ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

DEPARTMENT OF EMERGENCY AND CRITICAL CARE NURSING

UTILIZATION AND ASSOCIATED FACTORS OF ELECTRONIC MEDICAL RECORD SYSTEMS AMONG HEALTH PROFESSIONALS AT TIKUR ANBESSA SPECIALIZED HOSPITAL ADDIS ABABA, ETHIOPIA, 2025: AN INSTITUTION BASED CROSS SECTIONAL STUDY.

BY: MISHAME ELIAS (BSc)

JUNE, 2025

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A THESIS TO BE SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES DEPARTMENT OF EMERGENCY AND CRITICAL CARE NURSING IN PARTIAL FULFILMENT FOR THE REQUIREMENT OF MASTERS DEGREE IN EMERGENCY AND CRITICAL CARE NURSING

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DECLARATION

I hereby declare that this MSc thesis is my original work and has not been presented for a degree at any other university, and all sources of material used for this thesis have been duly acknowledged.

Name: Mishame Elias

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THESIS APPROVAL SHEET

UTILIZATION AND ASSOCIATED FACTORS OF ELECTRONIC MEDICAL RECORD SYSTEMS AMONG HEALTH PROFESSIONALS AT TIKUR ANBESSA SPECIALIZED HOSPITAL ADDIS ABABA, ETHIOPIA, 2025: AN INSTITUTION BASED CROSS SECTIONAL STUDY.

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LIST OF ACRONYMS AND ABBREVIATIONS

AAU	Addis Ababa University
AOR	Adjusted Odds Ratio
CDC	Center for Disease Control and Prevention
CHS	College of Health Science
CI	Confidence Interval
EMRS	Electronic Medical Record System
ETB	Ethiopian Birr
FMOH	Federal Ministry of Health
HIT	Health Information Technology
HTSP-II	Ethiopia Health Sector Transformation Plan
SPSS	Statistical Package for the Social Sciences
SRS	Simple Random Sampling
TASH	Tikur Anbessa Specialized Hospital
TUTAPE	Tulane University Technical Assistance Program
WHO	World Health Organization

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Background: - An electronic medical record system is a digital alternative to traditional paper charts, designed to store detailed patient health information. Its' implementation has the potential to improve healthcare quality and patient safety. The successful utilization of the system largely depends on the knowledge and attitudes of health professionals and other influencing factors.

Objective: - to assess utilization and associated factors of electronic medical record systems among health professionals Tikur Anbessa specialized hospital Addis Ababa, Ethiopia, 2025.

Methods: -An institution-based cross-sectional study was conducted from March 10 to 30, 2025. Study participants were selected using a simple random sampling technique, with the sample size proportionally allocated based on profession. Data was collected using a pretested, structured questionnaire through the Kobo Toolbox application. Statistical analysis was performed using the Statistical Package for Social Sciences version 25. Multivariable logistic regression was employed to identify factors associated with electronic medical record system utilization, using adjusted odds ratios with 95% confidence intervals, and a significance level set at $p < 0.05$.

Result: - A total of 410 respondents participated in the study, with a response rate of 97%. The overall utilization, good knowledge, and favorable attitude toward Electronic Medical Record System was 88%, 73.2%, and 75.4% respectively. Being male (AOR=2.254; 95%CI = 1.127, 4.509), used the system for > 2 years (AOR=3.320; 95% CI=1.594, 6.916), having part-time in private hospitals (AOR=2.308; 95%CI=1.029, 5.180), departmental enforcement (AOR=2.051; 95%CI=1.041, 4.040), favorable attitude (AOR=2.212; 95%CI= 1.046, 4.678), and good knowledge (AOR=3.255; 95%CI=1.046,10.131) were significantly associated factors with utilization of the system.

Conclusion: -The utilization of Electronic Medical Record Systems was found to be high, supported by good knowledge and a favorable attitude. Strengthening ongoing training, technical support, and consistent system enforcement is recommended. These actions can enhance healthcare quality and improve patient data management efficiency.

Keywords: - Knowledge, Attitude, Utilization, Electronic Medical Record System, Ethiopia

1. INTRODUCTION

1.1 Background

Health information technology (HIT) has revolutionized global healthcare. It has been helpful in managing patient information and updating healthcare systems. Electronic medical recording System (EMRS) is a key HIT tool that significantly enhances the quality of medical care (1).

EMRS is a digital health system that replaces traditional paper-based records and creates far better coordination and communication between various departments and healthcare professionals. It provides secure access to a patient's medical history, diagnoses, treatments, lab results, and other information to authorized healthcare providers and enables the provision of the highest quality of care (1–4).

EMRS supports health platforms like telemedicine and e-health by building a medical database. This database facilitates integration between healthcare practitioners and organizations by guaranteeing full-time capture of data generated throughout the treatment process and compliance with standards. It lowers expenses by making effective use of resources, avoids waste, and helps raise employee and patient satisfaction. Documenting treatment and care services simultaneously establishes a legal safety net and safeguards patients, healthcare providers, and healthcare facilities as stakeholders in healthcare services (4, 5).

The idea for EMRS was first proposed by Larry Weed in the late 1960s. The first EMR system was then created and introduced in 1972 by the Regenstreif Institute (6).

Globally, EMR implementation is increasing, albeit to varying degrees across different countries. In the United States of America > 90% of hospitals use a government-certified EMR (7).

In Ethiopia, the Tulane University Technical Assistance Program (TUTAPE) introduced EMR software called "smart care" in 2008, with the Federal Ministry of Health (FMOH) and the Center for Disease Control and Prevention (CDC). The first pilot program using this software was at Dill Chora Hospital in Dire Dawa. iCare was started as piloted at Tikur Anbessa specialized Hospital in 2018 (8).

1.2 Statement of Problem

Despite an increasing volume of health-related data being generated, accelerating the trend toward digitalization in health globally, persistent data gaps and fragmented approaches to health data governance contribute to inadequate data use (9).

Paper-based systems are inefficient and prone to errors, often leading to outdated and inaccurate data. This reliance on manual processes consumes significant human resources and time. Studies have shown that paper records are frequently vague, incomplete, and illegible, hindering data extraction and reuse (10,11).

There is widespread interest and high hopes for the adoption and use of EMRS, but weak EMRS and reluctance to adopt them contribute to medical errors worldwide. Studies showed that overall adoption rate of EMRS is very low, particularly in developing countries like Ethiopia with limited resources and high rates of disease incidence and prevalence. The adoption and use of EMRS in developing countries like Ethiopia is in its early stage for several reasons, like limited access to technology, poor internet infrastructure, low computer literacy among healthcare workers, inadequate funding, lack of proper training, and concerns about data security (1,3).

Many countries have dedicated themselves over the previous decades to the countrywide implementation of EMRS to improve healthcare systems and better control of human health needs. FMOH, like many other countries, recognizes the value of EMR in improving health care quality. FMOH adopted the EMR in 2008 and planned to extend it to all hospitals, and enhancing digital health technology is one of the strategic directions in Ethiopia's health sector transformation plan (HTSP-II); however, only a few health facilities have implemented EMRS (12,13).

Ethiopian health policies and strategies have largely ignored the attitude and behavioral factors of healthcare professionals in both private and public hospitals to use the EMR system, focusing instead on the material aspect, specifically the installation and infrastructure of EMRS. However strong resistance to change by many healthcare professionals, the issue of privacy and confidentiality, and inadequate knowledge and attitude of healthcare professionals on EMRS are big challenges, not only in hospitals that didn’t adopt it but also in those fully EMR implementing Hospitals (8,14,15).

Despite the growing implementation of EMRS in healthcare settings, there remains a dearth of research investigating healthcare professionals' utilization and associated factors of EMRS. This is particularly evident in Tikur Anbesa Specialized Hospital (TASH), where no study has been conducted to assess the current utilization level and associated factors of healthcare professionals towards EMRS usage after year of implementation.

This study aims to examine the utilization pattern of EMR and associated factors influencing EMR usage among healthcare professionals at TASH. By analyzing these aspects, this study identify areas for improvement.

1.3 Significance of the study

This study, which investigates the knowledge, attitudes, and factors associated with EMRS utilization among health professionals at TASH, seeks to address critical gaps in knowledge and attitude towards EMRS and identify factors associated with EMRS utilization. TASH Hospital managers will be the primary beneficiaries, as the study will help them understand their knowledge and attitudes while identifying factors contributing to EMRS utilization. Additionally, the study will provide evidence for TASH management to design targeted strategies and interventions to enhance EMR utilization and operational efficiency, ultimately improving patient care.

The results of this study will also benefit policymakers by offering essential data for evidence-based decision-making and priority setting. Insights from the study is hoped to guide the FMOH in formulating national-level strategies for scaling up EMRS, by considering knowledge, attitude, and associated factors with EMRS utilization alongside with infrastructures. Furthermore, the study contributes to the academic community of Addis Ababa University (AAU) and the College of Health Sciences (CHS), by providing valuable reference for research and training programs. It will also serve as a baseline for other researchers to further explore EMR-related challenges and solutions. Overall, this study has the potential to significantly enhance healthcare delivery at TASH, inform institutional and national strategies, and advance academic knowledge in the field.

2. LITERATURE REVIEW

The adoption of EMRS has become a critical component of modern healthcare systems, aimed at improving efficiency, reducing errors, and enhancing patient care. EMRS facilitates the digital documentation, retrieval, and sharing of patient information, thereby replacing traditional paper-based records. However, despite its numerous advantages, the successful implementation and utilization of EMRS remains a challenge in many healthcare settings, particularly in resource-limited environments (1,16).

Several studies have assessed the magnitude of EMR knowledge, utilization, and attitude among healthcare professionals worldwide. The level of knowledge, attitude, and utilization of EMRS varies significantly across different healthcare settings.

2.1 Utilization of EMRS

According to a meta-analysis study in Indonesia in 2023, several hospitals in Indonesia had implemented EMR. All EMRS using health professionals agree that EMRS provides several benefits for its users which results in increased interest of users (16).

A systematic review and meta-analysis done among health professionals in Ethiopia in 2023, revealed that the pooled estimate of EMRS use among health care professionals was 51.85%(1) .

According to a cross-sectional study in Dire Dawa city administration in 2019, it was revealed that 26.61% of health professionals were using EMRS. The EMR is most used for sending reports, followed by finding patients with certain characteristics (17).

A cross-sectional study conducted in eastern Ethiopia in 2021, revealed that 67.7% used the service and 54% used it daily. 66% of the respondents reported that they prefer EMR to paper-based systems (18).

A study done in 2022 among healthcare providers at Selected Health Facilities in Addis Ababa revealed that 68.5% of healthcare professionals used EMRS. The most widely used patient data recording system was a hybrid of paper and computerized recording systems. The most common functional features utilized by healthcare providers among the fundamental components of the EMR were to order and show laboratory tests Followed by e-prescribing (8).

2.2 Factors Associated with Utilization

According to a study done in central Malawi in 2017, EMRS usage varied significantly by educational level among the study participants. Health workers with tertiary-level education used EMRS and paper-based records in nearly equal proportions. However, those with secondary level education used EMRS more than paper-based records (19).

According to a study done in Nigeria among nurses in 2018, age, years of working experience, provision of EMRS computer system at the workplace, and training on EMR had significant influence on frequency of use of the EMR system among target users in the facility (20).

According to a cross-sectional study in Dire Dawa city administration in 2019, work experience, access to the EMR manual, discussions on the EMR in meetings, positive perceived EMR system quality, perceived service quality, and perceived benefit of the EMR had significant association with EMR utilization (17).

A cross-sectional study conducted in eastern Ethiopia in 2021 showed that, work experience, taking EMR training, good knowledge, and a good attitude had an association with EMRS utilization (18).

According to an institution-based cross-sectional study conducted in Ayder Referral Hospital in 2014, age, working experience, computer access, computer literacy, management support, uninterrupted electric power, regular meetings on the EMR, the presence of an EMRS manual, the presence of a standby generator, refreshment training and budget allocation had significant association on the EMRS use(15).

A study done at 2022 among healthcare Providers at Selected Health Facilities in Addis Ababa revealed that pharmacists, favorable attitude, access to EMR training had positive association with EMR utilization. Age 35 and over were less likely to use EMR than those aged 23 to 28(8).

2.3 Knowledge towards EMRS Utilization

According to cross sectional study conducted in 2019 among the front-line health care workers in Jos University Teaching Hospital, Plateau State Nigeria 71.5 % of participants had good level of

knowledge about EMRS(21). Other across sectional descriptive study conducted at the Lagos University Teaching Hospital, Nigeria in 2017 among doctors revealed that 99.5% of respondents had good overall knowledge of EMRS(22).

Cross sectional studies, conducted in 2021, in the Amhara region suggested that a significant majority of participants possessed good knowledge of EMRS. 76.8% of healthcare professionals in private hospitals and 78.3% of Physicians at the University of Gondar Comprehensive Specialized Hospital had good knowledge about EMRS(14,23).

Studies conducted in 2022 in Gamo zone and Sidama region among health professionals showed that 64.75% and 64.2% of had good knowledge of EMR respectively(24,25).

Studies conducted at 2019 in different areas in Ethiopia revealed that 52.8%, 62.3% and 45.9% of health professionals in Harar, Dire Dawa, and Bahir Dar respectively had good knowledge about EMR(17,26,27).

An institutional-based cross-sectional study conducted in 2018 in four selected primary hospitals (Assosa, Hidar 11, Sanja, and Wogera) revealed that 62.6% of the study participants had good knowledge (28).

2.4 Attitude towards EMRS Utilization

study conducted in three public hospitals in Northern, Southern, and Central Palestine among nurses showed that overall nurses have positive attitudes toward computerization of EHRS with the mean score of 59.7(29).

A cross-sectional descriptive study conducted in Lagos University Teaching Hospital, 2018 revealed that 100% of medical doctors had a good attitude towards EMR(30).

Studies conducted in 2022 in the Sidama region, in North Shewa Zone and Addis Ababa in three governmental hospitals (Debre Berhan University Hakim Gizaw Hospital, Yekatit 12 Hospital Medical College and Tirunesh Beijing General Hospital), and in Gamo zone public health institutions found that 74.5%, 48.2%, and 57.2% of respondents had a favorable attitude toward EMRS respectively(3,24,25).

An institutional-based cross-sectional study conducted in 2018 in four selected primary hospitals (Assosa, Hidar 11, Sanja, and Wogera) and revealed that 60.1% of the study participants had a favorable attitude towards EMRS (28). Another institutional-based cross-sectional conducted in 2018, at the five referral hospitals in Amhara regional state (University of Gondar, Debre Markos, Felege Hiwot, Dessie, and Debre Berhan Referral Hospitals) among physicians also revealed that 58.3% of them had favorable attitudes(31).

An institution-based cross-sectional conducted at the University of Gondar Comprehensive Specialized Hospital in 2021 revealed that 59.6% Physicians with favorable attitudes toward EMRS(23).

An institutional based cross-sectional study conducted 2014 among Health Professionals at Ayder Referral Hospital, Northern Ethiopia revealed that 56.7 % of them had a good attitude towards EMR system use(15).

Conceptual Framework

The conceptual framework of this study outlines the relationships between socio-demographic factors, technology-related factors, institution related factors, personal factors and the dependent variables, which is utilization of EMRS. The socio-demographic factors examined include age, sex, educational level, work experience, having part time job and profession. These factors are expected to influence the baseline familiarity and attitude toward EMRS.

Technology-related factors, including computer literacy, access to computers at work, and personal computer ownership, and comfortably using computers. Institution related factors presence of EMR manual, regular meetings on EMR, assigned personnel IT responsible for EMR, and training on EMR, play a crucial role in shaping utilization of EMRS. The relationships between these variables were analyzed to identify the most significant factors influencing EMR utilization at TASH.

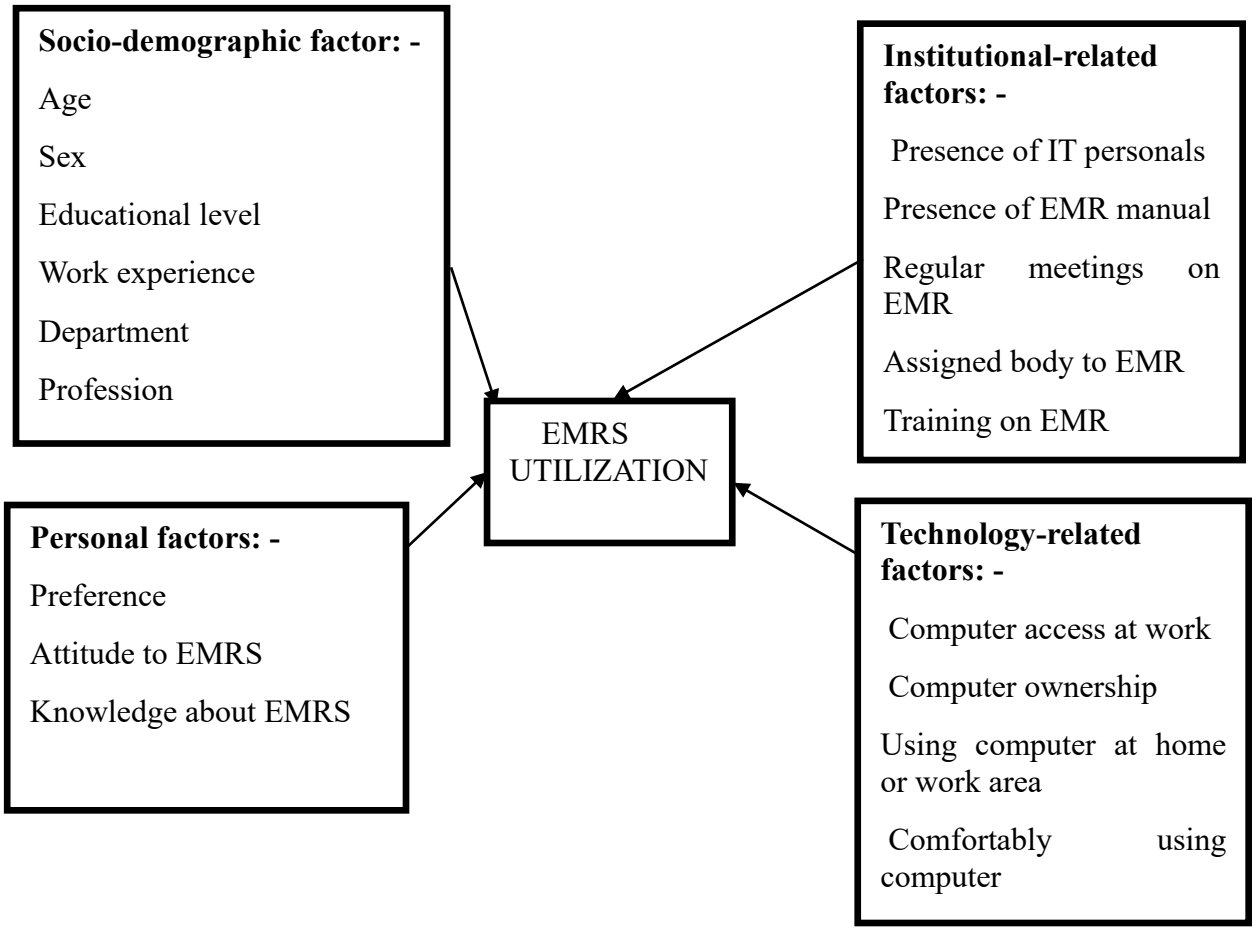


Figure 1:Adapted conceptual framework to assess utilization and associated factors of electronic medical record systems among health professionals at Tikur Anbessa specialized hospital Addis Ababa, Ethiopia, 2025.

3. OBJECTIVES

General Objective

- To assess Electronic Medical Record Systems utilization and its determinants among health professionals at Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia, 2025.

Specific Objectives

- To assess Knowledge towards Electronic Medical Record system utilization among health professionals of Tikur Anbessa Specialized Hospital, 2025.
- To assess Attitude towards Electronic Medical Record system utilization among health professionals of Tikur Anbessa Specialized Hospital, 2025.
- To assess utilization of Electronic Medical Record system among health professionals of Tikur Anbessa Specialized Hospital, 2025.
- To identify factors associated with utilization of electronic medical record system among health professionals at Tikur Anbessa Specialized Hospital, 2025.

4. METHODOLOGY

4.1 Study Area and Period

This study was conducted in TASH from March 10-30, 2025GC among health professionals. TASH is the largest referral and teaching hospital in Ethiopia. TASH is located in Addis Ababa which is capital city of Ethiopia and administrative capital of Africa union. It was established in 1972, it is teaching hospital of AAU, CHS, making it a central hub for medical education, clinical training, and research in Ethiopia.

It has a bed capacity of over 700 and provides comprehensive healthcare services to patients referred from across the nation. It offers diagnosis and treatment for approximately 370,000-400,000 patients a year. It specializes in a wide range of medical fields, including internal medicine, surgery, pediatrics, obstetrics and gynecology, and others(32). According to the human resource management office of the hospital it has around 1,800 health professionals.

Initially, the Hospital implemented the iCare EMRS on March 2018, developed by the iCare Company and subsequently transferred to Ethiopia's Ministry of Science and Technology(33). Currently, the hospital is using the IWKET Care EMRS for comprehensive patient data management, and Med web's system for radiology services.

4.2 Study Design

Institutional based cross sectional study design was conducted to this study.

4.3 Population

Source population

Health professionals who were working in TASH during study period

Study Population

All selected health professionals in TASH during study period.

4.4 Inclusion Criteria and Exclusion Criteria

Inclusion criteria

All voluntary health professionals in TASH during study period

Exclusion criteria

Health professionals on sick/annual leave.

Health professionals who came from other hospitals for short term programs.

Health professionals with less than 6 months stay in TASH.

4.5 Sample Size Determination

Sample size was estimated by using single population formula. Considering proportion of utilization of EMRS 67.7% of health professionals in eastern Ethiopia (18) and considering the following assumption given level of confidence interval (CI) 95% and margin of error 5%.

$n^o = [Z\ \alpha /2]^2\ p\ (1-p)\ /d^2$

Where: - n^o= minimum sample size

z= standard score corresponding to 95% CI

p = prevalence utilization

d = margin of error (5%)

q=non prevalence of EMRS utilization (1-p)

$n^o = (1.96)^{2\times}0.677(0.323)/(0.05)^2 = 336$, minimum sample size

By assuming a 10% non-respondent rate, 336 + 33.6= 369.6≈370

Sample size calculation for knowledge toward EMRS

Sample size was estimated by using single population formula. Considering proportion good knowledge toward EMRS 45.9% of health professionals in Bahir Dar (27), and considering the following assumption given level of CI 95% and margin of error 5%.

$n^o = [Z\ \alpha /2]^2\ p\ (1-p)\ /d^2 = (1.96)^{2\times}0.459(0.541)/(0.05)^2 = 381.57\approx382$, minimum sample size

By assuming a 10% non-respondent rate, 382 + 38.2= 420.2≈420

Sample size for favorable attitude toward EMRS

Sample size was estimated by using single population formula. Considering proportion favorable attitude towards EMRS of 48.2% health professionals in North Shewa Zone and Addis Ababa in 3 governmental hospitals (Debre Berhan University Hakim Gizaw Hospital, Yekatit 12 Hospital Medical College and Tirunesh Bejing General Hospital(3), and considering the following assumption given level of CI 95% and margin of error 5%.

$n^o = [Z\ \alpha /2]^2\ p\ (1\text{-}p)\ /d^2 = (1.96)^{2\times}0.482\ (0.518)/(0.05)^2 = 383.6 \approx 384$, minimum sample size

By assuming a 10% non-respondent rate, 384 + 38.4 = 422.4≈422

So, the selected sample size for this study was **422.**

4.6 Sampling Technique

A two-stage sampling technique was employed to select the study participants. In the first stage, proportional stratified sampling was used to categorize health professionals based on their profession to ensure representation of each professional group. The proportion of participants from each profession was determined based on their respective population size in the hospital.
In the second stage, to select the study participants from each professional group, simple random sampling was conducted. The lottery method was applied to select from sample frame which was obtained from human resource management and departments. After selecting from sample frame each study unit was addressed with the help of department heads.Proportional allocation was implemented for each profession by using the formula for proportional allocation.

$np = (Np/ N) * n$

Where: - np is the sample size for stratum P (each profession)
Np is the population size for stratum P
N is total population size, and
n is total sample size.

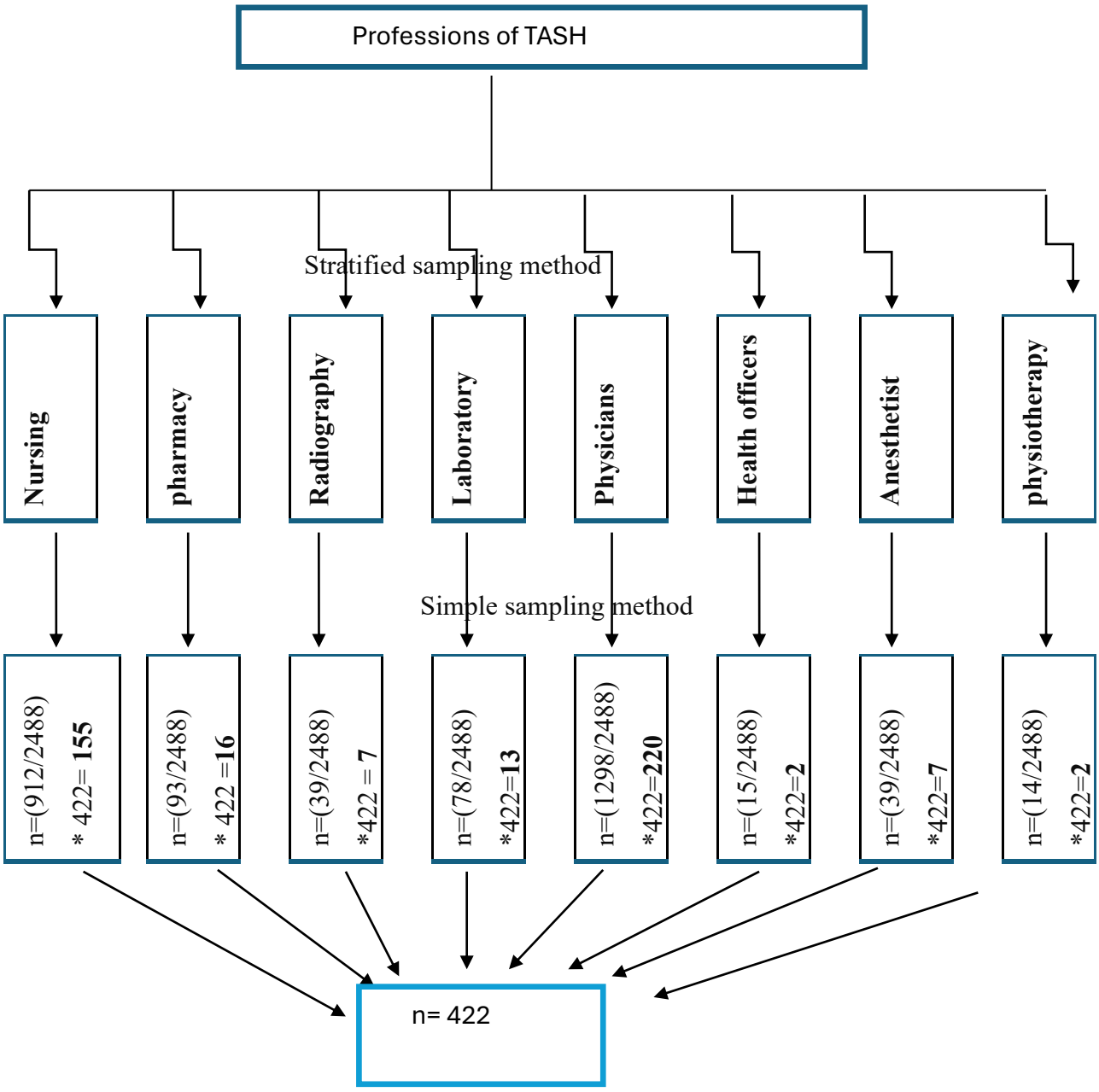


Figure 2:Schematic presentation of sampling procedure of utilization and associated factors of electronic medical record systems among health professionals at TASH Addis Ababa, Ethiopia, 2025.

4.7 Study Variables

Dependent variables

Utilization of EMRS

Independent variables

Socio-demographic factor: - Age, Sex, Educational level, Work experience, Profession, having part time job at private hospital

Institutional related factors: - Presence of IT personnel**,** Departmental enforcement, Presence of EMR manual**,** Regular meetings on EMR**,** Training on EMR

Technology related factors: - computer access at work**,** using a computer at home or work area, comfortably using computer

Personal factors: - Preference**,** Attitude to EMRS**,** Knowledge about EMRS, comfortable using EMRS

4.8 Operational Definition

Health professionals: - Individuals who are qualified and directly involved in patient care including Physician, nurses, pharmacists, laboratory technicians, Radiography, Anesthetist, Physiotherapy, and health officers.

EMRS: - an electronic recording system of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization

Utilization of EMRS: - determined by the extent to which health professionals use the EMRS to enter, access, update, or manage patient data, that is relevant to their specific professional roles.

Health professionals who reported using EMRS “every time” or “most of the time” for patient data within the scope of their role are categorized as having Utilized the EMRS.

Those who reported using EMRS “rarely” or “don’t use” for patient data applicable to their role are categorized as having Not Utilized the EMR system.

Level of knowledge: - refers to the knowledge level of health professionals about the functions and components EMRS.

Respondents who scored above ≥50% from knowledge questions were categorized as having Good Knowledge of EMRS. And respondents who scored < 50% were categorized as having poor Knowledge of EMRS(34).

Attitude: It is the perception, feeling, or thinking towards EMR. By using Bloom's cut-off point, respondents who scored ≥60% of the total possible score were classified as having a favorable Attitude toward EMR. Respondents who scored <60% were considered to have an unfavorable Attitude(35).

4.9 Data collection tool

The questionnaire for this study was developed based on a comprehensive review of relevant literature and previous similar studies (3,8,17,26). It comprises four main sections: seven items assessing socio-demographic characteristics; eight items evaluating knowledge, seven of which are yes/no and one multiple-choice; fifteen items measuring attitudes using a five-point Likert scale; and eighteen multiple-choice items examining factors associated with EMR utilization. The questionnaire includes a combination of open-ended, closed-ended, and Likert scale questions.

4.10 Data collection procedure

The data for this study were collected by using a self-administered structured questionnaire designed to assess health professionals' knowledge, attitude, and factors associated with the utilization of EMRS at TASH. To facilitate the process, 4 trained nurses were available to clarify any questions or instructions participants may have, though they didn't influence the responses. The data collection was done in the range of 20-25 minutes, and the nurses were responsible for distributing, collecting, and managing the complete questionnaires.

4.11 Data Quality Management

Data quality was assured before, during, and after data collection. Before actual data collection, a pretest was done on 5 % of the sample size in St. Paul Hospital. The response rate for the pretest was 100%, and modifications such as adding 1 question, which is 'Do you have EMRS access?', correction of typing errors, data collection period, and number of data collectors were done based

on the findings. The reliability of the questionnaire was assessed using Cronbach's alpha, and the result was 0.82. All data collectors took two days of training before data collection about the objectives of the study, every data item to be collected, the issues of consent, and the rights of the respondents.

During the data collection period, the purpose of data collection and the importance of the study were told to the participants to generate quality data. After data collection, the collected data was checked for completeness and consistency by the investigator.

4.12 Data Processing and Analysis

The data was coded, checked, and cleaned by the investigator. Then it was entered into Epi Data version 4.6 and exported to Statistical Package for Social Science (SPSS) version 25 for data analysis. The outcome variable was recorded to dichotomous outcomes as to whether to utilize EMRS or not. Health professionals who reported using EMRS every time or most of the time for patient data within the scope of their role were coded as 1, and those who reported using EMRS rarely or don't use were coded as 0.

Knowledge level was re-coded to dichotomous outcomes as good knowledge and poor knowledge. From 8 questions used to assess the knowledge level, one multiple-choice question was converted into 7 yes/no items, while the remaining 7 questions were initially designed as yes/no. 'Yes' responses were coded as 1, while 'No' and 'I don't know' responses were coded as 0. The total score ranged from 0 to 14. Respondents who scored 7 or above (≥50%) were categorized as having good knowledge, while those who scored less than 7 were categorized as having poor knowledge.

Attitude was re-coded to dichotomous outcomes as favorable Attitude and Unfavorable Attitude. A total of 15 items on a 5-point Likert scale, ranging from 5 = 'Strongly Agree' to 1 = 'Strongly Disagree.' The total possible score ranged from 15 to 75. Respondents who scored ≥ 60% were considered to have a favorable attitude, while those who scored < 60% were considered to have an unfavorable attitude.

Descriptive statistics like mean and frequency were computed and presented by using text, tables, and graphs. Binary logistic regression was undertaken to see the association between dependent and independent variables. Variables having a p-value of <0.25 in binary logistic

regression were considered as candidate variables for the multivariable logistic regression model. In the multivariable logistic regression model, variables having a P-value of <0.05 were considered statistically significant. Adjusted Odds Ratio (AOR) with 95% CI and P-value <0.05 were used to show the magnitude of association.

4.13 Ethical Consideration

Before beginning the research, the principal investigator got ethical approval from the Ethical Committee of the Department of Emergency and Critical Care Nursing, CHS, AAU & formal cooperation letter was given to TASH Clinical service directorate. Participants were provided with an informed consent form explaining the study's purpose, the voluntary nature of participation, and time it will take. And Informed consent was obtained from all participants before participating with the assurance that they may withdraw at any time without penalty. Confidentiality was strictly maintained, as no personal identifying information was collected, and all data remained anonymous. The data were securely stored and only accessible to the research team. It was told to participants if they feel uncomfortable with any part of the questionnaire, they can skip questions or discontinue participation without consequences.

5. RESULT

5.1 Socio-demographic characteristics

A total of 422 study participants were selected, of which 410 had responded, yielding a 97% response rate. The mean age of participants was 31.06 years (SD=3.971); with the majority 244 (59.5%) in the age group 30-39 years. Just over half of the respondents, 215 (52.4%), had less than 5 years of work experience, with a median of 5 years. (Table 1)

Table 1:- Socio-demographic characteristics of respondents

Variables	Category	Frequency (410)	Percentage (100%)
Age	20-29	157	38.3
	30-39	244	59.5
	>40	9	2.2
Sex	Male	193	47
	Female	217	53
Profession	Physician	210	51.3
	Nurse	153	37.3
	Laboratory	13	3.2
	Pharmacy	18	4.4
	Radiography	7	1.7
	Anesthetist	7	1.7
	Physiotherapy	2	0.5
Experience	< 5 years	215	52.4
	5-10 years	157	38.3
	10-15 years	36	8.8
	>15 years	2	5.5
Educational status	1st degree	259	63.2

	2nd degree	148	36.1
	> 2nd degree	3	0.7
Part-time job in a private hospital	Yes	141	34.4
	No	269	65.6

5.2 Knowledge of Health Professionals about EMRS Utilization

A total of 300 (73.2%) participants had good knowledge about EMRS utilization; with CI of 69%-77%. Good knowledge was defined as correctly answering ≥ 50% of knowledge related questions. About 388 (94.6%) of participants correctly identified the website used for EMRS in TASH. Ordering laboratories were mostly identified EMRS functions followed by reviewing patient status, obtaining results, and using e-prescription with percentage of 85.4%, 79.5%, 77.6%, and 60.8% respectively. (Figure 3)

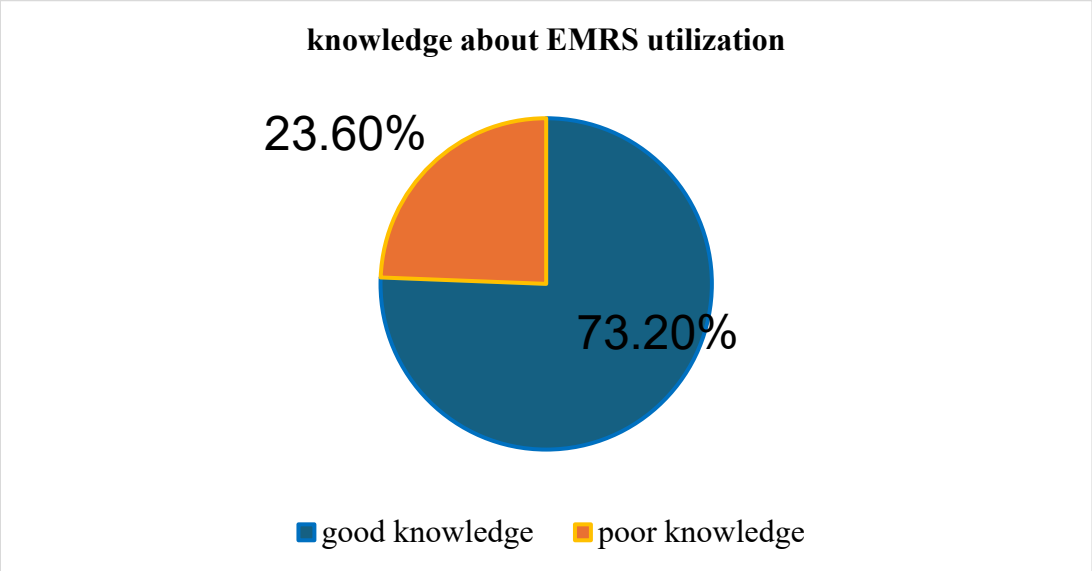
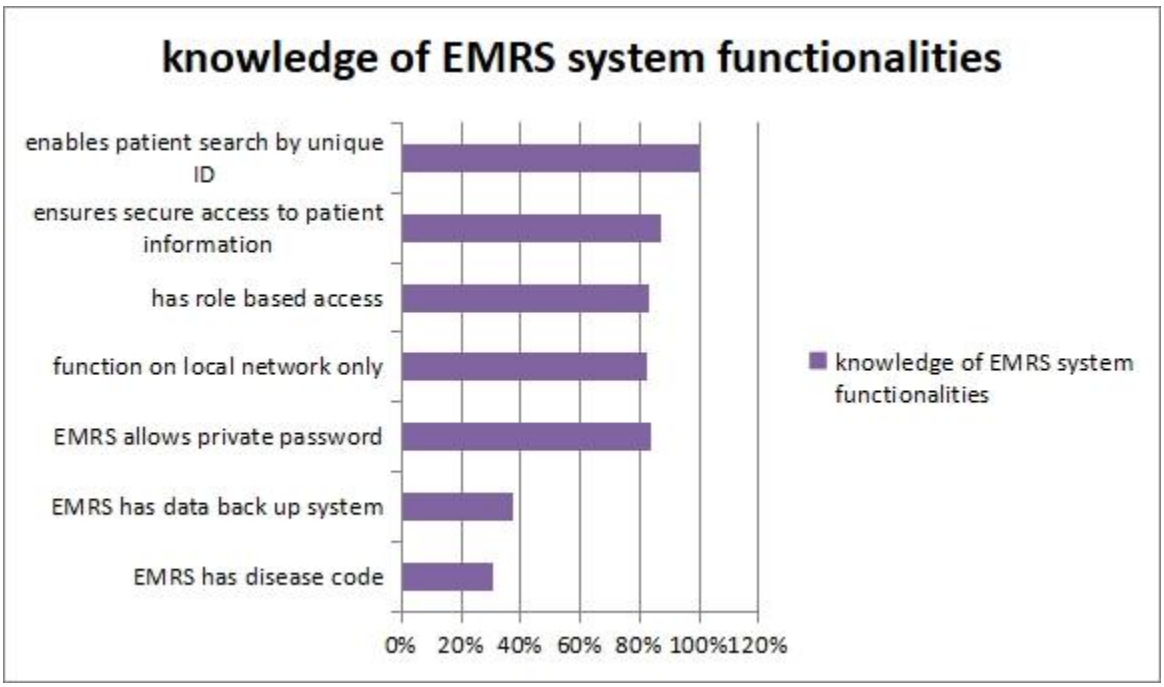


Figure 3: Knowledge about EMRS utilization

All participants were aware that on that EMRS allows patients to search for specific identification numbers. Knowledge of EMRS's secure access to patient information was recognized by 357 (87.1%) participants. (Figure 4)



* Multiple responses were allowed

Figure 4:knowledge of EMRS system functionalities

5.3 Attitudes of Health Professionals about EMR Utilization

A total of 309 (75.4%) of participants exhibited a favorable attitude towards EMRS utilization, with CI of 70.9%-79.3%. Favorable attitude was defined as correctly answering ≥ 60% of attitude related questions. Over half (52.9%) strongly agreed that EMRS increases practice productivity. 54.6% agreed and 32.4% strongly agreed on EMRS enhances transparency in healthcare processes. Only 17.6% strongly agreed and 32.9% agreed that EMRS improves the quality of care. Regarding patient interaction, only 15.1% strongly agreed that EMRS increases patient acceptance, though 30.2% agreed. A notable portion, 38.6% strongly agreed, 36.6% agreed EMRS should be implemented widely. (Figure 5)

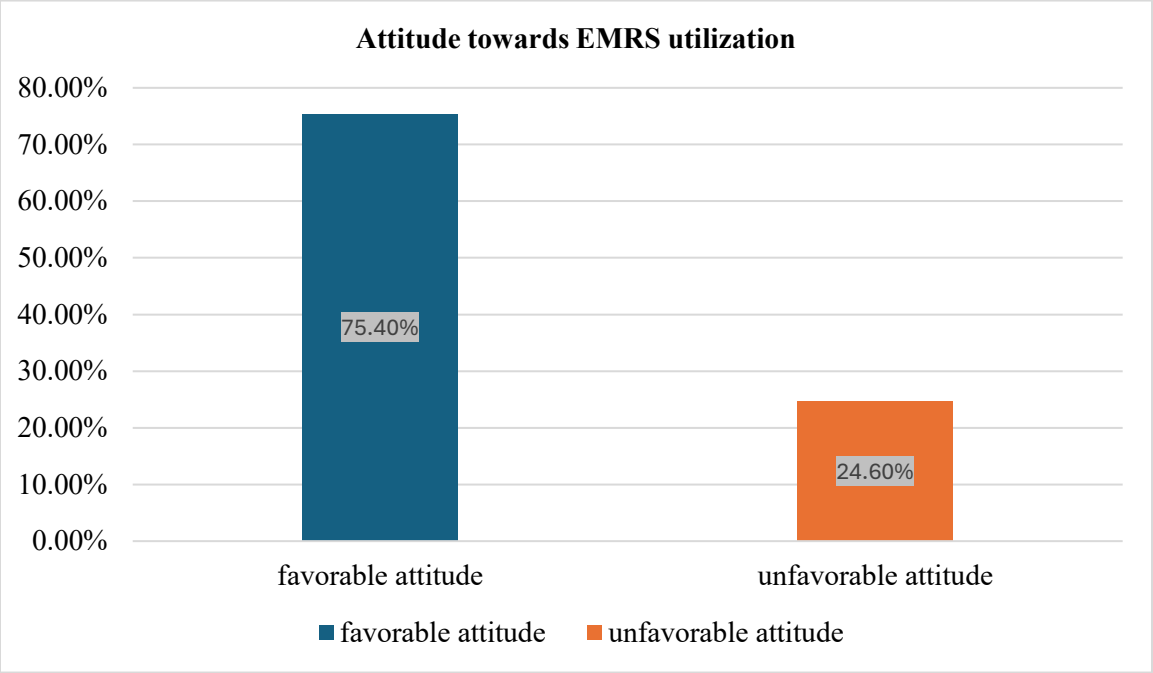


Figure 5:Attitude toward EMRS utilization

5.4 Utilization of EMRS

All 410 participants (100%) had access to EMRS. Of these, 360 respondents (87.8%) reported utilizing EMRS in their practice, with a 95% CI of 84.6% to 90.9%. EMR utilization was defined as using the system either every time or most of the time for patient data management within the scope of their role. One hundred eighty-one (44.1%) reported using only EMRS. Notably, 214(52.2%) of the respondents had been using EMRS for 2 years or less. (Figure 6)

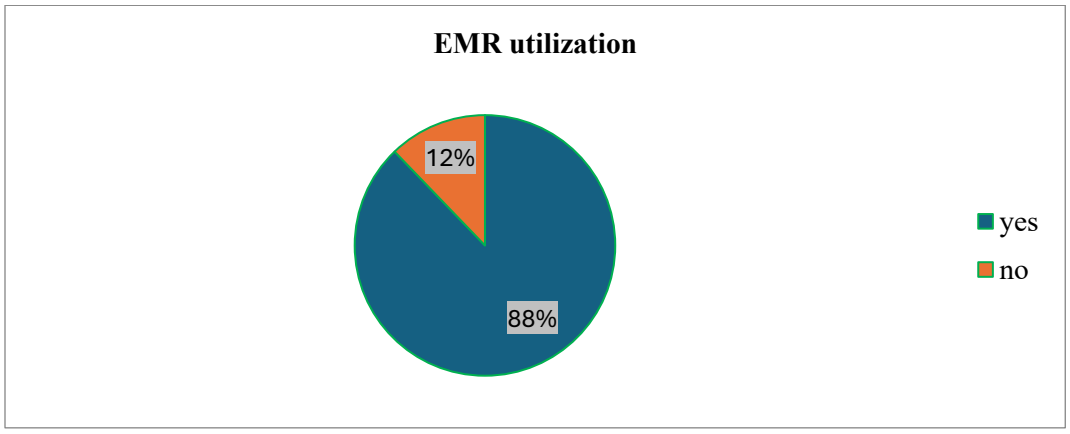
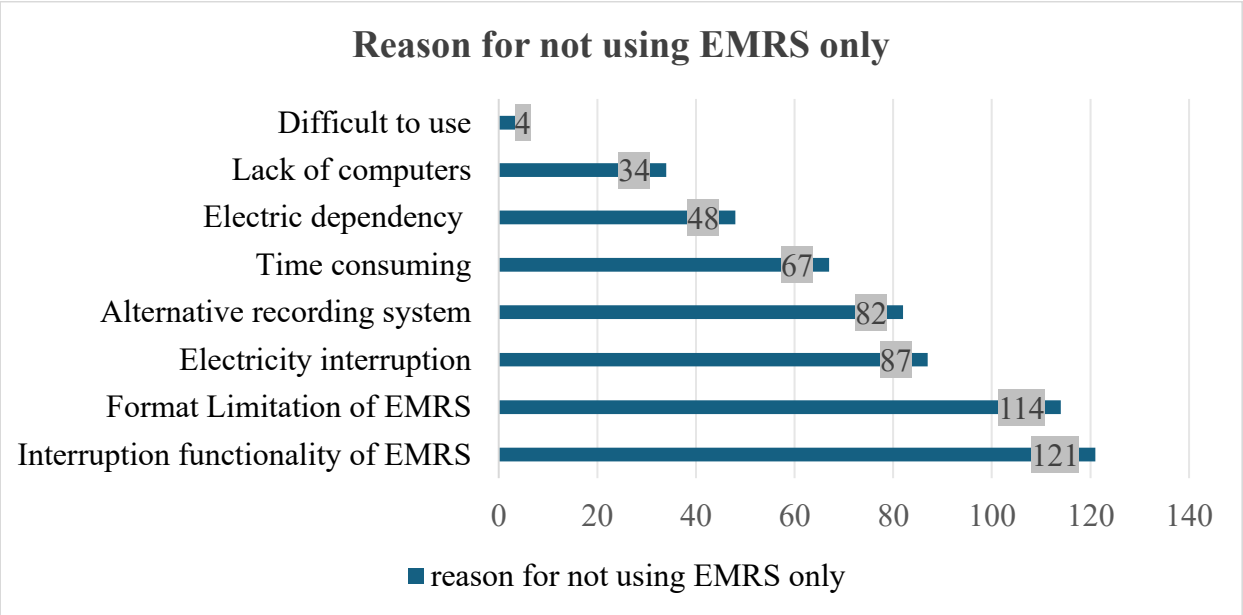


Figure 6:EMRS utilization

Two hundred twenty-seven participants (55.4%) utilized both EMRS and paper-based in combination. 121(29.5%) stated Interruption in EMRS functionality as a primary reason for not using EMRS only. (Figure 7)

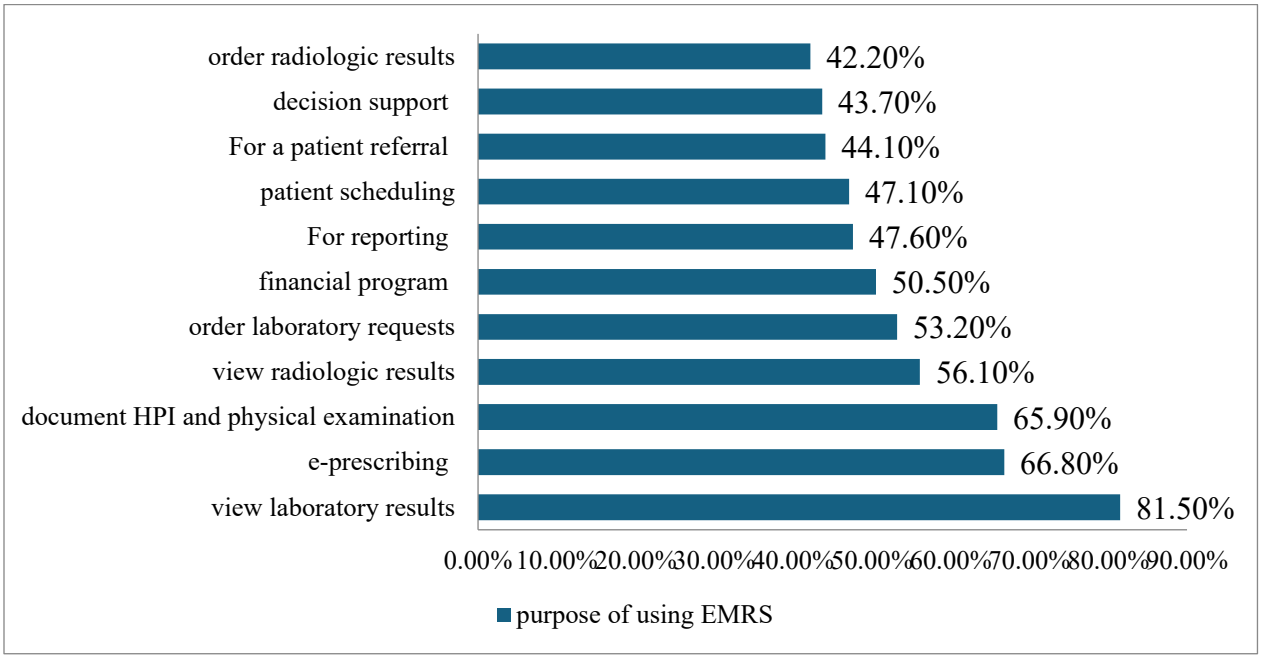


* Multiple responses were allowed

Figure 7:Frequency of reason for not using EMRS exclusively

A substantial majority, 371 (90.5%) participants reported using a desktop computer to access EMRS. During an electricity outage, approximately 145 (35%) of the participants reported using generators as an alternative power source and 108 (26.3%) used paper-based recording until the light came.

A significant majority, 334 participants (81.6%), utilized EMRS to access laboratory test results. (Figure 8)



*Multiple responses were allowed

Figure 8: Purpose of using EMRS

5.5 Technology Related Factors

A total of 362 (88.3%) used a computer at home or at work pace at least three months prior to the study period. (Figure 9)

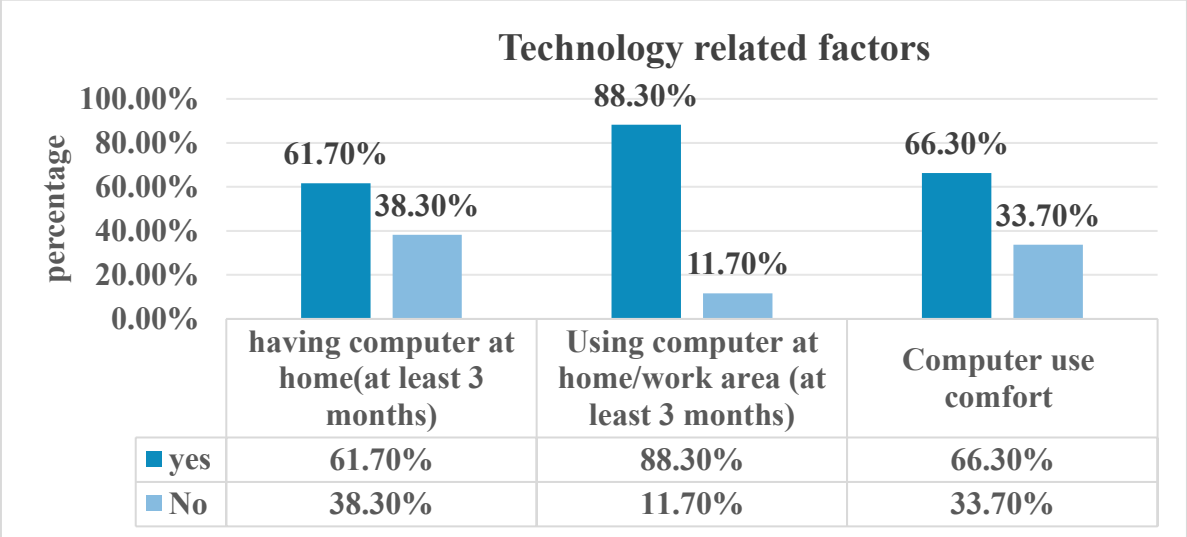


Figure 9:Technology related characteristics of respondents

5.6 Institutional Related Factors

A significant majority, 353 (86.1%) respondents indicated the presence of IT personnel providing technical support for EMRS. Only 55 (13.4%) respondents reported the presence of regular meetings on EMRS in their department. (Table 3)

Table 2:Institution related characteristics of respondents

Variable	Category	Frequency (410)	Percentage (100%)
departmental enforcement	Yes	223	54.4
	No	187	45.6
EMRS training	Yes	204	49.7
	No	206	50.3
Meeting on EMRS	Yes	55	13.4
	No	355	86.6
EMRS guideline access	Yes	119	29
	No	291	71
IT personnel to assist with EMRS	Yes	353	86.1
	No	57	13.9

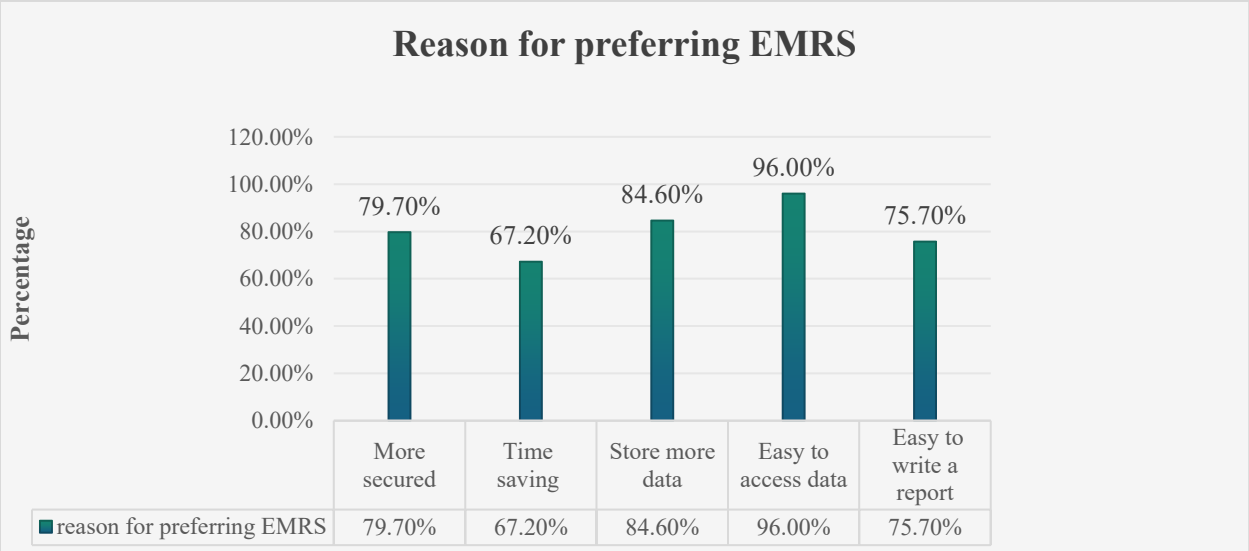
5.7 Personal Factors

A total of 272 (66.3%) respondents preferred using EMRS and 296 (72.2%) were comfortable utilizing it. (Table 3)

Table 3: Personal characteristics of respondents

Variable	Category	Frequency (410)	Percentage (100%)
Preferred documentation system	EMRS	272	66.3
	Paper-based	28	6.8
	both/ in combination	110	26.8
Comfortable in using EMRS	Yes	296	72.2
	No	114	27.8
	No	76	18.5

From a total of 272 respondents who preferred using EMRS, 261 (96%) reported easy access to patient data as a reason for their preference. (Figure 10)



*Multiple responses were allowed

Figure 10: Reason for preferring EMRS

5.8 Bivariate and Multivariable Analysis

After examining the statistical significance of independent variables using bivariate logistic regression, comfort in using computer, comfort in using EMRS, sex, duration of EMRS use, departmental enforcement to use EMRS, Regular meetings on EMRS, training, access to EMRS guidelines, assigned IT personnel, working part-time in private hospitals, knowledge, and attitude were found to be statistically significant ($p < 0.25$). Thus, these variables were further analyzed using multi-variable logistic regression. (Table 4)

Table 4: Summary of bivariate and multivariable logistic regression analyses.

Variables	EMRS utilization		COR (95%CI)	AOR (95%CI)	P value
	Yes N (%)	No N (%)			
Sex					
Male	176(43%)	17(4%)	1.857(1.304,3.454)	2.254(1.127,4.509)	0.022*
Female	184(45%)	33(8%)	1		
Duration of use					
> 2 years	184(44.9%)	12(2.9%)	3.311(1.675,6.542)	3.320(1.594,6.916)	0.001*
< 2 years	176(42.9%)	38(9.3%)	1		
Part-time job					
Yes	132(32.2%)	9(9.2%)	2.637(1.258,5.665)	2.308(1.029,5.180)	0.042*
No	228(55.6%)	41(10%)	1		
Regular meetings on EMRS					
Yes	51(12.4%)	4(1%)	1.898(1.321,5.499)	1.440(0.451,4.596)	0.538
No	309(75.4%)	46(11.2%)	1		

Training					
Yes	183(44.6%)	21(5.1%)	1.428(1.085,2597)	1.316(0.660,2.624)	0.436
No	177(43.2%)	29(7.1%)	1		
Guideline access					
Yes	101(24.6%)	18(4.4%)	0.693(0.251,0.849)	0.689(0.339,1.399)	0.689
No	259(63.2%)	32(7.8%)	1		
Department enforcement					
Yes	202(49.3%)	21(5.1%)	1.766(1.570,3214)	2.051(1.041,4.040)	0.038*
No	158(38.5%)	29(7.1%)	1		
Attitude					
Favorable attitude	276(67.3%)	33(8.1%)	1.693(1.498,3.191)	2.212(1.046,4.678)	0.008*
Unfavorable attitude	84(20.5%)	17(4.1%)	1		
Knowledge					
Good knowledge	273(66.6%)	27(6.6%)	2.673(1.458,4.901)	3.255(1.046,10.131)	0.042*
Poor knowledge	87(21.2%)	23(5.6%)	1	1	
Comfortable using computer					
Yes	235(57.3%)	37(9.0%)	0.661(0.203,0.941)	0.806(0.375,1.732)	0.580
No	125(30.5%)	13(3.2%)	1	1	
Comfortable using EMRS					
Yes	266(64.9%)	30(7.3%)	1.887(1.022,3.481)	0.843(0.261,2.724)	0.776

No	94(22.9%)	20(4.9%)	1	1	
Availability of IT personnel					
Yes	317(77.3%)	36(8.8%)	2.867(1.431,5.743)	1.862(0.828,4.186)	0.133
No	43(10.5%)	14(3.4%)	1		

* P value <0.05, N (%) frequency(percentage)

Male health professionals were found to be two times more likely to utilize EMRS than female respondents. (AOR= 2.254; 95%CI= 1.127, 4.509). Respondents who had been using EMRS for more than two years were three times more likely to utilize EMRS compared to those who had been using them for less than two years (AOR = 3.320; 95% CI=1.594, 6.916). Participants who had part-time jobs at private hospitals were found to be about twice as likely to utilize EMRS compared to those who did not work in private hospitals. This association was statistically significant, with (AOR=2.308; 95% CI = 1.029, 5.180).

Respondents who were working in departments with departmental enforcement to use EMRS were twice as likely to utilize EMRS as those in departments without enforcement (AOR [95%CI] 2.051[1.041, 4.040]). Regarding attitude, participants who had a favorable attitude toward EMRS were approximately twice as likely to utilize EMRS compared to those with an unfavorable attitude (AOR=2.212; 95%CI=1.046, 4.678). Respondents who had good knowledge about EMRS were about three times more likely to utilize them compared to those with poor knowledge (AOR=3.255; 95%CI= 1.046, 10.131).

6. DISCUSSION

EMRS is crucial for better healthcare services. This study assessed the knowledge, attitude, and utilization of EMRS and associated factors among health professionals at TASH. The utilization of EMRS was associated with male sex, > 2 years experience using EMRS, having a part -time job in private hospitals, departmental enforcement, favorable attitude and good knowledge.

The overall utilization of EMRS was 88% with a 95% CI [84.6%-90.9%]. It was found to be higher than the utilization among health professionals: 26.61% in Dire Dawa (17), 67.7% in Eastern Ethiopia (18), and 68.5% in selected health facilities in Addis Ababa (8). This difference may be due to time variations, particularly the ongoing digitization of healthcare services in Ethiopia, with TASH currently transitioning to a fully EMRS.

In this study 73.2% of participants had good knowledge of EMRS with 95% CI [69%-77%]. This finding is consistent with 71.5 % in Plateau State Nigeria (21). And higher than 64.75% in Gamo(24), and 64.2% in Sidama (25). This may be due to Addis Ababa as a city has advanced infrastructure, greater access to digital technologies, and training programs, which are less prevalent in more distant towns. This finding is lower than 76.8% in Amhara region in private hospitals(14) and 99.5% in Lagos Nigeria (22). The variation for the first one may be due to the study was done in private hospitals; Private institutions may prioritize EMRS adoption to enhance efficiency and competitiveness. The difference for the second one is attributed to the difference in study population; the study was conducted among physicians only.

According to the finding of this study 75.4% had favorable attitudes toward EMRS with 95% CI [70.9%-79.3%]. This finding is higher than 57.2% in Gamo (24), and 59.6% in Gondar(23) . This variation may be due to the previous study done before exposure to the EMRS, while this study was done after the exposure to the system. The finding of this study is lower than 100% in Lagos Nigeria(30). The difference may be attributed to professional groups studied, and the differing levels of healthcare infrastructure. The Nigerian study focused exclusively on physicians.

The study found out that being male had positive association with EMRS utilization (AOR=2.254; 95%CI= 1.127-4.509). This finding is supported by study done in Northwest Ethiopia Male health professionals were two times more likely to be ready for EMRS than female health professionals (AOR = 1.87, 95% CI = 1.26-2.78) (36). The variation in utilization

of EMRS in this study between males and females may be due to difference in digital gap. Despite improvements in internet and ICT usage around the world, the digital gap still disproportionately affects women, especially in developing countries (37).

In 2022, there were 259 million more male Internet users worldwide, with 69% of males using the Internet compared to 63% of women. With only 19% of women using the Internet in 2020 compared to 86% in developed countries, this gap is even more noticeable in low-income countries (38). Difference in digital gap may resulted this variation.

In the current study, respondents who used EMRS for >2 years were three times more likely to utilize EMRS than those who used it for < 2 years (AOR=3.320; 95% CI= 1.594-6.916). Prolonged exposure to EMRS may allow health professionals to become more skillful at using the system. Another study found that participants became more capable with the EMR and more time-efficient in their task completion as their expertise and familiarity with the system grew (39). Another study also pointed out that after utilization of EMRS for seven months, EMRS usage time by study participants reduced by 18%, saving approximately 23 hours despite an increase in patient encounters. Daily EMR use declined from seven to five hours(40). Thus, a prolonged exposure to EMRS boosts confidence and familiarity with the system which increases EMRS utilization.

In this study participants who had favorable attitude were two times more likely to utilize EMRS than those who had negative attitude (AOR=2.212; 95%CI =1.046-4.678). This finding is consistence with Eastern Ethiopia, (AOR=1.72; 95%CI= 1.09-2.70) (18), Addis Ababa (AOR=2.3; 95%CI= 1.2-4.5) (8),and Harar (AOR=2.48; 95%CI =1.53- 4.00)(26).According to technology acceptance model, perceived ease of use and perceived usefulness predict the acceptance of information technology(41). And theory of planned behavior also posits that an individual's behavior is directly influenced by their behavioral intention, and attitude is one of core components of behavioral intention (42). Therefore, healthcare professionals who perceive the systems as beneficial and user-friendly are more likely to utilize EMRS.

In this study, respondents who were working in departments with departmental enforcement to use EMRS were twice as likely to utilize EMRS as those in departments without enforcement (AOR=2.051;95%CI=1.041-4.040). This finding emphasizes organizational support and

empowerment as critical factors in the successful utilization of EMRS. The finding of this study supported by a study done in Iran based on the unified theory of acceptance and use of technology, showed that there is a significant relationship between facilitating conditions and Behavioral Intention(43). Organizational support and policies establish clear responsibilities and accountability for health professionals. This clarity reduces ambiguity, enabling employees to align their actions with organizational goals.

In this study, respondents who had good knowledge about EMRS were three times more likely to utilize EMRS than those who had poor knowledge (AOR=3.255; 95%CI=1.046- 10.131). The finding is consistent with studies done in Eastern Ethiopia (18), and Harar region (26) with (AOR=2.44; 95%CI=1.53, 3.90) and (AOR=1.71; 95%CI=1.07-2.72]) respectively. Healthcare professionals who possess a good understanding and knowledge about EMRS are more likely to appreciate and recognize its benefits and gain more confidence in their utilization, which leads to increased integration into daily clinical practices.

Participants who had part-time jobs at private hospitals were two times more likely to utilize EMRS than those without part-time jobs time in private hospitals (AOR=2.308; 95%CI= 1.029-5.180). This finding is supported by finding in Addis Abba private health facilities were more likely to utilize EMRS than public health facilities (AOR [95%CI] 7.17 [3.189-16.16])(8). Several factors may result in this disparity, Part-time roles in private hospitals may provide additional opportunities for EMRS training and skill development. Most private hospitals had EMRS based recording system, with better infrastructure, consistent power supply, and more robust technical support, facilitating smoother EMRS implementation and usage. In addition, private hospitals often prioritize efficiency and patient satisfaction, which may incentivize the utilization of EMRS to simplify processes and improve service delivery. Healthcare professionals working in these settings are thus more exposed to EMRS, leading to increased familiarity and utilization.

7. STRENGTHS AND LIMITATIONS OF THE STUDY

This study included proportionally all types of health professionals in TASH. The study was a single center, focused on one institution. The nature of the cross-sectional study by itself doesn't assess the cause-and-effect relationship of basic factors that affect the utilization of EMR. Recalling bias may have affected participants' responses. Data relied on self-reports, which may have resulted in under reporting or over reporting.

8. CONCLUSION

This study revealed a high level of EMRS utilization among health professionals at TASH. Most professionals are actively engaged with the system. Knowledge levels about EMRS were also found to be relatively strong, suggesting that many professionals are well-informed about its functions and benefits. Additionally, a majority of participants held a favorable attitude toward the EMRS.

The findings indicate that utilization of EMRS associated with Male gender, prior experience with EMRS, part-time work in private hospitals, supportive departmental enforcement, a favorable attitude, and good knowledge. The positive association of these factors with EMRS utilization established individual and institutional characteristics as pillars for the effective use of EMRS.

The high levels of knowledge and attitude observed among health professionals are promising for future increment of the EMRS. The association of utilization with structural and experiential factors such as departmental enforcement and prior exposure indicates the need for sustained institutional support, training, and policy reinforcement.

9. RECOMMENDATIONS

For FMOH: - Develop and Enforce National EMRS Utilization Guidelines

Create standardized national policies that mandate EMRS use in all public health facilities. Include clear protocols, roles, and enforcement mechanisms at institutional and departmental levels.

For TASH: -Implement Departmental EMRS Enforcement and Provide Continuous Training and Capacity Building

Establish and enforce department-level EMRS usage protocols. Appoint EMRS coordinators in each department to monitor compliance, offer support, and ensure proper documentation is consistently done through the system. Organize regular EMRS training for all health professionals, for it increase exposure and familiarity to the system, emphasis should be placed on those with limited prior exposure and females.

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11.ANNEXES

Dear respondents

This questionnaire is prepared in the title of “utilization and associated factors of electronic medical record systems among health professionals at Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia 2025.” In need of the partial fulfillment of the Master of Emergency and critical care nursing. The questionnaire contains both closed and open-ended questions. And you are kindly requested to provide genuine answers to the questions. The information you provide is confidential and is used only for the purpose of this study. If you have any questions, don ‘t hesitate to ask.

Your cooperation and participation until the completion of the questionnaire is very necessary for the successful completion of the assessment. Therefore, I ask for your genuine willingness. However, you have the right to turn down if you are not voluntary to participate.

Are you voluntary? Yes No

Thank you in advance for your cooperation

Data collectors sign: _____

INSTRUCTION

This form should be completed for each client in front of them.

Contact person name and address

Mishame Elias 0939822051

Email: -mishoelijah@gmail.com

Consent Form

In signing this document, I am giving my consent to participate in the study entitled “utilization and associated factors of electronic medical record systems among health professionals at Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia 2025.”

I have been informed that the purpose of this research project. I have been informed that my participation in this study is willing full and voluntary; even I have the right to refuse or interrupt the during filling the administered questioners; and my name will not be mentioned on the questionnaire.

I, undersigned, have understood the purpose of the study & fully agree and am willing to participate in the study.

Signature of the participant---------- Date ----------

Thank you.

Part 1: Socio-Demographic questions			
No	Questions	Response	Remark
1.	Age in years	…….	
2.	Sex	1. Male 2. Female	
3.	Profession	1. Physician 2. Nurse 3. Laboratory 4. Pharmacy 5. Radiography 6. Anesthetist 7. Physiotherapy 8. Health officer	
4.	Work experience	……	
5.	Level of educational status	1. 1st degree (BSc) 2. 2nd degree (MSc, MPH and Specialty) 3. > 2nd degree(Sub specialty, PHD) 4. < 1st degree	
6.	Do you Work part time at private hospitals	1. Yes 2. No	
7.	Do you have a computer at	1. Yes	

	home? (at least 3 months)	2. No	
8.	Do you use a computer at home or work area?	1. Yes 2. No	

Part 2 :- knowledge related questions			
No	Questions	Response	Remark
1.	EMRS allows to	1. Order laboratory 2. Obtain test result 3. Reviewing patient problems 4. Use e-prescription 5. Enter daily notes 6. to Follow patient result 7. Report Patient status	(select all applied)
2.	EMRS Has disease code	1. Yes 2. No 3. Don't know	
3.	EMRS Has data backup system	1. Yes 2. No 3. Don't know	
4.	EMRS allow private passwords.	1. Yes 2. No 3. Don't know	
5.	EMRS functions on local network only?	1. Yes 2. No 3. Don't know	
6.	EMRS have role-based access control	1. Yes 2. No 3. Don't know	
7.	EMRS ensures secure access to patient information	1. Yes 2. No 3. Don't know	
8.	EMRS allows users to search for patients using a specific identification number	1. Yes 2. No 3. Don't know	

Attitude related questions			
s.no	Questions	Response	Remark
1.	EMRS Increase practice productivity	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
2.	EMRS improves the quality of care	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
3.	EMRS enhances transparency in healthcare processes	1. I strongly agree 2. Agree 3. Neutral 4. Disagree Strongly disagree	
4.	The benefits of usingEMRS outweigh the costs.	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
5.	EMRS enhances the confidentiality of patient information.	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	

6.	EMRS increases patient acceptance	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
7.	EMRS decreases the waiting time of patients	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
8.	EMRS is simple than Paper-based record	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
9.	EMRS improves interaction with colleagues	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
10.	EMRS decrease the likelihood of errors.	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
11.	EMRS should be implemented at large	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	

12.	EMRS helps me to accomplish tasks fast.	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
13.	EMRS decrease the health professional's workload	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
14.	EMRS helps in making clinical decision	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	
15.	EMRSs Helps in clinical research	1. I strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree	

Part 2: EMRS utilization related questions			
1.	Do you have EMRS access	1. Yes 2. No	
2.	Which system do you use for patient records	1. EMRS only 2. Paper based only 3. both	If EMRS only skip the next

			question
3.	Why aren't you usingEMRS only?	1. Interruption functionality ofEMRS 2. Electricity interruption 3. Lack of computers 4. Presence of Alternative/paper recording 5. Time consuming 6. Difficult to use 7. Some formats are not available in currentEMRSS 8. Needs computer skill 9. Electric dependency 10. Others, specify----------	Select all applied
4.	Which one do you prefer?	1. EMRS 2. Paper based 3. both/ in combination	If no skip the next question
5.	Why do you preferEMRS	1. More secured 2. Time saving 3. Store more data 4. Easy to access data 5. Easy to write a report 6. Others, specify…….	
6.	For how long you useEMRS?	----------	
7.	Is there departmental enforcement to	1. Yes 2. No	

	useEMRS?		
8.	Are you comfortable usingEMRS?	1. Yes 2. No	
9.	Did you takeEMRS training?	1. Yes 2. No	
10.	Are there regular meetings onEMRS	1. Yes 2. No	
11.	Do you haveEMRS guideline access in your unit?	1. Yes 2. No 3. Don't know	
12.	WhichEMRS software/website do you use?	1. BriskEMRS systems 2. SMART-care/Tena-care 3. IWKET care 4. Don't know	
13.	What is the main device you use for Electronic Medical Record?	1. Laptop computer 2. Desktop 3. Tablet 4. Mobile	
14.	How do you manage patient data during the absence of electric power?	1. Using generator 2. Using paper based 3. Leaving it unlit light comes 4. Using paper temporarily and recording toEMRS	
15.	Is there IT personnel to assist with EMRS technical issues	1. Yes 2. No 3. Don't know	

16.	How often do you useEMRS that is relevant to your specific professional roles?	1. Whenever I'm with the patient /daily 2. Most of the time 3. Rarely 4. I don't use	
17.	For what purpose do you useEMRS	1. To document HPI and physical examination findings 2. To order laboratory requests 3. To view laboratory results 4. To order radiologic results 5. To view radiologic results 6. For e-prescribing (drug prescription and dispensing) 7. For patient scheduling 8. For a financial program or billing system 9. For a patient referral to other departments 10. For reporting to HMIS, facility manager or others 11. Decision support features to guide patient management (e.g. drug allergy notifications and warnings)?	
18.	Overall, are you satisfied with the electronic health record system?	1. Yes 2. No	