Effect of Health Information Technology on the Efficiency and Quality of Healthcare Delivery in Sierra Leone: A Case Study of Connaught Hospital

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Abstract: The Ebola outbreak (2014–2016) and the COVID-19 pandemic exposed serious deficiencies in Sierra Leone's healthcare sector, particularly in the use of information technology for patient data management. Most hospitals still rely on manual systems, leaving records vulnerable to damage or loss. This study investigates how Health Information Technology (HIT) influences efficiency and quality of care delivery at Connaught Hospital in Freetown. The research explores the state of patient record management, the role of policies in promoting HIT, and the impact of medical technologies on service delivery. Data was collected from 50 participants, including doctors, nurses, community health officers, and patients, through interviews and questionnaires. The findings highlight the urgent need for digital health systems to improve patient safety, reduce medical errors, and strengthen healthcare delivery in Sierra Leone.

Keywords: Internet, Patients, Records, Ebola, Service Delivery, Connaught Hospital.

I. INTRODUCTION

The Ebola (2014-16) and the COVID-19 epidemic exposed the health sector of Information Technology in almost all hospitals in the nation, as there were no technological machines to capture Relevant health information is not only for Ebola or Corona patients in the Epicenters (health centers for treating Ebola and Corona patients), but also for malaria and other related illnesses in the country (Save the Children Report 2014).

Also, the above infectious diseases highlighted severe inadequacies in the countries' ability to detect and diagnose infectious diseases due to insufficient laboratory infrastructure, diagnostic capabilities, and failures in diagnostic preparedness. Since then, significant advances have been made in strengthening laboratory capacity in Sierra Leone; however, reliable confirmation of suspected infectious diseases is still hindered by a lack of standardized methods and equipment, inadequate infrastructure and amenities, insufficient trained staff, and an inefficient laboratory supply chain. (WHO, 2018).

Sierra Leone has no healthcare Information system in almost all the hospitals in the nation, and as such, records the information of patients in books, files, etc., which have the propensity to be damaged at any given moment. The records of patients like pregnant women, birth and death records, and malaria records are still recorded in files, journals, etc., and are being stored in hospitals. In contemporary and comparative health systems, Sierra Leone is still not ready or serious about maintaining its health records through information technology, which would qualify it to be ranked in today's 21st Century, where nations are being overwhelmed to conform to modernization and the innovation of new technologies.

Under the current healthcare system in Sierra Leone, many healthcare providers do not keep up with up-to-date medical discoveries, following guidelines, or measure their performance, and they coordinate minimally with other healthcare providers (Bodenheimer, 2008; Taylor et al., 2005), this has left the health system incapacitated or destroyed, the performances of healthcare providers on Information Technology is inefficient and inadequate in country that leads to many challenges on Health Information Technology.

Many Healthcare providers in Sierra Leone have either chosen not to be computably literate, or the health environment is not conducive or friendly to them for Information Technology. In advanced countries where Information Technology is active in the health sector, healthcare providers have the quest for knowledge, as a result, they do research at YouTube, online or other health medical website etc. with the ultimate aim of improving their knowledge base which is the opposite end in Sierra Leone both the doctors, nurses and the pharmacies they just depending in traditional ways of doing things ignoring the information technology aspect.

The medical profession, where healthcare providers are competent with the knowledge acquired from their medical tutors. Sierra Leone is operating with a 3G internet system provided by mobile companies in the nation; these companies provide this 3G system with the ultimate aim of augmenting their service delivery. The effectiveness and efficiency of service delivery of this 3G system is another topic for discussion, which I believe to be ineffective and inefficient, or better still, slow in-service delivery. The quality and effectiveness, and efficiency of health Information Technology in Sierra Leone would not be married with the 3G internet system because there are many lapses to be mended before the health sector can lean on these companies for health information technology.

Although laboratory capacity has improved over the years, the absence of standardized data systems still prevents timely diagnosis and disease tracking (WHO, 2018). In most facilities, information technology integration remains minimal, and health workers seldom rely on digital evidence-based guidelines or collaborative platforms (Bodenheimer, 2008; Taylor et al., 2005). Furthermore, unreliable internet connectivity and insufficient ICT skills among healthcare staff limit the adoption of HIT. Hospitals lacked robust information management systems, which hindered effective tracking of patients, laboratory results, and treatment history (Save the Children, 2014). Beyond these epidemics, routine conditions such as malaria and maternal health continue to be managed with outdated manual records, typically stored in files and journals that are susceptible to loss or destruction.

➢ *Objectives of the Study*

The main objective of this study was to investigate the Effect of Health Information Technology on the Effectiveness and Efficiency of quality delivery in Connaught Hospital in Sierra Leone, while the specific objectives were to:

- To ascertain the role of Healthcare Medical Technologies on service delivery in Connaught Hospital.
- To examine the role of Healthcare Policies toward effective and efficient service delivery.
- To investigate the role of information technology in health records management in Connaught Hospital.
- To provide recommendations to policymakers about the effects of health information technology in Sierra Leone.

➢ *Research Question*

The key questions guiding the study were:

- What is the role of Healthcare Medical Technologies in service delivery in Connaught Hospital?
- What is the role of Healthcare Policies toward effective and efficient service delivery?
- What is the role of information technology in health records management in Connaught Hospital?
- What recommendations to be proffered to policymakers about the effects of health information technology in Sierra Leone?

II. STUDY METHODOLOGY

➢ *Research Design*

The study adopted a mixed-methods design combining qualitative and quantitative approaches. Questionnaires were administered to capture numerical data, while interviews provided deeper insights into respondents' experiences.

➢ *Study Location*

The study was conducted in the Western Area region in the municipality of Freetown Connaught Hospital.
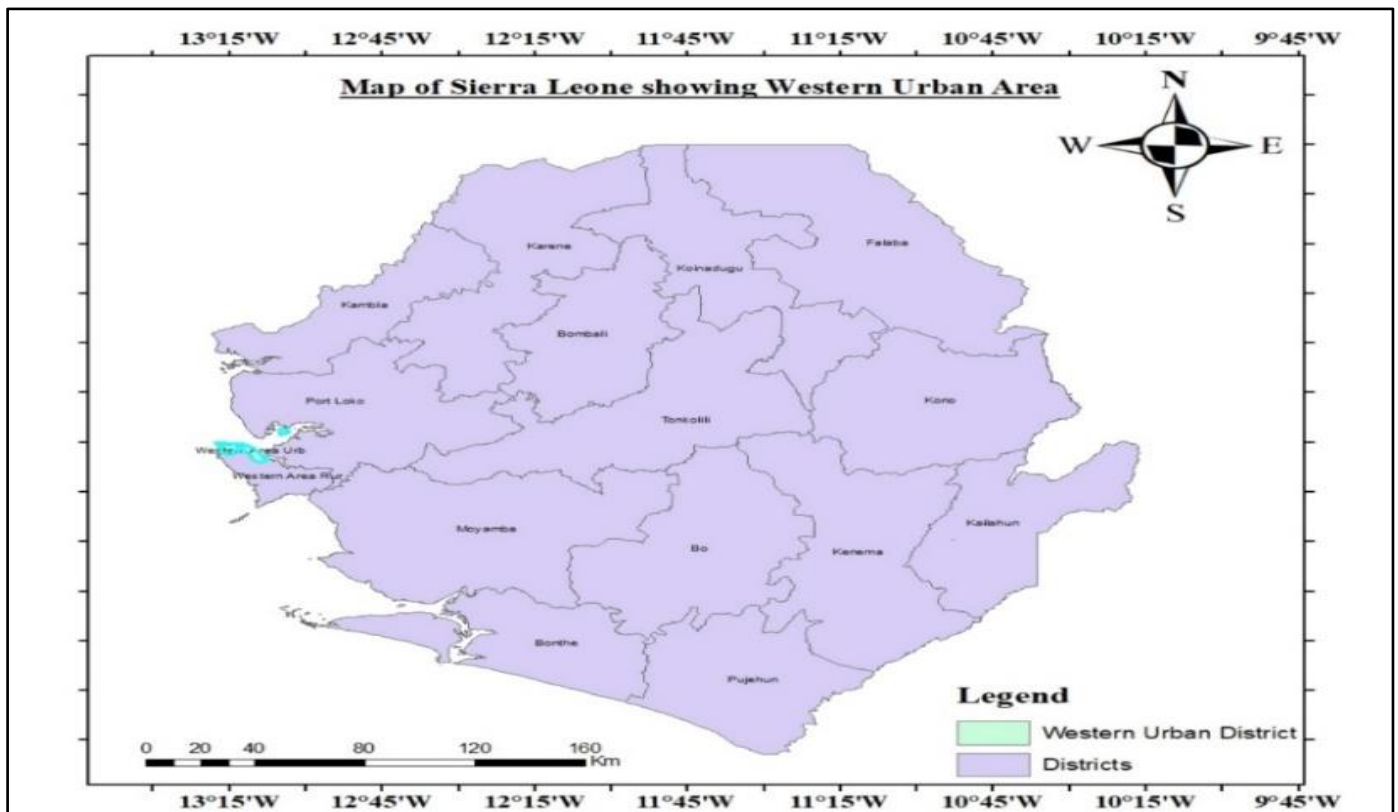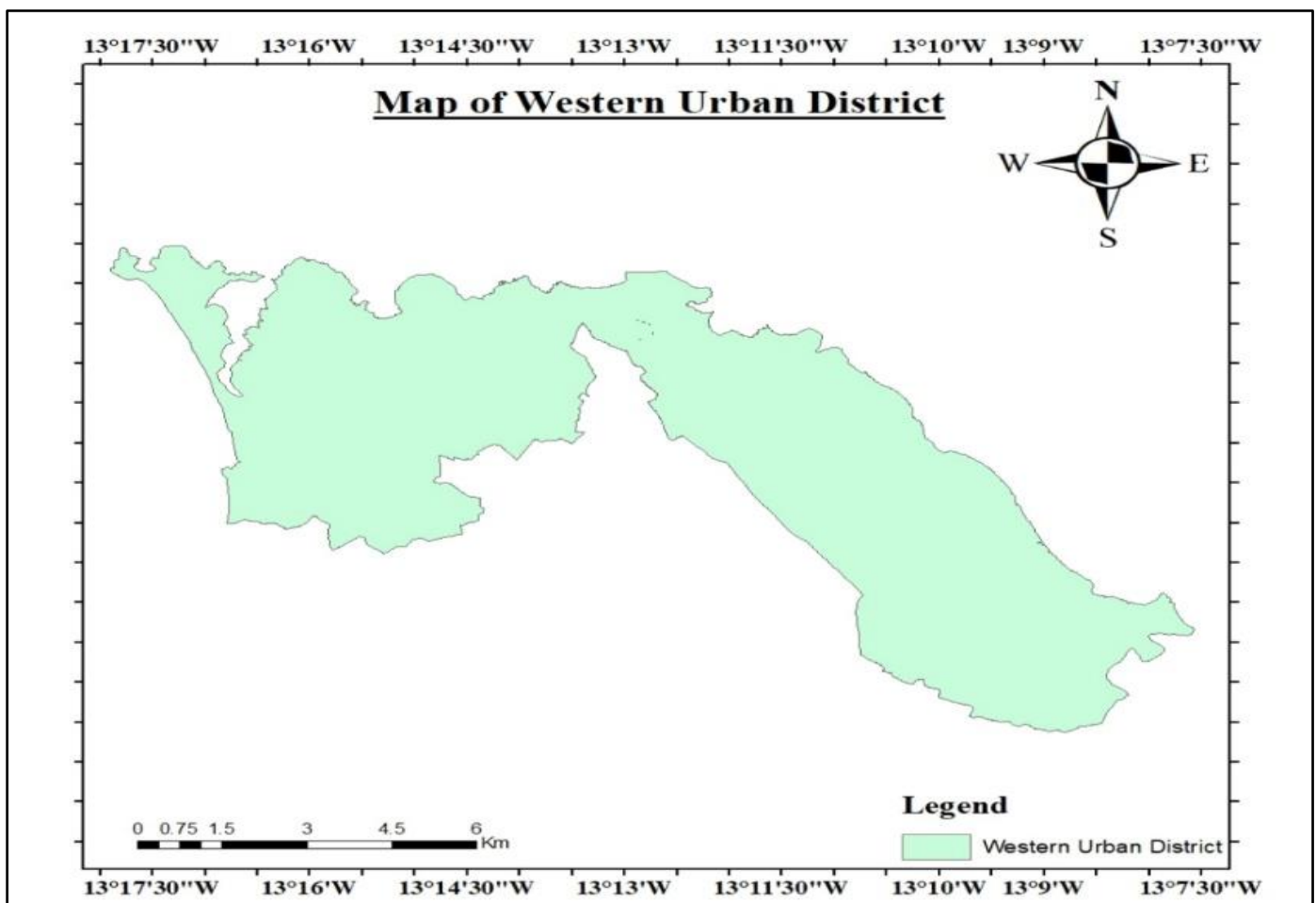
Fig 1 Map of Sierra Leone, Showing the Western Urban

Fig 2 Map of Western Urban District

> *Study Population and Sampling*

The target population comprised medical doctors, community health officers (CHOs), state-registered nurses (SRNs), and patients. A purposive sample of 50 participants was selected: 4 doctors, 10 CHOs, 10 SRNs, and 26 patients.

> *Sampling Technique*

Respondents were randomly drawn within each group, ensuring fair representation of healthcare providers and patients.

> *Data Analysis*

The data collected were processed using both descriptive and inferential analysis. Responses from questionnaires were coded and analyzed with IBM SPSS 23.0 and Microsoft Excel. Qualitative responses from interviews were thematically analyzed to complement statistical findings.

> *Age*

III. RESULTS AND DISCUSSIONS

This section presents the findings of the study and interprets them in relation to the research objectives. The results highlight how healthcare technologies, policies, and record management practices affect service delivery at Connaught Hospital. The discussion connects these findings with broader literature on HIT adoption, challenges, and opportunities for improvement in Sierra Leone.

> *Demographic Characteristics*

Most respondents were between the ages of 18 and 39, with a majority being single and holding at least a diploma qualification. Males were slightly more represented than females. This profile reflects a youthful, fairly educated workforce at Connaught Hospital.
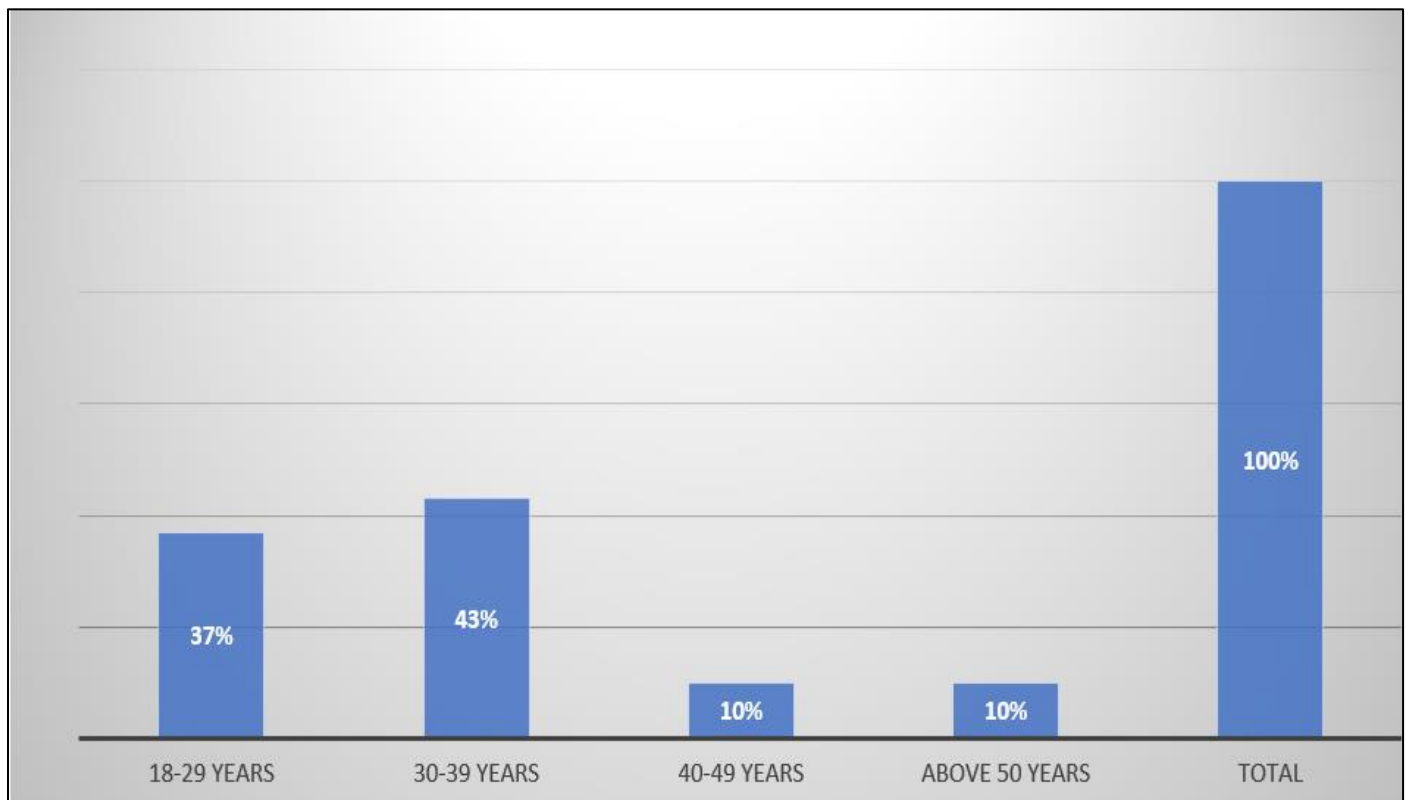

Fig 3 Showing Respondents by Age, Field Survey 2021

From figure 3 above, it is revealed 43% of the respondents were age between 30 to 39 years, 37% of the respondents were between age 18 and 29 years, 10% of the respondents were between 40 and 49 years, and 10% of the respondents were above 50 years old. This means that there are more young medical officers at Connaught Hospital and fewer older staff.
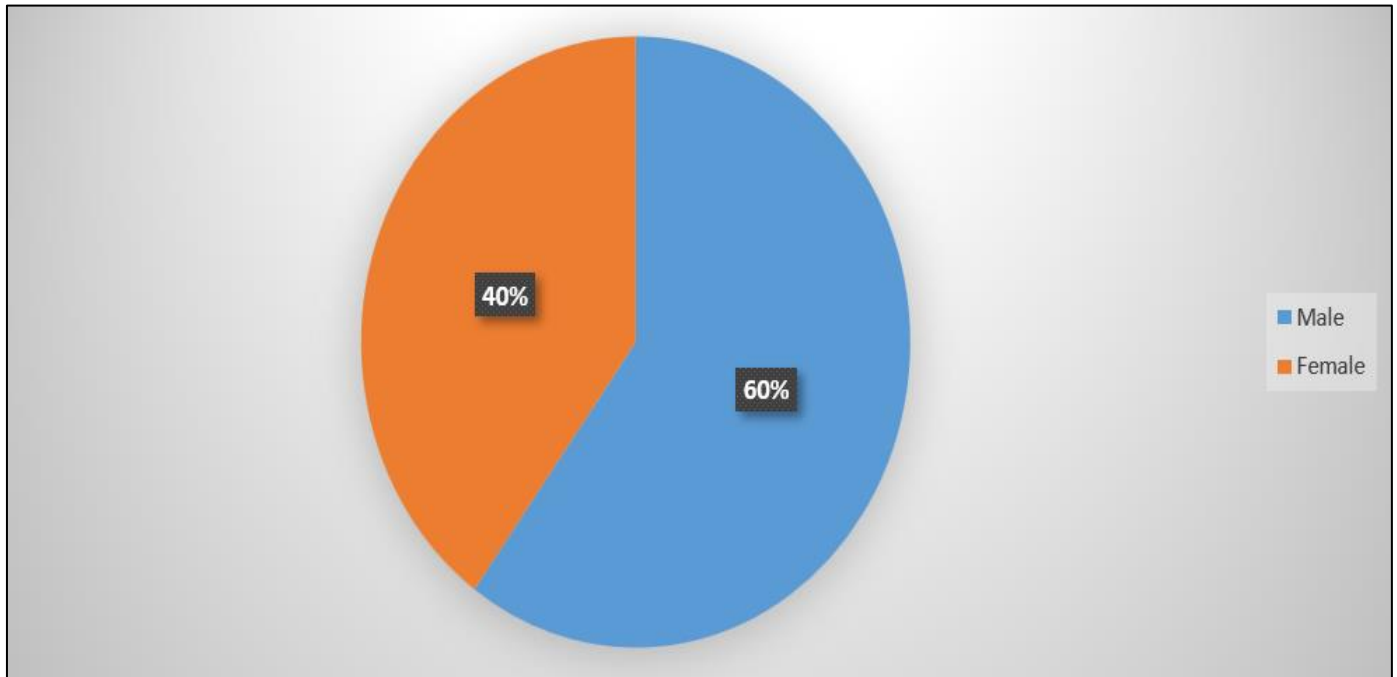
➢ *Sex*

Fig 4 Distribution of Respondents by Sex, Field Survey 2021

Figure 4 above illustrates that 60% of the respondents are male and 40% of the respondents are female. It shows that there are more male staff at Connaught Hospital than females.
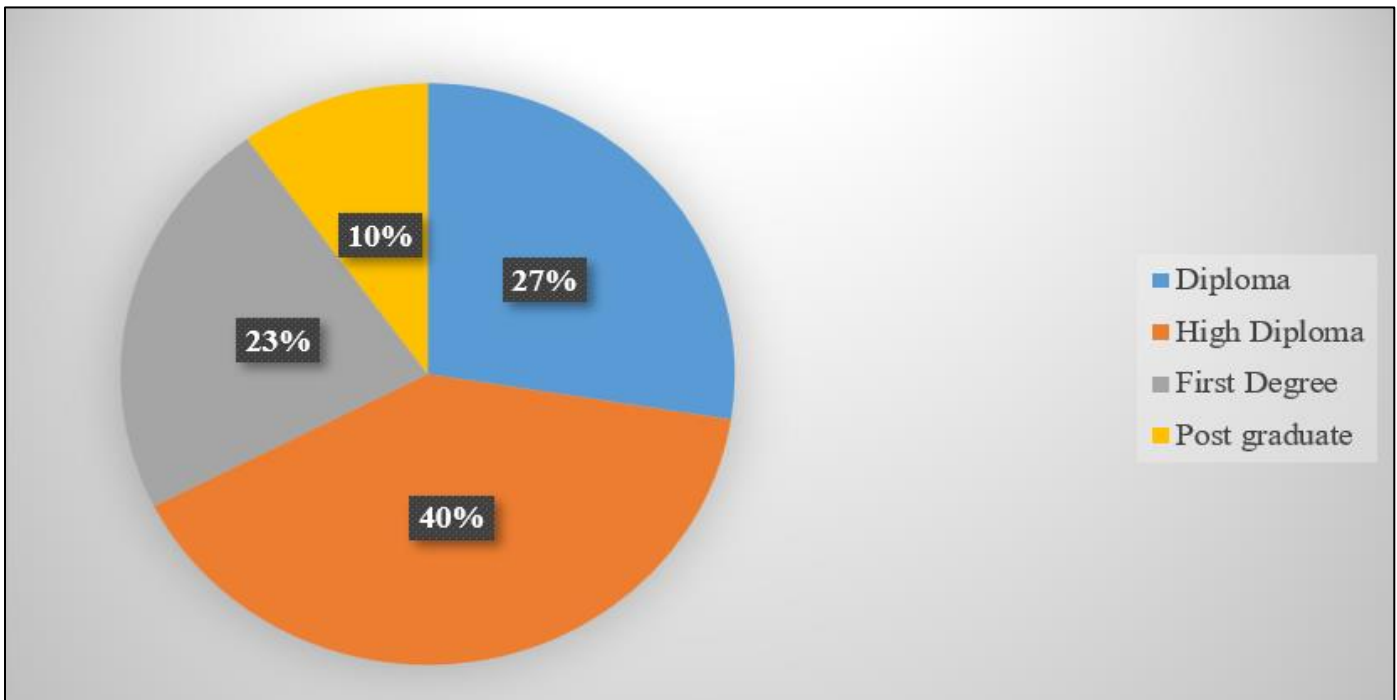
➢ *Level of Education*

Fig 5 Distribution of Respondents by Level of Education, Field Survey 2021

The study in Figure 5 above shows that 40% of the respondents hold higher diploma certificates, 27% of the respondents acquire diploma certificates, 23% of the respondents acquire a first degree, and 10% of the respondents hold postgraduate certificates. This shows that all the medical officers at Connaught hospital have good educational status, which means they can read and understand the questionnaire and understand all the systems of Connaught hospital.
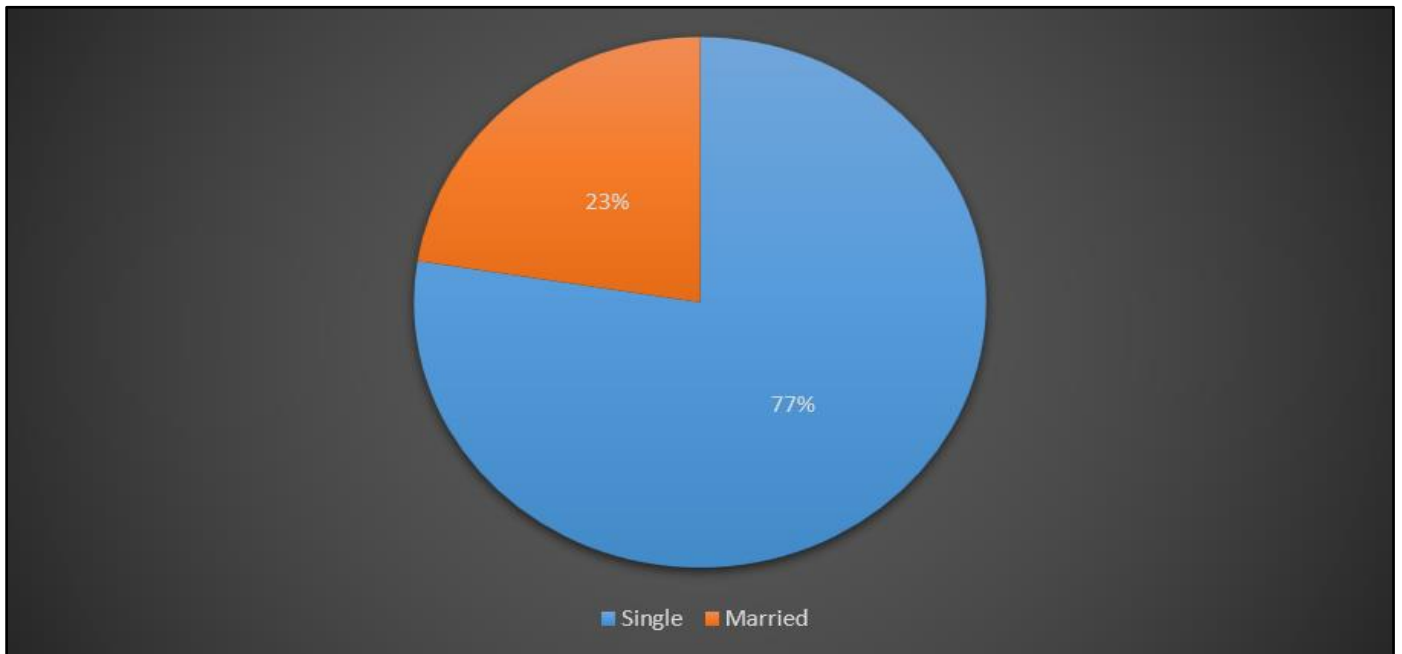
➢ *Marital Status*

Fig 6 Distribution of Respondents by Marital Status, Field Survey 2021

Figure 6 above illustrates that most of the respondents are single and the others are married. This is presented as 77% of the respondents are single, and 23% of the respondents are married. This is true because most of the respondents are of the youth age.

➢ *To Ascertain the Role of Healthcare Medical Technologies on Service Delivery in Connaught Hospital*
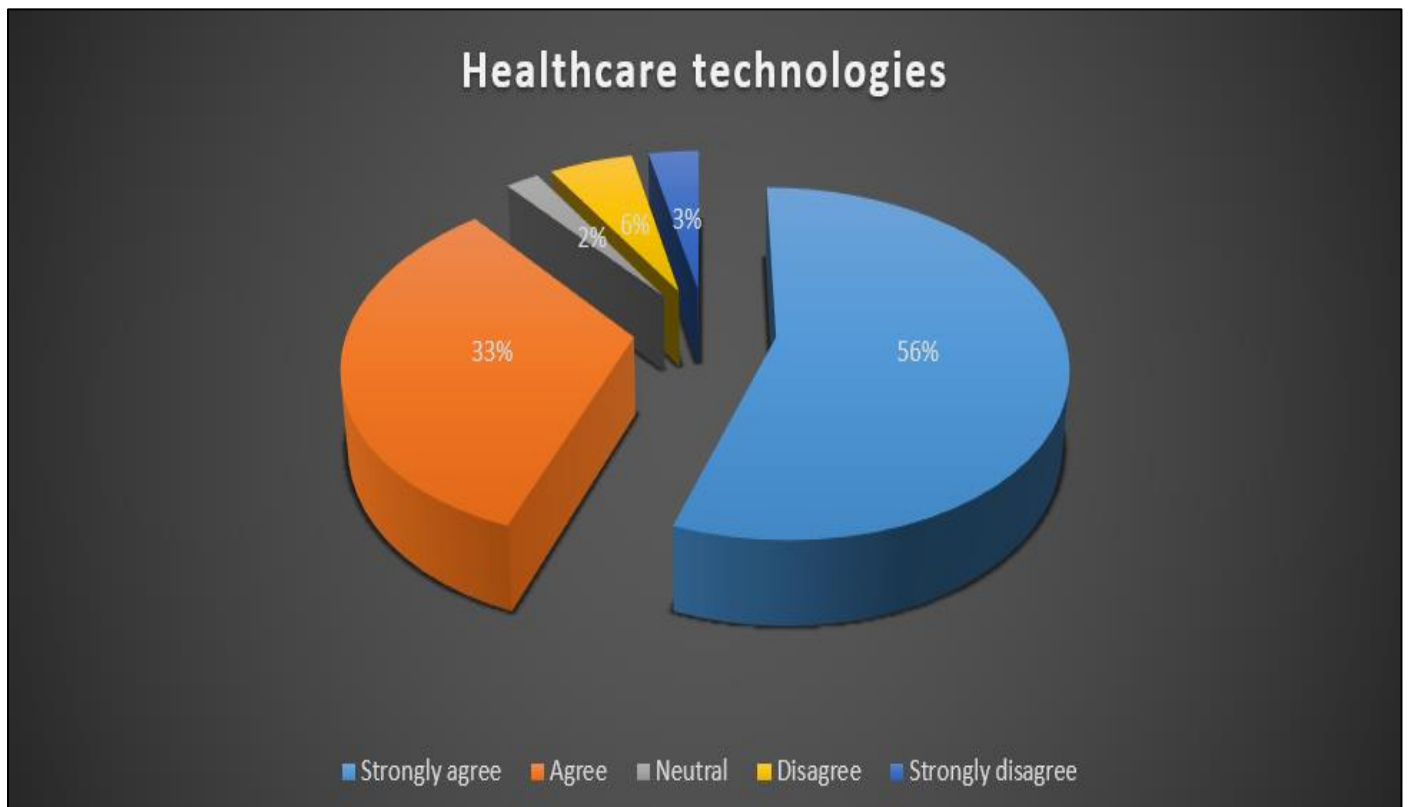
• *Healthcare Technologies*

Fig 7 Healthcare Technologies, Field Survey 2021

According to the findings in Figure 7, out of the 50 sampled individuals, a majority—totaling 33%—agreed that healthcare medical technologies influence service delivery in the hospital. Only 6% of respondents disagreed on this issue, while 56% strongly disagreed. Additionally, 2% were neutral,

meaning they were unsure about the influence of healthcare medical technologies on service delivery in the hospital.

➢ *To Examine the Role of Healthcare Policies in Effective and Efficient Service Delivery*
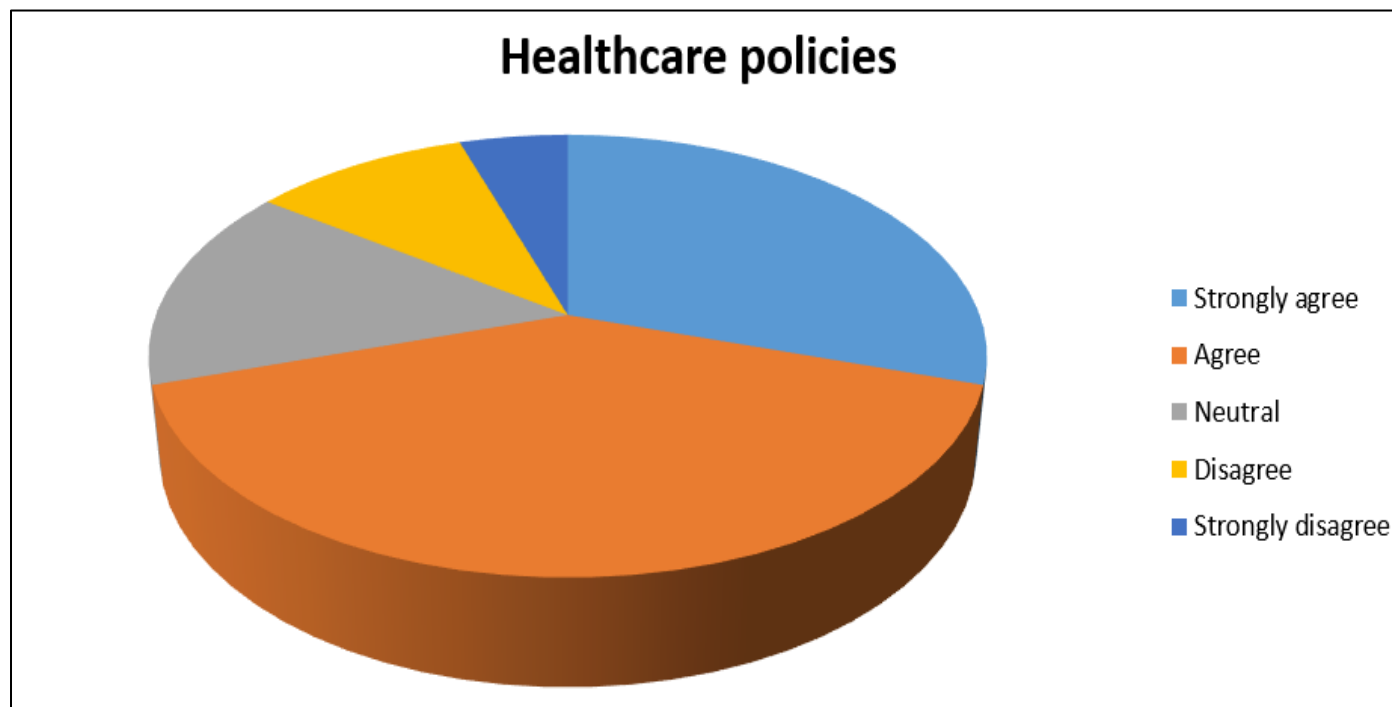
- *Healthcare Policies*

Fig 8 Healthcare Policies, Field Survey 2021

According to the findings in Figure 8, out of the 50 sampled respondents, 30% strongly indicated that policies influence service delivery in Connaught Hospital, 40% of the respondents agreed that policies influence service delivery in Connaught Hospital, 15% of them remained neutral, whilst

10% disagreed, and only 5% of respondents strongly disagreed on the issue.

➢ *To Investigate the Role of Information Technology on Health Records Management in Connaught Hospital.*
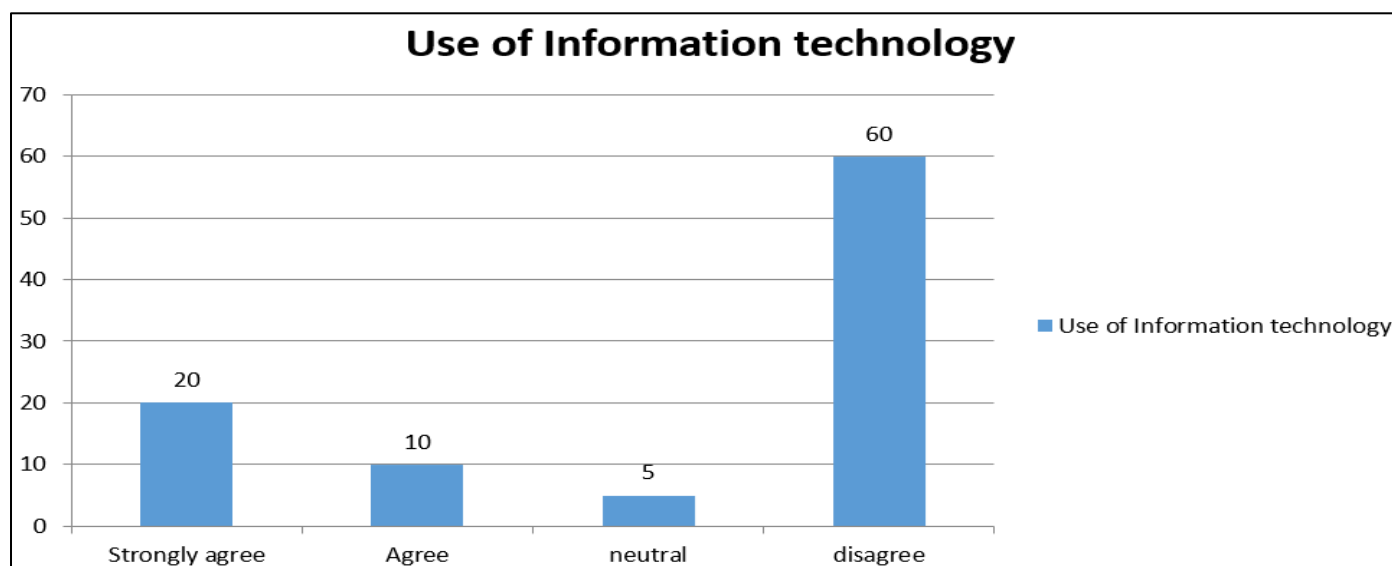
- *Use of Information*

Fig 9 Use of Information Technology, Field Survey 2021

The findings from Figure 9 clearly indicated the extent to which the respondents at Connaught Hospital (a public sector healthcare facility) use healthcare information systems in tendering their services to the patients. According to the findings, 20% of the respondents strongly agreed that healthcare information system integration is being applied in the hospital, out of the population targeted. It can be seen that 10% of respondents agreed with the assumption. From the total population sampled, the majority of respondents, representing 60% disagreed that healthcare information system integration (HCIS) is not being implemented in hospitals where they work.

➢ *To provide Recommendations to Policymakers About the Effects of Health Information in Sierra Leone*
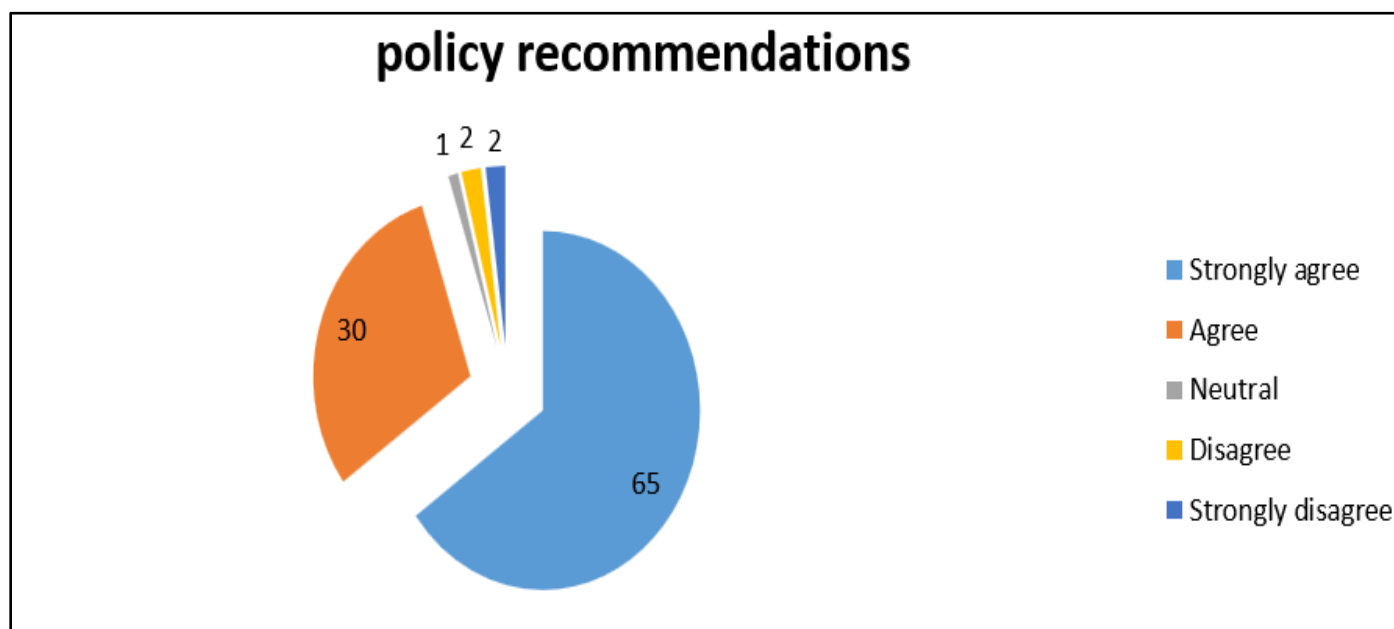
- *Policy Recommendations*

Fig 10 Policy Recommendations, Field Survey 2021

From figure 10 above it is clear from the data above 65% strongly agreed that there is a need for good policy recommendations to health authorities for health information system to be fully functional at the country's biggest healthcare facility such as Connaught Hospital while 30% agreed there is urgency to use the policy recommendations whereas, 1% neutral or rejected the recommendations and 2% of the respondents disagree about the policy recommendation in Connaught hospital and also 2% of the respondents strongly disagree on the recommendations.

IV. CONCLUSION

This study revealed that Connaught Hospital, and by extension Sierra Leone's healthcare system, remains largely dependent on traditional record-keeping methods. While healthcare policies exist, their implementation is inconsistent, and healthcare technologies are underutilized. Respondents highlighted the urgent need for digital health systems to reduce errors, enhance patient safety, and streamline service delivery.

Challenges such as inadequate infrastructure, limited ICT skills, and unreliable internet connectivity hinder adoption. However, the benefits of HIT, such as improved treatment processes, better patient tracking, and enhanced efficiency, make it an indispensable tool for modern healthcare.

RECOMMENDATION

➢ *Intensive Care Unit (ICU):*
Radiology, x-ray scan, and laboratory test of patients with severe injury are done in this unit, so it should be electronically equipped to avoid wrong medication, as it has been allegedly purported against the hospital.

The use of an electronic device constitutes power energy and internet facility for it to be effective and efficient. Connaught Hospital should not exclusively depend on the power supply of the Electricity Distribution and Supply Authority (EDSA) for its medical operation since the power is intermittently supplied.

For the use of internet facility, many agencies depend on the 3G internet facility provided by mobile companies, of which Connaught Hospital is not an exception. For this purpose, let Connaught Hospital have its own internet facility provider, as that will provide effective and efficient use of Health Information Technology in the hospital.

Connaught Mortuary needs to be modernized with modern medical equipment to harmonize with the health

standards of Health Information Technology. The use of forensic devices in testing the body sample of the deceased should be abundant, and the information or data should not be the domain of the pathologist.

➤ *Recommendation for Further Research*

Extend similar studies to other hospitals across Sierra Leone to establish nationwide evidence and strategies.

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