

**CRITICAL THINKING SKILL AND ASSOCIATED FACTORS AMONG
NURSES WORKING AT TERTIARY HOSPITALS IN SOUTHWEST
PART OF ETHIOPIA, 2022**

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JIMMA, ETHIOPIA

JIMMA UNIVERSITY
INSTITUTE OF HEALTH
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ABSTRACT

Background: *Critical thinking skill is one of the basic competencies of nursing practice and is associated with the provision of quality nursing care. Even though nurses are required to learn and implement critical thinking skills to conduct their work effectively and efficiently, a significant proportion of nurses still lack the required level of critical thinking skills.*

Objective: *To assess nurses' level of critical thinking skills and associated factors at tertiary hospitals in the Southwestern part of Ethiopia, in 2022.*

Method: *An institutional-based cross-sectional study design was conducted among nurses working at three tertiary hospitals in the Southwest part of Ethiopia from July, 20 to August 20, 2022. About 422 nurses were included in the study using a simple random sampling technique. Data were collected using a self-administered structured questionnaire. Multivariable linear regression analysis was used to determine factors significantly associated with critical thinking skills and a p-value of less than 0.05 was taken as statistically significant. The results were presented with text, tables, and graphs.*

Result: *Out of the 422 participants, 406 (96.2% response rate) of them returned distributed questionnaires and 399 questionnaires were analyzed while seven questionnaires were excluded because of missing data. Nearly half 196(49.1%) of the participants have a moderate level and 73 (18.3%) have a high level of critical thinking skills. Being a BSc degree holder ($\beta=0.230$, $p=0.000$) or MSc degree holder ($\beta=0.303$, $p=0.001$), following scientific publications ($\beta=0.298$, $p=0.000$), participating in scientific activities ($\beta=0.305$, $p=0.000$), working at outpatient department ($\beta=0.105$, $p=0.025$), being nurse manager ($\beta =0.201$, $p=0.000$), and taking capacity building training ($\beta= 0.158$, $p=0.000$) were associated with critical thinking skills of nurses.*

Conclusion: *The majority of nurses demonstrated a low and moderate level of critical thinking skills. Educational level, following scientific publications to update oneself on clinical practice, participation in scientific activities, working department/unit, working position, and taking capacity-building training were significantly associated with the level of critical thinking skills. It is necessary to arrange in-service training and educational opportunities for nurses to improve their critical thinking skills.*

Keywords: *Critical thinking, critical thinking skill, nurses, clinical practice, tertiary hospitals*

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ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis Of Variance
BSc	Bachelor of Science
CCTDI	California Critical Thinking Disposition Inventory
CT	Critical Thinking
ENA	Ethiopian Nursing Association
HSRT	Health Science Reasoning Test
ICU	Intensive Care Unit
JMC	Jimma Medical Center
MKRH	Mettu Karl Referral Hospital
MTUTH	Mizan Tepi University Teaching Hospital
N-CT-4 practice	Nursing Critical Thinking in Clinical Practice
NGO	Non-Governmental Organization
OPD	Outpatient Department
USA	United States of America
WGCTA	Watson Glaser Critical Thinking Appraisal

CHAPTER 1: INTRODUCTION

1.1 Background

Critical thinking is a cognitive process that utilizes thinking that is purposeful, insightful, reflective, and goal-directed in order to develop conclusions, solutions, and alternatives that are appropriate for the given situation (1). In the nursing literature, the term critical thinking was used interchangeably with problem-solving, clinical reasoning, clinical judgment, clinical decision-making, and nursing process (2,3).

A critical thinker is characterized by being inquisitive, well-informed, trustful of reason, open-minded, willing to reconsider, diligent in seeking relevant information, reasonable in the selection of criteria, clear about issues, and orderly in complex matters (4).

Critical thinking (CT) is made up of two components, including CT disposition and CT skills. CT disposition is a consistent willingness, motivation, intention, and inclination to be engaged in critical thinking. While, CT skill is the ability of nurses to engage in activities like an explanation, inference, analysis, assessment, and self-adjustment to specific issues, decisions, or judgments (3).

Critical thinking skills are developed over time through effort, practice, and experience (5). Several teaching methods can be used to develop critical-thinking skills including case scenario studies, problem-based learning, questioning, reflective learning, interdisciplinary patient rounds, simulation, and concept mapping. Some methods are applicable to a clinical setting, some are useful in a classroom setting, and others are applied during self-paced learning (6).

Critical thinking skills are essential for nurses to assess, plan for and deliver quality patient care (7). This cognitive process is critical to enhancing clinical decision-making and effective use of the nursing processes (8,9). It is also positively associated with nursing competence, nurse workplace production, problem-solving ability, and evidence-based practice (10–12). To provide quality nursing care, nurses must cultivate critical thinking abilities that will enable them to solve problems in flexible, individual, and situation-specific ways (13).

1.2 Statement of the Problem

The healthcare environment is becoming more complex and demanding due to the increased need for patient-centered care, evidence-based practice, and addressing patients' satisfaction in care and staff shifting issues (12). This increasingly complex healthcare environment requires nurses with good critical thinking skills to make effective clinical decisions, solve complex clinical problems, and provide quality patient care (14). Nurses that possess good critical thinking abilities perceive themselves as autonomous, view the patient holistically, and report higher levels of job satisfaction (17,19). Therefore, as an essential part of their professional liability, nurses are required to develop their critical thinking skills (16).

Evidence showed that critical thinking is a key skill and prerequisite for graduation in nursing (17,18). However, some newly graduated nurses and even those with years of working experience are challenged in implementing critical thinking skills in their clinical practice (19,20). This is currently becoming a major issue for nurse managers for continuity of quality improvement (21).

Low to moderate levels of critical thinking among nurses working in different units of the hospital were observed in different literature (12,20,22–25). A lack of critical thinking among nurses leads to poor clinical judgment and decision-making skills (26). Additionally, nurses with low critical thinking skills are challenged in implementing the nursing process and evidence-based practice, which can result in negative patient outcomes by promoting habitual thinking that may lead to incorrect medication administration or procedures (27,28).

Studies reported that being older age, having more years of clinical experience, and having a higher level of education foster nurses' acquisition of critical thinking skills (9,22,29). While some factors such as long working hours, job insecurity, stress, technically focused care, time shortage, and staff shortages may hinder the acquisition of critical thinking in clinical practice (30,31). However, the relationships between critical thinking skills and these variables are inconsistent.

Even though critical thinking has been considered a core competence of nursing, it is noted that some nurses still do not demonstrate critical thinking skills in clinical practice (26). While several studies have focused on critical thinking among nursing students, few studies have

explored the critical thinking ability of nurses in the clinical setting (13,32). Moreover, to the researcher's knowledge, no published studies have investigated this issue in Ethiopia. Hence, it is overriding to examine the level of critical thinking of nurses and to identify factors associated with critical thinking in Ethiopia.

1.3 Significance of the Study

The result of this study will have a significant contribution to nursing education, practice, and research. The finding of this study will provide useful feedback to nurses concerning their current critical thinking level and factors that may affect their critical thinking abilities. By knowing the factors that affect one's ability to think critically, nurses can take the appropriate measures to enhance critical thinking skills. Also, the study will be an input for nurse educators and nurse managers to propose further strategies to improve the critical thinking skills of nurses. Furthermore, the results of the current study will make a significant contribution to the literature because it will provide thorough descriptions of the critical thinking of nurses and its associated factors.

CHAPTER 2: LITERATURE REVIEW

This chapter provides a review of the literature which includes two major sections. Section one: level of critical thinking skills among nurses starting from global to local and section two: factors associated with the level of critical thinking skills among nurses.

2.1 Level of critical thinking skills among nurses

A cross-sectional study conducted in the USA using the Health Science Reasoning Test (HSRT) showed that 63% of participants had a moderate level of critical thinking skills, while 26 % of participants had high-level critical thinking skills (23).

A study conducted in Spain using the Nursing Critical Thinking in Clinical Practice Questionnaire (N-CT-4 Practice) showed that most clinical nurses had a moderate level of critical thinking skills. Regarding the four dimensions of the N-CT-4 Practice, nurses scored a high level of critical thinking skills in the intellectual and cognitive dimensions (33).

Using N-CT-4 Practice questionnaires, a cross-sectional study conducted in Vietnam revealed that most nurses reported a low (48.3%) or moderate (45.5%) level of critical thinking skills. In comparison, only 6.2% of the nurses had a high level of critical thinking. Regarding the four dimensions of the N-CT-4 Practice, the intellectual and cognitive dimension has a high mean score and the technical dimension has the lowest mean score (34).

In Norway, a cross-sectional study conducted using California Critical Thinking Disposition Inventory (CCTDI) reported that most, (80%) newly graduated nurses showed a high level of critical thinking (35).

Three studies conducted in Turkey using CCTDI reported that nurses' overall level of critical thinking was low but those studies did not specify the percentage of nurses who score low level (20,36,37). Additionally, a cross-sectional study conducted among nurses working at Istanbul medical faculty hospital, Turkey also showed that most, (91.4%) nurses had low levels of critical thinking while 8.6% had medium levels (38). On the other hand, nurses got moderate-level critical thinking scores, according to a cross-sectional study conducted in Turkey using a Turkish version of the N-CT-4 practice questionnaire (39).

Using HSRT, a cross-sectional study conducted among nurses working at public hospitals in Malaysia revealed that 57.9% of nurses had a low and 2.6% had a high level of critical thinking skills (14). Another study conducted in Malaysia using Watson-Glaser Critical Thinking Appraisal (WGCTA) among nurses working in private hospitals showed that most, (85.8%) nurses scored at a moderate level of critical thinking (26). Meanwhile, a cross-sectional study conducted among critical care nurses in Malaysia found that nurses had high levels of critical thinking (9).

An Indian study using the Nurses Critical Thinking Assessment Performa tool found that most, (77.3%) nurses had a moderate level of critical thinking skills (7). A study conducted among critical care nurses working in a university hospital in Jordan revealed that nurses' critical thinking score was below the mean which indicated a low level of critical thinking. (40). A study conducted in Egypt using CCTDI among nurses working in the public hospital found that most (85.7%) had a moderate level of critical thinking (25).

2.2 Factors associated with critical thinking skills among nurses

2.2.1 Personal factors

Several studies identified personal factors influencing nurses' level of critical thinking skills in clinical practices. A cross-sectional study conducted in Spain revealed that older age was associated with a higher level of critical thinking (22). Similarly, another study conducted in Spain reported that nurses aged between 53 and 65 scored higher critical thinking scores than younger nurses (33). Additionally, a cross-sectional study conducted in Vietnam reported that older nurses had a higher critical thinking ability (34).

A cross-sectional study of critical care nurses conducted in Malaysia revealed that older nurses scored higher on critical thinking skills than younger nurses (9). Also, a cross-sectional study conducted in Taiwan indicated that the critical thinking ability of nurses between 31–40 and those over 40 years of age was significantly higher than those between 20–30 years of age (12). Similarly, studies conducted among clinical nurses in Taiwan revealed that older nurses had higher critical thinking (29,41).

A study conducted in Korea among clinical nurses working at general hospitals also showed that nurses aged 35-39 and above 40 had significantly high critical thinking than young nurses (42). However, some studies are contradictory with the concept of advanced age associated with higher critical thinking skills. The level of nurses' critical thinking did not significantly associate with their age, according to studies done in the USA (23), India (7), Malaysia (14), Turkey (20,39,43), Iran (44), and Egypt (25).

Besides age, a personal factor commonly associated with the development of nurses' critical thinking skills was the level of education. In Spain, a cross-sectional study conducted among registered nurses and nurse managers showed that a master's degree qualification was associated with a higher level of critical thinking (22). A similar study conducted in Spain among clinical nurses reported nurses with master's degrees had higher overall levels of critical thinking than degree nurses (33),

A cross-sectional study conducted in southwest Vietnam reported that nurses with bachelor's or graduate degrees had higher critical thinking scores than those with diplomas (34). Likewise, a cross-sectional study conducted in Taiwan reported critical thinking ability of nurses with master's degrees was significantly higher than those with bachelor's degrees and diplomas (12). According to a cross-sectional study conducted in Japan, having the highest level of nursing education (bachelor's degree or higher qualification) had significantly associated with high critical thinking (45).

A cross-sectional study done in Malaysia showed that nurses with bachelor's degrees had significantly high critical thinking than diploma nurses (9). In a similar vein, a cross-sectional study conducted among nurses working at public hospitals in Malaysia found that the critical thinking score for nurses with a degree and above was significantly higher compared with nurses with a diploma (14). Additionally, another study carried out in Malaysia revealed that nurses with bachelor's degrees had better critical thinking abilities than nurses with diplomas (26).

A cross-sectional study conducted in Turkey revealed that nurses who received post-graduate education had significantly higher critical thinking scores than nurses who graduated with bachelor's degrees (39). Nurses with a higher level of education had a high level of critical thinking according to a study done among critical care nurses working in a Jordanian university

hospital (40). However, several studies conducted in Spain (33), Turkey (20,36,37,43), Iran (44), India (7), and Egypt (25) reported no association between critical thinking and educational level that could be considered significant level.

In addition to age and education level, gender and marital status were personal characteristics that affected nurses' ability to develop critical thinking skills. In the studies conducted in Vietnam and Iran male nurses had found to have better critical thinking abilities than females (34,44), whereas a study conducted in Turkey found that female nurses had higher levels of critical thinking than male nurses (46). The results of a study carried out in Korea revealed that married nurses had significantly high critical thinking than unmarried nurses (42). In contrast to this gender and marital status had no significant association with critical thinking in several other studies (7,25,33,40,43).

Nurses' ability to learn and think critically is limited by poor health. According to a study done in Southwest Vietnam, nurses with very good health had a higher level of critical thinking than nurses who self-rated their health as fair/bad/very bad. This study also reported that participants who had heard the term "critical thinking" displayed a higher level of critical thinking than those who had not heard this term (34).

It is believed that participating in scientific activities related to nursing fields will increase the scientific depth of nurses. A cross-sectional study conducted in Tokyo, Japan revealed that more participation in scientific events was significantly related to higher critical thinking (45). According to cross-sectional studies done in Turkey, the nurses who engaged in scientific activities reported a higher level of critical thinking than those nurses who did not (37,47).

2.2.2 Work-related factors

In different literature years of clinical experience, working department/unit, experience in the current department/unit, shift schedule, the position of work, previous exposure to critical thinking training, and any capacity-building training related to clinical practice were reported as work-related factors influencing the level of critical thinking skills of nurses.

The theory of critical thinking in nursing suggests that clinical experience and critical thinking skills are related (48). Another author in the novice to expert model suggests that clinical nurses having more years of experience would have a higher score on critical thinking skills (49).

Several kinds of literature have supported this theory and model while others reported the opposite result.

A cross-sectional study conducted in Vietnam showed that nurses who had worked for a longer duration as a nurse had a higher critical thinking ability (34). A cross-sectional study conducted in Malaysia also showed that nurses with clinical experience of more than five years have higher critical thinking compared to junior nurses (26). Similarly, a cross-sectional study conducted among nurses working at a tertiary hospital in Malaysia found that nurses with more clinical experience significantly have higher critical thinking than those with less clinical experience (9).

A cross-sectional study conducted in Taiwan revealed a significant mean difference among nurses categorized based on years of experience (12). Moreover, another study done in Taiwan revealed that experienced nurses had significantly higher critical thinking than novice nurses (29).

According to a study done among nurses working in a general hospital in Korea, nurses who worked above 10 years scored high critical thinking than junior nurses (42). Similarly, a study conducted in Jordan among critical care nurses reported senior nurses were significantly high critical thinking than junior nurses (40). However, years of clinical experience was not associated with the development of critical thinking skill according to the study conducted in Spain (22,33), India (7), Turkey (20,36,43), Malaysia (14), Iran (44), and Egypt (25).

Because emergency nurses deal with urgent and unpredictable cases, working in the emergency department trains nurses to think critically (40,45). According to a study done in Jordan, emergency room nurses scored higher on critical thinking skills than nurses working in intensive care (40). Two studies in Spain, using a cross-sectional study design reported that nurses working in critical care units had higher levels of critical thinking than in medical-surgical wards (22,33). A study conducted among nurses working at public hospitals in Malaysia found that nurses working in the surgical ward had higher critical thinking skills than nurses working in the medical ward (14). In contrast to this, the level of critical thinking of nurses had no significant association with the working departments/units in studies conducted in India (7), Iran (44), and Taiwan (12).

A cross-sectional study conducted in tertiary care hospitals in Spain showed that nurses with 11–15 years of work experience in the same department/unit had higher overall levels of critical thinking than junior nurses. Also, nurses who worked 7 hours shifts had higher critical thinking than nurses who worked 12 hours shifts (day or night) full time (33). A similar cross-sectional study at a tertiary hospital in Barcelona, Spain, found that Nurse Managers working part-time have higher levels of critical thinking skills than those working 12 hours shifts (22). Furthermore, a study conducted among nurses working at public hospitals in Turkey revealed that nurses who work in the daytime had higher critical thinking scores than shift nurses (39).

Promotion of position and title improve nurses' critical thinking skills (14). According to a cross-sectional study done in Vietnam (34), Spain (22), and Turkey (39,43) nurse managers had significantly higher critical thinking scores than staff nurses.

Literature suggested that in-service training and educational opportunities on critical thinking should be provided for nurses to develop their critical thinking skills (20,25). Two studies conducted among nurses in Turkey revealed that nurses who took in-service training had significantly high critical thinking than those who didn't take it (50,51).

Generally, from the reviewed literature several studies used different tools to measure the level of critical thinking skills and most of them reported that the level of critical thinking skills of nurses was at a low level. Age, gender, marital status, level of education, self-rated health status, participation in scientific activities, having heard the term critical thinking, years of clinical experience, working department/unit, the position of work, years of working in the current unit, shift schedule, critical thinking training, and capacity building training related to clinical practice were factors associated with the level of critical thinking skills among nurses. However, there is no consistent finding across nursing literature on whether factors significantly contribute to higher critical thinking skills which indicates the need for further investigation.

2.3 Conceptual framework

This conceptual framework was developed by reviewing theoretical models and scientific literature. Personal factors were selected from previous studies (4,25,34,37). Work-related factors were selected from the theory of critical thinking in nursing. Patricia Benner’s novice to expert model, and studies conducted in Jordan, Iran, Vietnam, and Egypt (25,34,40,44,48,49). Institution-related factors were newly added variables that were suggested as factors that improve critical thinking (12,25,40).

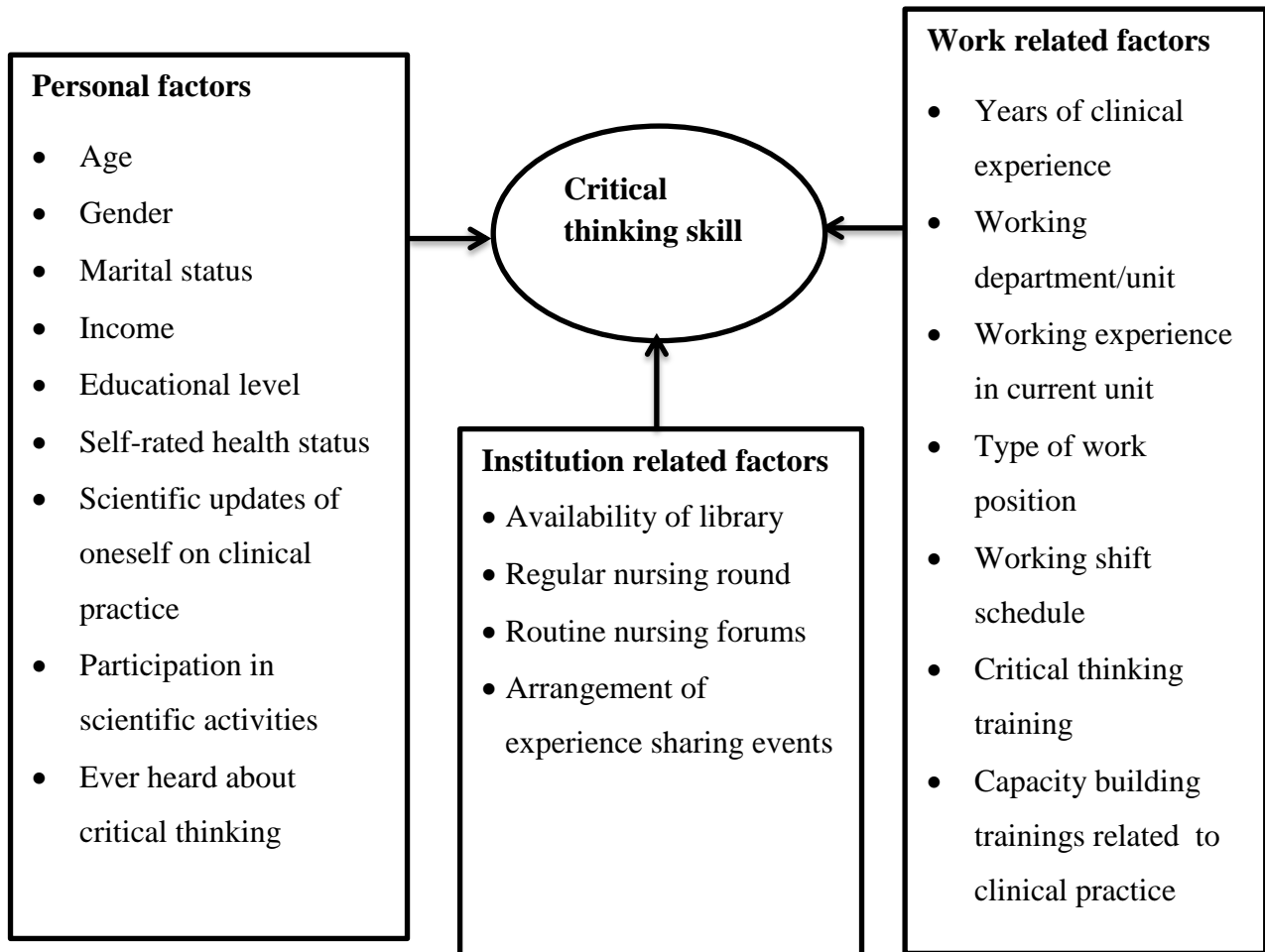


Figure 1: Conceptual framework developed to assess the level of critical thinking skill and its associated factors among nurses working at tertiary hospitals in the Southwest part of Ethiopia, 2022

CHAPTER 3: OBJECTIVES

3.1 General objective

To assess the level of critical thinking skill and its associated factors among nurses working at tertiary hospitals in the Southwestern part of Ethiopia, 2022.

3.2 Specific objectives

1. To determine the level of critical thinking skills among nurses working at tertiary hospitals in the Southwestern part of Ethiopia, 2022.
2. To identify factors associated with the level of critical thinking skills among nurses working at tertiary hospitals in the Southwestern part of Ethiopia, 2022.

CHAPTER 4: METHODS

4.1 Study area and period

This study was conducted in tertiary hospitals located in the Southwestern part of Ethiopia. There are three tertiary hospitals in the Southwest part of Ethiopia which include Jimma medical center (JMC), Mizan Tepi university teaching hospital (MTUTH), and Mettu Karl referral hospital (MKRH). JMC is located in the Jimma zone, 352 Kilometers (KM) away from Addis Abeba, the capital city of Ethiopia. MTUTH is located in the Bench-Shako zone, 585 Kilometers (KM) away from Addis Ababa, whereas MKRH is found in the Ilu Aba Bor zone at a distance of 600 KM from Addis Ababa. The total numbers of nurses in these three hospitals were around 829, which means 535 nurses from JMC, 164 nurses from MTUTH, and 130 nurses from MKRH. Data collection was carried out from July 20 to August 20, 2022.

4.2 Study design

The institutional-based cross-sectional study design was used.

4.3 Population

4.3.1 Source population

All nurses working at tertiary hospitals in the Southwest part of Ethiopia

4.3.2 Study population

All sampled nurses working at tertiary hospitals in the Southwest part of Ethiopia

4.3.3 Eligibility criteria

4.3.3.1 Inclusion criteria

Nurses having a diploma or above in nursing and available during the study period

4.3.3.2 Exclusion criteria

Nurses providing free service at the study hospital

4.4 Sample size and sampling procedure

4.4.1 Sample size determination

The sample size for this study was determined by using the single population proportion formula considering the assumptions:

- ✓ Confidence level of 95%, $Z_{\alpha/2} = 1.96$
- ✓ Margin of error 5% ($d = 0.05$)
- ✓ A population proportion of 50% was used since there is no previous study done in Ethiopia.

The sample size was calculated as follows:

$$n = \frac{(Z_{\alpha/2})^2 P(1-P)}{d^2}$$

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

By adding a 10% non-response rate, the final sample size was 422.

4.4.2 Sampling procedure

The total sample was distributed to three hospitals using proportional allocation based on the number of nurses working in each hospital.

$$n_i = n \left(\frac{N_i}{N} \right), \quad \text{Where;}$$

n_i = Number of nurses allocated to each hospital

n = Total number of nurses working in each hospital

N_i = Calculated sample size

N = Total number of nurses in three hospitals.

A list of nurses working in each hospital was obtained from the nursing director and matron which served as the sampling frame. Then simple random sampling technique was used by lottery method to select nurses from each hospital.

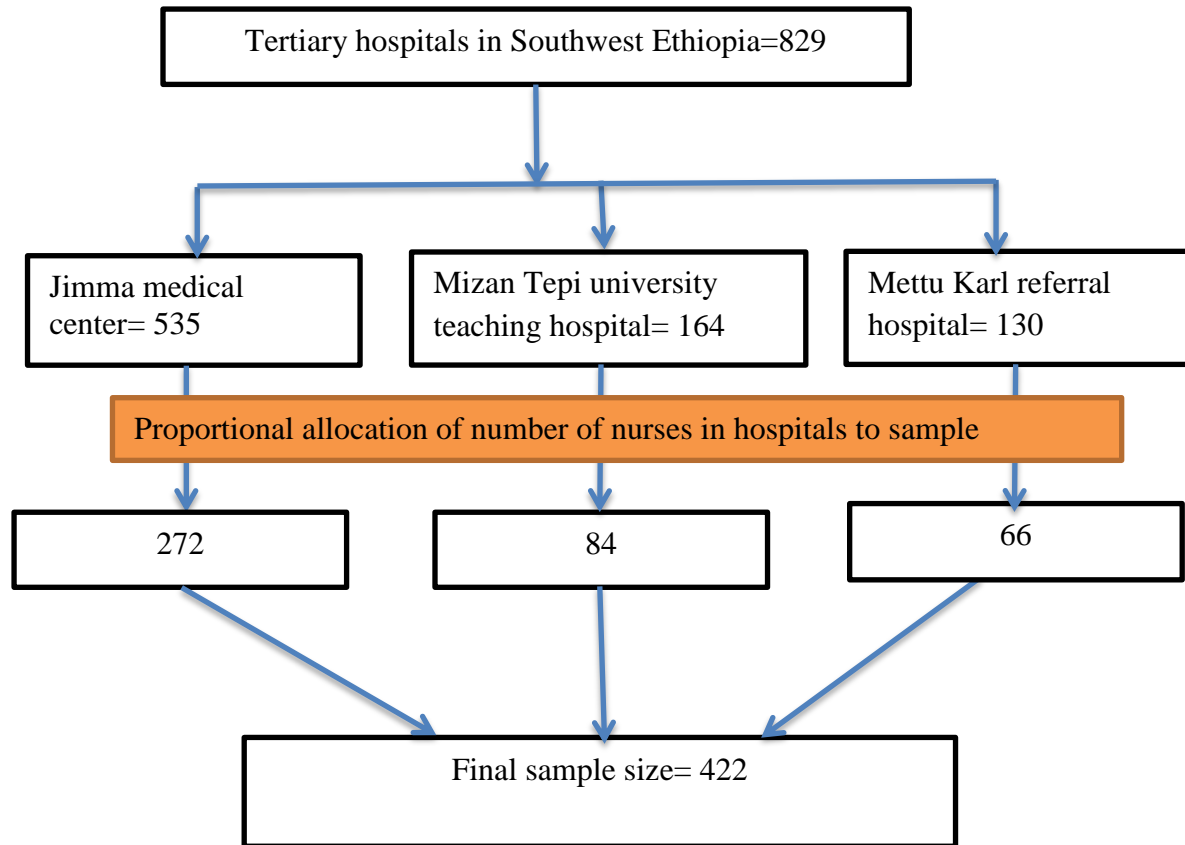


Figure 2: Proportional allocation of total sample size for three tertiary hospitals in the Southwest part of Ethiopia, 2022.

4.5 Study variables

4.5.1 Dependent variables

Level of critical thinking skill

4.5.2 Independent variables

Personal factors: Age, gender, marital status, educational level, income, self-rated health status, scientific updates of oneself on clinical practice, participation in scientific activities/events, and heard about critical thinking.

Work-related factors: Years of clinical experience in nursing, working department/unit, working experience in the current unit, type of work position, working shift schedule, critical thinking training, and capacity-building training related to clinical practice

Institutional-related factors: Availability of library, regular nursing rounds, routine nursing forums, and arrangement of experience-sharing events.

4.6 Data collection tool and procedure

4.6.1 Data collection tool

Data were collected by a structured self-administered questionnaire comprising four parts:-

Part one: Personal factors which include (9 items) age, gender, marital status, level of education, income, self-rated health status, scientific updates of oneself on clinical practice, participation in scientific activities, and having heard about critical thinking.

Part two: Work-related factors which include (7 items) years of clinical experience, working department/unit, years of experience in the current unit, working shift schedule, type of work position, critical thinking training, and capacity building training related to clinical practice.

Part three: Institution-related factors which include (5 items) availability of library, regular nursing rounds, routine nursing forums, and arrangement of experience-sharing events.

Part Four: Nursing critical thinking in clinical practice questionnaire (N-CT-4 practice) was used to measure the outcome variable. This tool was adopted which was originally created in Spanish and was designed and validated by Zuriguel-Pérez (2016) (52). It was also translated into English (52), Persian (53), Vietnam (34), and Turkish (54). N-CT-4 Practice was an instrument used to measure the level of critical thinking of nurses in their everyday practice.

The scale comprises 109 items, organized based on AlfaroLeFevre's 4-circle critical thinking model (2016), and assesses the construct of critical thinking by integrating four dimensions. These four dimensions were personal (39 items); intellectual and cognitive (44 items); interpersonal and self-management (20 items); and technical dimensions (6 items). The personal dimension (D1) assesses the individual pattern of intellectual behavior (attitudes, beliefs, and values) that act as triggers of critical thinking skills. The intellectual and cognitive dimension (D2) assesses the knowledge and understanding of nursing and the decision-making process. The interpersonal and self-management dimension (D3) assesses interrelation with the patient/family and interaction with the professional team and self-management. Technical dimension (D4) assesses knowledge and expertise in nursing procedures

The scale was rated using a four-point Likert response format (1 = never or almost never, 2 = occasionally, 3 = often, and 4 = always or almost always), All items were positively stated and the total score was the sum of the values obtained which ranges from 109 to 436. The scores were also determined for each dimension, with D1, 39-156, D2, 44-172, D3, 20-84, and D4, 6-24. In terms of the psychometric properties of the questionnaire, the total Cronbach alpha coefficient was 0.96 (ranging from 0.78 for D4 to 0.94 for D2) and the intraclass correlation coefficient was 0.77. Construct validity, analyzed by confirmatory factor analysis, showed the presence of the four dimensions proposed in Alfaro-LeFevre's theoretical model (52).

Questionnaires were pretested on 21 (5%) nurses working at Bonga Gebretsadik Shawo general hospital before the actual data collection. The clarity, understandability, and total time needed to fill the items were tested, and then necessary comments and feedback were taken and incorporated. Cronbach's alpha score for the overall N-CT-4 clinical practice scale was 0.95 with that of the dimensions ranging from 0.74 for the technical dimension to 0.92 for the intellectual and cognitive dimension (Table 4).

4.6.2 Data collection procedure

The data collection was facilitated by three trained BSc nurses and one BSc nurse supervisor who were recruited from a hospital other than the study hospital. The shift of the respondents was arranged in contact with the head nurses. Before participants fill out the self-administered questionnaire, the aim of the study and how to complete the questionnaire was clearly explained by the data collection facilitators. Then the questionnaire was distributed to the participants during their working time and they were asked to return their questionnaire on next day. When the participants were not found on that day repeated revisits were done.

4.7 Operational definitions

For this study, the total score of the N-CT-4 Practice scale was calculated by summing the response scores for the individual items. The total possible score ranges from 109 to 436, then the level of critical thinking skills of respondents was defined as follows (52):

Low level of critical thinking skill: the score of 329 and below the total score of the N-CT-4 Practice scale (52).

Moderate level of critical thinking: the scores between 329 and 395 from the total score of the N-CT-4 Practice scale.

High level of critical thinking skill: the scores above 395 from the total score of the N-CT-4 Practice scale

Good health: respondents rated their health condition as very good and good.

Poor health: respondents rated their health condition as fair and bad/very bad.

4.8 Data processing and analysis procedures

The collected data was cleaned, coded, and entered into EpiData 4.6 version. After checking and correcting errors, the data was exported to SPSS version 25 for analysis. Descriptive statistics such as mean, frequency, and percentage were calculated. All assumptions of linear regression were checked. The normality of distribution was checked by observing the histogram and the result showed that the data were normally distributed. Therefore, data transformation was not needed and the original data were used for subsequent analysis. Linearity and homogeneity of variances were checked by scatter plots, and there was no clear pattern on the scatter plot (no heteroscedasticity). Multicollinearity was checked by variance inflation factors (VIF) and all were less than 10 which indicates there is no issue of collinearity. Durbin-Watson was 1.905 which shows no autocorrelation threat.

For this analysis, dummy variables (for k categories, k-1 dummy variables) were created for categorical variables such as educational level and working departments/units. Bivariate linear regression was used to assess candidate variables and multivariable linear regression was used to assess the association between a dependent variable and independent variables. Variables with p-value less than 0.25 were selected as candidates for multivariable linear regressions. Finally, variables with P-value ≤ 0.05 were considered statistically significant in multivariable analysis. β -coefficients and p-value were used to show factors associated with critical thinking skills. The result was displayed using charts, graphs, and tables.

4.9 Data quality assurance

The English version questionnaire was pre-tested among 21 nurses (5% of the intended sample size) in Bonga Gebretsadik Shawo general hospital one week before actual data collection.

Supervisor and data collection facilitators were oriented by the principal investigator for one day on the objectives of the study, the way to keep privacy and maintain the confidentiality of the information, and related ethical issues. The filled questionnaires were checked for completeness by the supervisor on each day. Before entry into the computer and also, before analysis, the data were rechecked by the principal investigator for the missing value.

4.10 Ethical consideration

Ethical clearance was obtained from the institutional review board of Jimma University, Institute of Health. Then, a support letter was taken from the Jimma University, school of nursing to respective hospital management to gain support for the study. Letter of permission was obtained from each hospital before the commencement of the study and written informed consent was obtained from each participant. The purpose of the study, voluntary participation, and their right to withdraw at any time without explaining the reason was explained to the participants. To keep the confidentiality and anonymity of the study participant their name and any personal identifier was not included in the data collection format. Permission to use the scale (N-CT-4 practice) was obtained from the developer.

4.11 Dissemination plan

The result of the study will be submitted and presented to Jimma University, School of nursing. Further, a copy of the result will be provided for Jimma Medical Center, Mizan Tepi University Teaching Hospital, and Mettu Karl Referral Hospital for utilization. And also, attempts will be made to publish in a scientific reputable national or international journal.

CHAPTER 5: RESULT

Out of the 422 participants planned to be included in the study, 406 (96.2% response rate) of them returned the self-administered questionnaires. However, from the total returned questionnaires, seven questionnaires were incomplete and 399 questionnaires were used in this study for analysis.

5.1 Personal characteristics of the participants

The mean age of respondents was 31.5 ± 6.1 years, minimum age of 22 and maximum age of 50 years old (Table 3). About 167(41.9%) respondents age fall in the age group of 25-29. More than half 232(58.1%) of the respondents were females, 262(65.7%) were married, and 360(90.2%) of respondents rated their health status as a good health condition. The majority 335(84%) of nurses were BSc nurses. Two hundred forty-seven (61.9%) of the nurses stated that they followed scientific publications to update themselves on clinical practice, while 219 (54.9%) stated that they participated in scientific activities/events. Most, 328 (82.2%) respondents heard about critical thinking. The respondent's monthly income ranged from 3,500 ETB to 10,153 ETB with a mean salary of 7002.5 ± 1447.6 ETB (Table 1)

Table 1: Personal characteristics of nurses working at tertiary Hospitals in Southwest, Ethiopia, 2022.

Personal Characteristics		Frequency(N=399)	Percent
Age	<24	18	4.5
	25-29	167	41.9
	30-34	117	29.3
	35-39	49	12.3
	>40	48	12
Gender	Male	167	41.9
	Female	232	58.1
Marital status	Single	129	32.3
	Married	262	65.7
	Divorced	6	1.5
	Widowed	2	0.5
Educational level	Diploma	42	10.5
	BSc degree	335	84
	MSc degree	22	5.5
Self-rated health condition	Good health	360	90.2
	Poor health	39	9.8
Scientific updates of oneself on clinical practice	Yes	247	61.9
	No	152	38.1
Participation in scientific activities/events	Yes	219	54.9
	No	180	45.1
Ever heard about critical thinking	Yes	328	82.2
	No	71	17.8
Monthly income	<3934	9	2.2
	3934-7071	251	62.9
	7072-10,150	136	34.1
	>10,150	3	0.8

5.2 Work-related factors

The respondents' work experience ranged from 6 months to 26 years with a mean of 7.6 ± 5.7 years. Over half 212 (53.1%) of them had more than 5 years of experience and slightly more than half 203(50.9%) of respondents have been working in different wards. The average length of service of the respondents in the current unit was 2.9 ± 2.4 years. and 161 (40.4%) respondents were served in the same unit for 1-3 years. Most of the respondents, 345 (86.5%) were staff nurses, and 216 (54.1%) nurses worked full-time on 12 hours shifts, but no part-time employed

nurse. More than half, 227(56.9%) of respondents had taken capacity-building training related to clinical practice and 26(6.5%) of respondents received critical thinking training (Table 2).

Table 2: Work-related factors among nurses working at tertiary Hospitals in Southwest, Ethiopia, 2022.

Work-related factors		Frequency (N=399)	Percent
Years of clinical experience in the nursing	<6 months	3	0.8
	0.5-1 year	9	2.3
	1-3 years	95	23.8
	3-5 years	80	20.1
	>5 years	212	53.1
Working department/unit	Emergency unit	52	13
	ICU	35	8.8
	Ward	203	50.9
	OPD	73	18.3
	Others(nursing director, supervisor, matron, OR nurse)	36	9
Working experience in the current unit	<6 months	4	1
	0.5-1 year	131	32.8
	1-3 years	161	40.4
	3-5 years	53	13.3
	>5 years	50	12.5
Working position	Staff nurses	345	86.5
	Nurse manager	54	13.5
Working shift	12 hours shift: full time	216	54.1
	8 hours shift: full time	183	45.9
Critical thinking training	Yes	26	6.5
	No	373	93.5
Capacity building training	Yes	227	56.9
	No	172	43.1

Table 3: Mean and standard deviation of selected variables among nurses working at tertiary Hospitals in Southwest, Ethiopia, 2022.

Variables	Mean	Standard deviation	Minimum	Maximum
Age	31.5	6.1	22	50
Monthly income	7002.5	1447.6	3500	10,153
Years of clinical experience in nursing	7.6	5.7	0.5	26
Working experience in the current unit	2.9	2.4	0.5	14

5.3 Institutional-related factors

All respondents reported the presence of the library in their hospitals. One hundred seventy-seven (44.4%) respondents reported they had regular nursing round, 210(52.6%) reported they had routine nursing forums and 117 (29.3%) of respondents reported that their hospital had arranged experience-sharing events (Table 3).

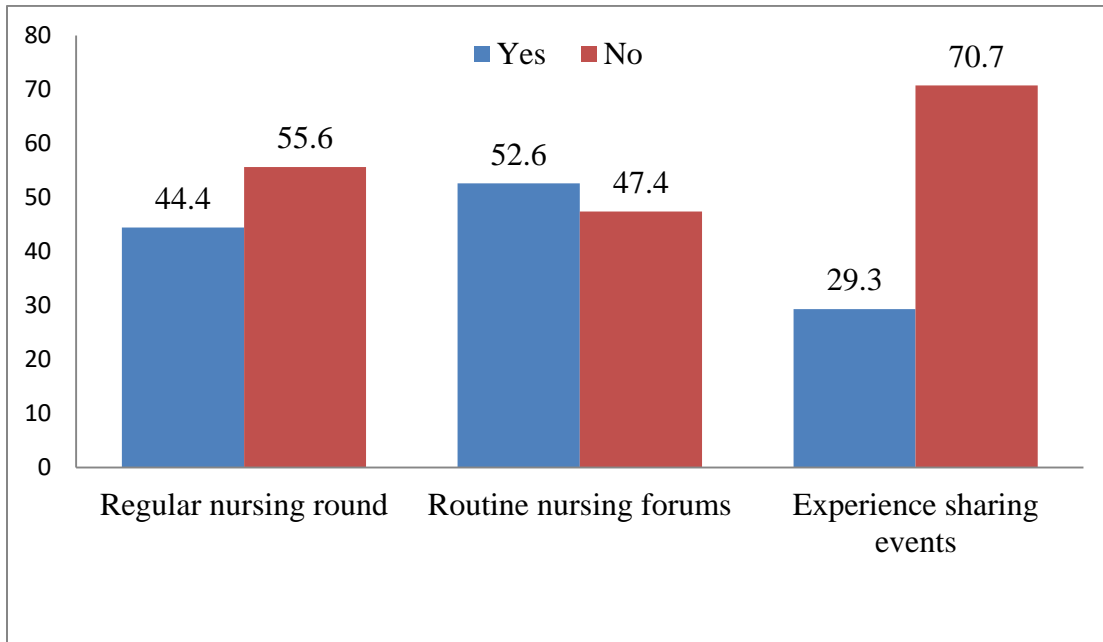


Figure 3: Institutional-related factors among nurses working at tertiary hospitals in Southwest Ethiopia, 2022.

5.4 Level of the critical thinking skills of the nurses

The mean score (with standard deviation) of the critical thinking scale (N-CT-4 Practice) of the study participants was 346.6 ± 50.9 with a minimum score of 203 and a maximum score of 427. Concerning the four dimensions, the mean score was 123.7 ± 18.8 in the personal dimension, 140.3 ± 22.3 in the intellectual and cognitive dimension, 63.3 ± 10.4 in the interpersonal and self-management dimension, and 19.3 ± 3.7 in the technical dimension (Table 4).

Table 4: Mean scores of overall critical thinking skills and each dimension among nurses working at tertiary hospitals in Southwest Ethiopia, 2022

N-CT-4 Practice scale total and dimensions	Mean	SD	Cronbach alpha
Personal dimension	123.7	18.8	0.87
Intellectual and cognitive dimension	140.3	22.3	0.92
Interpersonal and self-management dimension	63.3	10.5	0.81
Technical dimension	19.3	3.7	0.74
Total N-CT-4 Practice score	346.6	50.9	0.95

Around half 196(49.1%) of the respondents scored a moderate level of critical thinking skills and 73(18.3%) of them scored a high level of critical thinking skills (Figure 4).

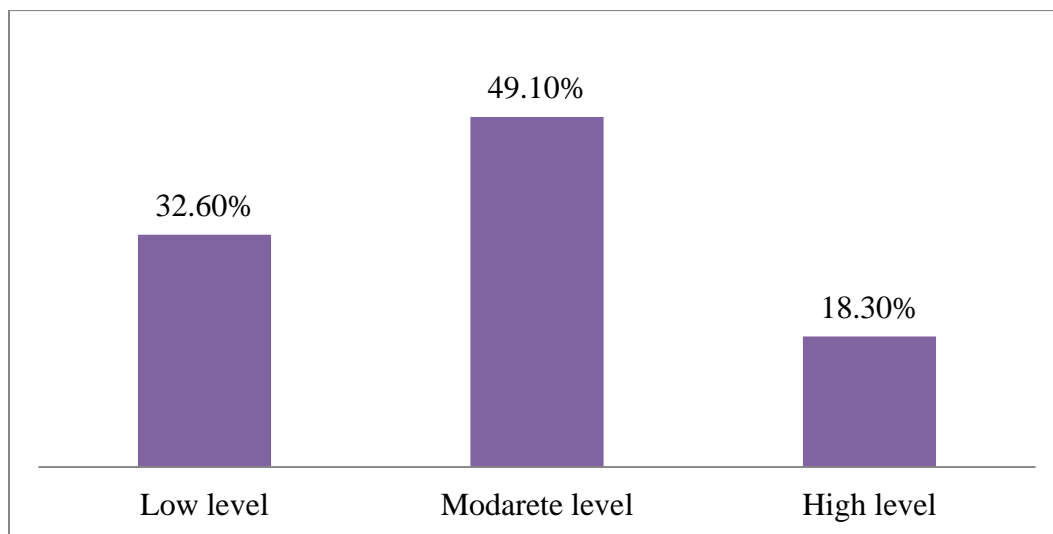


Figure 4: Levels of critical thinking skills among nurses working at tertiary Hospitals in Southwest Ethiopia, 2022.

5.5 Bivariate linear regression

From nineteen predictor variables entered one-by-one, 17 variables were selected for multivariable linear regression having a p-value of less than 0.25 (Table 5).

Table 5: Bivariate linear regression result showing candidate variables for multivariable analysis in the study of critical thinking skills among nurses working at tertiary Hospitals in Southwest Ethiopia, 2022.

Variables	Unstd. coefficients		t	P	95% CI	
	B	Std. Error				
Age	0.008	0.004	2.026	0.043*	0.000-0.015	
Gender (Male)	0.042	0.047	0.878	0.380	-0.052-0.135	
Marital status (Ever married)	0.085	0.050	1.705	0.089*	0.013-0.183	
Educational status	Diploma(R)					
	BSc nurse	0.280	0.074	0.792	0.000*	0.135-0.426
	MSc nurse	0.637	0.119	5.359	0.000*	0.403-0.870
Health condition (Good health)	0.140	0.079	1.784	0.075*	-0.014-0.294	
Following scientific publication (Yes)	0.544	0.040	13.702	0.000*	0.466-0.622	
Participation in scientific events (Yes)	0.502	0.040	12.642	0.000*	0.424-0.580	
Ever heard about “critical thinking” (Yes)	0.207	0.060	3.431	0.001*	0.088-0.326	
Monthly income	0.006	0.002	3.400	0.001*	0.002-0.009	
Working experience in nursing	0.010	0.004	2.519	0.012*	0.002-0.018	
Working department/unit	Emergency (R)					
	ICU	0.080	0.102	0.786	0.432	-0.121-0.282
	Ward	0.041	0.073	0.559	0.577	-0.102-0.184
	OPD	0.100	0.085	1.173	0.242*	-0.067-0.267
Others	0.033	0.102	0.328	0.743	-0.166-0.233	
Working experience in the current unit	0.001	0.010	0.086	0.931	-0.019-0.020	
Working position (Nurse manager)	0.381	0.066	5.797	0.000*	0.252-0.510	
Working shift (12 hours shift: full time)	-0.059	0.047	-1.255	0.210*	-0.151-0.033	
Critical thinking training (Yes)	0.381	0.093	4.097	0.000*	0.198-0.563	
Capacity building training (Yes)	0.278	0.045	6.161	0.000*	0.189-0.367	
Regular nursing round (Yes)	0.258	0.045	5.692	0.000*	0.169-0.347	
Routine nursing forums (Yes)	0.065	0.047	1.386	0.166*	-0.027-0.157	
Experience sharing events (Yes)	0.218	0.050	4.347	0.000*	0.120-0.317	

NB: Std.=Standard CI=Confidence interval R=Reference

*= Candidate variables (P<0.25)

5.8 Multiple linear regressions

A total of 17 candidate variables with p-value < 0.25 at simple linear regression analysis were entered into the multivariable linear regressions model through the backward method. From personal factor variables; educational level, following scientific publications, and participation in scientific activities were significantly associated with the level of critical thinking skills. From work-related variables; working department/unit, working position, and taking capacity-building training were significantly associated with the level of critical thinking skills. The six independent predictor variables in multivariate analysis explained 49.3% variation in the critical thinking skill score and all predictors were positively associated (Table 6).

The result showed that nurses with a diploma level of education had significantly lower critical thinking skills scores as compared with a BSc degree ($\beta=0.230$, $p=0.000$) and master's degree ($\beta=0.303$, $p=0.001$) while keeping other variables constant.

Nurses who followed scientific publications to update themselves on clinical practice had significantly higher critical thinking skills scores as compared with those who were not followed ($\beta=0.298$, $p=0.000$). Also, nurses who participated in scientific activities had significantly higher critical thinking skills scores than those who did not participate ($\beta=0.305$, $p=0.000$).

Concerning the working department/unit, working in the outpatient department increases critical thinking skills score by 0.105 times when compared with working in the emergency unit at $p = 0.025$ controlling the other variables constant. But working in the intensive care unit and different wards was not found statistically significant predictor of critical thinking skills in this study.

Being a manager nurse was another variable that was found to have a positive association with critical thinking skills; being a manager nurse has been shown to increase critical thinking skills score by 0.201 times than staff nurses at $p=0.000$ controlling the other variables constant.

The result also showed that those nurses who were exposed to capacity-building training related to clinical practice had significantly higher critical thinking skills scores ($\beta= 0.158$, $P=0.000$).

However, age, sex, marital status, health condition, monthly income, total working experience, working experience in current, working shift, having heard about critical thinking, exposure to

critical thinking training, regular nursing rounds, routine nursing forums, and experience sharing events were not significant predictors of nurses level of critical thinking skill in this study.

Table 6: *Multivariable Linear Regression final model showing associated factors with critical thinking skills among nurses working in tertiary hospitals in Southwest Ethiopia, 2022.*

Variables	Unstd. coefficients		T	p	95% CI for β	
	β	Std. error				
Educational status	MSc nurse	0.303	0.092	3.297	0.001**	0.122-0.483
	BSc nurse	0.230	0.055	4.169	0.000*	0.122-0.339
	Diploma (R)					
Following scientific publication (Yes)	0.298	0.041	7.249	0.000*	0.217-0.379	
Participation in scientific activities (Yes)	0.305	0.039	7.759	0.000*	0.227-0.382	
Working experience in nursing	0.006	0.003	1.912	0.057	0.000-0.012	
Working department/unit	OPD	0.105	0.047	2.244	0.025**	0.013-0.197
	Emergency (R)					
Working position (Nurse manager)	0.201	0.052	3.899	0.000*	0.100-0.302	
Capacity building training(Yes)	0.158	0.037	4.219	0.000*	0.084-0.232	
Regular nursing round (Yes)	0.070	0.039	1.779	0.076	-0.007-0.148	
Routine nursing forums (Yes)	0.069	0.036	1.913	0.056	-0.140-0.002	

NB: Dependent variable: total critical thinking score, Max. VIF=5.635, Min. VIF 1.113
R = 0.711, R Square =0.506, Adjusted R Square=0.493, F = 39.777, P = 0.000 CI= confidence interval, *= significant at <0.001, **= significant at <0.05

CHAPTER 6: DISCUSSION

This study revealed that the mean critical thinking scale score of nurses was 346.6 ± 50.9 . The study showed 49.1% of nurses had a moderate level of critical thinking skills, 32.6% had a low level and 18.3% had a high level of critical thinking skills. The critical thinking scale finding shows that the majority of nurses had a low or moderate level of critical thinking skills which is slightly consistent with the study conducted using the same tool in Vietnam which reported most nurses had a low or moderate level of critical thinking skills (34).

However, this result is higher when compared with other studies conducted in Turkey (38) and Malaysia (14) which showed that 91.4% and 57.9% of nurses had low levels of critical thinking respectively (38). Similarly, another study conducted in Turkey also reported that the critical thinking of nurses was generally at a low level (20,36,37). This difference might be due to differences in tools used to assess critical thinking skills. There are several instruments used to measure critical thinking and they yield results that are inconsistent from one study to another (52). Moreover, this difference might be due to differences in cultural backgrounds.

On the other hand, nurses scored a moderate level of critical thinking in the studies conducted in the USA (63%) (23), Malaysia (85.8%) (26), India (77.3%) (7), and Egypt (85.7%) (25) which is higher than the current study finding. The possible reason for this difference may be factors such as differences in education systems, individual socioeconomic differences, and the limited nature of management approaches to support and stimulate critical thinking.

The current finding is also lower than a study conducted in Norway which reported most, (80%) of nurses scored a high level of critical thinking skills (35). Moreover, a study conducted in Malaysia reported that most of the critical care nurses had a high level of critical thinking skills (9). These discrepancies may be attributed to the characteristics of the study participants in the case of the Malaysian study, where critical care nurses are more exposed to different clinical situations and capacity-building training which enhances their critical thinking skills, the difference in the educational system, and cultural differences.

The study also showed that educational level, following scientific publications to update oneself on clinical practice, participation in scientific activities, working department/unit, working position, and capacity-building training related to clinical practice were statistically significant predictors of critical thinking skills.

Evidence shows having the highest level of nursing education is related to the development of nurses' critical thinking skills (22). Similarly, the finding in the current study indicated that nurses with master's degrees ($\beta=0.303$, $p=0.001$) and BSc degrees ($\beta=0.230$, $p=0.000$) had significantly higher critical thinking skills scores than diploma nurses. This result is consistent with a study conducted in Vietnam (34), Malaysia (14,26), Turkey (39,55), Japan (45), and Jordan (40) which reported having a higher educational level had a significantly associated with high critical thinking skills. In fact, critical thinking is one of the important outputs of nursing education (56). However, several studies reported that the level of education had no significant association with the level of critical thinking of nurses (20,25,33,37,43,44).

According to the current study finding, nurses who followed scientific publications to update themselves on clinical practice had significantly higher critical thinking skills scores ($\beta=0.298$, $p=0.000$). Similarly, participating in scientific activities is significantly associated with higher critical thinking skills scores. This is consistent with studies conducted in Turkey which reported that the nurses who engaged in scientific activities had a higher level of critical thinking than those nurses who did not (37,47). The finding is also supported by a study conducted in Japan which revealed that taking seminars on nursing research was related to higher critical thinking scores (45). This can be explained by taking part in scientific activities related to their fields could enhance the scientific depth of nurses and also education on writing and analysis improves critical thinking (37,57).

Nurses working in the outpatient department (OPD) had significantly higher critical thinking skills than those in the emergency unit. This finding is inconsistent with studies conducted in Jordan and Japan found that working in the emergency unit was associated with higher critical thinking skills (40,45). This disparity might be due to the limitation of the study to only two units, emergency and ICU in the case of Jordan, and frequent rotation of nurses in the case of our study. Further, this may be explained by the fact that nurses working in the emergency unit face urgent and unpredictable situations which cause nurses to think more critically (40).

In the present study, working in the intensive care unit and wards were not found to have a statistically significant association with critical thinking skill. This is consistent with studies conducted in India (7), Iran (44), and Taiwan (12) which reported no significant association between the working department/unit and nurses' critical thinking skills.

The findings in this study also indicated that manager nurses ($\beta=0.201$, $p=0.000$) had higher critical thinking skills than staff nurses. This might be due to the fact that most of the time nurses assigned to management positions are those with a high educational level (34). This finding is supported by a study conducted in Vietnam (34), Spain (22), and Turkey (39,43) which showed that nurse managers had higher critical thinking abilities than staff nurses. Nurse managers with high critical thinking skills create an environment that favors the development of these skills and helps the staff nurses to deliver high-quality and safe patient care (58).

The current finding also revealed that nurses who have taken capacity-building training related to clinical practice had significantly higher critical thinking skills scores than those who didn't take it. It is usually expected that in-service training and certificate programs develop the critical thinking skills of nurses. This finding is in line with two studies conducted in Turkey, that reported taking in-service training had a statistically significant association with the level of critical thinking (50,51). This suggests that short-term or long-term capacity-building training may be crucial to enhancing nurses' critical thinking skills. However, the result of this study contradicts the finding of the study done in Turkey which couldn't find a significant association between participation in in-service emergency training and critical thinking skills (46).

Similar to the current study, various studies conducted in India (7), Turkey (20,39,43), Malaysia (14), Iran (44), and Egypt (25) reported no statistically significant association between levels of critical thinking and age. In contrast, the study conducted in Spain and Malaysia revealed that older age was associated with a higher level of critical thinking among nurses (9,22). Also, age was significantly associated with the level of critical thinking abilities in other studies conducted in Turkey (55), Taiwan (29), and Korea (42). This inconsistency may be due to methodological differences such as the tool used to measure critical thinking.

In contrast to our study finding, the theory of critical thinking in nursing and the novice to expert model suggests that more years of clinical experience are related to higher scores on critical

thinking skills (48,49). Findings from studies conducted in Vietnam (34), Malaysia (9,26), Taiwan (29), Korea (42), and Jordan (40) supported this theory and model. However, the results of other studies conducted in Spain (22,33), Egypt (25), Turkey (20,36,43), Iran (44), and Malaysia (14) reported that years of clinical experience was not associated with the development of critical thinking skill. This may be explained by the fact that having more years of experience does not guarantee that nurses have the ability to think critically, as it is possible to have experience without knowledge. Individual effort, relevant training courses, case reports, report writing, teaching, and other inputs do make a difference in one's critical thinking (41,59).

Strengths and limitations of the study

Strength

- This is the first study in our country that assesses the level of critical thinking skills and associated factors among nurses in the clinical setting.

Limitations of the study

There are some limitations that should be considered:

- The questionnaire was self-administered which requires subjective responses that may be prone to social desirability bias. The nurses, therefore, might over-report.
- The N-CT-4 Practice (V-v) questionnaire has too many items, it is possible that the subjects became fatigued and lost motivation when completing the instrument and thus can affect the accuracy of the results.
- Causality cannot be confirmed since the research design was cross-sectional in nature. Thus, in this study, the observed associations among variables might not have been causal.
- The findings of this study are limited to nurses working in tertiary hospitals; so the generalization of the finding may not be for nurses working at primary and secondary level health care and private institutions.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

The results of this study indicated that the majority of the nurses had a low and moderate level of critical thinking skills. Some personal and work-related factors, particularly educational level, following scientific publications to update oneself on clinical practice, participation in scientific activities, working department/unit, working position, and taking capacity-building training related to clinical practice were significantly associated with the level of critical thinking skills. On the other hand, age, gender, marital status, health condition, years of experience in nursing, years of experience in the current unit, having heard about critical thinking, taking critical thinking training, and institutional factors not associated with critical thinking skills of nurses.

7.2 Recommendations

It is clear that nurses are required to use critical thinking skills to make effective clinical decisions, solve complex clinical problems, and provide quality patient care. Hence, developing strategies to improve the critical thinking skills of nurses is required.

Based on the findings of this study, the following recommendations were forwarded:

Hospital management

- ☞ The hospital management should facilitate in-service training to improve nurses' critical thinking in collaboration with non-governmental organizations (NGOs), the Ministry of Health (MoH), and the Ethiopian nursing association (ENA).
- ☞ Hospital administrators, in collaboration with the MoH, should develop various educational programs for nurses and provide encouraging environments for obtaining higher degrees, in order to improve critical thinking skills.
- ☞ The hospital management should provide opportunities for staff nurses to be involved in different management positions.

Staff nurses

- ☞ Nurses should hold regular seminars and conferences to promote critical thinking skills.

- ☞ Nurses should actively follow scientific publications to update themselves on clinical practice.
- ☞ Nurses should actively participate in scientific activities/events like seminars and conferences for enhancing their critical thinking skills.

Nurse educators

- ☞ Nurse educators should implement teaching methodologies such as problem-based learning, case scenarios, simulation, small group work, and reflective diaries in the classroom and clinical practice.
- ☞ Critical thinking should be recognized and strengthened both in nursing education and clinical practice as an achievement of quality nursing care.

Researchers

- ☞ Further studies are required to identify other potential factors affecting the critical thinking skills of nurses and to explore the consequences of critical thinking.
- ☞ Longitudinal studies are required to examine the causal relations between variables and to explain the effect of the implementation of educational strategies to promote critical thinking.

REFERENCE

1. Janice L. Hinkle KHC. Brunner and Suddarths textbook of medical surgical nursing. 14th edition. 2018. 223 p.
2. P. T. Critical thinking in nursing education and practice as defined in the literature. *Nurs Educ Perspect*. 2005;26:272–7.
3. Giancarlo CA, Facione PA. A Look Across Four Years at the Disposition Toward Critical Thinking Among Undergraduate Students. *J Gen Educ*. 2001;50(1):29–55.
4. Alfaro-LeFevre R. *Critical Thinking, Clinical Reasoning, and Clinical Judgment: A Practical Approach*, sixth ed. Saunders/Elsevier, Philadelphia. 2016.
5. Newton SE, Moore G. Critical thinking skills of basic baccalaureate and accelerated second-degree nursing students. *Nurs Educ Perspect*. 2013;34(3):154–8.
6. Swinny B. Assessing and developing critical-thinking skills in the intensive care unit. *Crit Care Nurs Q*. 2010;33(1):2–9.
7. Niranjana P. R HP. Critical thinking skills among nurses of a selected hospital A cross-sectional survey. *Glob J Res Anal*. 2015;4(12):154–5.
8. Yildirim B, Ozkahraman S. Critical thinking in nursing process and education. *Int J Humanit Soc Sci*. 2017;1(13):257–62.
9. Ludin SM. Does good critical thinking equal effective decision-making among critical care nurses? A cross-sectional survey. *Intensive Crit Care Nurs* [Internet]. 2018;44:1–10. Available from: <http://dx.doi.org/10.1016/j.iccn.2017.06.002>
10. Wangensteen S, Johansson IS, Björkström ME, Nordström G. Research utilisation and critical thinking among newly graduated nurses: Predictors for research use. A quantitative cross-sectional study. *J Clin Nurs*. 2011;20(17–18):2436–47.
11. Lunney M. Use of critical thinking in the diagnostic process. *Int J Nurs Terminol Classif*. 2010;21(2):82–8.
12. Chang MJ, Chang YJ, Kuo SH, Yang YH, Chou FH. Relationships between critical

- thinking ability and nursing competence in clinical nurses. *J Clin Nurs*. 2011;20(21–22):3224–32.
13. Brunt BA. Critical thinking in nursing: an integrated review. *J Contin Educ Nurs*. 2005;36(2):60–7.
 14. Lee DSK, Abdullah KL, Chinna K, Subramanian P, Bachmann RT. Critical thinking skills of RNs: Exploring demographic determinants. *J Contin Educ Nurs*. 2020;51(3):109–17.
 15. Zurmehly J. The relationship of educational preparation, autonomy, and critical thinking to nursing job satisfaction. *J Contin Educ Nurs*. 2008;39(10):453–60.
 16. Mousazadeh N, Momennasab M, Sharif Nia H, Nazari R, Hajihosseini F. Effective Factors in Critical Thinking Disposition in Nursing Students. *Educ Res Int*. 2021;2021(1998).
 17. Jackson A, Halstead J. National League for Nursing Commission for Nursing Education Accreditation. *Nurse Educ*. 2016;41(6):303.
 18. Joint Commission. Joint Commission on Accreditation of Healthcare Organizations. Comprehensive accreditation manual for hospitals. Oakbrook Terrace (IL): Joint Commission on Accreditation of Healthcare Organizations. 2002. 85 p.
 19. Tyne SL. Critical Thinking and Clinical Judgment in Novice Registered Nurses. ProQuest Diss Theses [Internet]. 2018;126. Available from:
<https://www.proquest.com/dissertations-theses/critical-thinking-clinical-judgment-novice/docview/2016065559/se-2?accountid=25704>
 20. Gezer N, Yildirim B, Ozaydin E. Factors in the Critical Thinking Disposition and Skills of Intensive Care Nurses. *J Nurs Care*. 2017;06(02):390.
 21. Toofany S. Critical thinking among nurses. *Nurs Manag (Harrow)*. 2008;14(9):28–31.
 22. Zuriguel-Pérez E, Lluch-Canut MT, Agustino-Rodríguez S, Gómez-Martín M del C, Roldán-Merino J, Falcó-Pegueroles A. Critical thinking: A comparative analysis between nurse managers and registered nurses. *J Nurs Manag*. 2018;26(8):1083–90.

23. Lang GM, Beach NL, Patrician PA, Martin C. A cross-sectional study examining factors related to critical thinking in nursing. *J Nurses Staff Dev*. 2013;29(1):8–15.
24. Meherali SM, Profetto-McGrath J, Paul P. Nursing Students Critical Thinking and Research Utilization. *Qual Adv Nurs Educ - Avancées en Form Infirm*. 2015;1(3):Article 3.
25. Mahmoud AS, Mohamed HA. Critical Thinking Disposition among Nurses Working in Public Hospitals at Port-Said Governorate. *Int J Nurs Sci [Internet]*. 2017;4(2):128–34. Available from: <http://dx.doi.org/10.1016/j.ijnss.2017.02.006>
26. Seman N, Lin YW. Critical Thinking Skills among Nurses at a Private Hospital in Penang: A Quantitative Study. *ESTEEM J Soc Sci Humanit [Internet]*. 2021;5(1):48–55. Available from: <https://ejssh.uitm.edu.my>
27. Profetto-McGrath J, Hesketh KL, Lang S, Estabrooks CA. A study of critical thinking and research utilization among nurses. *West J Nurs Res*. 2003;25(3):322–37.
28. Fesler-Birch DM. Critical thinking and patient outcomes: A review. *Nurs Outlook*. 2005;53(2):59–65.
29. Chen FF, Chen SY, Pai HC. Self-reflection and critical thinking: the influence of professional qualifications on registered nurses. *Contemp Nurse [Internet]*. 2019;1–22. Available from: <https://doi.org/10.1080/10376178.2019.1590154>
30. Raterink G. Critical thinking - Reported enhancers and barriers by nurses in long-term care: Implications for staff development. *J Nurses Staff Dev*. 2011;27(3):136–42.
31. Shoulders, B., Follett, C., & Eason J. Enhancing critical thinking in clinical practice: Implications for critical and acute care nurses. *Dimensions of Critical Care Nursing*. *J Nurses Staff Dev [Internet]*. 2014;33(4):207–14. Available from: <http://dx.doi.org/10.1016/j.jaci.2012.05.050>
32. Zuriguel Pérez E, Lluch Canut MT, Falcó Pegueroles A, Puig Llobet M, Moreno Arroyo C, Roldán Merino J. Critical thinking in nursing: Scoping review of the literature. *Int J Nurs Pract*. 2015;21(6):820–30.

33. Zuriguel-Pérez E, Falcó-Pegueroles A, Agustino-Rodríguez S, Gómez-Martín M del C, Roldán-Merino J, Lluch-Canut MT. Clinical nurses's critical thinking level according to sociodemographic and professional variables (Phase II): A correlational study. *Nurse Educ Pract* [Internet]. 2019;41(October 2018):102649. Available from: <https://doi.org/10.1016/j.nepr.2019.102649>
34. Van Nguyen T, Liu HE. Factors associated with the critical thinking ability of professional nurses: A cross-sectional study. *Nurs Open*. 2021;8(4):1970–80.
35. Wangensteen S, Johansson IS, Björkström ME, Nordström G. Critical thinking dispositions among newly graduated nurses. *J Adv Nurs*. 2010;66(10):2170–81.
36. Yurdanur RN, PhD D. Critical Thinking Competence and Dispositions among Critical Care Nurses: A Descriptive Study. *Int J Caring Sci*. 2016;9(2):489–95.
37. Fantus Uncu, Hasan Evacimen UD. An nvestigation of the Critical Thinking Abilities of Nurses in Generation-X and -Y: the Case of Elaziğ. *J Anatolia Nurs Heal Sci*. 2021;24(4):548–54.
38. Polat Ş, Kutlu L, Ay F, Purısa S, Erkan HA. Decision-making styles, anxiety levels, and critical thinking levels of nurses. *Japan J Nurs Sci*. 2019;16(3):309–21.
39. Urhan E, Zuriguel-Perez E, Harmancı Seren AK. Critical thinking among clinical nurses and related factors: A survey study in public hospitals. *J Clin Nurs*. 2022;31(21–22):3155–64.
40. Rababa M, Al-Rawashdeh S. Critical care nurses' critical thinking and decision making related to pain management. *Intensive Crit Care Nurs* [Internet]. 2021;63:103000. Available from: <https://doi.org/10.1016/j.iccn.2020.103000>
41. Feng RC, Chen MJ, Chen MC, Pai YC. Critical thinking competence and disposition of clinical nurses in a medical center. *J Nurs Res*. 2010;18(2):77–87.
42. Lee JY, Pak SY. Relationship between the Practice Environment of Nursing and Critical Thinking Disposition of Nurses in Local General Hospitals. *J Korean Acad Nurs Adm*. 2014;20(2):145.

43. Yazar Soyadı YA, ZAYBAK A, ERZİNCANLI S. the Relationship Between Critical Thinking Disposition and Problem Solving Skills in Nurses. *Int Ref J Nurs Res.* 2015;2(3):26–26.
44. Ali-Abadi T, Babamohamadi H, Nobahar M. Critical thinking skills in intensive care and medical-surgical nurses and their explaining factors. *Nurse Educ Pract* [Internet]. 2020;45(April 2019):102783. Available from: <https://doi.org/10.1016/j.nepr.2020.102783>
45. Futami A, Noguchi-Watanabe M, Mikoshiba N, Yamamoto-Mitani N. Critical thinking disposition among hospital nurses in Japan: Impact of organizational versus personal factors. *Japan J Nurs Sci.* 2020;17(2):1–9.
46. Kaya H, Yalniz N. Critical thinking dispositions of emergency nurses in Turkey: A crosssectional study. *Hong Kong J Emerg Med.* 2012;19(3):198–203.
47. İskender MD KA. Determining the Critical Thinking Levels of Senior Nursing Students. *Dokuz Eylul Univ Fac Nurs Electron J.* 2015;8(1):3–11.
48. Martin C. The theory of critical thinking of nursing. *Nurs Health Care Perspect.* 2002;23(5):243–7.
49. Munjas BA. From Novice To Expert: Excellence and Power in Clinical Nursing Practice. *J Psychosoc Nurs Ment Health Serv.* 1985;23(5):39–39.
50. Yildirim B. Investigation of Critical Thinking Disposition In Nurses Working In Public Hospitals. *Int J Business, Humanit Technol.* 2012;2(3):61–7.
51. Sukran Ozkahraman BY. Investigation of Critical Thinking Disposition in a University Hospital of Nurses Working in Turkey. *Int J Appl Sci Technol.* 2012;2(3):61–7.
52. Zuriguel-Pérez E, Falcó-Pegueroles A, Roldán-Merino J, Agustino-Rodriguez S, Gómez-Martín M del C, Lluch-Canut MT. Development and Psychometric Properties of the Nursing Critical Thinking in Clinical Practice Questionnaire. *Worldviews Evidence-Based Nurs.* 2017;14(4):257–64.
53. Fallah Nezhad Z, Ziaeirad M. The relationship between the quality of working life and

- critical thinking of nurses in Milad Hospital of Isfahan, Iran. *Prev Care Nurs Midwifery J*. 2018;8(3):62–8.
54. Urhan, E., & Seren AKH. Validity and reliability of Turkish ver_sion of the nursing critical thinking in clinical practice questionnaire. *Univ Heal Sci J Nurs*. 2019;1(3):147–156.
 55. Erkus B, Bahcecik N. Level of critical thinking and problem solving skills of administrator nurses and nurses who work at private hospitals. *J Marmara Univ Inst Heal Sci*. 2015;5(1):1.
 56. Kim KS, Choi JH. The relationship between problem solving ability, professional self concept, and critical thinking disposition of nursing students. *Int J Bio-Science Bio-Technology*. 2014;6(5):131–42.
 57. Hayashi H, Yamada T. Improving Critical Thinking Disposition by Teaching Research Literacy : Focusing on Academic Writing and Data Analysis Abilities. 2012;18(18):41–51.
 58. Zori S, Nosek LJ, Musil CM. Critical thinking of nurse managers related to staff RNs' perceptions of the practice environment. *J Nurs Scholarsh*. 2010;42(3):305–13.
 59. Ryan C, Tatum K. Objective measurement of critical-thinking ability in registered nurse applicants. *J Nurs Adm*. 2012;42(2):89–94.

ANNEXES

Annexes I: Informed consent form

Information sheet

Good morning/afternoon. My name is..... I am here on behalf of Wondimagegn Admasu a master's student at Jimma University School of nursing. He is conducting research on **the level of critical thinking skills and associated factors among nurses working at tertiary hospitals in southwest Ethiopia**. He received permission from all hospitals included in the study. You are selected randomly to participate in this study. Your participation is entirely voluntary, and if you wish to withdraw from the study, you may do so at any time. You will not be requested to give reasons for withdrawing from the study. However, your participation in the study has a significant contribution to the study.

If you agree to participate in the study, you will be asked to answer some questions about yourself, regarding critical thinking skills. Filling out the questionnaire will take 30 minutes. Participating in this study will not have any kind of risks. You may not directly benefit or get payment from participating in this study, but your participation will help policymakers and leaders to propose strategies to improve critical thinking skills. Your participation also will help to conduct other studies in the future. Your responses will be kept confidential. Names and any identifiers will not be written in the questionnaire, instead only codes will be used and this data will not be used for any purposes other than this study.

Your willingness and active participation are very important for the success of this study. If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact us through the following address:

Address: Cell phone +251931899208/ Email:- wondeadmasu1927@gmail.com

Questionnaires ID _____

Certificate of consent

I have read the information. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction.

I am willing to voluntarily participate in this study.

Participant's signature _____ Date _____

Data collection facilitator:

Name _____ Signature _____

Date ____/____/____

Checked by supervisor; Name _____ Signature.....

Date

Annexes II: Questionnaire

JIMMA UNIVERSITY
INSTITUTE OF HEALTH
FACULTY OF HEALTH SCIENCE
SCHOOL OF NURSING

This questionnaire has four parts. Please read all instructions before selecting and entering your response.

Part I: Personal factors

Instruction: Please encircle the number in front of the option you choose and fill in the blank space that best describes you on the right side of the table.

SN	Questions	Response	Skip
101	Your age in years	_____	
102	Your gender	1. Male 2. Female	
103	What is your marital status?	1. Single 2. Married 3. Widowed 4. Divorced	
104	What is your educational level?	1. Diploma 2. BSc degree 3. MSc degree	
105	How do you rate your status of current health?	1. Very good 2. Good 3. Fair 4. Bad/very bad	
106	Do you follow scientific publications (journals, books, magazines) to update yourself on clinical practice?	1. Yes 2. No	
107	Do you participate in scientific activities/events?	1. Yes 2. No	
108	Have you ever heard about critical thinking?	1. Yes	

		2. No	
109	Your monthly income	_____Ethiopian birrs	

Part II: Work-related factors

Instruction: Please encircle the number in front of the option you choose and fill in the blank space that best describes you on the right side of the table.

SN	Questions	Response	skip
201	Total years of clinical experience in the nursing profession.	_____ Years	
202	Your current working department/unit.	1. Emergency OPD 2. ICU 3. Ward (i.e medical, surgical, pediatrics, gyna, etc) 4. Outpatient department 5. Other specify_____	
203	Your working experience in current department/unit.	_____years	
204	What is your current work position?	1. Staff nurse 2. Head nurse 3. Mentor 4. Supervisor 5. Nursing director	
205	What is your working shift schedule?	1. 12 hours shift: full time 2. 8 hours shift: full time 3. Part-time	
206	Have you ever taken critical thinking training?	1. Yes 2. No	
207	Have you ever taken any capacity-building	1. Yes	

407	I look for alternative responses when I am faced with one that isn't satisfactory.	1	2	3	4
408	I am able to identify the time and place to be constructively critical.	1	2	3	4
409	When I have the information I try to interpret it before expressing a definitive conclusion.	1	2	3	4
410	Before acting I reflect upon the advantages and disadvantages of my decision	1	2	3	4
411	I think before I act.	1	2	3	4
412	I act in a reasoned, step-by-step manner.	1	2	3	4
413	I am aware of when I am acting in an impulsive manner.	1	2	3	4
414	I believe in myself and in others and act accordingly.	1	2	3	4
415	I see problems as challenges to be overcome, and not as threats	1	2	3	4
416	I believe that I act in a firm/strong manner.	1	2	3	4
417	My behavior is firm.	1	2	3	4
418	I initiate and complete tasks on my own.	1	2	3	4
419	I take responsibility for my own actions.	1	2	3	4
420	I consider myself to be meticulous/careful in my actions	1	2	3	4
421	I consider myself to be prudent/practical in my actions.	1	2	3	4
422	I accept that there is more than one way to approach life.	1	2	3	4
423	I make decisions in an objective manner.	1	2	3	4
424	I accept cultural differences in people's responses to situations.	1	2	3	4
425	I look for real solutions to problems.	1	2	3	4
426	I look for solutions appropriate to each situation.	1	2	3	4
427	I consider the consequences before taking action.	1	2	3	4
428	I create chances for improvement and offer innovations.	1	2	3	4
429	I act when I have the chance to do so.	1	2	3	4
430	I remain loyal to my values in the face of opposition from others.	1	2	3	4
431	The greater the chance of failure in an undertaking, the likelier I am to go ahead.	1	2	3	4
432	I know how to be patient in achieving my goals.	1	2	3	4

433	I see myself as persistent in trying to reach my goals.	1	2	3	4
434	I don't impose my own thinking on others, and I see myself as open to change.	1	2	3	4
435	I see myself as having a healthy lifestyle	1	2	3	4
436	I encourage others to follow a healthy lifestyle.	1	2	3	4
437	I look for self-improvement in my way of thinking.	1	2	3	4
438	I promote patient health.	1	2	3	4
439	I promote action in the organization designed to improve safety and quality.	1	2	3	4
Intellectual and cognitive dimension					
440	I have the scientific knowledge required to carry out my professional practice.	1	2	3	4
441	I have the theoretical basis in nursing methodology needed for my professional practice.	1	2	3	4
442	I have the knowledge needed to deal with the psychosocial aspects of the patients.	1	2	3	4
443	I apply knowledge derived from scientific evidence in carrying out care.	1	2	3	4
444	I am able to communicate effectively.	1	2	3	4
445	I fill out the nursing records in a complete, rigorous manner.	1	2	3	4
446	I believe that the people that I look after are equal regardless of social or cultural differences.	1	2	3	4
447	I provide safe, competent, and compassionate care.	1	2	3	4
448	I carry out professional practice based on the principle of respect for the rights of the patient.	1	2	3	4
449	I respect the privacy and confidentiality of the patient.	1	2	3	4
450	I am able to commit myself to realize the values of the profession	1	2	3	4
451	I take the actions needed to prevent risk to patients.	1	2	3	4
452	I try to guarantee the safety of the workplace.	1	2	3	4
453	I choose among different alternatives, examining the consequences of	1	2	3	4

	each.				
454	I use strategies designed to encourage the participation of patients and their families or caregivers in the decision-making regarding patient health.	1	2	3	4
455	I carry out a systematic, careful assessment in order to collect the information needed to identify health problems.	1	2	3	4
456	I obtain the data that are key to determining the factors that may play a role in the care of patients.	1	2	3	4
457	I observe which patient signs or symptoms are within normal limits, and which ones are not.	1	2	3	4
458	I decide when data outside the normal limits may be signs or symptoms of specific problems.	1	2	3	4
459	I identify what information may be relevant to understanding a specific health problem.	1	2	3	4
460	I compare what the patient says (subjective data) with what I observe (objective data).	1	2	3	4
461	I am able to recognize contradictions between the subjective and objective data.	1	2	3	4
462	I analyze the data and identify possible omissions.	1	2	3	4
463	When the information available is incomplete I look for whatever else is needed in order to better understand the clinical situation.	1	2	3	4
464	On the basis of the data collected I identify the current and potential problems of the patient.	1	2	3	4
465	I determine the causes and factors underlying the problems.	1	2	3	4
466	I identify the results that I expect to observe in the patient following the care process.	1	2	3	4
467	I prioritize the actions to be taken on the basis of each patient's situation.	1	2	3	4
468	I consider the patient and the family or caregivers to be central figures when making decisions about the management of patient health.	1	2	3	4
469	I decide upon the interventions appropriate for achieving the expected results.	1	2	3	4

470	I treat interventions and nursing actions one by one in order to prevent or control problems.	1	2	3	4
471	I am able to recognize when changes that are relevant to patient health occur.	1	2	3	4
472	I am able to interpret the signs and symptoms that may be indicative of complications in a patient's state.	1	2	3	4
473	I am able to foresee the appearance of complications in the patient and apply appropriate preventive measures.	1	2	3	4
474	I modify the care plan or therapy plan in accordance with the patient's state.	1	2	3	4
475	I carry out actions designed to foster the health of patients and their families or caregivers.	1	2	3	4
476	I try to educate patients regarding the prevention of complications in their health.	1	2	3	4
477	I am able to distinguish between situations that represent ethical conflicts and those that do not.	1	2	3	4
478	I use the documented information resources in a critical manner.	1	2	3	4
479	I use the documented information resources to support my clinical practice.	1	2	3	4
480	I understand which of my abilities will be useful in achieving what I set out to do.	1	2	3	4
481	When I have assimilated newly learned material I try to analyze how I came to learn it.	1	2	3	4
482	When I need to learn something I know what actions I have to take in order to do so.	1	2	3	4
483	I share the mission, vision, and values of my organization.	1	2	3	4
Interpersonal and self-management dimension					
484	I adapt the information to the needs and capacities of the patient.	1	2	3	4
485	I offer emotional support to the patient and family/caregiver.	1	2	3	4
486	I defend the rights of the patient and family/carer.	1	2	3	4

487	I use strategies designed to enhance the empowerment (increasing capacities and involvement) of the patient and family/caregiver in the care process.	1	2	3	4
488	I apply strategies to resolve conflicts arising from relations between the patient and family/caregiver, when necessary.	1	2	3	4
489	I defend the rights of the professional team.	1	2	3	4
490	I use strategies designed to enhance the empowerment of the members of the professional team	1	2	3	4
491	I use strategies designed to resolve conflicts arising from professional relations.	1	2	3	4
492	I adapt to organizational changes in my workplace.	1	2	3	4
493	I try to assist in the adaptation of others in the work team to organizational changes in the workplace.	1	2	3	4
494	I share my experiences with the nursing team in order to achieve common goals.	1	2	3	4
495	I share my experiences with other professionals in order to achieve common goals.	1	2	3	4
496	I am able to optimally manage my time.	1	2	3	4
497	I use strategies (establishing priorities, organizing time, organizing the workplace) in order to better manage time.	1	2	3	4
498	I use critical thinking in order to propose new solutions to problems that have been identified.	1	2	3	4
499	I delegate tasks in line with the knowledge, abilities, and skills of the people who will carry them out.	1	2	3	4
4100	I carry out follow-ups of the delegated tasks.	1	2	3	4
4101	I try to have a positive influence on other members of the professional team so that they can achieve the goals that have been set.	1	2	3	4
4102	I am able to manage a professional group to achieve stated goals.	1	2	3	4
4103	I am able to help contribute to a healthy working environment.	1	2	3	4
Technical dimension					

4104	In the event of clinical uncertainty I know how to obtain reliable information from the scientific databases.	1	2	3	4
4105	I possess skills in the use of information and communication technologies needed to produce optimal professional results.	1	2	3	4
4106	I am able to carry out needed techniques and procedures, relevant to the complexity of each case.	1	2	3	4
4107	I match the procedure to be done with the appropriate context for carrying it out.	1	2	3	4
4108	I administer medication in a safe manner (dose, preparation, and handling of instruments to administer the medication).	1	2	3	4
4109	I carry out the care associated with administering medication (assessing the therapeutic response, previous and subsequent monitoring) in the correct manner	1	2	3	4

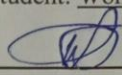
THANK YOU!!

DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

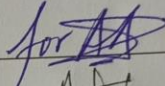
The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the Institute of Health College of Health sciences in effect at the time of grant is forwarded as the result of this application.

Name of student: Wondimagegn Admasu

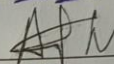
Signature  Date 1/5/2015

APPROVAL OF THE ADVISORS

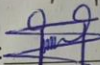
Name of first advisor: Dr. Fikadu Balcha

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Name of second advisor: Mr. Abdulwahid Awol

Signature: 

Name of the internal examiner: Mr. Girma Bacha

Signature: 

Name of the external examiner: Dr. Maleda Terefe

Signature: for 