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PRACTICE OF EARLY PHYSICAL REHABILITATION AND ASSOCIATED
FACTORS AMONG HEALTH CARE PROFESSIONALS IN MEKELLE CITY
PUBLIC HOSPITALS, TIGRAI, NORTHERN ETHIOPIA, 2025

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Advisor's Approval Sheet

This is to certify that the thesis entitled "PRACTICE OF EARLY PHYSICAL REHABILITATION AND ASSOCIATED FACTORS AMONG HEALTH CARE PROFESSIONALS IN MEKELLE CITY PUBLIC HOSPITALS, TIGRAI, NORTHERN ETHIOPIA, 2025" is submitted in partial fulfillment of the requirements for the master's degree in physiotherapy to the Graduate Program of College of health sciences Mekelle University and has been carried out by Haftom Tesfay ID No: CHS/MPR/003/13 under my supervision. Therefore, I recommend that the student has fulfilled the requirements and hence hereby can submit the thesis to the Department.

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DECLARATION

I hereby declare that all information on this thesis entitled “PRACTICE OF EARLY PHYSICAL REHABILITATION AND ASSOCIATED FACTORS AMONG HEALTH CARE PROFESSIONALS IN MEKELLE CITY PUBLIC HOSPITALS, TIGRAI, NORTHERN ETHIOPIA, 2025” is my own work and has been obtained and presented according to the academic rules and ethical conduct under the guidance and supervision of Mr. Melaku Hailu, (Asst. Professor in Physiotherapy), Mr. G/Medhin Haile (MSc in Physiotherapy) and Mr. Abera Berhe (MSc BHI). I also declare that, as required by these rules and conduct, I have fully cited and referenced all materials and results that are not original of this work.

Haftom Tesfay
(Principal Investigator)

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List of Abbreviations

ACSH – Ayder Comprehensive Specialized Hospital

AOR – Adjusted Odds Ratio

CI – Confidence Interval

COR – Crude Odds Ratio

EPR – Early Physical Rehabilitation

GPs – General Practitioners

HCPs – Health Care Professionals

ICU – Intensive Care Unit

IPD – In Patient Diagnosis

IRB – Institutional Review Board

LOS – Length of Stay

MDT – Multi Disciplinary Team

MSc – Masters of Science

WHO – World Health Organization

NGOs – Non – Governmental Organization

ODK – Open Data Kit

OPD – Out Patient Diagnosis

PTs – Physical Therapists

PMR – Physical Medicine and Rehabilitation

PNI – Peripheral Nerve Injury

SPSS – Statistical Package for Social Science

VIF – Variable Inflation Factor

Abstract

Background: Rehabilitation is an essential part of universal health coverage along with promotion of good health, prevention of disease/impairment, treatment and palliative care. Early physical rehabilitation (EPR) is crucial for promoting functional recovery, improving patient outcomes, preventing complications, and minimizing long-term disability following injury, illness, or surgery. Despite its critical role in the healthcare service, there remains a significant gap in healthcare providers' practices concerning early physical rehabilitation, along with persistent misconceptions that hinder its effective implementation.

Objective: To assess the practice of early physical rehabilitation service and associated factors among health care professionals in Mekelle city PUBLIC HOSPITALS, Tigray, Northern Ethiopia, 2025.

Methods and materials: An institutional based cross sectional study design was used from August 2024 to May 2025. By employing simple random sampling technique 371 health care professionals were participated, and data were collected through structured interview. The data was entered, cleaned and analyzed by SPSS version 27. Bivariate and multivariate logistic regression analyses were done to evaluate the associated factors. And variables with 95% CI, P value of less than 0.05 in the multivariate analysis were considered significant.

Result: Out of 371 respondents, the majority of them (65.2%) were females. The practice of EPR service among health care professionals was 27.8% with 95% CI: (23.3% -32.65%). Factors like: Female: (OR = 0.42, 95% CI; 0.217 - 0.814), Nurses: (OR = 0.08, 95% CI; 0.02 - 0.367), work experience ≤ 5 years: (OR = 0.35, 95% CI; 0.148 - 0.848), knowledge: (OR = 0.40, 95% CI: 0.213 - 0.743), and attitude: (OR = 0.20, 95% CI: 0.072 - 0.567) were significantly associated with practice of early physical rehabilitation.

Conclusion and recommendations: this study revealed that, the practice of EPR among health care professionals is below average (27.8%). Factors significantly associated with practice of EPR are these with sufficient knowledge, positive attitude, being male, being medical doctor, and being senior in experience. It is recommended that policymakers, health bureaus, and other organizations organize and improve the practice of EPR in healthcare through capacity building, continuous professional development, and strong support for the health service systems to guide evidence-based and effective interventions.

Key words: Health Care Professionals, Public hospitals, Early Physical Rehabilitation, Practice

1. Introduction

1.1 Background

The practice of physical rehabilitation is becoming increasingly multipart. Rapid changes in the health care system are placing increased pressure on rehabilitation professionals for effective and efficient management of patients amidst high patient turnover. Patient diagnosis, prediction of prognosis, intervention, and patient-family education must be done quickly and accurately. The integration of examination, evaluation, diagnosis, prognosis, and intervention are advocated as part of routine patient/client management[1, 2].

Rehabilitation is an important part of universal health coverage and is a key strategy for achieving Sustainable Development Goal 3 – “Ensure healthy lives and promote well-being for all at all ages”[3]. Effective physical rehabilitation can reduce complications, enhance mobility, and speed up recovery. Early physical rehabilitation is a key for improving recovery outcomes in patients following surgery, injury, or illness. Historically, there has been a shift towards a more holistic approach to health care, which includes early intervention and rehabilitation to prevent complications and promote faster recovery[3]. Professional legislation, the medical professionals, politicians, and policy makers are perceived to act as both barriers to and facilitators of access for physical rehabilitation[4].

The rehabilitation process should begin as soon as possible following an injury and should integrate seamlessly with other therapeutic interventions. It may also commence prior to or immediately after surgery when the injury necessitates surgical treatment [5]. The initial phase of Rehabilitation typically lasts around 4-6 days[6].

1.2 Statement of the problem

In many parts of the world, the increasing need for rehabilitation is going largely unmet. More than half of people living in some low- and middle-income countries who require rehabilitation services do not receive rehabilitation services. This may be due to multiple factors like lack of prioritization, funding, policies, and plans for rehabilitation at a national level, lack of available rehabilitation services outside urban areas, long waiting times, lack of trained rehabilitation professionals, misconceptions about rehabilitation (Rehabilitation is only for people with disabilities or long-term physical impairments, Rehabilitation is a luxury health service that is available only for those who can afford it and rehabilitation is an optional service to try when other interventions to prevent or cure a health condition fail)[3].

Despite the known benefits of early physical rehabilitation, many health care professionals expressed concerns about the risks of early rehabilitation. It may be necessary to conduct a risk-benefit analysis of early mobilization and provide appropriate practice guidelines to promote implementation. This could further enhance the health care professionals' confidence in practicing early mobilization and improve health care[7]

There is a concerning lack of comprehensive understanding among health care providers regarding knowledge, attitude and practices related to early physical rehabilitation. Variations in the implementation of early physical rehabilitation among health professionals often stem from these disparities. Many health care providers may not fully recognize the benefits of early physical rehabilitation, leading to delays in patients consultation and sub optimal recovery outcomes. This gap in knowledge, attitude and practice can be from inadequate training, limited resources and lack of awareness of current best practices[8, 9].

As a community of in a post war recovery time, the need for early physical rehabilitation tends to become in high demand.[10-13] But to best of my knowledge there is a dearth of studies done on the assessment of practices of early physical rehabilitation on health service system (mainly health care professionals) at country level. There is scarce of documented standards and guidelines in health care facilities and institutions in Tigray. This gap in paucity of studies and rehabilitation protocols can lead to clients delayed admission and /or no admission to physical rehabilitation as well. In addition to this, the main intent of this study is to assess the practices of early physical rehabilitation and associated factors of health care professionals in Mekelle city PUBLIC HOSPITALS, Tigray, Northern Ethiopia.

1.3. Significance of the study

As a physiotherapy professional, I have observed that many clients are referred to physical rehabilitation services near the time of their discharge, often after complications have arisen and with delays. This late intervention increases the risk of residual impairments or disabilities. And as we are in post-war, early physical rehabilitation service is crucial to address these issues for many more clients with curable impairments using EPR promptly. Therefore, it is important to evaluate current practices of early physical rehabilitation on health care professionals and identify factors affecting their ability to deliver timely care.

This study can help inform strategies to improve the quality and consistency of early physical rehabilitation practices across health care settings, ultimately benefiting patients and health care system as whole. And it can help identify possible barriers to effective rehabilitation and inform strategies to improve patient care through better education and training and also highlight areas where interventions may needed to improve practice and patient outcomes.

This study investigate early physical rehabilitation practices and associated factors among health care professionals in Mekelle city public hospitals, Tigray, Northern Ethiopia, and make stakeholders such as Federal ministry of health, regional health bureau, health professionals especially physiotherapists (PTs), Non-Governmental Organizations (NGOs), and policy makers to focus on it. It also helps as a baseline for policy implementation, guideline and/or standard preparation and for further studies.

2. Literature review

2.1 Overview of early physical rehabilitation

In the global setup, the practice of early physical rehabilitation includes managing of client conditions using physical therapy, occupational therapy and physical exercises aimed at preserving or restoring physical functions[14]. However, the definition of ‘early’ physical rehabilitation is somewhat ambiguous, The Australian clinical guidelines for stroke recommend that rehabilitation should commence the first day after stroke[15], whereas European guidelines simply recommend rehabilitation should commence ‘early’ [16]and the United States guidelines recommend that rehabilitation should commence as early as possible, once medical stability has been attained [17].

The current data regarding the optimal timing for the commencement of physical rehabilitation after stroke according to some evidences is that, physical rehabilitation should commence within 2- 3 days of stroke has significantly associated with discharge home within 6 weeks of stroke[18, 19] and reducing disability by 15.3% ($P < 0.001$) [20]. and resulted in better ambulation and activity of daily living (ADL) function, rated via non-validated outcome measurement tools[7, 21].

A multi-ICU, coordinated implementation of an early rehabilitation program starts as early as the first or second day of admission to intensive care unit (ICU) and involves timely progression through a series of simple activities to full ambulation[22]. Early physical rehabilitation in ICU was found to improve physical and cognitive functions, decrease mechanical ventilation time, reduced ICU and hospital length of stay and decrease overall health care costs[23-25].

The World Health Organization emergency medical team standards and recommendations for rehabilitation launched in 2016, signaled significant progress in recognizing the role that physical rehabilitation professionals play and the necessity of early intervention[26]. Any emergency medical teams (formerly known as ‘foreign medical teams’)[27] are required to include physical rehabilitation professionals and equipment in their team, while there are also standards for teams that will just be delivering physical rehabilitation[28].

According the study done on early physical rehabilitation following surgical fixation of a femoral shaft fracture, Phase I of the femur fracture rehabilitation protocol began on postoperative day 1 in the hospital and lasted 4 weeks[29, 30]. If physiotherapy management to be effective, the choice of treatment and timing of intervention should best influence the physiological and biomechanical properties of the injured tissue during every phases of healing[31].

In the study conducted in Edinburgh in a randomized, prospective, clinical trial to compare four treatment regimens for 102 partial tears of the lateral ligaments of the ankle. Early physiotherapy (within 48 hours of injury) that included ice and elevation was found to be superior to no treatment at all, use of a Tubigrip bandage or immobilization in plaster-of-paris[32]. The study done to compare the results of early physiotherapy with delayed physiotherapy in the management of 98 patients with grade I or II sprains to the lateral ligament of the ankle. The patients treated with cryotherapy, protected weight bearing (within 24 hours of injury), followed by early physiotherapy (within 48 hours), had a faster resolution of symptoms and return to normal functional activities[31, 33].

Deconditioning and weakness commonly occur in traumatically injured patients and those treated in ICUs [34-36]. Among traumatically injured patients, early PT is associated with decreased odds of complications, shorter hospital length of stay (H-LOS) and ICU-LOS, and a favorable discharge disposition to home[36].

2.2 Practice of early physical rehabilitation

In the cross sectional study conducted in Latin America on the application of early physical therapy in ICU has shown passive mobilization (85.0%), manual and instrumental techniques for drainage of mucus secretion (81.8%), and positioning techniques (81%). The professionals who most participated in the rehabilitation process in ICUs were physiotherapists (98.7%), intensive care physicians (61.6%), nurses (56.1%), and respiratory therapists (43.8%)[37]

In the study done in Europe, the practice of EPR in pediatric ICUs shows the prevalence of provided mobility activities was 39% (179/456) (95% CI 34.7–43.9%) Nurses were involved in 72% (924/1283) of the early physical rehabilitation practice events; in the remaining 28%, occupational therapists, physicians, family members, or other professionals were involved[38].

General practitioners referred adults with first-time onset of low back pain (LBP) to physical therapy within 3 to 4 days and showed that it was feasible, receiving strong support from the general practitioners based on favorable feedback from patients[39].

In the study done on physicians working in Saudi Arabia on the awareness, perception and beliefs about physiotherapy shows, 11% of them referred patients to physiotherapy departments regularly, while 14% referred patients occasionally[40].

2.3 Associated factors of early physical rehabilitation practice

2.3.1 Socio-demographic factors

In the studies done on early physical rehabilitation practices of healthcare professionals, the following several influential factors were determined. Male participants achieved significantly higher attitude scores compared to their female counterparts. (Male healthcare professionals may have more exposure to certain aspects of PNI care during their training or professional development, leading to positive attitudes towards managing these conditions).[7, 41, 42]

According to the study done in Ethiopian tertiary hospitals, there is fair knowledge and attitude towards early mobilization in ICU. Factors associated with better knowledge were being a physiotherapist, having a total work experience >5 years (AOR = 4.6, 95% CI = 1.7–12.1), having an intensive care unit work experience >5 years (AOR = 2.8, 95% CI = 1.1–6.8)[25, 43].

2.3.2 Knowledge and attitudinal factors

The difference in knowledge scores between health care providers that might stem from discrepancy in their education training. Healthcare professionals actively involved in the treatment or care of patients exhibited higher practice scores, higher professional titles can reflect enhanced technical experience and academic achievements.[44]

Another study was conducted in the management of peripheral nerve injury and the healthcare professionals exhibited moderate knowledge and positive attitudes. Those involved in the treatment or care of PNI have significantly higher practice[7].

In the study done on the management of acute respiratory failure in ICU and although the knowledge levels differ across professions, the overall knowledge of health professionals on early mobilization in ICU shows, (16.8%) had poor knowledge (CI = 12.8–21.4), (57.9%) had fair knowledge (CI = 52.6–63.5) and (25.3%) had good knowledge (CI = 20.4–30.6)[25]

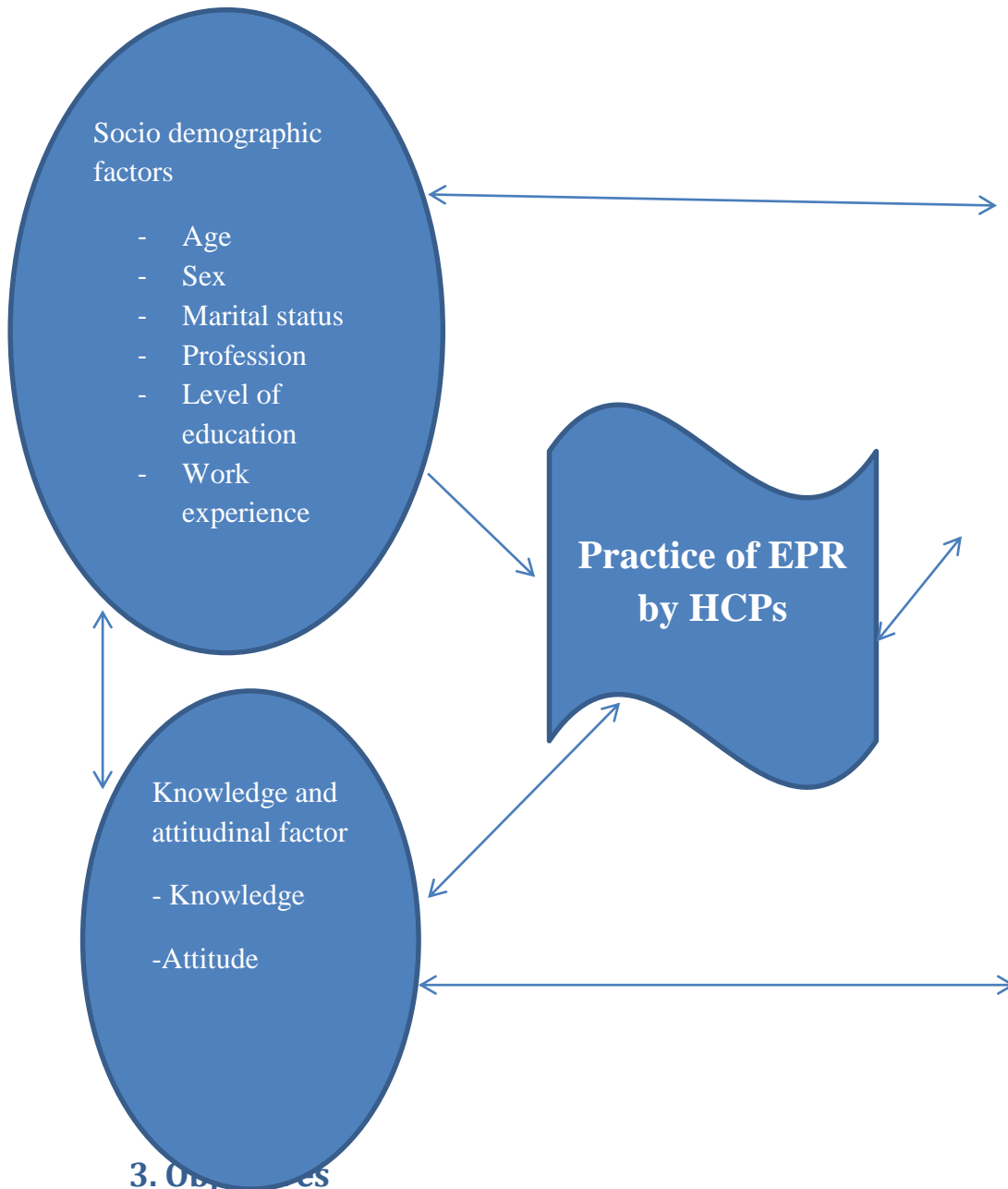
General practitioners (GPs) in Shiraz, Iran, are not equipped with adequate knowledge of rehabilitation and have a moderate attitude toward collaborating with a rehabilitation team. GPs rarely use physical medicine and rehabilitation (PMR) consultations for their patients' complications[45].

2.3.3 Profession related factors

Factors including institutional issues (e.g. staffing, consultation/referral requirements for rehabilitation clinicians), clinician issues (e.g., training and inter-professional communication),

lack of leadership and lack of regular re-evaluation of progress in overcoming barriers previous in-service training, and access of guidelines, attending early mobilization courses and practices, and presence of mobilization advocators[44, 46].

2.4 conceptual framework



3. Objectives
3.1 General Objective Figure 1: conceptual frame work showing associated factors for health care professionals practice of EPR [7,26,48,49,50,51,52,53]

To assess the practice of early physical rehabilitation and associated factors among health care professionals in Mekelle city public hospitals, Tigray, Northern Ethiopia, 2025.

3.2 specific objectives

- To determine the practice of early physical rehabilitation services among healthcare professionals in Mekelle City public hospitals, 2025.
- To identify factors associated with practice of early physical rehabilitation among health care professionals in Mekelle City public hospitals, 2025.

4. Methods and materials

4.1 study area and period

The study was conducted in Mekelle city public health care facilities, Tigray, northern Ethiopia. The study was conducted from Feb - May 2025.

Mekelle is a municipal zone and capital of the Tigray Region of Ethiopia. It is located around 780 kilometers (480 mi) north of the Ethiopian capital Addis Ababa, with an elevation of 2,254 metres (7,395 ft) above sea level. Administratively, Mekelle is considered a Special Zone, which is

divided into seven sub-cities. Namely: Hawelti, Adi-Haki, Kedamay Weyane, Hadnet, Ayder, Semien and Quiha. Within each local administration there are kebeles and ketenas. Mekelle is the economic, cultural, and political hub of northern Ethiopia. Mekelle's 2024 population is estimated at 611,574. It has grown by 24,167 in the last year[47]. According to Tigray regional health bureau, Mekelle has 1 tertiary hospital, 1 rehabilitation center, 12 public health centers and 4 public hospitals providing promotive, preventive, curative, and rehabilitative services.

4.2. Study design

Institutional based cross sectional study design was conducted from Feb - May 2025 at Mekelle public health care facilities.

4.3 Population

4.3.1 Source of population

The source of population for this study was all health care providers involved in patient care across all health care facilities in Mekelle city, Tigray, northern Ethiopia.

4.3.2 Study population

The study population was health care providers actively working in governmental health care facilities in Mekelle city, Tigray, northern Ethiopia.

4.4 Inclusion /exclusion criteria

4.4.1 Inclusion criteria

- Health care professionals who are permanently employee of the public health care facilities.
- Health care professionals who have at least six months of experience in health care services.
- Health care professionals who are actively involved in patient care services during the study period.

4.4.2 Exclusion criteria

- Health care professionals who are working on administrative positions only.
- Health care professionals who are working out of clinical attachment (like community public health services) were excluded from this study.

4.5 Sample size determination

The sample size for this particular study was calculated using formula for a single population proportion considering the following assumptions: A 95% confidence level, margin of error (0.05) and assuming prevalence of 50% ($p = 0.5$). These parameters were substituted in the following single population proportion Formula;

$$N = \frac{\left(\frac{z^{\alpha}}{2}\right)^2 \times p(1-p)}{d^2}$$

$$\frac{(1.96)^2 \times 0.5(1-0.5)^2}{0.05^2} = 384$$

Where, n = Sample size

p = Proportion of people

d = margin of error (0.05)

z = confidence level 95% (i.e. 1.96)

$$n = (1.96)^2 \times 0.5(1-0.5) / (0.05)^2$$

$$n = 1.96^2 \times 0.5 \times 0.5 / 0.05^2$$

$$= 3.8416 \times 0.25 / 0.0025$$

$$= 0.9604 / 0.0025 = 384.16 = 384$$

Since the source population was less than 10,000, (I.e. 2816) the final sample size was calculated by using population correction formula: $N_f = \frac{n}{1 + (n/N)}$

$$1 + (n/N).$$

Where:

N_f = corrected sample size

n = sample size without correction (previously calculated as 384)

N = population size (2816)

$$N_f = 337.92 \sim 338$$

Non-response rate in this study was considered to be 10% (34 participants)

The Sample size for the second objective was calculated using the study variable which is work experience. Based on this sample size was calculated using Epi info -7 assuming CI = 95% and Power = 80%.

Ratio (unexposed –exposed) = 0.24

%out come in unexposed group =19.28%

%outcome in exposed group = 80.72 %

Based on the above information sample the sample was 70

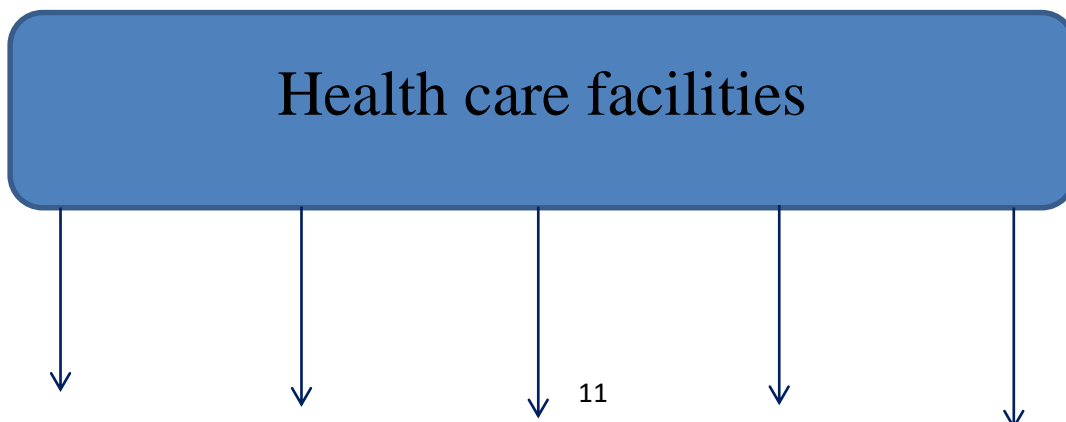
By adding 10 % non-response =7

Total sample size = 70 + 7 = 77. This sample size is too small and it cannot generalize the entire population. So the larger number was used to conduct.

Therefore, the final sample size of this study was 372.

4.6 sampling technique and procedure

Out of 5 public health care facilities (1 tertiary hospital, 2 General Hospitals and 2 primary hospitals), Proportional allocation was used to select study participants from all centers. Based on that allocation, 372 health care professionals was included using a simple random sampling technique to assess the practice and associated factors of early physical rehabilitation among health care professionals.



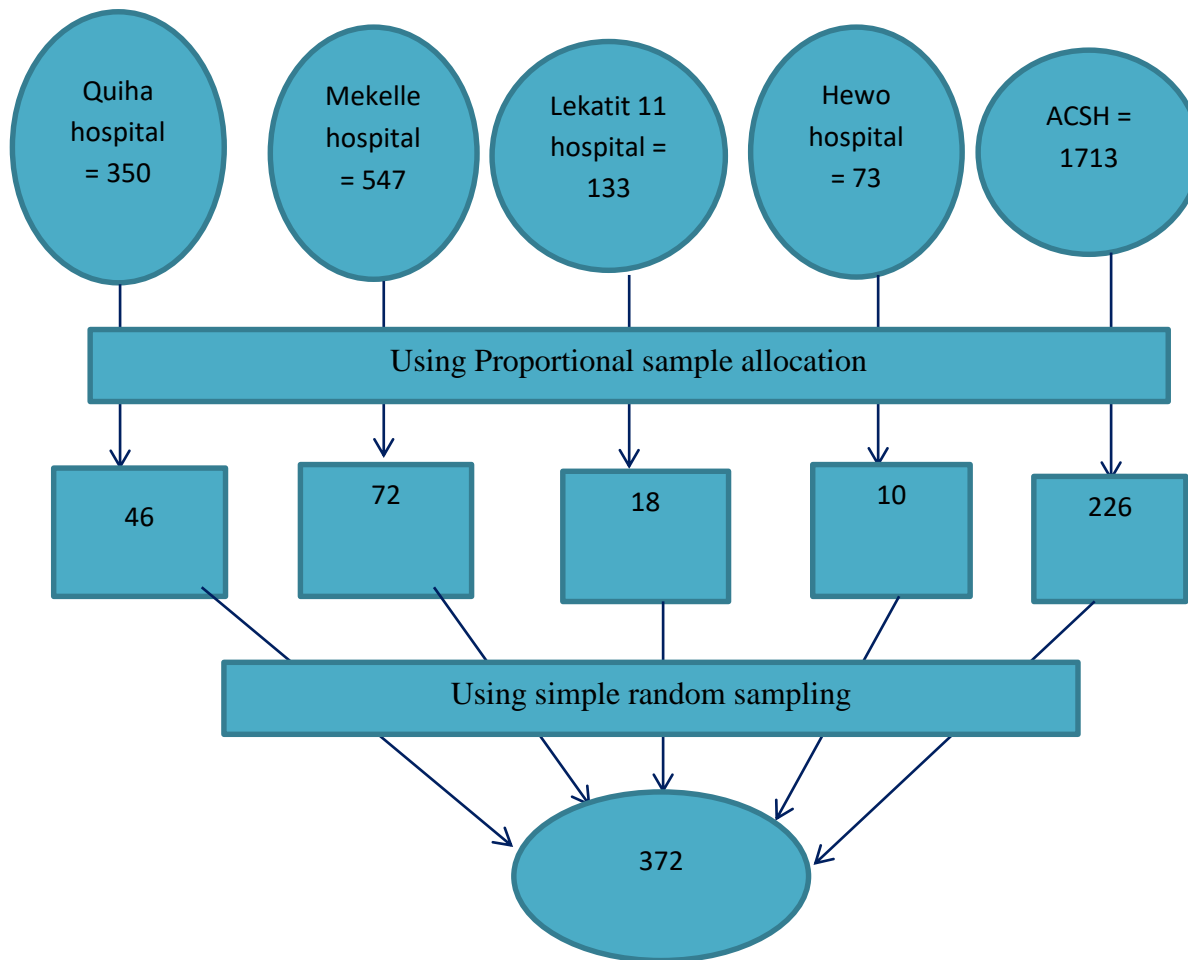


Figure 2: schematic presentation of sampling procedure for practice of EPR and associated factors among health care professionals in health care facilities Mekelle, Tigray, Ethiopia 2025

4.7 Data collection method and instrument

Data was collected by using a structured, pretested and interviewer-administered questionnaire using open data kit (ODK) which was prepared in English language and it has developed from several validated studies to measure quantifiable information, The questionnaire included four parts; the 1st part included questions about socio demographic variables, the 2nd knowledge and attitude related variables, the 3rd practice of EPR variables and the 4th was professional related variables.

4.8 Data quality assurance

One day of extensive training was given for one supervisor (BSc in physiotherapy) and data collectors (five undergraduate physiotherapy students) by experts (major advisor and principal investigator). The content of the training was on detailed content and context of the questionnaire for practice of EPR, consent & confidentiality, data collection techniques, ODK skill adaptation, and interview approaches for HCP on service based data collection. The questionnaire was pretested in 5% (19 health professionals) working in Wukro hospital. Inputs from pretest were incorporated on the questionnaire in context and content modification. In the process of data collection, the daily activities of the data collectors and the quality of the data were checked by the supervisor and principal investigator each day. The collected data was checked for completeness, clarity, consistency, accuracy and understandability by the principal investigator and timely feedback was provided for the data collectors on a daily basis for completed questionnaires.

4.9 operational definition

Early physical rehabilitation: refers to the initiation or commencement of rehabilitation treatment service within average time of ≤ 7 days after injury, surgery, and or medical condition occurs [21, 39, 48].

Knowledge of early physical rehabilitation practice: the understanding and awareness that health care providers have on the principles and benefits of early physical rehabilitation services. And it was categorized using Bloom's cut-off point. For this study it was categorized into two meaning full categories: sufficient and insufficient knowledge. An early physical rehabilitation practice knowledge domain was considered sufficient knowledge if the score was between 60 and 100% and insufficient knowledge if the score was $< 60\%$..[25, 49]

Attitude towards early physical rehabilitation practice: the health care providers' beliefs, feelings, and opinions towards practice of early physical rehabilitation. And it was categorized using Bloom's cut-off point. For this study it was categorized into two meaning full categories: scores between 60% and 100% was considered as positive attitude, and scores below 60% was considered as negative attitude towards practice of EPR.[25, 49]

Practice of Early physical rehabilitation: the actual implementation of early physical rehabilitation service by health care professionals in their daily clinical work. In this study practice was considered if a HCP have linked/referred a client(s) to an early physical rehabilitation service

or have applied the service to the client by him/herself within that specific time up to the seventh day of admission.

If a HCP linked a client to EPR service or applied the service by him/herself on the client and if a HCP did both of them at a time, he/she is practicing early physical rehabilitation.

Health care professionals: qualified and licensed individuals that deliver medical services, treatments, and care to patients to promote health, prevent illness, and manage medical conditions working in health care facilities.

Public hospitals: public hospitals that are described as per the classification of federal ministry of health service standard (as primary hospital, general hospital, and referral hospital) which is mandatory to have physical rehabilitation services[50].

4.10 Data processing and analysis

The data was exported to SPSS version 27 from ODK using conversion process for analysis. Cross tabulation was done, descriptive statistics were computed, and data was presented using percentages, texts, tables, and figures. Binary logistic regression analysis was used to identify the association between the independent variables and early physical rehabilitation practices. The strength and direction of the statistical association was measured by adjusted odd ratio (AOR) at 95 % confidence interval. All variables that were significant at a p-value <0.25 in the bi-variate binary logistic regression analysis were entered to multivariate binary logistic regression to adjust for possible confounders, and when the p-value < 0.05, it was declared as statistically significant. Multi-collinearity test was checked using the variance inflation factor (VIF) and variables a mean VIF < 10 were included in the final analysis. The Hosmer and Lemeshow goodness of fit test was used to test the model fitness and it was fitted (0.71). And with 83 % of prediction power; suggesting a high level of accuracy in identifying factors associated with early physical rehabilitation practice.

4.11 Study variables

A) Dependent variables: practice of early physical rehabilitation.

B) Independent variable

Socio demographic factors

Age

Gender

Marital status

Profession

Level of education

Work experience

Knowledge and attitudinal factor

Attitude

Knowledge

Profession related factors

Trainings on EPR

Level of health facility

Working unit

MDT

Having standard practice guidelines and protocols

Having EPR service in the health care facility

4.12 Ethical considerations

Ethical approval was obtained from institutional review board (IRB) of college of health sciences, Mekelle University and official permission was obtained from each hospital administration. Participants were informed about the purpose, risk, and benefit of the study. Oral informed consent was obtained from each study participant before the beginning of the interview. Participation was voluntary, the questionnaire's anonymity and confidentiality of the information they provided were maintained. The participants were also informed to withdraw from the interview at any time if they felt uncomfortable with the process they spent their time responding to the questionnaire. Otherwise, there is no possible additional risk associated with participating in the study. Confidentiality was maintained at each step of data collection and processing.

4.13 Dissemination and utilization of result

The study results will be presented and submitted to the department of physiotherapy, school of medicine college of Health Sciences. Copy documents of the findings will also be sent to Tigray regional health bureau and the public hospitals. Non-governmental organizations can use the data to create educational and strategic plans on practices and associated factors of health care providers

towards early physical rehabilitation. Publications in peer-reviewed national or international journals and presentations at professional, local, national, and international meetings will be attended.

5. Results

5.1 Socio-demographic characteristics of the respondents

A total of 371 health care professionals were participated in this study giving 99.73% of response rates. Nearly half of participants (49.3 %) were between 41-50 years and females comprised the majority (65.2%) in sex respondents. Most participants were nurses (64.2%) by profession, and the majority (77.4%) of them had a bachelor's degree of educational status. More than half of them (52%) have 6- 10 years of experience in the field of expertise as a health care professional. Details of health care professionals socio-demographic characteristics are presented in (Table 1).

Table -1 Socio-demographic factors of health care professionals on EPR practice

Variables	Freq. (N)	Percentage (%)
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Age			
	<30	136	36.7 %
	30 - 40	18	4.9 %
	41 - 50	183	49.3 %
	>=51	34	9.2 %
Sex			
	Female	242	65.2 %
	Male	129	34.8 %
Marital Status			
	Married	249	67.1 %
	Unmarried	122	32.9 %
Profession			
	MD	73	19.6 %
	Nurse	238	64.2 %
	Others (Midwifery, PT, Clinical pharmacy, dental medicine, psychiatry and public health)	60	16.2 %
Level of Education			
	Diploma & bachelor Degree	287	77.4 %
	Masters & above	84	22.6 %
Work Experience			
	<=5years	84	22.6 %
	6-10 years	193	52 %
	>10years	94	25.3 %

5.2 profession related characteristics of health care professionals

About 60.6% of respondents worked in referral hospitals, and a large majority of respondents (88.7%) reported working without standard guidelines that includes EPR service in their health care facilities. Among the total participant gross majority of them (88.67%) are working in healthcare facilities which didn't have early physical rehabilitation service. A vast majority (94.9%) of participants didn't receive any training related to early physical rehabilitation service. further details for professional related characteristics participants are presented in (Table 2).

Table -2 Profession related characteristics of health care professionals

Variables	Frequency (N)	Percent (%)
Type of health care facility	28	7.54%

Primary Hospital	118	31.80%
General Hospital	225	60.64%
Referral Hospital		
Working unit		
IPD	224	60.37%
OPD/ EOPD	147	39.62%
Having physical rehabilitation services in the health care facility		
Yes	42	11.32%
No	329	88.67%
Having EPR service practice Guideline		
Yes	42	11.32%
No	329	88.67%
Having MDT approach that includes EPR service		
Yes	100	26.95%
No	271	73.04%
Any training on EPR service		
Yes	19	5.13%
No	352	94.87%

5.3 Knowledge and attitudes of HCP towards EPR practice

Below half (45.6%) of the healthcare professionals have sufficient knowledge on EPR service and the majority (76.8%) of health care professionals have positive attitude toward EPR.

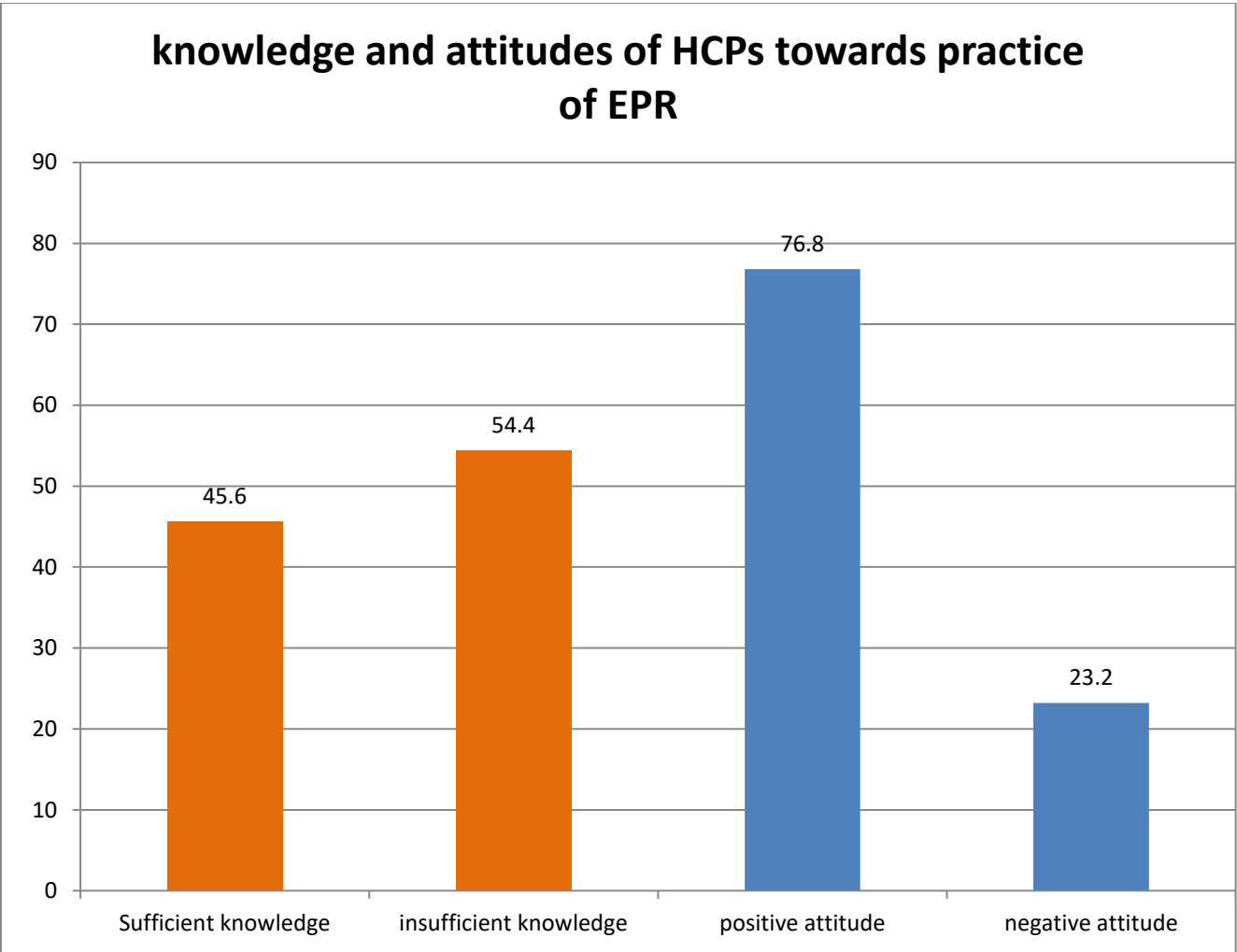


Figure 3: knowledge and attitudes of health care professionals towards practice of EPR

Practice of EPR by health care professionals

The practice of EPR by health care professionals was 27.8% (95 % CI; 23.3 % -32.65%). About 61.1% of participants who practice EPR were males in comparison with their female counterparts. And the majorities (55.3 %) of health care professionals who practice EPR were medical doctors. Most (57.2%) of the HCPs practicing early physical rehabilitation were located in referral hospital.

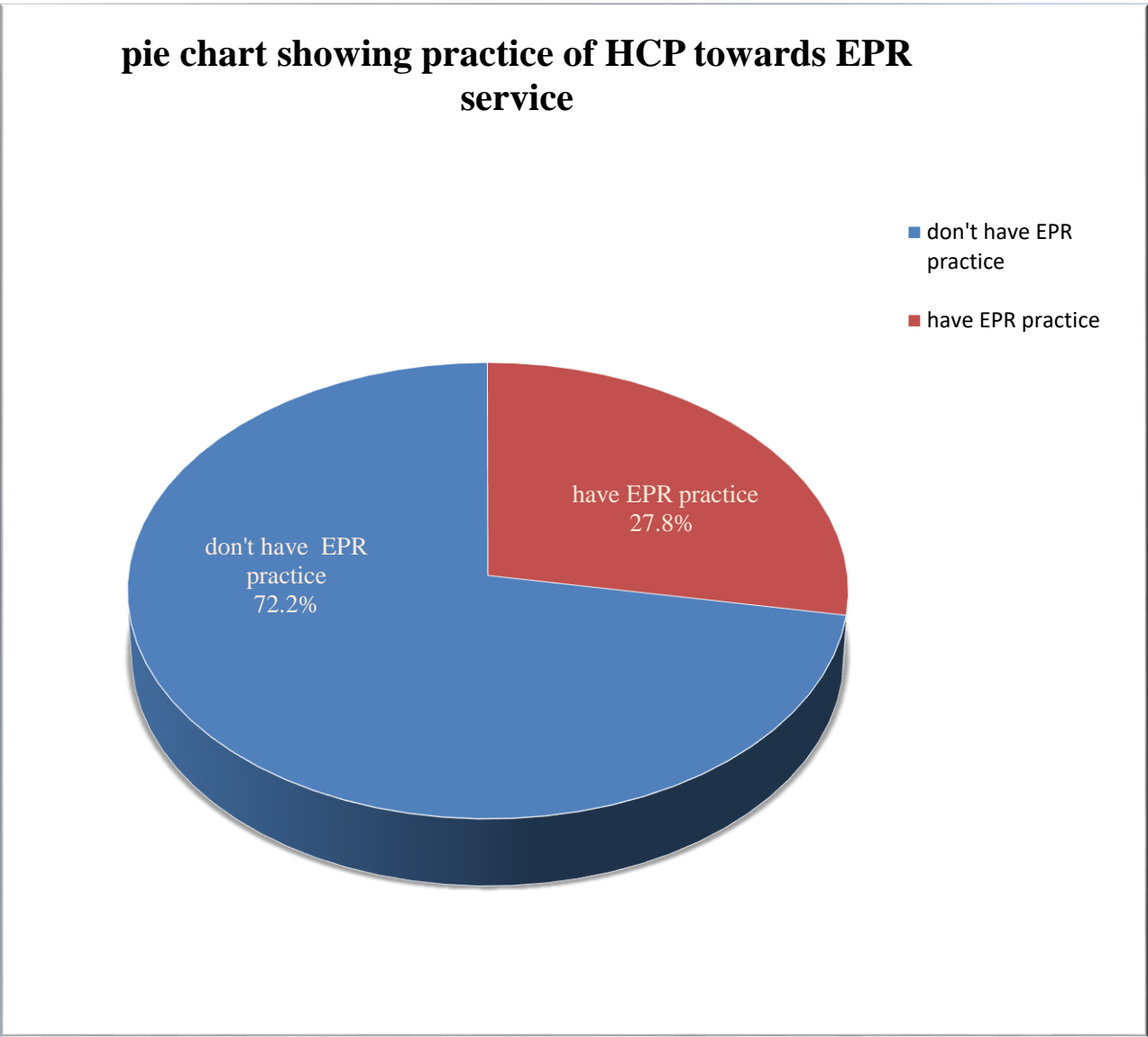


Figure 4: practice of EPR by health care professionals

5.4 Factors associated with practice EPR among health care professionals

In the bivariate logistic regression analysis; age: (95% CI 8; 1.856 - 34.49), sex: (95% CI 0.207; 0.128 - 0.337). Marital status: (95% CI 1.715; 1.07 - 2.747), profession: (95 % CI 0.048; 0.025 - 0.094), educational level: (95% CI 0.07; 0.04 - 0.125), work experience: (95% CI 0.288; 0.147 - 0.566), knowledge: (95% CI 0.202; 0.122 - 0.333) and attitude: (95% CI 0.174; 0.078 - 0.393) were significantly associated with practice of early physical rehabilitation at a P- value of < 0.25.

In multivariate analysis (at P – value <0.05) knowledge: (OR = 0.39, 95 % CI; 0.213 - 0.743), attitude: (OR = 0.20, 95% CI; 0.072 - 0.567), sex: (OR = 0.42, 95% CI; 0.217 - 0.814), Profession: (OR = 0.086, 95 % CI; 0.02 - 0.367) and work experience: (OR = 0.355, 95% CI; 0.148 - 0.848) were significantly associated with early physical rehabilitation practice.

Health care professional who have insufficient knowledge were 61% less likely to practice early physical rehabilitation compared with those who have sufficient knowledge with (AOR = 0.398, 95% CI: 0.213 - 0.743) and p-value 0.004. In terms of attitude; HCPs with poor attitude toward early physical rehabilitation were 80% less likely to practice early physical rehabilitation effectively, at (AOR = 0.20, 95% CI; 0.072 - 0.567) and p-value 0.002.

Female health care professionals were (58%) less likely to engage in early physical rehabilitation (EPR) practices compared to males (AOR = 0.42, 95% CI; 0.217–0.814) p = 0.01. Nurses had a markedly lower likelihood (91%) of practicing EPR compared to medical doctors (AOR = 0.086, 95% CI; 0.02–0.367) p = 0.001. while other professionals (midwifery, physical therapy, clinical pharmacy, dental medicine, psychiatry, and public health) were also 90% less likely to engage in EPR practices (AOR = 0.10, 95% CI; 0.024–0.455) p = 0.003. Additionally, health care professionals with five or fewer years of work experience were 65% less likely to practice EPR than those with over ten years of experience (AOR = 0.35, 95% CI; 0.148–0.848) p = 0.02.

Table -3 Factors associated with EPR practice of health care professionals in Mekelle, Tigray, Ethiopia 2025.

Variables	EPR practice		COR(95% CI)	AOR(95% CI)	P - value
	Yes (%)	No (%)			

[©]Reference group, ^{**} Significant at P-value ≤ 0.05, COR: Crude odds ratio, AOR: Adjusted odds ratio CI: Confidence interval

Age	38(27.9%)	98(72.1%)	6.20(1.41-27.16)	2.16(0.31-14.88)	0.43
<30					
30 - 40	2(11.1%)	16(88.9%)	2(0.25- 15.53)	2.20(0.23-20.43)	0.48
41 - 50	61(33.3%)	122(66.7%)	8 (1.85 - 34.49)	2.96(0.48-18.14)	0.24
>=51 [*]	2(5.9%)	32(94.1%)		-	
Sex					
Female	40(16.5%)	202(83.5%)	0.20(0.12-0.33)	0.42(0.21-0.81)	0.01**
Male [*]	63(48.8%)	66(51.2%)		-	
Marital Status					
Married [*]	60(24.1%)	189(75.9%)		-	
Unmarried	43(35.2%)	79(64.8%)	1.71(1.07 - 2.74)	0.64(0.3-1.37)	0.25
Profession					
MD [*]	57(78.1%)	16(21.9%)		-	
Nurse	35(14.7%)	203(85.3%)	0.06(0.02 - 0.14)	0.08(0.02-.36)	0.00**
Others	11(18.3%)	49(81.7%)	0.048(0.02-0.09)	0.10(0.02-0.45)	0.00**
Level of Education					
BSc Degree & Diploma	43(15%)	244(85%)	0.07(0.04-0.12)	0.639(0.18-2.23)	0.48
MSc Degree & above [*]	60(74.1%)	24(28.6%)		-	
Work Experience					
<=5years	26(31%)	58(69%)	0.88(0.50-1.53)	0.35(0.14-0.84)	0.02
6-10 years	65(37.7%)	128(66.3%)	0.28(0.14-0.56)	0.386(0.13-1.10)	0.077
>10years [*]	12(12.8%)	82(87.2%)		-	
Knowledge					
Yes [*]	75(44.4%)	94(55.6%)		-	
No	28(13.9%)	174(86.1%)	0.20(0.12-0.33)	0.39(0.21-0.74)	0.00**
Attitude					
Yes [*]	96(33.7%)	189(66.3%)		-	
No	7(8.1%)	79(91.9%)	0.17(0.07-0.39)	0.20(0.07-0.56)	0.00**

6. Discussion

The aim of this study was to assess early physical rehabilitation practices and associated factors among health care professionals in Mekelle city public hospitals, Tigray, Northern Ethiopia. This study incorporated various independent variables. Accordingly, knowledge, attitude, sex, profession and experience were factors significantly associated with early physical rehabilitation practice.

The practice of early physical rehabilitation service among health care professionals in Mekelle city public hospitals, Tigray, northern Ethiopia was 27.8% (95 % CI; 23.3 % -32.65%). This was in line with the study done in china in pediatric intensive care unit among Chinese medical staff with total practice scores of 26.54 ± 6.454 [51, 52].

however, the result of this study is lower practice compared to study done in china[7], Nigeria[53]. This discrepancy could be due to variations in factors of practice and sample size differences.

The study results showed a significant relationship between the knowledge of health care professionals and early physical rehabilitation practice. Individuals with insufficient knowledge were 60% less likely to practice early physical rehabilitation effectively compared to those with those who have sufficient knowledge, with (AOR = 0.398, 95% CI; 0.213 - 0.743) at p-value 0.004. This finding is supported by the study conducted in India[54], Nigeria[53], and in the study done in Seattle [55].

HCPs with poor attitude toward EPR were 80% less likely to practice of EPR effectively at (AOR = 0.20, 95% CI; 0.072, 0.567) with p-value 0.002. this result is consistent with the study done in china and Saudi Arabia[7, 9].

Additionally this study also revealed that, female professionals were (58%) less likely to engage in practice of EPR compared to males (AOR = 0.42; 95% CI: 0.217–0.814) p = 0.01. the findings in our study is consistent with study conducted in China [56]. Differences in training, education, and professional experiences between male and female healthcare professionals may play a role in shaping their practice. For example, male healthcare professionals may have more exposure to certain aspects of EPR practice during their work or professional development, leading to positive attitudes towards EPR practice.

In terms of profession of the respondents, nurses with 91% lower likelihood of practicing EPR compared to medical doctors at AOR 95% CI 0.086; (0.02, 0.367) and p-value of 0.001. and other health professionals (midwifery, physical therapy, clinical pharmacy, dental medicine, psychiatry, and public health) were also 90% less likely to engage in EPR practices AOR 95% CI = 0.104; (0.024–0.455) p = 0.003 respectively. This result was also supported by the study done in Namibia[57] and study conducted in united states[58]. The difference in EPR practice scores between physicians and nurses might stem from discrepancy in their education training. In China,

physicians usually undergo comprehensive medical training, while nurses might not receive the same depth of training in specific areas[59]. Another possible reason could be, healthcare professionals involved in the treatment or care of patients are professionals with higher practice scores.

In addition, this study revealed that health care professionals with ≤ 5 years of experience were 65% less likely to practice EPR than those with >10 years of experience at (AOR = 0.35, 95% CI; 0.148, 0.848) p-value of 0.02. This is in line with a study reported from china[42]. and tertiary hospitals of Melbourne, Australia[60]. This result can indicate more professional experiences can reflect enhanced practice of EPR service.

6.1 Strength and limitation of the study

This study has revealed a timely health rehabilitation service practice on HCPs with maximum rate of 99.73% and higher (83%) predictive power. However, this study have also number of limitations like inability to establish causality between practice and the factors for HCPs, interviewer based report without practical observation.

7. Conclusion

This study showed the practice of EPR and associated factors among healthcare professionals in Mekelle city public hospitals, Tigray, Northern Ethiopia. The findings revealed that EPR practice remains 27.8% of professionals regularly implementing it. Key factors that are significantly associated with EPR practice included knowledge, attitude, sex, profession, and years of experience. Specifically, healthcare professionals with better knowledge, positive attitudes, greater experience, males and those in the medical profession were more likely to engage in EPR. These results underscore the need for capacity-building initiatives (like continuous professional development (CPD) and MDT) with proper guidelines to improve the practices of EPR by HCPs.

8. Recommendations

We recommend for health care professionals, health policymakers, regional health bureau, governmental and non-governmental organizations and researchers to prioritize; EPR in healthcare planning, building the capacity of healthcare professionals, promoting EPR practices to enhance patient recovery, and strengthening support systems for individuals benefiting from EPR services, routine monitoring and intervention programs to address physical and functional challenges among patients, expansion and ensuring access to early rehabilitation services, and to conduct future longitudinal studies and interventional guidelines using this study as a baseline reference.

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Annexes

Annex I: Information Sheet

Title of the project: “practice of early physical rehabilitation and associated factors among health care professionals in Mekelle city public hospitals, Tigray, Northern Ethiopia, 2025.”

Principal Investigator: Haftom Tesfay

Advisor: Mr. Melaku Hailu (Asst. professor in Physiotherapy), Mr. G/Medhin Haile (MSc in Physiotherapy) and Mr. Abera Berhe (MSc in BHI)

Department: Department of Physiotherapy. College of health sciences school of medicine

Introduction:

This information sheet is prepared to explain the research project that you are asked to join by the investigator, who is currently undertaking an MSc in physiotherapy at College of Health Science School of medicine, Mekelle University. The investigator is on his final year of post graduate class and this study is as part his partial fulfillment of MSc program and the assessment required to

submit a research proposal on an area of interest within his professional scope of practice conducting Assessment on early physical rehabilitation practices and associated factors among health care professionals in Mekelle city public hospitals, Tigray, Northern Ethiopia, 2024. It is primarily designed to find practice of early physical rehabilitation and identify possible factors that contribute to practices of early physical rehabilitation among health care professionals.

The research team includes: one Physiotherapy MSc student (the principal investigator) and three advisors (two from Physiotherapy department and one from public health department).

Name of investigator: Haftom Tesfay

Name of advisors: Mr. melaku hailu (Asst. professor in Physiotherapy), Mr. G/Medhin Haile (MSc in Physiotherapy) and Mr. Abera Berhe (MSc BHI)

Procedure: This study will be conducted using institutional based cross-sectional study design

Duration: The time that needs to complete questionnaire is 10 to 15 minute.

Risk and Confidentiality: There is no risk for anyone who participates in the study. Name, title and work place will not be record anywhere. If you have question or concerns or for information you can call! Please speak to principal investigator – Haftom Tesfay (MSc student)

Mobile number: +251960723312

E-mail: tesfayhaftom6@gmail.com

I will be very grateful if you are going to participating in this study.

You have a full right not to participate in this study.

Are you voluntary to participate? If Yes, continue

If No stop

Annex II: Informed Consent Form

Title of the project: “practice of early physical rehabilitation and associated factors among health care professionals in Mekelle city public hospitals, Tigray, Northern Ethiopia, 2025”

I have been well aware of that this research undertaking is for a partial fulfillment of MSc degree in Physiotherapy which is fully supported and coordinated by the Department of physiotherapy, College of health sciences and the designate principal investigator is Haftom Tesfay. I have been fully informed in the language I understand about the research project objectives are to understand the practice of early physical rehabilitation and associated factors of health care providers in Mekelle city health care facilities, Tigray, northern Ethiopia.

I have been informed that all the information I shall provide to the interviewer will be kept confidential. I understood that the research has no any risk and no composition, and I understood I am assigned to participate randomly. I also knew that I have the right to withhold information, skip questions to answer or to withdraw from the study any time I have acquainted nobody will

impose me to explain the reason of withdrawal. It is also enlighten there would have no effect at all in my health benefit or other administrative effect that I get from the refuge.

I have assured that the right to ask information that is not clear about the research before and or during the research work and to contact Mekelle University, College of health sciences IRB.

Principal Investigator's Name: Haftom Tesfay

Tel: +251960723312

Advisor's Name and Address: Mr. Melaku Hailu (Asst. Professor in Physiotherapy), Mr G/Medhin Haile (MSc PT) and Mr Abera Berhe (MSc BHI)

I have read this form, or it has been read to me in the language I comprehend and understood the condition stated above, therefore, I am willing and confirm my participation.

Agreed to participate in the study: Yes No

Annex III: Assurance of Principal Investigator

I, the undersigned, agree to accept all responsibilities for the scientific and ethical conduct of the research project and for the provision of required progress reports as per the terms and conditions of the requirements of the department. I will provide timely progress report to my advisors and seek the necessary advice and approval from my major advisor in the course of the research.

Name of the Masters student: Haftom Tesfay

Signature: _____

Date: _____

Approval of the Major Advisor

Name of the primary Supervisor: Mr. Melaku Hailu (Asst. Professor in Physiotherapy)

Signature: _____

Date: _____

Annex IV: Questionnaire

Questionnaire for Assessing Practice of early physical rehabilitation and associated factors among Health Care professionals in Mekelle City public hospitals, Tigray, Northern Ethiopia, 2024.

Section A: Socio-Demographic Information

A1.	Questionnaire ID	_____
A2.	What is your age?	_____
A3.	What is your Gender?	1, Male 2, Female
A4.	What is your marital status?	1, single 2, married 3, divorced 4, widowed 5, other (specify)
A5.	What is your Level of Education?	1, Diploma 2, Bachelor's degree

		3, Master's degree 4, Doctorate degree 5, Other (please specify)
A6.	What is your profession?	1, Physician 2, Nurse 3, Physical Therapist 4, Midwifery 5, Other (please specify)
A7.	How many years of work experience do you have as a HCP?	_____

Section B: Questions on knowledge of HCP towards EPR practices/services

B1.	Do you heard about of early physical rehabilitation services?	1, Yes 2, No → skip to B3
B2	If yes for Q B1 , what is your source of information?	1, Media 2, Friend 3, Reading 4, training/course 5, Other (specify)
B3.	In your knowledge, after how many days early physical rehabilitation is recommended for a client after admission or surgery?	_____
B4.	How important do you think early physical rehabilitation for fast recovery of patients?	1, Not at all 2, Slightly important 3, moderately important 4, very important 5, extremely important
B5.	How important do you think early physical rehabilitation to improve functional outcomes of patients?	1, Not at all 2, Slightly important 3, moderately important 4, very important 5, extremely important

B6.	How important do you think early physical rehabilitation in reducing risk of complications?	1, Not at all 2, Slightly important 3, moderately important 4, very important 5, extremely important
B7.	How important do you think evidence-based practice guidelines for early physical rehabilitation?	1, Not at all 2, Slightly important 3, moderately important 4, very important 5, extremely important

Section C: Questions on attitude of health professionals towards practices of EPR

C1.	How important do you believe early physical rehabilitation services?	1, Not at all 2, Slightly important 3, moderately important 4, very important 5, extremely important
C 2.	How do you perceive the role of multidisciplinary teams for early physical rehabilitation services?	1, Not at all 2, Slightly important 3, moderately important 4, very important 5, extremely important
C 3.	How do you believe/agree the importance of early physical rehabilitation to be part of patient care protocols?	1, Not at all 2, Slightly important 3, moderately important 4, very important 5, extremely important

C 4.	How do you believe that the importance of early physical rehabilitation on improving patient outcomes?	1, Not at all 2, Slightly important 3, moderately important 4, very important 5, extremely important
C 5.	How do you believe that the importance of early physical rehabilitation on reducing clients' economic costs?	1, Not at all 2, Slightly important 3, moderately important 4, very important 5, extremely important

Section D: Questions on practices of HCP on Early physical rehabilitation services

D1.	As a health professional have you ever linked or referred a client to early physical rehabilitation services?	1, Yes 2, No	
D 2	If yes for Q D1 , for what type of clinical cases did you link to EPR?	List at least 3 cases based on your working unit/department _____	
D 3.	If yes for Q D1 , did you follow the progress of your patients on early physical rehabilitation services?	1, Yes 2, No	
D 4.	As a health professional, did you apply (practice) the following techniques of early physical rehabilitation for your patients by yourself?	1, Mobilization	1, Yes 2, No
		2. Manual and instrumental techniques	1, Yes 2, No
		3, Positioning	1, Yes 2, No
		4. Patient/functional trainings	1, Yes 2, No

Section E: Questions on professional related factors towards practice of EPR among HCP

E 1.	What is your health care facility setting?	1, referral hospital 2, general hospital 3, primary hospital
E 2.	What is your professional specialization? (if you have more than one, select or list them)	1, orthopedics 2, neurology 3, pediatrics 4, ICU 5, other (specify)
E3	What is your frequent working department?	1, OPD 2, Surgical ward 3, Orthopedic ward 4, Medical ward 5, Pediatric ward 6, Emergency 7, Other (specify)
E4	Is there a standard of practice guideline that includes EPR in your institution?	1, Yes 2, No
E 5.	Is there a clinical protocol in your unit/department that includes early physical rehabilitation services?	1, Yes 2, No
E 6.	Have you ever taken any training related to early physical rehabilitation practices/ services?	1, Yes 2, No
E7.	If yes for Q E6, how many training?	_____
E8.	In your health facility, does Physical Rehabilitation services provided?	1, Yes 2, No