　　　Yes ( )　　　　No ( )

48) Satisfaction of continuity of care

A. How long has the primary physician you're seeing been your doctor?

B. How often do you see your primary physician (not an assistant or partner) for routine check-ups

(1)Never　　　(2)Rarely　　　(3)Sometimes　　　(4)Often　　　(5)Always

C. How often do you see your primary physician (not an assistant or partner) for appointments when sick

(1)Never　　　(2)Rarely　　　(3)Sometimes　　　(4)Often　　　(5)Always

5.14 PHCC Questionnaire

A) Demographic		
1) Gender	Male ( )	Female ( )
2) Marital status - Married - Single - Divorced - Widow/ Widower		
3) Age - 18-23 years - 24-31 years - 32-40 years - 41-60 years - Older than 60 years		
4) Educational level:- - Less than high school - high school - diploma - bachelor - higher education		
5) What work do you do? - I am not working - I am a homemaker (Housewife) - I am working for myself (Self-employed) - I am working for the Government - Federal, State or Local Government - I am working for a private company - I am a student - Others ………………………..		
6) Family income - 3,000-5,000 SR - 5,001-8,000 SR - 8,001-11,000 SR - 11,001-15,000 SR - 15,001-20,000 SR - Higher than 20,000 SR		
7) Number of family members: - 1-2 - 3-4 - 5-6 - 7-8 - More than 8		
B) Behaviour		
8) How long have you been registered with the PHCC? - Recently/ less than one month	(1)	

185

- Two to six month	(2)	
- More than six months to two years	(3)	
- More than two years to four years	(4)	
- More than four years	(5)	
9) Is this primary care centre located in the neighbourhood where you live?	Yes ( )	No ( )
10) What is the reason/illness for visiting the PHCC?		
11) Did family or friends influence your decision to visit the healthcare facility you chose?	Yes ( )	No ( )
12) Do you have health insurance? If the answer is yes please answer 13 & 14 following questions:	Yes ( )	No ( )
13) What is the side-funded health insurance?		
- Insurance from a private company	Yes ( )	No ( )
- Insurance of the National Guard Hospital	Yes ( )	No ( )
- Insurance of King Abdul-Aziz Hospital	Yes ( )	No ( )
- Insurance of Military Hospital	Yes ( )	No ( )
- Individuals insurance	Yes ( )	No ( )
- Other …………………………….		
14) If you have insurance, what is the reason for coming to this PHCC?		
- MOH facilities are easier to access (location), process and easily available		
- I trust MOH services more than I do other services	Yes ( )	No ( )
- Other services were closed	Yes ( )	No ( )
- MOH provides better services	Yes ( )	No ( )
- My insurance requirements have not yet been completed	Yes ( )	No ( )
- Other …………………………………………….	Yes ( )	No ( )
15) Since when have you been suffering from this problem?		
- Suddenly- arise today	(1)	
- From one to two days	(2)	
- From one to two weeks	(3)	
- Almost a month	(4)	
- More than a month	(5)	
16) Do you have any chronic health problems?	Yes ( )	No ( )
17) If the answer is yes please specify it:		
18) How many times do you usually visit the PHCC during the year?		
- More than once during a month	(1)	
- Every one to two months	(2)	
- Every three to five months	(3)	
- Six months to one year	(4)	
- Rarely	(5)	
19) When was the last time you presented to the PHCC?		
- One day ago	(1)	
- A month ago	(2)	
- Three months ago	(3)	
- Six months ago	(4)	
- A year ago	(5)	
- Other …………………………….		
20) Have you ever left the PHCC without seeing a doctor or getting treatment?	Yes ( )	No ( )

21) If the answer is yes what was the reason for leaving?		
- Overcrowding	Yes ( )	No ( )
- Unavailability of doctors	Yes ( )	No ( )
- Other …………………………..		
22) Do you have an option other than the PHCC when you are sick?	Yes ( )	No ( )
23) If the answer is yes, what are your other options?		
- Telephone counselling	Yes ( )	No ( )
- Contact by Email	Yes ( )	No ( )
- Emergency department	Yes ( )	No ( )
- Visit doctors' clinics	Yes ( )	No ( )
- Go to the pharmacy	Yes ( )	No ( )
- Herbal medication at home	Yes ( )	No ( )
- Other …………………………		
24) How many times do you usually visit the MOH hospital's ED during the year?		
- More than once during a month	(1)	
- Every one to two months	(2)	
- Every three to five months	(3)	
- Six months to one year	(4)	
- Rarely	(5)	
25) When was the last time you presented to the MOH hospital's ED?		
- One day before	(1)	
- A month ago	(2)	
- Three months ago	(3)	
- Six months ago	(4)	
- A year ago	(5)	
- More than a year ago		
- hasn't been visited the ED before		
26) Did you try to visit an ED of the MOH before visiting the PHCC?	Yes ( )	No ( )
27) If your answer is yes what is the reason for trying to seek ED before PHCC?		
C) Knowledge		
28) Do you know which clinics are available in the PHCC?		
- General clinic	Yes ( )	No ( )
- Chronic Diseases Clinic	Yes ( )	No ( )
- Healthy Child Clinic	Yes ( )	No ( )
- Dental Clinic	Yes ( )	No ( )
- Bandaging Clinic	Yes ( )	No ( )
29) Do you know that some PHCCs of the MOH open for more than 8 h a day?	Yes ( )	No ( )
30) Do you know the working hours of the PHCC you are registered with? If the answer is Yes, please answer the next question;	Yes ( )	No ( )
31) How many are the working hours of this PHCC?		
32) Do you know what services are provided by the PHCCs?		
- Online appointments	Yes ( )	No ( )
- Reminder of children's vaccine	Yes ( )	No ( )
- Phone triage	Yes ( )	No ( )
D) Satisfaction		
33) Do you get better services from the ED than the PHCC?	Yes ( )	No ( )

34) If the answer is yes please specify why?	
- The ED is easier to access than PHCCs in terms of getting appointments and location - ED doctors are more qualified than PHCC doctors - I trust ED doctors more than I do PHCC doctors - ED doctors are more knowledgeable about patients than PHCC doctors - ED opening hours are more convenient than PHCC opening hours - ED doctors provide better examination and treatment than PHCC doctors Other …………………………………..	

Please rate the following, as 1 is Poor, 2 is Acceptable, 3 is Good, 4 is Very Good and 5 is Excellent

35) Satisfaction of PHCC access	1	2	3	4	5
A. Ability to speak to your doctor by phone when you have a question/need medical advice	( )	( )	( )	( )	( )
B. Getting a medical appointment when sick	( )	( )	( )	( )	( )
C. Obtaining information by telephone	( )	( )	( )	( )	( )
D. Punctuality of appointments	( )	( )	( )	( )	( )
E. Convenience of Centre's location	( )	( )	( )	( )	( )
F. Convenience of Centre's hours	( )	( )	( )	( )	( )
G. In your opinion, the length of time you have to wait before receiving care from the staff	( )	( )	( )	( )	( )

36) Satisfaction of contextual knowledge of the patient	1	2	3	4	5
A. Primary physician's knowledge of your medical history	( )	( )	( )	( )	( )
B. Primary physician's knowledge about what worries you the most about your health	( )	( )	( )	( )	( )

37) Satisfaction of integration	1	2	3	4	5
A. Help regular doctor gave you in getting an appointment for specialty care	( )	( )	( )	( )	( )
B. Communication with specialists or other doctors who saw you	( )	( )	( )	( )	( )
C. Understanding what specialists or other doctors said about you	( )	( )	( )	( )	( )

38) Satisfaction of communication	1	2	3	4	5
A. Thoroughness of primary physician's questions about symptoms	( )	( )	( )	( )	( )
B. Doctor's attention to what you say	( )	( )	( )	( )	( )
C. Doctor's explanations of your health problems or treatments	( )	( )	( )	( )	( )
D. Doctor's instructions about symptoms to report and when to seek further care	( )	( )	( )	( )	( )
E. Doctor's advice and help in making decisions about your care	( )	( )	( )	( )	( )
F. The length of time usually spent during your consultation with the PHCC doctor	( )	( )	( )	( )	( )

39) Satisfaction of physical examination	1	2	3	4	5
A. Thoroughness of primary physician's physical examinations to you	( )	( )	( )	( )	( )
B. The healthcare you are receiving (e.g. drugs) from the PHCC	( )	( )	( )	( )	( )
C. The improvement in your health condition after your last visit to the PHCC	( )	( )	( )	( )	( )

40) Satisfaction of interpersonal treatment	1	2	3	4	5
A. Primary physician's patience, friendliness, caring, and respect	( )	( )	( )	( )	( )
B. The manner you were received by the staff of the PHCC	( )	( )	( )	( )	( )
C. The performance of the staff that attended to you at the PHCC	( )	( )	( )	( )	( )

41) Satisfaction of trust	1	2	3	4	5
A. Your satisfaction with the PHCC doctor's qualifications	( )	( )	( )	( )	( )
B. Your trust in the physician's judgments about your medical care	( )	( )	( )	( )	( )
C. My doctor would always tell me the truth about my health, even if there was bad news	( )	( )	( )	( )	( )
D. If a mistake was made in my treatment, my doctor would try to explain to me	( )	( )	( )	( )	( )

42) Satisfaction of convenience	1	2	3	4	5
A. How adequate is the space provided for patients and visitors in the waiting are of the PHCC?	( )	( )	( )	( )	( )
B. The seats provided for patients and visitors in the waiting area of the PHCC	( )	( )	( )	( )	( )
C. The neatness of the PHCC	( )	( )	( )	( )	( )
D. The hygiene of PHCC	( )	( )	( )	( )	( )
E. In your opinion, the safety of the care you receive from the PHCC	( )	( )	( )	( )	( )
F. The services and resources of the PHCC					

43) General satisfaction	1	2	3	4	5
A. Your general satisfaction with the PHCC					

45) Satisfaction of preventive counselling

A.   Primary physician has discussed the following with you: smoking, seat belt use, diet, exercise, stress.   Yes ( )   No ( )

46) Satisfaction of continuity of care

   A. How long has the primary physician you're seeing been your doctor?

……………………………………………………………………………………………

   B. How often you see primary physician (not an assistant or partner) for routine check-ups

    (1)Never   (2)Rarely   (3)Sometimes   (4)Often   (5)Always

   C. How often you see primary physician (not an assistant or partner) for appointments when sick

    (1)Never   (2)Rarely   (3)Sometimes   (4)Often   (5)Always

5.15 Consent Form

Understanding why some non-urgent patients seek care at emergency departments of hospitals whilst others seek care at primary health care centres in Saudi Arabia

Consent Form

If you are happy to participate please complete and sign the consent form below

	Activities	Initials
1	I confirm that I have read the attached information sheet (**Version 1, Date 27/6/2019**) for the above study and have had the opportunity to consider the information and ask questions and had these answered satisfactorily.	
2	I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving a reason and without detriment to myself and it will not affect your medical care. I understand that it will not be possible to remove my data from the project (by February 2020) once it has been anonymised and forms part of the data set. I agree to take part on this basis.	
3	I agree to the questions being **asked**.	
5	I agree that any data collected may be published in anonymous form in **academic thesis, books, reports or journals.**	
6	I understand that data collected during the study may be looked at by individuals from The University of Manchester or regulatory authorities, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my data.	
7	I agree that the **anonymised** data collected may be shared with **researchers/researchers at other institutions**.	
9	I agree that the researchers may retain my contact details in order to provide me with a summary of the findings for this study.	
10	I agree to take part in this study.	

Data Protection

The personal information we collect and use to conduct this research will be processed in accordance with data protection law as explained in the Participant Information Sheet and the <u>Privacy Notice for Research Participants</u>.

_____   _____   _____
Name of Participant   Signature   Date

_____   _____   _____
Name of the person taking consent   Signature   Date

If you would like to receive a summary of the findings via e-mail, please provide your email below:

……
[1 copy for the participant, 1 copy for the research team (original)]

5.16 ED Participant Information Sheet

Understanding why some non-urgent patients seek care at emergency departments of hospitals whilst others seek care at primary health care centres in Saudi Arabia

Participant Information Sheet (PIS)

You are being invited to take part in a research study aims to measure the characteristics of patients using primary care services compared to non-urgent cases visiting emergency department (ED) to determine factors that impact on patient's choice of care they seek. This research is for a PhD degree from the University of Manchester. Before you decide whether to take part, it is important for you to understand why the research is being conducted and what it will involve. Please take time to read the following information carefully before deciding whether to take part and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. It's important to know that your medical care will not be influenced by your decision to take part or not. Thank you for taking the time to read this.

About the research

➢ **Who will conduct the research?**

The main supervisor for this research is Aneez Esmail, Professor of General Practice, Primary Care and Health Services Research department, School of Health science, Faculty of Biology, Medicine and Health, The University of Manchester. The co-supervisor is Maria Panagioti, Division of Population Health, Health Services Research & Primary Care School of Health Sciences, Faculty of Biology, Medicine and Health, The University of Manchester. The Principle Investigator is Sundus Dawoud, PhD student in Health Services Research, School of Health science, Faculty of Biology, Medicine and Health, The University of Manchester. The Data collector is Frequency Company in Saudi Arabia (SA).

➢ **What is the purpose of the research?**

By "participating" in this research study, we hope to use the findings to help plan the services that you receive so that they can be more appropriate to the type of care that you may need.

We want to collect some information about you, for example your age, sex, income, where you live and the type of insurance cover that you have. We want to ask you whether you suffer from any pre-existing medical conditions and what factors were important to you when you decided to come here to receive your care.

We are interviewing a random sample of people who are over 18 and who have come to receive their health care on this occasion from the King Fahd ED for non-urgent case. Those participants must be able to write and read and sign a consent form. If you are unable to consent for any reason your companion can sign the consent.

➢ **Will the outcomes of the research be published?**

This research identifies the predictors that may affect the utilization of ED and primary healthcare centers (PHCCs). The finding will help the government healthcare services, during the first stage, to achieve optimum utilization of its resources, and may also help in reducing emergency crowding and improving PHCC access.

The Ministry of Health will be sent a summary of the study findings at the end of the research study. Dissemination of results to a wider audience will be through papers in peer-reviewed journals, the PhD thesis, presentations at conferences

publishing articles and blogs in the local media. I will share the findings with local physicians, hospital administrators and policymakers.

> **Who has reviewed the research project?**

In order to ensure that the research fulfils the ethical requirements, an application will be submitted to obtain approval from the University of Manchester Research Ethics Committee (UREC) and the Directorate of Health Affairs- Jeddah, Saudi Arabia. The supervisory team and the researcher reviewed the study protocol, information sheets, consent forms and topic guides. An informed consent form explaining the purpose of this study is included in the data sheet packet. All study data will be confidential and for study use only.

> **Who is funding the research project?**

Funding is being provided by the Saudi cultural bureau as part of the research costs for the PhD.

What would my involvement be?

> **What would I be asked to do if I took part?**

This information sheet will be given to you on your arrival at the ED, if you do decide to take part, you will be asked to keep the information sheet with you. The interviewer will take you into a private area and ask you to sign a consent form. The interviewer will start asking you the questions and the interview which takes approximately 15 - 20 minutes. The interview includes questions about your health status, usual healthcare practice, if you are registered to a PHCC, your usual visits to a PHCC and ED and your satisfaction with your PHCC that you are registered in. This interview will be carried out after the consultation with the medical provider in a private area within this ED. You have the right to not answer all questions, if you are not happy to answer any question please inform the interviewer.

> **Will I be compensated for taking part?**

There are no direct benefits for participants taking part in this study, but we hope to use the information we gather from this study to improve the health services in Saudi Arabia.

> **What happens if I do not want to take part or if I change my mind?**

It is up to you to decide whether or not to take part. If you decide to take part you are still free to withdraw at any time without giving a reason and without detriment to yourself and it will not affect your medical care. However, it will not be possible to remove your data from the project once it has been anonymised (by February 2020) as we will not be able to identify your specific data. This does not affect your data protection rights. If you decide not to take part you do not need to do anything further.

Data Protection and Confidentiality

> **What information will you collect about me?**

In order to participate in this research project we will need to collect information that could identify you, called "personal identifiable information". Specifically we will need to collect:

1. Demographic characteristics: Patients will be asked about their age, gender, nationality, educational background, employment and marital Status. Day, time and patient's reason for seeking healthcare will be recorded.

2. Health status and disease condition, such as chronic diseases and mental health conditions.

3. Usual healthcare practices: patients will be asked if they have a regular primary healthcare provider, where they usually go for healthcare, how many times they went to a PHCC during the past year, how many times they came to the ED during the past year and if they contact a PHCC provider for this problem before coming to the ED.

4. Reasons for attending the ED: the questionnaire will also include; why did they choose to attend the ED for this problem, since when they have the symptoms, and who involved in the decision to attend the ED.

5. Behaviour and knowledge: measuring the patient's knowledge about primary health care services such as services, places, when to go, and how to access.

6. Satisfaction of the services provided by the PHCCs, this will include: Satisfaction with working hours, services, doctors, medication, and overall experience.

There will be no audio or video recording.

➢ **Under what legal basis are you collecting this information?**

We are collecting and storing this personal identifiable information in accordance with data protection law which protect your rights. These state that we must have a legal basis (specific reason) for collecting your data. For this study, the specific reason is that it is "a public interest task" and "a process necessary for research purposes".

➢ **What are my rights in relation to the information you will collect about me?**

You have a number of rights under data protection law regarding your personal information. For example you can request a copy of the information we hold about you.

If you would like to know more about your different rights or the way we use your personal information to ensure we follow the law, please consult our Privacy Notice for Research.

Please see the attached copy of privacy notice to this information sheet.

➢ **Will my participation in the study be confidential and my personal identifiable information be protected?**

In accordance with data protection law, The University of Manchester is the Data Controller for this project. This means that we are responsible for making sure your personal information is kept secure, confidential and used only in the way you have been told it will be used. All researchers are trained with this in mind, and your data will be looked after in the following way:

- Confidentiality will be maintained by anonymising all the transcribed data including any notes from fieldwork, and any information that identifies the participant will be removed.

- Each participant will be assigned a study code, and this is not associated with any information that could make the participant identifiable. The linked data (i.e. study IDs and names) will be stored separately to the anonymised data.

- This information will be stored electronically at the Frequency Company's servers in Saudi Arabia and will be password protected. The researcher will be the only person who will have access to this data.

- Wherever possible field notes will be made either during or after the interview, they will be anonymised during transcription and any information that could identify the participant will be removed.

- Consent to take part in the study will be recorded on the tablet computer by the patient signing the form on the screen. This will be kept in SA on the Frequency Company servers. This information will not be connected to the data.

- This data and consent forms will be retained for 5 years.

If you wish to receive a summary of this study please provide us your email in the consent form.

Please also note that individuals from The University of Manchester or regulatory authorities may need to look at the data collected for this study to make sure the project is being carried out as planned. This may involve looking at identifiable

data. All individuals involved in auditing and monitoring the study will have a strict duty of confidentiality to you as a research participant.

What if I have a complaint?

➢ **Contact details for complaints**

If you have a complaint that you wish to direct to members of the research team, please contact:

The principle investigator is Sundus Dawoud at sundus.dawoud@postgrad.manchester.ac.uk or on +966505518331. The project supervisors are Prof. Aneez Esmail– aneez.esmail@manchester.ac.uk and Dr Maria Panagioti – maria.panagioti@manchester.ac.uk

If you wish to make a formal complaint to someone independent of the research team or if you are not satisfied with the response you have gained from the researchers in the first instance then please contact

The Ministry of Health research Manager Dr. Ola Abd-Alrasheed on 012-6347334/ 012-6347335 or by email to research-jeddah@moh.gov.sa

The Research Governance and Integrity Officer, Research Office, Christie Building, The University of Manchester, Oxford Road, Manchester, M13 9PL, by emailing: research.complaints@manchester.ac.uk or by telephoning 0161 275 2674.

If you wish to contact us about your data protection rights, please email dataprotection@manchester.ac.uk or write to The Information Governance Office, Christie Building, The University of Manchester, Oxford Road, M13 9PL at the University and we will guide you through the process of exercising your rights.

You also have a right to complain to the Information Commissioner's Office about complaints relating to your personal identifiable information Tel 0303 123 1113. If you wish to make complain to ICO go to https://ico.org.uk/make-a-complaint/ choose your personal information concerns and follow the instruction in the website.

Contact Details

If you have any queries about the study or if you are interested in taking part then please contact the researcher; Sundus Dawoud at sundus.dawoud@postgrad.manchester.ac.uk or on +966505518331.

5.17 PHCC Participant Information Sheet

Understanding why some non-urgent patients seek care at emergency departments of hospitals whilst others seek care at primary health care centres in Saudi Arabia

Participant Information Sheet (PIS)

You are being invited to take part in a research study aims to measure the characteristics of patients using primary care services compared to non-urgent cases visiting emergency department (ED) to determine factors that impact on patient's choice of care they seek. This research is for a PhD degree from the University of Manchester. Before you decide whether to take part, it is important for you to understand why the research is being conducted and what it will involve. Please take time to read the following information carefully before deciding whether to take part and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. It's important to know that your medical care will not be influenced by your decision to take part or not. Thank you for taking the time to read this.

About the research

➢ **Who will conduct the research?**

The main supervisor for this research is Aneez Esmail, Professor of General Practice, Primary Care and Health Services Research department, School of Health science, Faculty of Biology, Medicine and Health, The University of Manchester. The co-supervisor is Maria Panagioti, Division of Population Health, Health Services Research & Primary Care School of Health Sciences, Faculty of Biology, Medicine and Health, The University of Manchester. The Principle Investigator is Sundus Dawoud, PhD student in Health Services Research, School of Health science, Faculty of Biology, Medicine and Health, The University of Manchester. The Data collector is Frequency Company in Saudi Arabia (SA).

➢ **What is the purpose of the research?**

By "participating" in this research study, we hope to use the findings to help plan the services that you receive so that they can be more appropriate to the type of care that you may need.

We want to collect some information about you, for example your age, sex, income, where you live and the type of insurance cover that you have. We want to ask you whether you suffer from any pre-existing medical conditions and what factors were important to you when you decided to come here to receive your care.

We are interviewing a random sample of people who are over 18 and who have come to receive their health care on this occasion from the primary healthcare centers (PHCCs) associated by King Fahd Hospital. Those participants must be able to write and read and sign a consent form. If you are unable to consent for any reason your companion can sign the consent.

➢ **Will the outcomes of the research be published?**

This research identifies the predictors that may affect the utilization of ED and PHCCs. The finding will help the government healthcare services, during the first stage, to achieve optimum utilization of its resources, and may also help in reducing emergency crowding and improving PHCC access.

The Ministry of Health will be sent a summary of the study findings at the end of the research study. Dissemination of results to a wider audience will be through papers in peer-reviewed journals, the PhD thesis, presentations at conferences

publishing articles and blogs in the local media. I will share the findings with local physicians, hospital administrators and policymakers.

> **Who has reviewed the research project?**

In order to ensure that the research fulfils the ethical requirements, an application will be submitted to obtain approval from the University of Manchester Research Ethics Committee (UREC) and the Directorate of Health Affairs- Jeddah, Saudi Arabia. The supervisory team and the researcher reviewed the study protocol, information sheets, consent forms and topic guides. An informed consent form explaining the purpose of this study is included in the data sheet packet. All study data will be confidential and for study use only.

> **Who is funding the research project?**

Funding is being provided by the Saudi cultural bureau as part of the research costs for the PhD.

What would my involvement be?

> **What would I be asked to do if I took part?**

This information sheet will be given to you on your arrival at the PHCC, if you do decide to take part, you will be asked to keep the information sheet with you. The interviewer will take you into a private area and ask you to sign a consent form. The interviewer will start asking you the questions and the interview which takes approximately 15 - 20 minutes. The interview includes questions about your health status, usual healthcare practice, if you are registered to a PHCC, your usual visits to a PHCC and ED and your satisfaction with your PHCC that you are registered in. This interview will be carried out after the consultation with the medical provider in a private area within this PHCC. You have the right to not answer all questions, if you are not happy to answer any question please inform the interviewer.

> **Will I be compensated for taking part?**

There are no direct benefits for participants taking part in this study, but we hope to use the information we gather from this study to improve the health services in Saudi Arabia.

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It is up to you to decide whether or not to take part. If you decide to take part you are still free to withdraw at any time without giving a reason and without detriment to yourself and it will not affect your medical care. However, it will not be possible to remove your data from the project once it has been anonymised (by February 2020) as we will not be able to identify your specific data. This does not affect your data protection rights. If you decide not to take part you do not need to do anything further.

Data Protection and Confidentiality

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2. Health status and disease condition, such as chronic diseases and mental health conditions.

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4. Reasons for attending the ED: the questionnaire will also include; why did they choose to attend the ED for this problem, since when they have the symptoms, and who involved in the decision to attend the ED.

5. Behaviour and knowledge: measuring the patient's knowledge about primary health care services such as services, places, when to go, and how to access.

6. Satisfaction of the services provided by the PHCCs, this will include: Satisfaction with working hours, services, doctors, medication, and overall experience.

There will be no audio or video recording.

➢ Under what legal basis are you collecting this information?

We are collecting and storing this personal identifiable information in accordance with data protection law which protect your rights. These state that we must have a legal basis (specific reason) for collecting your data. For this study, the specific reason is that it is "a public interest task" and "a process necessary for research purposes".

➢ What are my rights in relation to the information you will collect about me?

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If you would like to know more about your different rights or the way we use your personal information to ensure we follow the law, please consult our Privacy Notice for Research.

Please see the attached copy of privacy notice to this information sheet.

➢ Will my participation in the study be confidential and my personal identifiable information be protected?

In accordance with data protection law, The University of Manchester is the Data Controller for this project. This means that we are responsible for making sure your personal information is kept secure, confidential and used only in the way you have been told it will be used. All researchers are trained with this in mind, and your data will be looked after in the following way:

- Confidentiality will be maintained by anonymising all the transcribed data including any notes from fieldwork, and any information that identifies the participant will be removed. - -
- Each participant will be assigned a study code, and this is not associated with any information that could make the participant identifiable. The linked data (i.e. study IDs and names) will be stored separately to the anonymised data.
- This information will be stored electronically at the Frequency Company's servers in Saudi Arabia and will be password protected. The researcher will be the only person who will have access to this data.
- Wherever possible field notes will be made either during or after the interview, they will be anonymised during transcription and any information that could identify the participant will be removed.
- Consent to take part in the study will be recorded on the tablet computer by the patient signing the form on the screen. This will be kept in SA on the Frequency Company servers. This information will not be connected to the data.
- This data and consent forms will be retained for 5 years.

If you wish to receive a summary of this study please provide us your email in the consent form.

Please also note that individuals from The University of Manchester or regulatory authorities may need to look at the data collected for this study to make sure the project is being carried out as planned. This may involve looking at identifiable data. All individuals involved in auditing and monitoring the study will have a strict duty of confidentiality to you as a research participant.

What if I have a complaint?

➢   **Contact details for complaints**

If you have a complaint that you wish to direct to members of the research team, please contact:

The principle investigator is Sundus Dawoud at sundus.dawoud@postgrad.manchester.ac.uk   or on +966505518331. The project supervisors are Prof. Aneez Esmail– aneez.esmail@manchester.ac.uk   and Dr Maria Panagioti – maria.panagioti@manchester.ac.uk

If you wish to make a formal complaint to someone independent of the research team or if you are not satisfied with the response you have gained from the researchers in the first instance then please contact

The Ministry of Health research Manager Dr. Ola Abd-Alrasheed on 012-6347334/ 012-6347335 or by email to research-jeddah@moh.gov.sa

The Research Governance and Integrity Officer, Research Office, Christie Building, The University of Manchester, Oxford Road, Manchester, M13 9PL, by emailing: research.complaints@manchester.ac.uk   or by telephoning 0161 275 2674.

If you wish to contact us about your data protection rights, please email dataprotection@manchester.ac.uk or write to The Information Governance Office, Christie Building, The University of Manchester, Oxford Road, M13 9PL at the University and we will guide you through the process of exercising your rights.

You also have a right to complain to the Information Commissioner's Office about complaints relating to your personal identifiable information Tel 0303 123 1113. If you wish to make complain to ICO go to https://ico.org.uk/make-a-complaint/ choose your personal information concerns and follow the instruction in the website.

Contact Details

If you have any queries about the study or if you are interested in taking part then please contact the researcher; Sundus Dawoud at sundus.dawoud@postgrad.manchester.ac.uk   or on +966505518331.

5.18 University of Manchester Simplified Research Privacy Notice

General Information

As part of our commitment to research integrity, the University of Manchester follows the General Data Protection Regulation (GDPR) and the UK Data Protection Act 2018 (DPA).

This means that by law, anyone wanting to collect your information must have a legal reason to do so and when the information is more sensitive an extra legal reason is needed. The law allows us as researchers to collect your information under two legal reasons:

1) A task carried out in the public interest;

   And for more sensitive information

2) Where the information is necessary for scientific or historical research purposes or statistical purposes.

What is Personal Data (personal information)?

Personal data means any information which can identify you. It can include items such as your name, gender, date of birth, address/postcode or other information such as your opinions or thoughts. The specific information that the researcher wishes to obtain from you is listed on the participant information sheet.

What is sensitive information (special category data)?

Researchers may process some information about you that is considered to be 'sensitive' and this is called 'special category' personal data. This includes, but is not limited to, information such as your ethnicity, sexual orientation, gender identity, religious beliefs or details about your health. These types of personal information require additional protections which the University ensures are in place.

Who is responsible for my personal information?

The University of Manchester is the **Data Controller** for this study. This means it is responsible for protecting your information and making sure it is:

1. Kept securely and confidentially;
2. Used only in the way the researchers tell you it will be used.

Who will my personal information be shared with?

Your personal information will be kept confidential by anonymising all the transcribed data including any notes from fieldwork, and any information that identifies the participant will be removed. Each participant will be assigned a study code, and this is not associated with any information that could make the participant identifiable. The linked data (i.e. study IDs and names) will be stored separately to the anonymised data.

Both your personal information as well as the anonymised information will only be shared with members of the research team in order to conduct the project. If they need to share your information with anyone else, you will be told who they are and why this is the case in the participant information sheet.

How long will you keep my personal information?

Any personal information which has not been anonymised will be kept for 4 months for the purposes of data collection to be completed.

Any information which has been anonymised and cannot be linked back to you will be kept for 5 years.

Your rights

By law, you have a number of rights regarding the personal information we hold about you. These include the right to:

- See the information/receive a copy of the information
- Correct any incorrect information
- Have the information deleted
- Limit or raise concerns to the processing of your information
- Move your information

These rights only apply to your information before it is anonymised as once this happens we can no longer identify your specific information. Sometimes your rights may be limited if it would prevent or delay the research. If this happens you will be informed and have the right to complain about this to the Information Commissioner.

Who can I contact?

If you have any questions about the information in this document please contact the University's Data Protection Officer, Alex Daybank (dataprotection@manchester.ac.uk) or write to:

The Data Protection Officer
Information Governance Office
Christie Building
University of Manchester
Oxford Road
Manchester M13 9PL

Appendix 2

5.19 Ministry of Health Ethical Approval

مديرية الشؤون الصحية بمحافظة جدة
Directorate of Health Affairs – Jeddah
(202/275) (٢٠٢/٢٧٥)   اللجنة المحلية لأخلاقيات البحوث
جدة

وزارة الصحة
Ministry of Health

Final approval letter
Institutional Review Board - Jeddah

IRB registration Number with KACST: KSA: H-02-J-002

Date of Issue:10/11/2021

Research Title: Understanding why some non-urgent patients seek care at emergency department of hospitals whilst others seek care at primary health care centers in Saudi Arabia

Research Subtitle: Evaluation of the factors associated with inappropriate use of the emergency department at King Fahd Hospital, Jeddah City, and the role of primary care

Primary Investigator: Sundus Dawoud, ,

Co/Investigator/s: Aneez Esmail, Maria Panagioti

Research Number: 01041

IRB Approval Number: A00707

Dear investigator/s

This letter to inform you that the above titled research grants the final approval of the local IRB in Jeddah health affairs via <u>review</u> according to KACST (GCP) regulations and after ascertaining the completion of all what stated in the initial approval.

Best Regards,,

Chairman Institute Review Board
Jeddah

Dr/Hanouf Assem BinHimd

المرفقات :   التاريخ ،   ١٤   /   /   ٢٠   /   /   /٤٧/ج   /   الرقم ،

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5.20 University of Manchester Ethical Approval

Research Governance, Ethics and Integrity

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Ref: 2019-6364-11409

18/07/2019

Dear Ms Sundus Dawoud, Dr Maria Panagioti, Prof Aneez Esmail

Study Title: Usage of A&E by primary care patients in Saudi Arabia

University Research Ethics Committee 1

I write to thank you for submitting the final version of your documents for your project to the Committee on 16/07/2019 21:54 . I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form and supporting documentation as submitted and approved by the Committee.

Before recruitment begins, please submit a formal amendment containing appropriately version controlled participant information sheets.

Please see below for a table of the title, version numbers and dates of all the final approved documents for your project:

Document Type	File Name	Date	Version
Participant Information Sheet	Letters of invitation to managers - ethics	14/03/2019	PDF
Additional docs	Protecting Human Subject Research Participants CME	02/05/2019	PDF
Default	Questionnaire - PC - ethics	28/06/2019	PDF
Default	Questionnaire - PC translated	28/06/2019	PDF
Participant Information Sheet	Simplified privacy notice statement version 6 FINAL	28/06/2019	PDF
Participant Information Sheet	Simplified privacy notice statement version 6 FINAL - Translated	28/06/2019	PDF
Additional docs	DAWOUD Sundus - Study Away from the University	28/06/2019	PDF
Additional docs	Occupational health certificates	28/06/2019	PDF
Lone Worker Policy/Procedure	On-campus lone worker checklist v2.0	28/06/2019	PDF
Participant Information Sheet	letter of translation	01/07/2019	PDF
Data Management Plan	DMP-Ethics application	03/07/2019	PDF
Default	Questienaire-ED - ethics	03/07/2019	PDF
Default	Questionnaire - ED translated	03/07/2019	PDF
Default	PhD Protocol - ethics[1]	03/07/2019	PDF
Lone Worker Policy/Procedure	Risk_Assessment_Form Mar 2015 - Ethics	03/07/2019	PDF
Default	letter of translation	03/07/2019	PDF
Consent Form	Consent form_GDPR	15/07/2019	PDF
Consent Form	Consent form_GDPR-Translated	15/07/2019	PDF
Participant Information Sheet	PIS_GDPR UoM General Ethics - ED	16/07/2019	PDF
Participant Information Sheet	PIS_GDPR UoM General Ethics - PC	16/07/2019	PDF
Participant Information Sheet	PIS_ED-Translated-Ethics	16/07/2019	PDF
Participant Information Sheet	PIS_PC-Translated-Ethics	16/07/2019	PDF
Participant Information Sheet	PIS_PC-Translated-Ethics	16/07/2019	PDF
Letters of Permission	Translation of MOH Ethics approval	16/07/2019	PDF
Additional docs	Aggrement of MOH	16/07/2019	PDF
Additional docs	MOH Ethical Approval	16/07/2019	PDF
Additional docs	Letter 2 ethics comments	16/07/2019	PDF
Additional docs	2nd Responses to ethics comments letter 2 _ 6364	16/07/2019	PDF

Page 1 of 2

This approval is effective for a period of five years however please note that it is only valid for the specifications of the research project as outlined in the approved documentation set. If the project continues beyond the 5 year period or if you wish to propose any changes to the methodology or any other specifics within the project, an application to seek an amendment must be submitted for review. Failure to do so could invalidate the insurance and constitute research misconduct.

You are reminded that, in accordance with University policy, any data carrying personal identifiers must be encrypted when not held on a secure university computer or kept securely as a hard copy in a location which is accessible only to those involved with the research.

Reporting Requirements:

You are required to report to us the following:

1. Amendments: Guidance on what constitutes an amendment
2. Amendments: How to submit an amendment in the ERM system
3. Ethics Breaches and adverse events
4. Data breaches
5. Notification of progress/end of the study

Feedback

It is our aim to provide a timely and efficient service that ensures transparent, professional and proportionate ethical review of research with consistent outcomes, which is supported by clear, accessible guidance and training for applicants and committees. In order to assist us with our aim, we would be grateful if you would give your view of the service that you have received from us by completing a **UREC Feedback Form**. Instructions for completing this can be found in your approval email.

We wish you every success with the research.

Yours sincerely,

Ms Kate Hennessy

Secretary to University Research Ethics Committee 1