



Descriptive literature review of human resource information systems (HRIS) adoption issues in the health sector, South Africa



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ABSTRACT

No organisation is ever static. For several reasons, each organisation reviews its aims and objectives from time to time. These reasons may be internally or externally driven. They could also be politically, economically and or socially motivated. Research has established that most of the attempts at bringing about change are based on the needs of employees and customers. Essentially, for the purposes of better management of employees and customers, human resource information systems (HRIS) are touted as the panacea for effective and efficient health sector service delivery. Focusing on South Africa, this paper used the descriptive literature review method to determine HRIS adoption issues within the health sector of South Africa. As an important sector in any growing economy, the health sector in our view benefits from a constant review of its mission. Within the context of South Africa, substantial emphasis is yet to be placed on health sector effectiveness. Elsewhere, in other regions and continents, research on HRIS adoption within the health sector suggests that its adoption is problematic, but useful. The South African health sector is yet to fully embrace this technology and as a result is suffering from employee dissatisfaction, brain drain and general maladministration. Investment in HRIS research is therefore instructive especially within the context of South Africa. What we have found through this review is that investing in HRIS is crucial; however, it requires thorough consideration for its funding, infrastructural support, and skilled manpower among others.

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Introduction

Several factors are known to drive change within organisations. These factors are either internal or external to the organisations. External factors can include competing organisations, clients/patients, and government regulation, whereas internal factors can be management, new focus, and or employees (McCracken, McIvor, Treacy, & Wall, 2017). In particular, employees and the way they are managed are regarded as significant components in any change value chain (Gardeazabal et al., 2021). Regarding human resource management, Human Resource Information Systems (HRIS) are considered effective for change management (Redelinghuys, 2021), as well as facilitate the achievement of competitive advantage (Anger, Tessema, & Craft, 2021).

The use of HRIS can, therefore, be an important strategic exercise in any organisation driving the delivery of a reliable health service (Molete, Stewart, Moolla, & Igumbor, 2021). Acknowledging the necessity for HRIS within the health sector, Anupam and Sharma (2017) highlight that HRIS saves the health sector the pain of manual administration of patients and employee records which can result in the loss of patient and employee data. The lack of a proper information system in the health sector can cause an unnecessary loss of human lives (Sharma, Devkota, & Acharya, 2021). For instance, in South Africa, a more recent example is the Life Esdimeni tragedy where several mentally ill patients were unlawfully relocated to unregistered care centres which resulted in the death of over

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140 of those patients and some still unaccounted for to this day (Timeslive, 2018). It is argued that carelessness on the part of the health management, lack of information system and poor infrastructure were to blame for such loss (Dhai, 2018). An effective information system could have assisted to eliminate such carelessness in the health sector (Keogh, 2014; Zaiter, Koabaz, Lakkis, Chahine, & Zaiter, 2021).

The health sector is regarded as one of the most important sectors in a growing economy due to its influence and practicality in human lives (Muthoka, 2016). According to Tetteh (2014:42), the health sector "consists of all associations, establishments and capitals that are interacted and managed to improve health sector services in a country". The sector is also recognised as one of the most valuable, fastest-growing and significant sectors for economic growth and social development because an economy that does not consider human lives as a priority in their economic growth might find it difficult in achieving the expected growth (Mayende & Musenze, 2018). Governments utilise information systems to make decisions about the status of health in their various countries, which is an indication that HRIS is an important aspect in the health sector of a growing economy (Maruru, 2014; Kuyo, Muiruri, & Njuguna, 2018). Therefore, an investment in HRIS is important for the sector in South Africa (C. Iwu & Benedict, 2013; Many, Sahay, Braa, & Shisia, 2018).

The need for HRIS usage in the health sector is high (Mahalakshmi & Devi, 2020), often leading to several research endeavours aiming to understand it better for more effective deployment. Even though the use of HRIS in the health sector has attracted the attention of researchers, Wright et al. (2017) indicate that HRIS research in the South African health sector is still limited. Investment in HRIS research has therefore been called for in developing countries. According to Al-Dmour, Obeidat, Masa'deh and Almajali (2015), there is a need to conduct a study on the utilisation of HRIS in the health sector to determine its influence on the administration of the workforce. Alam, Masum, Beh and Hong (2016) suggest the need to conduct studies that can unravel other factors that inhibit the use of HRIS as well their impact on the health sector. This, according to Tjoflåt et al. (2018) may assist in influencing the potential of HRIS in contributing towards organisational efficiency through workforce planning, financial planning, administration and staff retention. Sligo, Gauld, Roberts and Villa (2017) contend that the HRIS has been flaunted as a solution in the health sector. This stems from the benefits of HRIS which include streamlining HR processes to a level of effectiveness, early detection of malfeasance in an organisation and timely prosecution of devastating conditions. Notwithstanding these benefits, reports suggest that HRIS has not been effectually implemented, and exploited in the health sector (Were et al., 2019). Alhazemi's (2017) study noted the continuous interrogation of HRIS adoption for developing a reliable human resource system in the health sector. ElNakib, Ragheb, Youssef, and Ghanem (2021) propose further studies to identify problems faced by HRIS adoption in the health sector for effective delivery of health services. Katuu (2018) argues that several challenges that impede the adoption of HRIS need to be further researched using empirically developed frameworks, theories and models, for a comprehensive analysis of HRIS in the health sector of South Africa. This paper therefore extends our understanding of HRIS adoption issues within the health sector of South Africa.

Research and Methodology

This paper was written using the descriptive literature review method. This is a premeditated technique of detecting, assembling and assessing literature on a particular phenomenon to ascertain any interpretable arrangements or trends concerning the phenomenon (Etim & Iwu, 2019). The strong point of this method is that writers can carefully gather, from a body of knowledge, publications that articulate different views (Mokoena, 2019). We considered the descriptive literature review method to be appropriate for the purpose of this research because we needed to meticulously find, evaluate, and interpret pertinent studies on HRIS adoption issues especially within the health sector. We felt this approach would enable us to sort and appraise a collection of previous studies to understand specific HRIS adoption issues within the South African health sector. The selection of this method is reinforced by the methodological practices of information technology studies (e.g. (King & He, 2005; Bragge, Relander, Sunikka, & Mannonen, 2007; Grant & Booth, 2009; Yang & Tate, 2012; Opute, Irene, & Iwu, 2020).

For a thorough and reliable enquiry, we did not restrict our appraisal to only journal publications despite Gulko et al. (2020) suggesting that journal publications are the most reliable sources of academic knowledge. Furthermore, due to the frequently held view that the issue of non-effective usage of HRIS in the health sector constitutes a problem (Khan, Hussainy, Khan, & Khan, 2017) we considered it necessary to include other sources of publication to thoroughly address the topic. In considering various sources, we adopted a comprehensive strategy involving the search for relevant publications in online databases such as Medical/Health (Cochrane library, MedLine, Embase); Social Sciences (Abi/Inform, Asia, Sociological Abstracts); Multidisciplinary Research (Scopus, Web of Science core collection, Science direct), ICT (IEEE Xplore); gray literature sources including reports from World Health Organisation (WHO); African Union (AU); professional bodies (Chartered Institute of Personnel and Development, Nursing Council, Doctors Association, Healthcare Information and Management Systems); and Google Scholar. Consequently, a total of 142 sources of literature were utilised to develop the review as shown in table below.

Table 1: Summary of literature sources used

Source type	Quantity
Journal articles	92
Books	4
Book sections	3
Thesis	22
Conference papers	8
Reports	10
Website page	2
Working paper	1

Grounding Concepts

Overview of Human resources management (HRM)

Studies have shown that human resource management is seen as the origin of sustainable, competitive advantage in various sectors. Khatri (2015) contend that organisations need to emphasize more of their competitive strength to have a long-term suitable strategy in place with regards to HRM. The competitive strength of an organisation revolves mainly around human resource management as it assists in the facilitation of strategic objectives. Due to globalisation, effective HRM is being pursued to have standardised HRM capabilities and processes to manage the workforce for sustainable competitive advantage (Alzhrani, 2020).

HRM is defined by Armstrong (2014:5) as “a strategic, integrated and coherent approach to the employment, development and well-being of workforce in organisations”. Originally, HRM was restricted to three functions; recruitment, salaries, and administration, and as time went by, it was realised that these three functions were not sufficient to function as a fully-fledged HRM system (James, 2006). For this reason, in 2001, the South African Ministry of Labour launched an HRM strategy for government parastatals such as the health sector using an information system to assist in skills development and knowledge sharing to compete with High-Income Countries (HIC) with regard to workforce retention. These strategies are yet to be accomplished in the South African labour force (Mishra, 2020).

An important function of the human resource department of any organisation is to hire people based on their ability to improve the organisation’s productivity (Grobler, Wörnich, & Mokobane, 2018). An organization is productive if it achieves its goals and does so by transferring inputs to outputs at the lowest cost (Ukandu, Iwu, & Allen-Ile, 2014; Grobler et al., 2018). As such, it can be argued that productivity implies a concern for both effectiveness and efficiency. Effectiveness relates to successfully meeting the needs of clients, while efficiency relates to doing so at low cost (Robbins, 2009). Effective monitoring of human resource within an organisation has the advantage of reducing workplace stressors (Turek & Wojtczuk-Turek, 2015; Grobler et al., 2018). HRIS has thus become known for benefitting organisations with timely detection of debilitating workplace conditions that cause employee dissatisfaction (Udekwe, 2016; Katuu, 2018). To develop a comprehensive HRIS necessitates a complete HR component for health sector effectiveness (Saka, 2013). Therefore, the consideration for HRIS should include not only sufficient funds, and infrastructure but also skilled employees (Maruru, 2014; Dilu, Gebreslassie, & Kebede, 2017; Manya et al., 2018).

State of the health sector in South Africa

The South African health system is a manifestation of many years of historic development (Katu, 2018) essentially reflecting the many changes in policy and legislation (Van Rensburg & Harrison, 1995). The physical state and management of public healthcare facilities that serve the majority of South Africa’s population have been inadequate, which accounts for the lack of system upgrades and delivery of health services in the country (South Africa, 2010). Katuu (2018) thus suggests a need to make changes in terms of sophisticated systems to control the internal processes and structures in the South African health system. A speedy transformation in the sector will not be easily achieved without an effective information system in place (Schneider, Barren, & Fonn, 2007; Lv, Cai, & Chang, 2021;).

Currently, the South Africa health system is made up of 9 Provinces which consist of 44 district municipalities, 226 local municipalities and 8 metropolitan municipalities (South Africa, 2021). In other words, there are major contemporary public health sectors in South Africa which are, National Health Sector (NHS), Provincial Health Sector (PHS), and District Health Sector (DHS) (Rapakwana, 2004). These sectors are expected to work simultaneously to achieve efficient healthcare delivery in the country, but due to the lack of prioritisation of the health system by the government, they are not able to achieve it (Geyer, Mogotlane, & Young, 2009; Ballard et al., 2020).

As several reports inform, the South African health sector is currently going through a devastating health workforce shortage which has negatively affected service delivery in the country's health system (Katuu, 2016). This workforce shortage has become an issue that requires studies to be conducted, to find ways to assist in solving the workforce shortage using an information system to identify the healthcare-related problems and also how the South African health system can be improved to compete with other countries that attract their health workers (Katuu, 2019). This is an important call that this paper responds to

Human resource information system (HRIS)

HRIS is defined by Kavanagh, Gueutal and Tannenbaum (1990:13) as "a system that is used to acquire, store, manipulate, analyse, retrieve, and distribute human resource information". Thus, HRIS is a software solution for challenges linked to, among others, data tracking and data information of workers (Anupa, 2021). Studies on the use of HRIS in the health sector have been conducted, yet there are unanswered questions regarding the capacity of HRIS to improve the quality of health services in South Africa (Iwu, Allen-Ile, & Ukpere, 2012; Tursunbayeva, Bunduchi, Franco, & Pagliari, 2017; Davarpanah & Mohamed, 2020). There are various types of information systems that make up the HRIS. The competencies achieved from the widespread use of various HRIS allow for the retention of workforce that is required for the sustainability of organisations, which denotes that HRIS is an organisational high-level solution that is provided by HRIS vendors (Udekwe, 2016; Wahid & Kurnianda, 2021). Notwithstanding, the utility of information systems in managing human resource, lies in the ability to reduce difficulties because, on its own, managing employees can be a formidable task (Grundy, Dakulala, Wai, Maalsen, & Whittaker, 2019; Mabaso, 2020).

According to Aggarwal and Kapoor (2012), the sustainability of organisations through the application of HRIS is linked to the improvement made on policies and procedures relating to human resources. Aggarwal and Kapoor (2012) further argue that fast-tracking decision-making on issues like promotion, transfer, nomination, setting employees provident funds, retirement, gratuity, leave travel concession and earned leave compensation produce reliable statistics and convey to the authorities and professional bodies suitable information for the improvement of stable and quality decision process. Furthermore, producing numerous, precise, and real-time human resource associated reports intensifies the desirability of organisations by transforming human resource processes, health workforce satisfaction and providing human resource services much faster, accurately and reliably. We then argue that delivering a wide range of information as an assimilated database assists the health sector to offer crucial connectivity across various units/facilities and actions, to intensify the speediness of information communications.

Evidence of effective use of HRIS in the health sector can be found in the speedier recruitment process, update and care of workforce personal data, producing reliable human resource reports and statistics, workforce payroll and deductions, direct payment distributions, career development, self-service technology, and effective training (Matimbwa & Masue, 2019). In considering the above benefits of HRIS, it is prudent to understand some of the limitations of HRIS within the health sector. Grobler et al. (2018) mention that HRIS can be expensive to acquire and maintain. This view suggests that acquiring HRIS should be based on the need, demand and capacity of the organisation that needs it (Tariq, Sang, & Gulzar, 2016; Udekwe & de la Harpe, 2017)

Nachit and Okar (2020) emphasize that HRIS can be complex in the sense that it is not easily accessed by the users which require a simplification of functionalities and training for user convenience. Also, the fact that documents are not accurately and timely captured in HRIS is part of the limitations identified by Simms (2020) and that creates a high level of distrust by the management and staff with regard to having confidence in the report generated in the health sector. Resistance to change by management and workers in the use of HRIS also creates a sense of untrust in the report generated for health workforce purpose, with the impression that most of the skilled health workers are not interested in what happens in HRIS, so long as they get their salary, unknown to them of the benefits they could achieve in the use of HRIS (Islam, Raju, & Azad, 2021).

Discussions

HRIS standards in the health sector

Globally, the use of non-upgraded and standard HRIS in the health sector has created a step back in the advances of health workforce management in the health sector of South Africa. Waters, Zuber, Simbini, Bangani, and Krishnamurthy (2017) emphasize the assessment of HRIS in the South African health sector by stipulating the need for a global standard of HRIS to improve data capturing, strengthen the regulation and deployment of health workers. The lack of proper guidance in the development of such standard HRIS in planning and decision making for the health workforce in South Africa is still a problem affecting HR for health adoption and sustainability (Chugh, 2014; Elharish, Denna, Maatuk, & Elberkawi, 2021).

Studies have shown that there is a need for a standardized HRIS usage in African countries given the need to understand the various levels of brain drain (Riley et al., 2012). In this regard, Ngwenya, Aigbavboa and Thwala (2019) are of the view that using standard HRIS solutions for effective analysis and growth of organisations in various sectors of the economy such as the health sector will assist in identifying job scarcity and also support the sector in producing reliable health workforce sustainable data in the sector. Were et al. (2019) also opine that the absence of a standard HRIS in the South African health sector produces a bogus health workforce data that serves no use for health strategies at the national, provincial and local government levels. Not using a standard HRIS is often assessed as factor of poor funding and lack of prioritisation of HRIS by the government of South Africa, which requires more ways to address the use of such information systems to support the health workforce (Ngwenya et al. 2019).

HRIS functionality in the health sector

The demand for HRIS functionalities varies according to the purpose and affordability of organisations as most HRIS comes with various functionalities such as recruitment and selection, training and development, time and attendance management, analytics, performance management and HR management information system. These functionalities, according to Witter et al. (2020), indicate that organisations have a wide variety to choose from which in any case relies on availability of funds, and resources (Udekwe & de la Harpe, 2017).

The HRIS used by the South African health sector is still primitive and does not have all the required functionalities to maintain the workforce in the sector. The fact that the health department of South Africa uses HRIS for basic payroll and not for strategic decisions calls for great concern as it affects the management of health workforce in the country (Witter et al., 2020). Effective HRIS functionalities are expected to assist the health sector in supporting the health workforce retention and also identify unreasonable remuneration packages for a better-skilled workforce decision of which the current HRIS in the South African health sector is not able to achieve (Beulen, 2009; Mabaso, 2020). This situation has created dissatisfaction in health workforce sustainability in South Africa, which requires a need to conduct studies in identifying ways that the government can assist to uplift the standard of HRIS through the inclusion of the required functionalities for health workforce retention and sustainability in South Africa (Bag, Dhamija, Pretorius, Chowdhury, & Giannakis, 2021).

HRIS strengthening process in the health sector

Within the South African context, Spero, Mcquide and Matte (2011) are of the view that the health sector has suffered from the inability to effectively plan its workforce which negatively impacts the sector. Tursunbayeva, Pagliari, Bunduchi, and Franco (2015) on the other hand argue that HRIS has the potential to improve the health system through financial, operational and administration level.

According to Spero et al. (2011), there are six steps that assist to strengthen the health sector through the HRIS and they are as follows; structured HRIS controls stakeholders; reinforcement of Information Communication Technology (ICT) infrastructure; upgrade HRIS software solution; promote evidence-based decision-making; build HRIS capacity and ensure data quality and security. Contentious as it may appear, these identified steps are yet to be accomplished in the South African health system using HRIS (Matimbwa & Masue, 2019; Prasad, 2020). According to Dilu et al. (2017), insufficient funds have been the major reason why some health sectors including the Non-Governmental Organisations (NGO's) in the health sector are not able to achieve their strengthening process, which according to Kiros (2018), is also the reason they are not able to fully deploy HRIS in the health sector.

Challenges of HRIS usage in the health sector

The use of HRIS in the health sector poses a great challenge to the effectiveness of the sector in South Africa. Matimbwa and Masue (2019) indicate that HRIS can be useful in human resource functions such as recruitment and selection, maintenance of workers data, generation of reports including workers details, employees' payroll, career planning and self-service. Dilu et al. (2017) are of the view that even though the above mentioned HRIS functions are necessary for an effective system, yet the use of HRIS in the South African health sector is faced with numerous challenges such as lack of financial capacity to upgrade HRIS, lack of maintenance of the HRIS, lack of ICT and HRIS proficiency in the sector, lack of government support in the performance of HRIS, lack of computers, manual intervention, infrastructural challenges, poor incentives, unstable internet connectivity and lack of top management support.

In Matimbwa and Masue's (2019) study, they identified recommendations that will assist in dealing with the above mentioned HRIS challenges faced by the South African health sector such as increase in budget allocation in the health sector, reinforcement and coordination between different health departments on the use of HRIS for compares and updates. These recommendations are yet to be accomplished in the effective HRIS in the South African health sector (Prasad, 2020). Dey and Saha (2020) support Matimbwa and Masue (2019) by identifying the major challenges facing the HRIS usage in the South African health sector are infrastructural, skills and managerial which are explained below.

Infrastructural challenges

According to Maamari and Osta (2021), HRIS infrastructural challenges include a poor supply of resources and logistics, dilapidated infrastructure, lack of data and backup systems, and other equipment, load shedding, lack of information security measures, lack of sufficient funds, and non-sophistication of HRIS. In a study conducted by Islam et al. (2021) on HRIS challenges in productivity using digitalised ICT, they found that a knowledge-based society focused on ICT infrastructure development would struggle with ensuring productivity when there is lack of improvement on the system.

Amedari and Ejidike (2021) are also of the view that HRIS is challenged by poor infrastructure and network connection, inadequate training on HRIS use, employee incapacity, absence of professional support, which results in a situation where HRIS technology cannot meet up with the expectations of the employees. In this regard, there is a need to involve the authorities to support the use of HRIS in the health system through the improvement of infrastructure (Al-hawari & Bandyopadhyay, 2021).

Skills challenges

Udekwe (2016) highlights skills challenges regarding HRIS usage in the South African sector to include lack of skilled workforce in the use of HRIS, lack of skilled IT workers in the sector, poor accessibility of the HRIS system by the entire workers, lack of training in the use of computer and information system, and lack of data handling proficiency. This requires the sustainability of the required skills and training development programs, promotions, incentives to enhance workforce performance, thus indicating that skills requirement is an essential challenge facing the effectiveness of HRIS, particularly in the health sector. Harsha (2021:10781) describes skills sustainability as “the capacity of an organisation to continuously attract, hire, nurture, engage and retain skilled individuals with the right competencies for organisational objective”. Further emphasis is placed on the need to re-engineer hospitals in sub-Saharan Africa through effective HRIS usage and upskilling of users. Sithole and Pwaka (2019) for instance advocate the need for professional development to retain skills in the health sector of South Africa. Mahlulo (2020) also encouraged the need to have a large investment in information system in the South African health sector of which is yet to be accomplished. Where these challenges are not abated, Okolo and Iruo (2021) remarked that the accrued rewards in the use of HRIS in health which include skills retention and high job satisfaction will continually erode organisations. In short, upskilling HRIS users with the right talent will enable the health sector to function effectively (Harsha, 2021).

Managerial challenges

According to Suharti and Sulisty (2018), the managerial challenges affecting the use of HRIS in the health sector include lack of effective management support, lack of teamwork and staff participation, low HRIS passion by stakeholders, lack of proper incentives to motivate HRIS users, lack of attention to HRIS usage and low human resource support system. These challenges are common in the HRIS environment (Udekwe & de la Harpe, 2017), thus requiring further research to identify HRIS usage and sustainability issues in the health sector.

HRIS is considered as an effective mechanism to improve motivation, job satisfaction and retention in the health sector. This is the view of many researchers including Arasa (2019) who avow that the inability of HRIS to fully support the health sector can be linked to numerous managerial challenges related to the complexity of the services rendered to the public, and the negligence of management Grabner and Martin (2021) also remarked management support is needed to fund the provision of other infrastructure that facilitate HRIS implementation in the health sector. Not prioritizing HRIS and its implementation by management of the health sector will render it useless causing low employee morale and possibly the intention to quit (Amore & Garofalo, 2021). Overall, we are of the view that the strategic role of any management is to pursue programmes that motivate employees. These programmes come in the form of requisite infrastructure for painless delivery of service, and incentives among others.

Adoption of HRIS in the health sector

Certain factors affect the adoption of HRIS in the South African health sector which according to Quaosar (2018) include performance expectancy, effort expectancy, and social influence. The health workforce involvement and training to support the adoption of HRIS usage are also part of the factors affecting the adoption of HRIS. Aksoy and Sallam (2018) highlight that health workforce involvement in the adoption of HRIS for a sustainable health sector is critical in ensuring that HRIS usage and workforce satisfaction are both related to assisting in achieving the adoption process of HRIS in the health sector.

Using the technology-organization-environment framework (TOE framework), Puspitarini, Handayani, Pinem, and Azzahro (2018) explain that the process of adopting and implementing technological innovations such as HRIS are influenced by the technological context, organizational context, and environmental context. What we gather from this explanation is that the adoption of HRIS in an organisation relies of human (individual/behavior), and drawing from (Awa, Ojiabo, & Orokor, 2017) higher-level attributes (i.e., the technological, organizational, and environmental contexts). At whatever level HRIS adoption is considered, important elements according to Ijaz and Chaudhry (2021) include perceived benefit to the health sector, knowledge, expertise, and management. These are somewhat consistent with Iwu's (2021) as well as Wahid and Kurmianda (2021) are of the view that the adoption of HRIS in the health sector demands proper management oversight including workforce capacity development and infrastructural support.

Mahlulo's (2020) supports Puspitarini et al. (2018) in their view on the adoption of HRIS in the health sector is inspired by factors such as organisational, technical and environmental. In regard to organisational factors, Mahlulo (2020) argues that workforce competency and communication skills do create an impact on the HRIS adoption process in terms of accessing knowledge-based human resource management. The technical factors focus on how technology and information systems inspire the adoption of HRIS in the health sector and the benefits that are expected to gain in the adoption of technology that will increase service quality and reliable health care. The environmental factors encompass the area where the health facilities are located which will include the government guidelines and supportive infrastructures. Alkhowaiter, Dwivedi and Williams (2013) as well as Ambundo (2017) emphasise the need to embrace the factors mentioned above for the effective adoption of HRIS in the health sector.

Government support for effective HRIS adoption in the health sector

An effective HRIS in the health sector requires the initiation, acknowledgement, and support of the government; such support will assist to improve the health sector broadly to compete with other health facilities elsewhere. Many et al. (2018) contend that national governments should prioritise their expenditure on information system in the health sector. This contention seems to fit the thoughts

of Dilu et al. (2017), who argue that low government support creates several issues such as lack of skilled employees, heavy workload, staff turnover, high absenteeism and poor commitment in the health sector. Interestingly, these issues are part of the major reasons why HRIS has not been able to prove its efficiency in the health sector (Maruru, 2014; Moshidi, Malema, Muthelo, & Mothiba, 2021).

The fact that HRIS is regarded as the automation of human resource process that the health sector can use to manage scarce skills, and government not using the system for such purpose becomes a big problem that deprives the health sector of sustainability. Kiros (2018) emphasise that without government support on issues that affect the use of HRIS in the public health sector, successful service delivery becomes a problem. Therefore, government needs to come up with policies to motivate the health workforce using HRIS to improve their attitude, behaviours and mind-set towards their work performance to improve the health sector in general (Kavanagh & Thite, 2020).

HRIS and health workforce scarcity

Studies have shown that the lack of HRIS usage has impacted the drastic scarcity in the health workforce of most countries in Africa. A study conducted by Berzenn (2018) indicates a growth in the number of specialised health workers migrating from low and medium income countries (LMIC) to high-income countries (HIC) and there is no effective HRIS system to monitor those movements and also no idea of the number of skilled health workforce produced by the African continent. Anand and Fan (2016) propose the need for substantial commitment in HRIS research to address the issue of health workforce retention, reduction, and migration among African countries.

Motsoaledi (2015), focuses on the comparison between BRICS nations with regard to the use of HRIS to monitor the health workforce in their various countries, pointing out that India has 80 nurses and 61 doctors per 100,000 patients; China has 148 nurses and 103 doctors per 100,000 patients; while South Africa has 77 nurses and 54 doctors per 100,000 patients. This shows that the proportion of doctors and nurses to patients in South Africa compared to India and China is 25% of nurses and 24% of doctors, which indicates that South Africa sustains less of their health workforce and does not effectively utilise HRIS to monitor the number of skilled health workforce produced in the country. According to WHO (2021), in Africa, the lack of effective HRIS will create a shortage of 18 million health workers by 2030 and South Africa stands as the country that will be most affected (WHO, 2021). This is because the lack of HRIS usage makes it difficult for Africa to account for the number of skilled health workforce in the continent, which is a critical problem, faced by the continent. In this aspect, a non-impressive picture of the health workforce on the African continent suggests that since 2005, the African region has had an average of 1.3 health workers per 1000 population which is far below the 4.5 per 1000 required for an effective health system and sustainable development goals (African Union, 2020). Furthermore, 14.5 million is the estimated global health workforce shortage of which Africa is the most severely affected standing at an estimated 6.1 million by the year 2030 shows that Africa is still lagging in the use of HRIS to support the health workforce sustainability.

Makkink, Stein and Bruijns (2021) emphasise that due to the shortage of specialised health personnel and lack of HRIS to identify the skilled workforce in mostly the low and medium income countries, people without medical qualifications are now practising as skilled physicians which is unprincipled and dangerous to the life and well-being of the society. Due to the lack of effective HRIS and increasing shortage of skilled workforce, the effect of the COVID-19 pandemic has negatively affected countries such as South Africa, China, Brazil, and India (BRICS NATIONS) (Reddy et al., 2021). Reddy et al. (2021) further argue that the above-mentioned countries are the most affected in terms of COVID-19 infections due to the lack of effective HRIS to monitor the number of the skilled health workforce in the country. There is a need for the BRICS nations to prioritise their health sector, services, and workforce using effective HRIS to monitor and manage the healthcare process for health sector sustainability (Opote et al., 2020; Iwu, 2021a).

The backbone of efficient HRIS usage in the service delivery system is skilled workforce retention, which according to Saluja, Rudolfson, Massenburg, Meara, and Shrime (2020), is in short supply in the South African health system. The health system of South Africa lacks the capacity to identify accurate number and type of skills to meet the demand of the health sector. Currently, the national health system is faced with an unprecedented challenge with regard to advanced migration, ageing population, and difficulties in ensuring the right number of skills mix in the health system of which according to Lv et al. (2021), there is need to introduce a sophisticated HRIS for their human resource functions to assist in dealing with an increase in demand for services.

Boskovic et al. (2021) highlights the use of HRIS to assist in the drivers of demand and supply of health workforce for service delivery and sustainability depicted in figure 1 below.

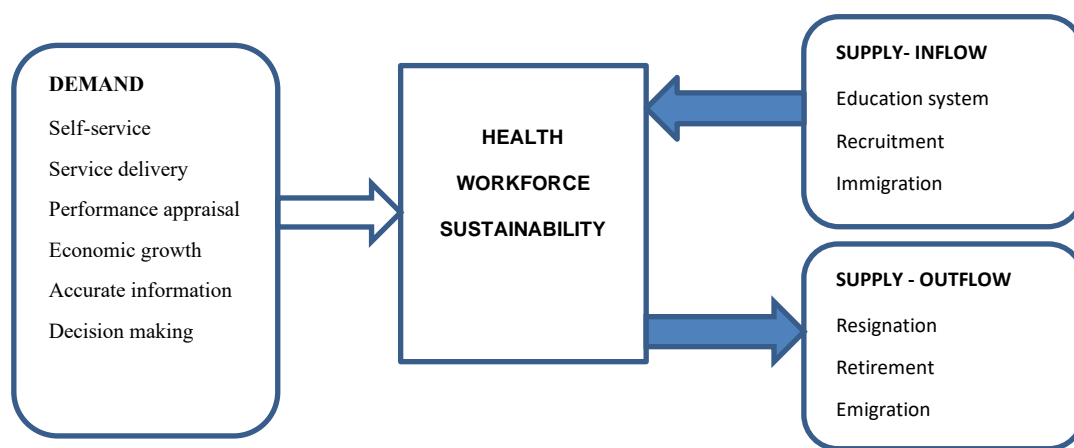


Figure 1: HRIS drivers of demand and supply of health workforce for service delivery; Source: Boskovic et al. (2021)

Figure 1 identifies the relationship between HRIS usage and health workforce sustainability with the impact of workforce supply compared to the demand of HRIS usage in the health sector. The effectiveness of HRIS argues Boskovic et al. (2021) can assist to equate the demand of the information system and the supply of skilled workforce.

In a study on South African health workforce assessment, Edoaka, Fraser, Jamieson, Meyer-Rath, and Mdewa (2021) related the massive crisis of youth unemployment to the increase in HIV/AIDS and COVID-19 pandemic as major challenges that the health sector needs to pay attention to. Interestingly, Dorward et al. (2021) are of the view that these unemployment challenges may be difficult to manage owing to inefficient HRIS and insufficiency in the number of health workers to meet the demand of the population.

The African region is the most affected with the lowest number of health workers in the world even though the region is one of the most populated. The indication that Africa needs an effective HRIS in the health sector for proper control of the health workforce can be gleaned in the table below which shows how far behind it is in regard to low health workforce.

Table 2: HRIS usage concerning health workforce ratios per 10,000 populations 2005-2019

List of World Regions	Physicians	Nursing and Midwifery Personnel	HRH per population	Density 10,000	Dentists	Pharmacists	Community Health Workers
Worldwide average	13.9	29.0	42.9	2.6	4.4	0.0	
African Region	2.5	9.1	11.6	0.4	0.6	0.0	
Region of the America	20.4	71.5	91.9	0.0	6.9	0.0	
Southeast Asia	5.5	9.9	15.4	0.7	4.2	0.8	
European Region	33.3	84.2	117.5	5.0	6.0	0.0	
Eastern Mediterranean	10.8	15.9	26.7	1.9	5.2	0.0	
Western Pacific	15.2	19.5	34.7	0.0	4.4	7.9	

Source: (African Union, 2020)

Table 2 above depicts a worrying picture of low health workforce population. It is argued that these low figures can be better checked through the monitoring component of HRIS. Essentially, the need for Africa to improve in their HRIS and other technologies in the health sector is even more necessary if one considers the Sustainable Development Goals (SDG) of the United Nations (Chukwu, 2017; WHO, 2019; African Union, 2020) and South Africa’s National Development Plan (NDP) (Padarath & Barron, 2017; Choto, Iwu, & Tengeh, 2020; Assegai, 2021; Staden, 2021).

Practical Implications

Numerous studies have been conducted concerning the effective use of HRIS in the health sector (Gavurová, Balloni, Tarhaničová, & Kováč, 2018). Miller’s (2021) study proposed the introduction of appropriate policies for the sustainability of the health sector using HRIS. Munir, Glorino and Pandin (2020) emphasise the importance of keeping accurate information of the skilled health workers in the HRIS. Fundamentally, Sandjong (2021) seem to argue that for the government policy on health workforce retention

to be operational, an effective HRIS that keeps a record of the activities of the workforce is needed for sustainability and benefit purpose in the health sector. Nwadiuko, Switzer, Stern, Day, and Paina (2021) are also of the view that the World Health Organization (WHO) code of practice that includes the circular on migration policy suggests that migration trends can be successfully monitored with a policy that will require the workforce planners to invest significant resources in HRIS to control migration in Africa.

Drawing from Egieyeh, van Huyssteen, Coetzee, and Bheekie (2021), HRIS contributes to the augmentation of healthcare delivery which leads to better quality, efficient and available health systems for Sustainable Development Goals (SDG) and the National Development Plan (NDP). An effective HRIS in the health sector thus will require a successful application and good governance, to harmonize the activities of the human resources department, workforce retention and sustainability in the sector (Lai, Taylor, Haigh, & Thompson, 2018; Oleribe et al., 2019; Hompashe, 2021). It is crucial to appreciate the government of South Africa's large investment of funds in procuring various information systems to support the HRIS in the health sector. Notwithstanding this, the lack of HRIS causes the health sector to face copious challenges such as disintegration, lack of management, the dominance of manual intervention, poor infrastructure, lack of health workforce and lack of effective HRIS functionalities to support the health system in South Africa (Thaiya, Julia, Joram, Benard, & Nambiro, 2021). The shortage of health workforce will continue to hinder the public health sector thus requiring an effective HRIS to monitor and control skills shortage (Nkala, Mudimu, & Mbengwa, 2021).

The health sector is one of the most critical sectors in an economy (Risky, Harun, & Depu, 2021). Abebe and Chui (2018) as well as Bhembe (2020) support Thaiya et al. (2021) by mentioning that in South Africa, health systems operate under immense pressures ranging from dilapidated infrastructure, shortage of medical equipment, long hours of work, workload and insufficient budget. Effective observation of the conditions requires the effectiveness of HRIS to track the process of talent management, workforce sustainability and record-keeping accuracy in the health sector. Unfortunately, these significant conditions are lacking in the health sector (Kuyo et al., 2018; Αυγητίδου, 2021). The lack of HRIS for the sustainability of the health workforce makes it difficult to manage and monitor which negatively affects service delivery in South Africa (Anupam & Sharma, 2017; Ditlopo, Blaauw, & Lagarde, 2017; Mabaso, 2020). All these translate into workplace stressors and negative outcomes for the health specialists. Often these conditions are not easy to identify and therefore not managed effectively. Notably, these conditions bring about high turnover rates in the health industry. In acknowledging the usefulness of HRIS within the health sector, it is critical to appreciate the necessity for a dedicated budget for HRIS acquisition, and maintenance including the essence of a skilled workforce. We draw from the views of Matimbwa and Masue (2019) and Prasad (2020) in recommending the escalation of HRIS procurement plans within the health sector to priority level among the national, provincial and local government of South Africa.

Conclusions

HRIS is considered a critical information system and the need to adopt such a system in the health sector cannot be overemphasised. As critical as HRIS is to a sustainable health sector so is the presence of capacitated workforce in South Africa. The lack of effective use of HRIS to assist in the improvement of the health sector mars the effective adoption and utilisation of HRIS. This review uncovers other significant challenges which include lack of management support and prioritisation of HRIS usage, the dominance of manual intervention as against digitalised system, poor infrastructure, and lack of supportive information systems, insufficient fund, and insecurity at the workplace. These challenges have created major dissatisfaction of health workers and the need for the government and management of the health sector to assist in the improvement through the introduction of policies to motivate the workers in the sector. This can be achieved by investing in the health sector and its workforce after all, the sustainability of the health sector remains an important strategic direction for both government and the health sector itself.

Government participation in the adoption of HRIS is an important one and as such its role must be emphasised. There is also a need for the government to be actively involved in resolving infrastructural and other issues with regard to the use of HRIS in the health sector. Management in the government parastatals need to be devoted and loyal to addressing the eminence of HRIS usage and also give their support towards solving the critical problems surrounding the effectiveness of HRIS in the health sector.

Extant literature confirms the gains to the government and the health sector in general to include an improved and sustained adoption of HRIS to achieve further benefits such as better workforce planning, better financial planning, better administrative and staff planning. Also, streamlining human resource processes by creating a successful application and good governance process, and the creation of a skilled management system. The timely access to an affordable and quality health system and long-term health service delivery will require an effective HRIS in South Africa.

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