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Assessing the Knowledge, Practice, and Attitudes of Healthcare Workers on E-Health Systems in Oshakati District, Namibia

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ABSTRACT

The study aimed to assess healthcare workers' knowledge, practice, and attitudes on e-Health systems in Oshakati district. There were 56 healthcare workers from different health facilities (Ekamba clinic, Ongwediva Health Center, Eluwa clinic, Oshakati state hospital - PHC) Oshakati district. The educational backgrounds of many healthcare workers regarding electronic health are little in many developing countries. Many healthcare professionals in the health industry find it difficult to use and it takes time for them to adapt to the e-health systems and thus contributing to ignorance behaviors, which leads to digitized data discrepancy. e-Health in developing countries are challenging, as there are no sufficient funds to keep such developments (e-Health systems) running and active all the time. Conclusively Limited power and internet connectivity is accessible in developing countries' rural areas. The aim of the study was to assess the knowledge, practice, and attitudes of healthcare workers on e-Health systems. The study design for this study was a cross-sectional study design that falls under descriptive studies. The sample size consisted of 56 respondents from 5 different health facilities in Oshakati district. A simple random sampling method was used, and quantitative method which is a self-administered questionnaire was used as a data collection tool.

INTRODUCTION

Electronic health (e-Health) aims to provide health professionals, patients, clinicians and other relevant users with information support services to manage, disseminate, collect, administer, control and monitor healthcare information and improve health service delivery and quality of care support in the health industry (Luxton, David, June, Jennifer, Chalker, Samantha, 2015). Electronic health (e-Health) is defined as the medical practice supported by electronic devices, patient monitoring devices, personal digital assistants, and other electronic wireless devices, furthermore, services provided by various electronic health systems removes geographical and temporal limits while improving coverage, quality, cost savings, and healthcare user provisions (Martínez-Pérez, Borja, de la Torre-Diez, Issabel, Lopez-Coronado, Miguel, 2013). African countries have been evidently addressing the quality of Health Information Management, and among others Namibia is one of the countries that are still implementing e-Health system (Broomhead, Sean, Mars, Maurice, Scott, Richard, Jones, Tom, 2021).

Healthcare is an industry that is highly concerned with the sensitivity of patients' data, and healthcare workers in Namibia are using paper-based system to record, disseminate, and report patient data and Information, furthermore, these acts contribute to the loss of patient information and information breach, which leads to unauthorized disclosure of sensitive health information (Angula & Dlodlo, 2017).

To expand the reach of digital health, e-health technologies have been implemented, but these systems largely add to the problem of silo patient data, with few seamlessly

interoperating with the electronic health systems that are now scaled nationally in many low and middle income countries, including Namibia (Were, Martin, Savai, Simon, Mokaya, Benard, Mbugua, Samuel, 2021). A range of resources has become available, for remote monitoring and more comprehensive patient data capturing. In addition to that, there has been an increase in the adoption of electronic devices by healthcare professionals in recent years, for e-Health systems. Furthermore, many healthcare professionals are yet to get used to the new technological implementations (Choi, Park, Min, Hong, Kim, Euseok, Ahn, Ryeok, Wookjin, 2013).

Problem Statement

e-Health in developing countries are a challenging, as there are no sufficient funds to keep such developments (e-Health systems) running and active all the time (Hsu, Su, Feng, Weng, Rhay, Jung, Chen, 2013). Moreover, power supplies and internet connections to the rural areas of the developing countries are limited. In addition, the educational backgrounds of many healthcare workers regarding electronic health are little in many developing countries. In Namibia, through the Ministry of Health and Social Services and its development partners, has implemented its first and commonly used health electronic record system (District Health Information System-DHIS) in the year 2003. In addition, prior to the implementation of DHIS in Namibia, health information was fragmented as a result of the competing platforms, making it incredibly difficult to integrate, triangulate, and evaluate data (U.S Embassy Windhoek, 2017).

Health information is disseminated manually (printed

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papers instead of carrying devices with information) by health professionals to communities for health educations, and in addition, Namibia is a large and sparsely populated country, therefore manual distribution system is inefficient and ineffective (Angula & Dlodlo, 2017). Human capital plays a big role in terms of managing e-Health systems. Many healthcare professionals in the health industry, find it difficult to use and it takes time for them to adapt to the e-Health systems and thus contributes to ignorance behaviors which leads to digitized data discrepancy (Angula & Dlodlo, 2017). In addition, lot of hesitancy coming from the older healthcare workers due to computer use, and lack of computer literacy among healthcare workers, have an effect when it comes to data quality and consistency which leads to untimely reporting (Riley, Ensor, Snell, Debray, Altman, Moons, Collins, 2016). In addition, it takes time to learn and adapt to new electronic health systems, and it is challenging for healthcare workers without or with little information technology background which compromise the timely, availability, use and quality health information data (Duhm, Julian, Fleischmann, Robert, Schmidt, Sein, 2016).

The use of paper-based system poses difficulties to access patient records in a timely manner especially in the case of emergency. Relatively, paper based systems impose additional challenges to the interoperability, that allows easy documentation of patient encounters, fast access to patient needed information at point of care, and easily and consistently communication of information between primary care and other health providers (Bhattacharya, Kumar, Kaushal, Singh, 2018). Healthcare workers uses paper based system to carry out activities related to health information management, and poor knowledge on e-Health systems is associated with too much errors when it comes to patient health information and data quality, which leads to poor health decision making from improper or lack of health evidence (Ellimoottil, An, Moyer, Sossong, Hollander, 2018). Therefore, it is imperative to assess the knowledge, practice and attitudes of the healthcare workers on e-Health systems in Oshakati in 2022.

Research Aim

The aim of this study was to assess the knowledge, practice and attitudes of healthcare workers regarding the e-health systems among health facilities in Oshakati districts in the year 2022. The study results will improve the factors that hinders higher level, good attitude and practice of healthcare workers on e-Health systems in Oshakati district and MOHSS.

Research Objectives

- To assess the knowledge of healthcare workers regarding e-Health in the Oshakati district in 2022.
- To determine the intention of healthcare workers on the use of e-health system Oshakati district in 2022.
- To determine the challenges experienced when dealing with e-health systems in Oshakati districts in 2022.

Research Questions

- Do healthcare workers have knowledge in using e-Health systems in Oshakati district, 2022?
- Do healthcare workers have any intention in using e-Health systems in Oshakati districts, 2022?
- What are the challenges experienced when dealing with e-health systems in Oshakati?

Significance of the Study

The study would be helpful for further related academic researches. It would also form a proper standard and foundation of proper trainings regarding e-Health systems, which would perfectly contribute to proper implementation of new e-Health systems in the future. It would also identify the challenges associated with e-Health systems and enhance the level of knowledge, practice and attitude of healthcare workers which will contribute to quality health care delivery.

LITERATURE REVIEW

Electronic health systems refers to health services and information supplied or improved through the Internet and similar technologies, is a developing field at the crossroads of medical informatics, public health, and business or it can be the application of Information and communication technology to support healthcare and the provision of health services (Ellimoottil *et al.*, 2018). The healthcare and welfare systems in all countries around the globe are facing similar problems. The solution to improper use and lack of knowledge regarding e-Health system needs mitigation to avoid health data impacts that may come as a result.

Hence, education and training are one of the solutions to improper utilization of e-Health systems; a research needs to be done to assess the knowledge, practice and attitudes toward the e-Health systems. Standards and procedures that guides the HIS (Health Information Systems) practices need to be adhered to improve the HIS practice. The main aspect is to go through and review the existing data and findings from previous literature to find the solution regarding the matter. The literature will be arranged considering the level of knowledge of healthcare workers regarding the electronic health systems.

Factors Contributing to Knowledge Regarding E-Health Systems

The service quality and individual knowledge of health care plays a deterministic role in influencing the future use of e-Health services in health industry. Many countries' health information systems are characterized by a lack of data availability and quality, as well as a lack of knowledge and a culture of using information system for planning and decision making (Asangansi & Braa, 2010). According to a study conducted in Germany by Pharow & Blobel, (2008) the e-Health domain, proprietary solutions, outdated approaches, and old methods are still in use for transferring sensitive information. Furthermore, the level of awareness of principles is not particularly high, real,

potential threats are frequently not addressed, and this results in weak and inadequate security.

A similar cross-sectional study about the difference in knowledge and attitudes of using electronic device health applications was conducted by Lee *et al.*, (2020) in Seoul, Korea, 625 participants who were contacted, 323 participants (healthcare workers) were granted full inclusion in the study. Demographics, knowledge, self-confidence, and perceived benefits and barriers by experience with using e-Health were compared, and then performed logistic regression to identify the factors associated with e-Health systems use. Among the participants 64.1% (N = 207) had experience in using e-Health systems than the rest (35.9%) and less experienced counterparts. Although the experienced group was more likely to have higher self-confidence in using e-Health system, about half of the study participants, including people with experience in using e-Health system, did not have appropriate knowledge of mobile technology.

Mohammadzadeh & Safdari, (2014) and Barton, (2012) both indicated that technology may be well-received in developing countries, but when the content is sensitive, such as healthcare provision, adoption of technology is typically contingent on the quality of the services and individual expertise of service. In addition, there are a number of patients who possess less knowledge and understanding of personal health problems, but cannot afford time or money to visit doctors or medical centers on a regular basis. Individual researchers that are clinical or pilot and project-based application developments do not offer or contribute to knowledge.

Practice of Healthcare Workers on Security Measures Regarding E-Health Systems

Health information security is known the degree to which access to a person's personal information is restricted and limited to those who have been granted permission (Keshta & Odeh, 2021). They went on to say that in the number of studies, three security-safeguard themes, namely physical, technological, and administrative, were used. These themes include a variety of security measures employed by healthcare organizations to protect the confidential health information stored in electronic health records.

The rise of electronic health systems, increased use of electronic devices such as smartphones, and the much-anticipated exchange of data between and among organizations, clinicians, federal agencies, and patients are all contributing to growing concerns about health information security. Patients may not be forthcoming with the physician if their confidence has been shattered. Records at the office must be preserved in order for the patient to trust the physician. Medical personnel must be aware of the security precautions that must be taken to preserve patient data and practice data (Schwartz, Maxim, Gupta, Anand, Kavesky, 2007). Even though some security precautions must be taken when working with electronic

health systems, the e-health automates information, access has the ability to speed up the clinician's workflow. Other care-related tasks, such as evidence-based decision support, quality monitoring, and outcomes reporting, can be supported directly or indirectly by the electronic health systems through various interfaces.

Attitudes of Healthcare Workers on E-Health Systems' Applications and Manuals

Proper knowledge and understand in use of e-health system induces the need for electronic devices to be safe, from electrical, and personal standpoint and addressed on a higher quality and reliability level. Information has to be protected and shared within the e-Health systems, by presenting a privacy policy and a medical legal disclaimer with all the appropriate information and furthermore, the evaluation of usability and efficacy by making tests for short and long-terms outcomes and also making provision of feedback options (Bouras, Lu, Zhang, Wan, Tao, Ning, 2020). This also means that information has to be translated into knowledge by providing optional access to additional data.

An electronic solution to strengthen the work of healthcare workers needs to be coordinated and supported by backbone systems for example, to produce the electronic collection forms, to store, process and report the data collected, and generate work schedules and feedback reports back (Ilozumba, Van Belle, Dielman, Liem, Choudhury, Broerse, 2018). The e-Health system's application technologies has a huge potential for circumventing the aforementioned challenges and improving data reporting. There should be a manual to be followed on steps needed to be ensured when developing e-Health systems in low- and middle-income countries, by characterizing the problems and targeted users, which means that users have to be know how to use the systems and well informed (Hegde & Hegde, 2021).

There should be a procedures to determine what applications are available and assess their quality and worth before installed into the electronic devices for health-related activities or usage (Luxton *et al.*, 2015). This means that there are enormous number of applications available in the marketplace; users (healthcare professionals) may find it challenging to identify which application is ideal for their requirements and whether it will deliver reliable information. As a result, it is critical to study all accessible information on any application of interest in order to determine its overall quality and suitability and in the context of this study; this will help healthcare workers to understand the type of applications being used. In addition, an examination of the application's or programs available written material, as well as an online search for information from the maker or group that created it should be encouraged. User manuals or clinical guidelines are available from some organizations.

An ideal health application evaluation framework should integrate the identified domains within one structure, to support individual users or organizations in choosing

the best health applications for disease management and promoting healthy lifestyles (Hensher, Cooper, Dona, Angeles, Nguye, Heynsbergh, Chatterton, 2021). Evaluation criteria to assess an application should be clear, concise, specific, and objective. Innovative tools made possible by health technologies can help with issues like the prevention of information security risks and other related problems. These technologies aim to broaden the use of common treatments and risk management strategies in the healthcare industry rather than replacing the expertise of traditional health care practitioners (Choi, Leslie, Crystal, Francis, Sulzbach, 2015).

In conclusion, education and training are one of the solutions to improper utilization of e-Health systems. Moreover, a lack of data availability and quality, as well as a lack of knowledge and a culture of using information system for planning and decision-making characterize health information systems. Lastly, proper knowledge and understanding regarding the use of e-health system induces the need for electronic devices to be safe, from electrical, and personal standpoint and addressed on a higher quality and reliability level.

METHODOLOGY

Study Design

A study design used for this study was a cross sectional study. Zangirolami-Raimundo *et al* (2018), defined the study design as the collection of data from a diverse range of respondents, enabling researchers to compare a wide range of variables at a particular point in time. In order to capture what occurred in a real-world environment without changing the variables or limiting the respondents' expressions of thought or emotion, a quantitative approach was used.

Sampling Methods

The simple random sampling technique was used to select healthcare workers among selected health facilities in Oshakati district. Rahim (2008) indicated that simple random sampling yields the best results when the population is small or the size and quantity of individual samples are modest since all candidates have an equal chance of being chosen. Christians (2020) outlined that simple random sampling is a subset of a statistical population where there is an equal chance of each member being chosen.

Sampling

There are about 65 healthcare workers available at health centers and clinics, in Oshakati District (Christians, 2020). Slovin's formula was used to calculate the sample size within the district. The formula is employed when you don't have enough knowledge on a population's behavior (or the distribution of a behavior) to know the proper sample size otherwise (Ellimoottil *et al*, 2018).

The following formula was used to determine the sample size $n = N / (1 + N(e)^2)$

Oshakati district $n = 65 / (1 + 65(0.05)^2) = 56$

Whereby, n =represented the sample size, N =represent the study population, margin of error = 0.05 = 95% confidence interval.

A total of 56 respondents was calculated to include respondents from the Oshakati district.

Data Collection

Data collection is the process of gathering and measuring information on variables of interest in a systematic and defined manner in order to respond to particular research questions, test hypotheses, and evaluate findings (Zangirolami-Raimundo *et al*, 2018). Data collection is an act of acquiring and analyzing data on certain variables in an established system, which allows one to analyze results and respond to pertinent queries (Keshta & Odeh, 2021). Piloting was done and it involved 10 respondents, the reason was to check if the respondents will understand or able to answer the close ended questions, and as a result they all found it easy. A self-administered questionnaire (See Appendix B) (part of quantitative data) was developed and distributed among 56 respondents (healthcare workers) from selected facilities. The goal of using the questionnaire was to assess the knowledge of healthcare workers on e-Health systems in Oshakati district in 2022.

Data Analysis

The process of analyzing, cleansing, translating, and modeling data in order to find relevant information and draw conclusions is called data analysis (Amedzro St-Hilaire, 2018). The data was organized, presented, and stored using an SPSS version 28 (Statistical Package for the Social Sciences). Data that was analysed and was summarized and presented in terms of cross-tabulations.

Ethical Consideration

The proposal to conduct the study was submitted to the faculty of Health and Applied Sciences at the Namibia University of Science and Technology (See Appendix E) for approval. Permission to conduct the research study in Oshakati district was granted by the Ministry of Health and Social Services (See Appendix D). Authorisation to conduct the study within Oshakati district was obtained from Oshakati district health social welfare services under Oshana regional health directorate (See Appendix C). An informed consent (See Appendix A) was signed by all the respondents to state their voluntary participation in the study. The principal of respects of persons was also upheld, by ensuring that information about aims and goals of the study were completely disclosed. Efforts were made to ensure that respondents fully understood all the information about the research study. Respondents had every right to withdraw from the study anytime. No participant was forced or got paid to be part of the study.

Study Limitations

Financial resources were the limit in terms of transport,

because the study was self-funded and resources were not sufficient. Due to lack of resources, not all the health facilities in the Oshakati district were selected, but only 5 out of 17 public health facilities. Another limitation is that respondents might not have been honest when answering the questions.

RESULTS AND DISCUSSIONS

The results were presented in a table's format with explanations below. The results section below provides a summary of the reliability analysis' findings.

Section A

Demographic Data

The demographic data of the respondents is indicated and summarized in this section.

Table 1: Shows the demographics information of respondents (Healthcare workers)

Close ended questionnaire questions	Frequency (N)	Percentage (%)
Age groups		
20-29	19	33.9
30-39	31	55.4
40-49	4	7.1
50+	2	3.6
Total	56	100
Gender		
Male	15	27
Female	41	73
Total	56	100
Educational Level		
Master's degree	1	2
Bachelor degree	27	48
Certificate/diploma	28	50
Total	56	100
Occupation		
Enrolled nurses	18	32.1
Registered nurses	20	35.7
Data clerks	5	8.9
Community care workers	4	7.1
HIS Officers	3	5.4
Administrative officers	3	5.4
M&E Data clerks	1	1.8
Pharmacist assistants	1	1.8
Environmental health practitioners	1	1.8
Total	56	100
Workplace		
Oshakati state hospital – PHC	34	61
Eluwa Clinic	13	23
Ongwediva health center	5	9
Ekamba clinic	4	7
Total	56	100

Findings Table 1

Age Group

Age distribution among respondents in Oshakati district in 2022 was, the highest age groups of respondents is the 30-39 ages with n=31 (55.9 %), 20-29, (33.9%) equals to n=19 respondents, 40-49 (7.1%) which is equals to n=4 respondents, and the lowest 50-60 with 3,6% which equals to n=2 respondents.

Gender

Male respondents were n=15 (27%), and female respondents were n=41 (73%) respectively.

Education level

Frequency and percentage distribution of educational level among the respondents, respondents with qualifications of certificates/diploma in health related

fields where the highest with n=28 (50%), respondents with bachelor's degree where n=24 (48%), and only n=1 (2%) respondent with a master's degree.

Occupation Distribution

The Registered Nurses were the highest with 35.7% respondents, Enrolled Nurses with 32.1% of the respondents, Data Clerks with 8.9%, community care worker 7.1%, HIS Officers 5.4%, administrative officer 5.4%, and lowest with 1.8% respondent each were environmental health practitioners, M & E Data clerk and pharmacist assistant.

Workplace

Frequency distributions of workplaces of respondents

were as follows: in Oshahati state hospital n=34 (60.7%), Eluwa clinic had n=13 (23.2%), Ongwediva Health Center n=5 (8.9%), and Ekamba clinic n=4 (7.1%).

Section B

Knowledge of Healthcare Workers on E-Health Systems

The understanding of healthcare workers on e-Health systems is reported in this section. The segment consists of 9 questions that evaluated the healthcare worker's knowledge on e-Health systems.

Findings Table 2

Table 2, shows the results of first objective, which was to assess the knowledge and practice of healthcare workers

Table 2: Shows the responses on knowledge and practice of e-Health systems

Close ended questionnaire questions	Frequency (N)	Percentage (%)
Trainings related to any eHealth systems		
Never got trained	32	58
Once in 6 months	13	24
Twice a year	10	18
Total	56	100
Electronic devices used		
Computers	23	41
Computers and Tablets	17	30
Cell phone and Laptops	15	27
Never used e-Devices	1	2
Total	56	100
Types of e-Health systems used		
DHIS Tool	25	45
Go data Tool	13	24
Red Cap system	3	5
Others	15	26
Total	56	100
Features of the e-Health systems familiarized with		
Capturing and record management	6	11
Capturing, record management, reports	28	50
Capturing	18	32
Record management	4	7
Total	56	100
Easy to use e-Health systems using electronic devices		
Yes	46	82
No	10	18
Total	56	100
Easy to adapt on or using e-Health systems		
Yes	16	29
No	40	71
Total	56	100
Strong network (internet) connection at your work place?		
Yes	39	70
No	17	30

Total	56	100
Security threats concerning patient information, experienced when using the e-Health system at work place		
Yes	15	27
No	41	73
Total	56	100
Healthcare workers needs more training to improve their knowledge regarding e-Health systems		
Yes	53	95
No	3	5
Total	56	100

regarding e-Health systems in Oshakati district in 2022. The table indicates that 58% respondents answered that they never got training regarding e-Health systems, 24% respondents indicated that they get trainings at least once in 6 months, while 18% respondents indicated that they get training twice or more in a year. The results showed that respondents who use computers (desktops) only when dealing with e-Health have appeared to be 41% of the respondents, tablets together with computers 30% of responses, cellphone and laptops with 27%, and 2% of the respondents indicated that they never used an electronic device before. Respondents have shown to use different types of e-Health systems, of which 45% of the respondents indicated that they have used DHIS tool before, 24% indicated that they have used Go Data tool, 5% Red Cap system, and 26% stated that they have used other types of e-Health systems.

The results also show that 50% of respondents are familiar with capturing records management and report creation in e-Health systems, 32% of them only knows how to capture data, 11% capture and create records, while 7% of them stated to only now or granted access to record managements. The result table shows that 82% of the respondents find it easy to use e-Health systems, while 18% of the respondents indicated that they struggle to use e-Health systems.

On matter of adaptation to e-Health systems the table

indicated that 71% respondents do not take them long to adapt and use the e-Health systems, while 29% respondents indicated they it takes them a while to adapt. 70% of respondents indicated that they have good internet or network connectivity at their respective workplaces and 30% of the respondents showed that they do not have good internet connectivity at their workplaces. 73% of the respondents indicated that they never experienced any security threats regarding patient information when dealing with e-Health systems, while 27% of the respondents indicated that have an experienced. The results also indicated that 95% of the respondents suggested that staff members in the health facilities to frequently trained on e-Health, while 5% indicated that is not necessary.

Section C

Intentions of Healthcare Workers on the Use of E-Health Systems

The goal or intentions of healthcare workers regarding e-Health systems is presented in this section. The segment consists of a total of 12 questions that evaluated the healthcare workers on this matter. All of the questions were close-ended.

Findings Table 3

The table 3 shows the results pertaining to the second

Table 3: Shows the response on the intentions of healthcare workers on the use of e-health system Oshakati district in 2022

Close ended questionnaire questions	Frequency (N)	Percentage (%)
Using e-Health systems will make communication between health care providers more efficient and accurate		
Agree	52	93
Disagree	1	2
Not sure	3	5
Total	56	100
Using e-Health systems will make easy and fast to retrieve data.		
Agree	53	94
Disagree	1	2
Not sure	2	4
Total	56	100
e-Health systems may enhance communication via text messaging (SMS) between health providers and patients.		
Agree	54	96
Disagree	1	2
Not sure	1	2

Total	56	100
Less time will be required to update client information than the paper-based		
Agree	54	96
Disagree	1	2
Not sure	1	2
Total	54	96
Health data analysis and collection can be more accurate with e-Health Systems.		
Agree	52	93
Disagree	1	2
Not sure	3	5
Total	56	100
Documentation of patients' data will be streamlined and it will reduce errors.		
Agree	49	87.5
Disagree	0	0
Not sure	7	12.5
Total	49	87.5
Using e-Health systems can easily detect duplicates during data collection.		
Agree	51	91
Disagree	3	5.4
Not sure	2	3.6
Total	56	100
Patient information is more secure in e-Health systems.		
Agree	44	78.6
Disagree	3	5.4
Not sure	9	16.1
Total	56	100
It is easy to schedule patient appointments using e-Health systems		
Agree	41	73.2
Disagree	2	3.6
Not sure	13	23.2
Total	56	100
The use of e-Health systems in sharing health information is not Important.		
Agree	10	17.9
Disagree	40	71.4
Not sure	6	10.7
Total	56	100
Preference on e-Health systems to still be used.		
Agree	55	98.2
Disagree	0	0
Not sure	1	1.8
Total	56	100
I prefer other knew e-Health systems to still be used		
Agree	42	75
Disagree	4	4.1
Not sure	10	17.9
Total	56	100

objective, which was to determine the interest of usage in Oshakati district in 2022. The table revealed that of healthcare workers regarding e-Health systems 93% respondents indicated that by using e-Health

communications between healthcare providers might be more efficient, 2% of the respondents indicated that it is impossible, and 5% of the respondents were not sure. Furthermore, 94% of respondents thought that data retrieval would be more accurate when using e-Health systems, while 2% thought that it might be a challenge and 4% of the respondents were not sure.

The table shows that 96% of respondents agreed that using e-Health might enhance communication via text messaging (SMS) between health providers and patients, and 2% indicated to disagree, while 2% were not sure. The results indicated that of the respondents, 96% agreed that it may takes less time update information in e-Health system, 2% of respondents disagreed with the statement while another 2% were not sure. In addition, when it comes to data analysis and collection, 93% of the respondents indicated that using e-Health might be accurate and simple to analyses and collect data, 2% of the respondents disagreed and 5% were not sure. The table results also showed that 87.5% of respondents indicated that Documentation of patients' data might be more streamlined and it might reduce errors when using e-Health systems, and 12.5% of the respondents were not sure about it.

The result also detailed that 91% of the respondents have indicated using e-Health could easily detect duplicates when collecting data, 5.4% have indicated that e-Health might not detect duplicates during data collections, and

3.6% respondent were not sure. The results indicated that 78.6 % of the respondents indicated that patient information would be more secured in e-Health systems, 16.1% of the respondents were not sure, while 5.4% thought that it might not be the case. The results table indicated that 73.2 % have indicated that scheduling patient appointment would be easy when using e-Health systems and 3.6% have shown may be hard to handle patient appointments using e-Health systems, and 23.2 % of respondents were not sure. 71.4% indicated that the use of e-Health systems would booster the sharing of information within the health organization, and 17.9% have thought otherwise, while 10.7% were not sure. When it comes to the usage of e-Health systems 98.2% of the respondents preferred e-Health system to be used, while on the other hand, 1.8% where not sure if e-Health must still be used. Continuing with the intention of usage, 75% agreed and thoughts that new e-Health systems can still be implemented, 17.9% of the respondents were not sure, and 4.1% have disagreed for new e-Health systems to be implemented.

Section D

Challenges Associated With the E-Heath Systems

This section presents the results that determined the challenges of e-Health systems. This section consists of 5 questions that evaluated the expertise of respondents on the challenges of e-Health systems.

Table 4: Shows response of healthcare workers on the challenges associated with the e-Heath systems

	Frequency (N)	Percentage (%)
There are technical errors when using eHealth system.		
Agree	40	71.4
Disagree	16	28.6
Total	56	100
Enough staffs capture and manage eHealth system at Facility.		
Agree	19	33.9
Disagree	37	66.1
Total	56	100
Staffs undergo trainings when new e-Health system is updated.		
Agree	17	30.4
Disagree	39	69.6
Total	56	100
e-Health system servers does not run well sometimes.		
Agree	44	78.6
Disagree	121	21.4
Total	56	100
e-Health system goes off & on sometimes causing errors with records.		
Agree	37	66.1
Disagree	19	33.9
Total		

Findings Table 4

The table 4 shows the results of the third objective that

was to determine the challenges and barriers experienced when dealing with e-health systems in Oshakati districts,

2022. The table shows that out of 56 respondents 71.4% indicated that there are technical errors associated with e-Health systems, while 28.6% indicated that there are no technical errors associated with e-Health systems. The table also indicates that 66.1 of the respondents thinks that there are no enough staffs to manage and use the e-Health systems in Oshakati district in 2022, and 33.9 of the respondents thinks that there might be a possibility that there are enough staffs to manage e-Health system. In addition, 69.6% of the respondents have indicated that enough staffs are not trained when the new e-Health system is being implemented, while 30.4% of the respondents showed that staffs are well trained on e-Health systems. Moreover, when it comes to e-Health system issues, 78.6% of the respondents indicated that the system server does not run well sometimes, and 21.4% thinks that the system server runs well. The table also indicated that 66.1% of the respondents agrees that the e-Health systems goes on and sometimes causing errors with records, while 33.9% indicated that there are no errors being caused when the e-Health systems goes off.

DISCUSSION

e-Health refers to the devices and services that make use of information and communication technologies to enhance patient health and lifestyle management, diagnosis, and treatment or the established industry that employs technological breakthroughs to provide patients with better services (Ellimoottil *et al.*, 2018). A cross-sectional was used to assess the knowledge of healthcare workers in Oshakati district, 2022. A self-administered questionnaire was used as a data collection tool.

The aim of this study was to assess the knowledge, practice and attitudes of healthcare workers regarding the e-Health systems among health facilities in Oshakati districts in the year 2022. The targeted samples of this study was 56 respondents. Demographically, among the 56 respondents that participated in the study, 27% respondents were males and 73% were females. The age group of these respondents were categorized, were by 30-39 age group had 55.4% of respondents which was the highest, 20-29 age group had 33.9% respondents, the age group of 40-49 had 7.1% of the study respondents, and the least representation among age groups was 50-60 which had 3.6% of respondents.

As per the data analysis, the study respondents had different occupations, the highest occupation among the respondents was the registered nurses with 35.7% respondents, and enrolled nurses were 32.1%, data clerks where 8.9%, Community care workers were 7.1%. Health Information Systems Officers were 5.4% as well as administrative officers 5.4%, and least among the occupations were environmental health practitioner with 1.8% respondent, Monitoring and Evaluation with 1.8% and 1.8% pharmacist assistant. Apart from occupations respondents were also required to provide their educational level, were by only 2% of the respondents had a master's degree, bachelor's degree was

represented 48% of the respondents, and the highest was the certificate/diploma, which were represented by 50% of the respondents. Different occupation brings different views in the study (Mohammadzadeh & Safdari, 2014). Work place distribution showed that respondents from Oshakati state hospital had the highest frequency with which equates to 61%, and Eluwa clinic was represented 23%, Ongwediva health center had 9% of respondents, and the least was Ekamba clinic, which had 7% of workplace distribution.

Knowledge of Healthcare Workers Regarding E-Health in the Oshakati District in 2022

In terms of trainings regarding the knowledge on eHealth systems. On this study, some respondents indicated that they never got an official training and thus was indicated during data analysis by 58%, 24% indicated that they only get formal once in 6 months, and 10 18% of respondents get trained twice or more in a year. A study on Practices and beliefs among healthcare professionals by (Wernhart *et al.*, 2019) stated that, e-Health should be of the healthcare workers' trainings curriculum in order to raise the respective knowledge and awareness among healthcare practitioners on e-Health systems. To use e-Health systems healthcare workers must have an electronic device, which can be a desktop computer, cellphone, and a laptop. Respondents that indicated to have used computers only (desktop) were 41%; both tablets and computers 30% of respondents, cellphone and laptops with 27%, and 2% of the respondents indicated not have used any type of electronic devices.

Assessing knowledge and practice of eHealth systems by healthcare workers. It is essential that data be captured, handled, and stored by trained healthcare providers in a structured manner that protects its validity and integrity (Janet, 2015). 50% of the respondents indicated to only knew how to capture, manage records and create reports. Furthermore, 32% respondent only knew how to capture, 11% of respondents were only exposed to capture, manage records such as removing duplicates and adding missing information or editing when granted access and not to create reports (that can be that they are not granted access), and according to 7% of the respondents only knows how to manage records.

Regarding the use of electronic devices, 82% of the respondents finds it easy to use electronic devices while 18% of the respondents indicated that they do not find it hard to use electronic devices. A similar study about e-Health and telemedicine by (Wernhart *et al.*, 2019) stated that healthcare workers' attitudes and perceptions have a significant impact on how they accept new technology. Concerning adaptation of using eHealth systems, 71% of the respondents indicated that it does not take them too long to adapt to new electronic health systems, while 29% of respondents during the study indicated that it takes them a while to adapt and cope with the new eHealth systems. In addition, internet connectivity plays a big role when it comes to eHealth systems, 39 (70%)

of the respondents revealed that there is good network connectivity at their respective work places, and 39% indicated that sometimes the network connectivity is not dependable. Furthermore, (Wernhart *et al.*, 2019) stated that, today's healthcare delivery involves at least basic ICT with Internet connectivity, as well as increasing public adoption and distribution of consumer-oriented technologies.

Adding to knowledge criteria, the majority of healthcare professionals were generally supportive of eHealth features, which support knowledge. In this study, healthcare professionals appeared to see eHealth as an improvement. Therefore, 93% of the respondents have shown knowledge during the study that e-Health makes communication (sharing of information) between patient and healthcare workers and between healthcare workers and stakeholders more efficient and secure, while 2% of respondents disagreed with the statement and 5% were not sure. Several studies have looked at how healthcare professionals know and practice eHealth systems in the healthcare industry, such as (Qureshi *et al.*, 2021). Similar to that, our study found generally positive attitudes toward the knowledge of healthcare workers on eHealth system in the district of Oshakati, 2022.

Intention of Healthcare Workers on the Use of E-Health System Oshakati District in 2022

A study on healthcare workers' perceptions on e-Health systems carried out by (Granath *et al.*, 2022), indicated that the healthcare sector can benefit from clear, dependable, and easily accessible digital information for managing patient data. It was determined that 96% of the respondents have agreed that it takes less time to update patient information in eHealth systems, while 2% of the respondents disagreed, and 2% of the respondents were not sure. It was also determined during data analysis that, 93% of the respondents agreed that data analysis and collection is more accurate when using eHealth systems, in addition, 2% of the respondents disagreed, and 5% of the respondents were not sure. Respondents have shown that documentation of patient data is more streamlined and reduces errors, this was discovered during data analysis that, 87.5% have agreed and none of the respondents shown disagreement in the responses, however 12.5% of the respondents have indicated not to be sure. A study carried out by (Hyla & Pejas, 2019), indicated that e-Health has a system in place to identify unauthorized alterations to patient medical records, access permissions, and logs. Electronic documentations can be beneficial and may turn out with drawbacks.

A number of respondents have shown patient information is more secure in eHealth than paper-based, the results showed that 78.6% of the respondents agreed that information will be, and is more secured in eHealth systems, in addition, 5.4% have disagreed, while 16.1% respondents were not sure. The results also showed that, 73.2% were in an agreement that by using eHealth systems it is easy to make or schedule patient appointments, however 3.6% have disagreed, and 23.2% were not sure if

it is easy or not easy. Moreover, 98.2% of the respondents indicated that they prefer the usage of eHealth system, and only 1.8% of the respondents disagreed. According to data analysis results, 70% of the respondents have an opinion that staffs need to be trained on new systems. In addition, (Brørs *et al.*, 2020) elaborated that the healthcare electronic systems require resources to deliver services and appropriate information, and the providers must be qualified to do so and use technology in a secure and safe manner. The data have shown and indicated that there is an interest of healthcare workers to start using eHealth systems.

The Challenges and Barriers Experienced When Dealing with E-Health Systems in Oshakati Districts in 2022

Electronic health systems can be challenging in many occasions, this study, through results and data analysis, determined the challenges encountered when using eHealth systems. Through data analysis, 71.4% of respondents indicated that there are recurrent technical errors associated with eHealth systems, while 28.6% have indicated the opposite. In addition, 69.6% of the respondents at Oshakati district have shown in their responses that there are not enough staffs to manage eHealth systems, and 30.4% had an opinion that there are enough staffs. A similar study done by (Qureshi *et al.*, 2021) also narrated that a shortage of health professionals to manage eHealth systems is a challenge in all parts of the world. Therefore, about security-related threats, an analysis about the response made, 41 respondents have indicated that there are not as many as recurrent security threats regarding eHealth systems at Oshakati district, and 15 respondents have indicated or are of the opinion that there are security threats related to eHealth system.

CONCLUSION

Healthcare workers from Oshakati district were found to have "excellent level" of knowledge and practice towards e-Health systems but were found to have "bad level" of attitude towards e-Health systems, and this was determined to be one of their weaknesses. Majority of healthcare workers do not get regular or adequate trainings regarding e-Health systems. Challenges regarding e-Health systems were identified within the scope of the study, and enhancing the habits of e-Health trainings will influence the attitude of healthcare workers on e-Health systems. The number of females were more respondents recorded than males, and the occupation distribution, registered nurse was the highest occupation with many or more respondents. In addition, 50% of the respondents are familiar with eHealth features and 71% of the respondents find it easy to adapt to new eHealth systems. Moreover, 98% of respondents have shown preference to use eHealth systems. Regarding challenges associated with eHealth system, respondents have shown that there are some challenges associated with eHealth systems.

RECOMMENDATIONS

- The Oshakati districts should make provisions of formal trainings over a certain period of time and awareness regarding the use of eHealth system to healthcare workers within the district.
- Healthcare workers should participate in disaster recoveries event on digital systems regarding security threats by taking part in workshops.
- The district should make an assessment to identify intentions of healthcare workers regarding e-Health systems.
- Updated and new versions of different software should always be installed in electronic devices used for digital information transfers.
- Some functions and features may be disabled in the electronic devices (such disabling screenshots for security reasons) so that devices can only be used for intended purposes.
- Internet routers should always be replaced with new ones for proper network connections.
- New staffs should be recruited to manage the eHealth systems, so that the systems can always be up to date.
- There should make provision of a supplementary power supply source for the peripheral clinics and health centers within the district. (supplementary power supply source may be used during incidence of power failures that may disrupt e-Health systems).

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