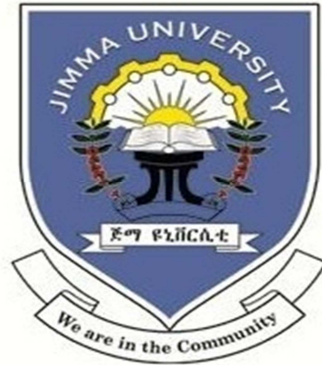


PERCEIVED NURSE - PHYSICIAN COMMUNICATION IN PATIENT CARE AND
ASSOCIATED FACTORS IN PUBLIC HOSPITALS OF JIMMA ZONE, SOUTH
WEST ETHIOPIA.



BY

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A THESIS SUBMITTED TO THE DEPARTMENT OF NURSING, COLLEGE OF
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Assurance of principal investigator

I, Chanyalew Worku, declare that the work entitled “Perceived nurse - physician communication in patient care and associated factors in public hospitals of Jimma zone, south west Ethiopia “presented in this MSc thesis is original. It has not been presented to any other university or institution. Where, the work of other people has been used, reference has been provided. It is in this regard that I declare this work as original mine, and it is here by presented in partial fulfillment of the MSc Degree in Adult Health Nursing.

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Abstract

Background: Nurse–physician relationships have been shown to have a significant impact on the job satisfaction and retention of nurses and physicians in combination with other individual and organizational factors. In areas where it has been studied, communication failure between nurses and physicians was found to be one of the leading causes of preventable patient injuries, complications, death and medical malpractice claims.

Objective: To determine perception of nurses and physicians towards nurse-physician communication in patient care and associated factors in public hospitals of Jimma zone, southwest Ethiopia in 2014.

Methods: Institution based cross-sectional study was conducted from March 10 – April 16/2014 among all of 509 participants (341 nurses and 168 physicians) using a pre tested structured self - administered questionnaire in census method. Data were entered into EpiData version 3.1 and exported to Statistical Package for Social Sciences version 16.0 for analysis. Factor analysis was carried out. Descriptive statistics, independent sample t-test, linear regression and one way analysis of variance were used for data analysis. Variables with P-value < 0.05 was considered as statistically significant. Finding was presented in tables and graphs.

Results: The response rate of the study was 91.55 % .The mean perceived nurse-physician communication scores (as the percentages of maximum scale scores) was 50.88±19.7 % for perceived professional respect and satisfaction and 48.52±19.7% for perceived openness and sharing of patient information on nurse-physician communication. Age, salary and organizational factors were the potential predictors for perceived respect and satisfaction. Moreover, Sex, working hospital, work attitude individual factors and organizational factors were predictors of perceived openness and sharing of patient information in nurse-physician communication during patient care.

Conclusion: Perceived level of nurse-physician communication mean score has attention seeking gap and was lower among nurses than physicians. Hence, there is a need for developing and implementing nurse-physician communication improvement strategies like discussion forum regarding nurse physician relationships to solve communication mishaps patient problems.

KEY WORDS: Communication, Nurse-Physician, Nurse-Physician Communication, Perceived Nurse-Physician Communication.

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List of Abbreviations and Acronyms

ANOVA	Analysis of Variance
BscN	Bachelors of Science degree in nursing
EBR	Ethiopian Birr
GP	General Practioner
ICU	Intensive Unit Care
JU	Jimma University
JUSH	Jimma University Specialized Hospital
MD	Medical Doctor
MSCN	Master of Science degree in nursing
MPH	Master of Public Health
OPD	Outpatient department
OR	Operation room
NPC	Nurse-physician Communication
PCA	Principal Component Analysis
SBAR	Situation, Background, Assessment and Recommendation
SM	Percentage maximum scale score
SNNP	Southern Nations Nationalities and Peoples
SPSS	Statistical Package for Social Sciences
US	united States
USA	United States of America
VHA	Veterans Health Administration

Chapter One: Introduction

1.1 Background

Communication is the a process where information is transferred , exchanged or feelings, needs and preferences are shared to create common understanding among members of the health care team in patient care (1). Effective communication is more than just exchanging of information; it is a combined set of skills to recognize and understand those of the person communicating with (2).

Nurse-physician communication is described as a professional interaction, working together, sharing in decision making around health issues, to formulate collaborative patient care plan in which the actual team's performance was measured. Although nursing is typically characterized as caring and medicine as curing both are essential disciplines with combining art, science, caring, treatment and curative functions. Both professional work their activity with nurse-physician interprofessional communication (3,4). In addition, smooth working relationships between nurse and physician are prerequisite and paramount for efficient care delivery and a second goal of the joint commission national patient safety in 2013 (5–7) .

Nurses and physicians need to work together as a team by solving problems and engaging each other's strengths and learning from one another which can help their team to flourish an environment suitable to put unique contribution of their work during patient care. Which in turn can help to deliver quality patient care (8). Both nurses and physician ethically have to communicate with each other effectively to reduce the mortality rate and improve patients satisfaction and outcome, reduce errors, and minimize patient's hospital length of stay, make nurses and physician satisfied (9).

There were varied reasons for communication mishaps including organization's culture, stressful environment, a culture of autonomy and hierarchy that inhibits staff from speaking up if they see or suspect an error, a lack of team training, treatment plans,

personality behaviors (10), personal values and expectations, differences in schedules and professional routines , varying levels of preparation, qualifications, and status , differences in professional education norms , accountability, lack of defined roles and responsibilities, payment and rewards regarding clinical responsibility (11,12).

Nurses often choose silence instead of dealing with physicians on their professional relation. Perceptions of nurses and physicians as elements of communication may provide better knowledge of how communication can be modified. Setting specific strategies are better to improve communication between them .But, before such specific interventions can be developed, a clearer understanding of nurses' and physicians ' perceptions of their interprofessional communication is necessary (13).

Since effective nurse-physician communication in Jimma zone hospitals is essential and has impact on health care delivery and outcomes of patients, it is the interest and observed problem to assess perceived nurse- physician communication and associated factors in this area.

1.2. Statement of the problem

In today's health care delivery system there are many interfaces to give care for patient among different health care providers including physicians and nurses with varying levels of educational training. For effective clinical practice information must be accurately communicated. When health care professionals are not communicating effectively, patient safety is at risk for several reasons: lack of critical information, misinterpretation of information, unclear orders and overlooked changes in status (12).

As a result, nurse-physician communication in the practice of healthcare setting is important issue that requires international attention because of its relationship with nurses' job satisfaction, turnover, patient safety, can prevent medical mistakes and above all the quality of care (14–17), and strong professional communication and respect are key to successful collaboration (18). Dysfunctional nurse-physician communication is linked to medication error, a major risk factor to patient injury, and its failure was reported by joint commission to be the leading root cause of sentinel events in all categories in 2005 (10), 65% of sentinel events in 2006 (19), 82% of the sentinel events in 2007 (17,20), and 60% in 2011 (21). Majority of unwanted events occur due to miscommunication, and communication failure and deficits in teamwork, particularly between nurses and physicians are the leading cause of preventable patient injuries and death and medical malpractice claims (11,16,17,22,23).

Communication failure also includes hierarchical differences, upward influence, interpersonal power conflict, ambiguous role to carry out specific tasks (24). In Victoria, the direct cost of medical errors in public hospitals is estimated at half a billion dollars annually (11). In Slovenia, Eastern Europe, physician and nurse groups estimated that they had a low level of personal involvement in their organizations and indicated insufficient involvement in teamwork, while nurses also thought that they were subordinated to physicians (25).

Although, nurses and physicians share a common historical ground in caring for the sick through skill and knowledge, at present the two professions fail to understand their complementary roles. However, from earlier times nursing was regarded as secondary to the role of the physician (3), and communication between the professions does not flow as it is and the one factor that is most associated with excess hospital mortality (26).

On the surface, there are important benefits from nurse-physician collaborative work, and yet this collaborative emphasis is not sufficiently stressed in medical education nor seen in actual practice. (18).

In Toronto, 30 % of procedurally relevant exchanges involved communication failures which were inaccurate, misunderstood which resulted harm on patients and flared into tension between staff members (27). Hence, nurse-physician relationships and communication have been the focus of ongoing argument; it has a major effect on workplace and patients safety. To get the job done right, information is transmitted in a clear and reliable way with respect and satisfaction. It is not only what is said that matters, but also the way it is communicated between nurse –and physician (28).

It was agreed that better nurses and physicians communication is necessary for efficient health care delivery but it has often been seen as problematic and little is known about the perceived level and factor that matter (29).

In Egypt, physicians perceive as their role as the most important one in the health care team (30) which have a significant impact on the job satisfaction and retention of nurses in combination with other workplace factors, disruptive behavior contributes significantly to increased workplace stress and burnout and strongly influences nurses' job satisfaction and decisions to leave the profession (12,31). Nurse-physician communication can be conflictive that arise from competition for status and power and different values and believes (28).

In Ethiopia nurses are not satisfied with their relation with physicians whereas physicians are relatively satisfied with their relation with nurses (29).

Solutions attempted to have good nurses - physician's communication are Culture Change (most fundamental intervention to foster an organizational culture that is patient-centric, safety-focused, and supportive of open communication and teamwork. Leaders can support open communication and teamwork and adequate policies for addressing disruptive physician behavior, a significant barrier to effective communication) and Specific communication tools that focuses on the development of four core competencies: leadership, situation monitoring, mutual support, and communication (25). Poor nurse-physician communication has many negative consequences, including delaying care, extending the length of a patient's stay, and causing patient injury and death *and* remains underappreciated and insufficiently addressed (32).

There is a need to investigate nurse – physician communication in public hospitals of Jimma zone like other hospitals in the country because it increases physician-nurse interaction, higher patient satisfaction and outcomes, lower length of stay. It is an actual observed problem during clinical practice that needs to be studied to see optimal patient care from effective nurse-physician communication. Therefore; this study was tried to see perception of nurses and physicians towards to nurse-physician communication and associated factors in public hospitals of Jimma zone.

Chapter Two: Literature Review

2.1 Nurse-physician communication

A survey of physicians and nurses in eight nonsurgical intensive care units in University of Texas, by Thomas and his colleagues with response rate of 58% (40% for physicians and 71% for nurses) showed as there was discrepancy of perceived level of nurses and physicians communication. Seventy three percent of physicians and thirty three percent of nurses reported quality of collaboration was high or very high respectively. Nurses report as disagreements were not resolved appropriately, their input was poorly received in decision making, and difficult to assert themselves which can be source of nurses' dissatisfaction to their profession and led to nursing shortage. The recommendation was good teamwork is associated with better job satisfaction and less time missed from work which led to good work performance and better patient outcomes (33). The study was in ICU with low response rate which can limit its generalizability.

Also physician's better communication score than nurses were found in conveniently sampled study on nurses, physicians, hospital executives, and other employees by Rosenstein in Veterans Health Administration (VHA) West Coast of America which noted the harmful consequences of poor communication on job satisfaction and retention among nurses. Nurses mean rating of the overall atmosphere of nurse-physician relationships was 6.74, while to physicians it was 7.52), nurses' mean rating of a physician's value and respect for nurses' input and collaboration was 5.83, while the physicians was 7.26. Physicians' awareness of the importance of nurse-physician relationships on nurse satisfaction, nurses and physicians also disagreed, giving ratings of 4.71 and 6.18, respectively. 30% of respondents reported knowing at least one nurse who left the hospital as a result of disruptive physician behavior(raising the voice, disrespect, condescension, berating colleagues, berating patients, and use of abusive language that can be contributing factor to nurse satisfaction and morale) (34).

In addition, cross-sectional survey done by LPT Chang, e'tal (2010) in all medical personnel working full-time in the intensive Care Unit of West Indies University Hospital with response rate of 95% on the interdisciplinary communication showed that overall communication openness was thought to be better by the doctors (73%) than the nurses (32%) and tended to decrease with increasing seniority. Most physicians thought doctor-to-nurse communication (70-73%) was good and nurses felt less communication with physicians (35-67%), especially with consultants. 53% physicians stated that they had received incorrect information from 32% of the nurses. Most physicians found it enjoyable to talk with all categories of nurses at work (77-87%). But most nurses did not enjoy talking to physicians; especially consultants. 85% of nurses found it easy to take advice from senior residents and higher percentage of physicians found it easy to take advice from senior nurses. More nurses (87%) than physicians (63%) felt that they had a good overall understanding of patient care goals (35). On the other hand, study finding in USA on frequency of nurse-physician collaborative behaviors in an acute care hospital by Dawn Marie e'tal and conveniently sampled, cross-sectional studies in two Midwestern hospitals on nurses working in medical surgical units by D. Tschannen et al on the impact of nursing characteristics and the work environment on perceptions of communication revealed that mean score for sharing of patient information was higher for nurses than physicians and perceived communication were more open among nurses than physicians respectively (17,36).

Moreover, conveniently sampled study by Azza T. et al (2011) at Alexandria Main University Hospital, Egypt on nurses and physicians to see their perceptions of their interprofessional relationships in medical and surgical units also showed that physicians higher mean scores than nurses were found with coordination and cooperation, nurse physician relationship, work environment and conflict. On the other hand, the nurses higher mean score than physicians were found in mutual trust and respect, understanding each other role and communication (30).

In a cross-sectional study done by Minamizono et al (2013) on the perceptions of interprofessional collaboration in clinical training on medical doctors at a university hospital and six foundation hospitals in Japan showed that a negative perception of interprofessional collaboration for providing patient-centered care was associated with older age. Age and a lower frequency of interprofessional meetings can lead to a breakdown in communication that may have a direct impact on patients (37).

On the other hand a conveniently sampled, cross-sectional, study on nurses working in four in-patient medical surgical units in two Midwestern hospitals by D. Tschannen and E. Lee on the impact of nursing characteristics and the work environment on perceptions of communication revealed that nurse with higher education levels, more years of experience and more positive environment have greater perceptions of communication openness with physician. Nurses working the evening shift perceived lower openness of communication compared to day shift nurses (17). The study is limited in medical surgical unit only and its sampling is convenient.

Quantitative descriptive survey by Baiyekusi I. in Central Ostrobothnia Hospital, Kokkola on the perception of nurses worked in the internal medicine and surgical units on physician-nurse relationship reported that nurse autonomy (100%), nurse accountability and responsibility (98.6%), nursing knowledge and experience (31.3%) were the factors that affect nurse-physician relationship. The highest percentage of 43.8% indicated that they often provided information to physicians and 2.7% never contributed on unique areas of Nursing (3). Whereas, a qualitative study on barriers to effective nurses-physician communication in long-term care setting in USA and artificial nutrition in patients with dementia in Flanders, Belgium showed lack of nurse skill in assessment, time constraints, physician attitude towards the nurses, nurses' attitude towards the physicians, way they were communicating. poor communication skills of nurses and physicians were factors of nurse physician communication (38,39).

Study on nurses from 26 Long term care facilities in Connecticut by Tjia Jennifer and his colleagues showed that the barriers to nurse-physician communication are openness

/Collaborativeness(hard for nurses to talk with physicians was feeling hurried by the physician (28%). Many (17%) felt the physician did not want to deal with the problem and about 13% reported physicians do not take nurse views into consideration when managing patients), Material Challenges, Professional Respect and Frustration (13-17% of nurses face physicians with rudeness and disrespect behavior and physician interrupted before the nurse had finished reporting on a patient (16%). One in ten nurses reported feeling frustrated after interactions with a physician. Mutual Understanding (10% of nurses reported understanding a physician due to language or tone of voice was a problem. Nurse Preparedness(3% felt uncomfortable determining what to report to the physician(40).

A cross- sectional Study in three teaching hospitals in Iran on nurses' perception of nurse-physician communication showed that the dimensions of nurse- physician communication sub-scales were rated as frustration with Interaction: 77%; mutual understanding 65%; openness: 47%, and relevance and satisfaction: 42%. Female nurses perceived more positive communication with physicians. Nurses with work experience more than 20 years had a better perception of nurse-physician communication. There is no difference in perception of nurse-physician communication among educational and age groups (41). This study results indicate the need for large-scale and in-depth studies to determine the nationwide situation on this important health care issue.

In Southern Nigeria study finding on the working relationships between nurses and physicians showed that doctors (66.7%) suggest inadequate development of interpersonal skill play a role in their working relationship than nurses (57.5%) . 52.1% nurses and 24.2% physicians think that poor social interaction outside work affect their working relationships. Other potential personal factors are perception of respect, compliance with advice, personality traits and communication gaps between the two groups, staff shortages, disregard for one's profession, and hospital management and government policies. In general, nurses had better opinion of physicians ' work than physicians had about nurses' work (5).

A cross – sectional study at Hawasa Referral and Teaching Hospital ,Ethiopia on the perception of nurses and physicians towards barriers to nurse-physician communication and its impact on patients' outcomes reported that three leading factors with priority of effect as perceived by nurses were unfavorable management decision (77.2%), information gap 72.8% and uncooperativeness at work (72.8%) for nurses where as poor interpersonal communication skill (86.1%), information (80.6%), and poor attitude to work 77.8%)were priority for physicians. Most nurses (38.6%) expressed their overall perception as poor; whereas the majority of physicians (44.4%) expressed their overall perception as good (29).

In conclusion, most of the studies in the reviewed literature were conducted in ICU and in limited units within the hospital and showed that scarcity of studies related to nurse - physician communication in patient care in developing countries, in particular in Ethiopia, in Jimma Zone in general. Therefore, conducting study by considering all units where nurse and physicians are interacting in patient care in the hospital is appropriate to see the perceived level of nurse and physician on nurse- physician communication in patient care and associated factors for the future development and implementation of nurse - physician interprofessional communication in Ethiopian particular in public hospitals of Jimma zone is essential.

2.2 Conceptual Framework

The conceptual frame work was developed after reviewing different literatures by the investigator.

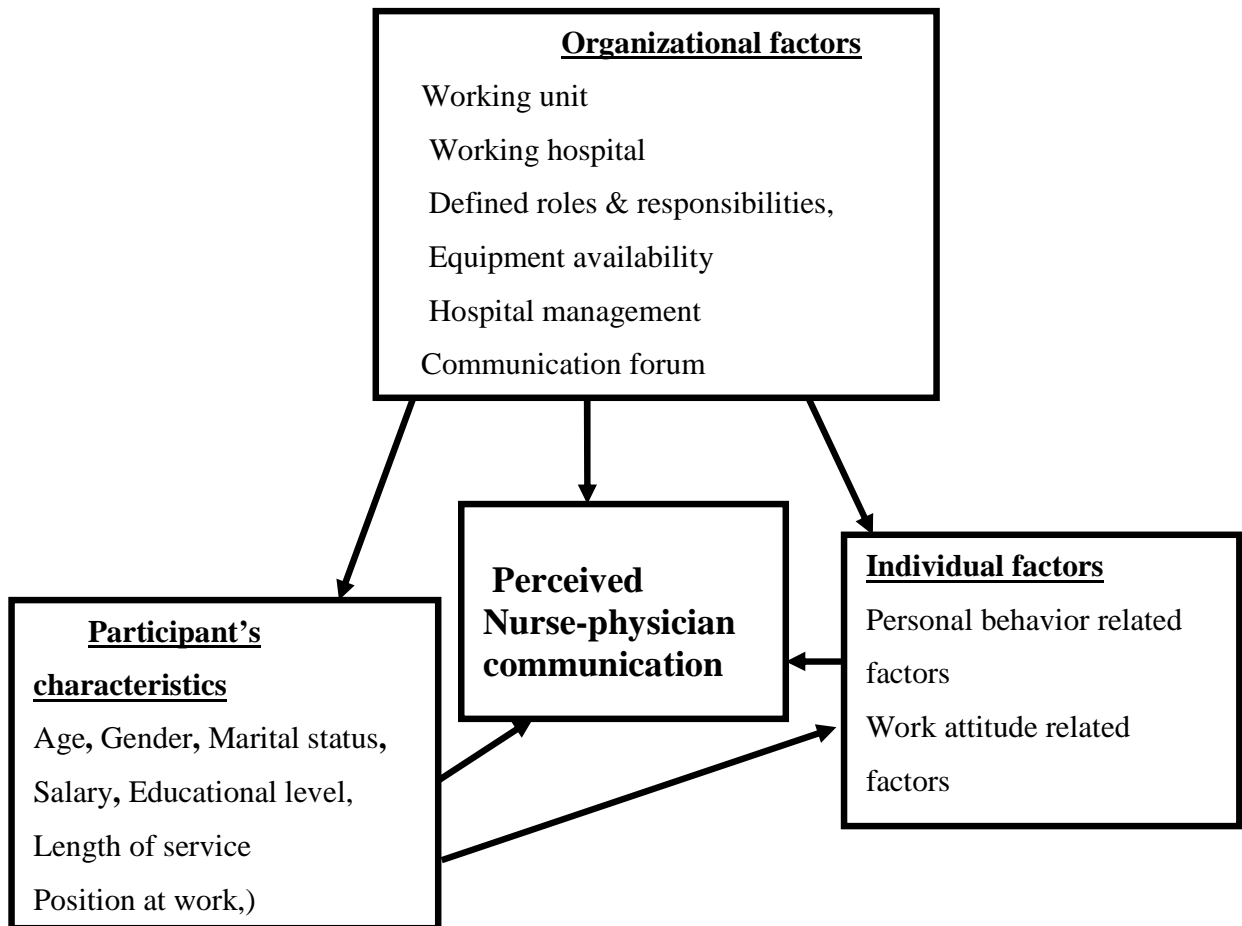


Figure 1: Conceptual frame work is developed by investigator from literatures to show nurse-physician communication in patient care and associated factors in public hospitals of Jimma zone southwest, Ethiopia, 2014 (n=466).

2.3 Significance of the Study

Because nurses and physicians are directly involved in delivering care and treatment to patients their interprofessional communication is central to improve care quality, and miscommunication between them affects the entire health care delivery in the hospital.

Although some studies have been done on the nurses - physician communication factors in developed countries, there is little known in developing countries particularly in Ethiopia and their generalization does not represent perception of Ethiopian nurse and physician and most of the studies were done in critical patient care units.

To address these issues, conducting a study to see the perceived level and factors to effective nurse-physician communication as perceived by nurses and physicians in hospital patient care is essential. Therefore, delivery of care will be better and more efficient by decreasing mortality, morbidity and long hospital stay, which in turn contribute to the community and country's socio-economic development. This ensures quality patient care in the institutions. Hence, helps health institutions, to identify and act on areas where gaps are identified. The finding of the study will help for the hospitals, the nursing and medical profession, nursing association and policy makers by showing areas of gaps and making plan and polices based on the gaps identified.

We hope that our findings will be useful to increase the awareness of nurse-physician communication in hospital nurses and physicians to improve their interprofessional communication which help them to achieving positive patient outcomes.

Lastly, to our best knowledge no previous studies have examined nurse-physician communication level at country level and findings of this study will be used as resource for other studies to be conducted related to nurse-physician communication.

Chapter Three: Objective

3.1. General objective:

To assess the perceived nurse-physician communication in patient care and associated factors among nurses and physicians who are working in Jimma Zone public hospitals, in 2014.

3.2. Specific Objectives:

1. To measure perceived nurse-physician communication score among nurses and physicians who are working in Jimma Zone public hospitals in 2014.
2. To identify factors associated with perceived nurse-physician communication among nurses and physicians who are working in Jimma Zone public hospitals in 2014.

Chapter Four: Methods and Materials

4.1. Study area and period

Study was conducted in public hospitals of Jimma zone, south west Ethiopia which is one of the seventeen Zones in Oromia Regional State and situated about 352 km from Addis Ababa, in the South western part of the country. Based on the 2007 Census , this Zone has a total population of 2,486,155, an increase of 26.76% over the 1994 census, of whom 1,250,527 are men and 1,235,628 women; with an area of 15,568.58 square kilometers (42). In this zone there are three public hospitals namely, Jimma University specialized hospital (JUSH), Shenen Gibe and Limu Genet hospital. The first two are situated in Jimma town where as the later one is in Limu town which is 72 km far from Jimma town. Except JUSH, the other two are district level. JUSH plays a pivotal role in this zone and it is the only teaching and referral hospital in the southwestern part of the country, and provides specialized clinical services to about 15 million people (43). There were 433 nurses and 185 physicians working in these public hospitals. The study was conducted from March 10/03/2014 – April 16 /04/2014.

4.2. Study design:

Institution based cross-sectional study design was employed.

4.3. Population

4.3.1 Source population

The source populations included all physicians (senior physicians and residents physician) and nurses who provide service in public Hospitals of Jimma zone.

4.3.2 Study population:

The study population was all physicians (senior physicians and residents) and nurses who give service in public hospitals of Jimma Zone.

4.3.3 Inclusion criteria

Nurses and physicians who have been working for at least six months in the studied hospitals and available in the data collection period were included.

4.3.4 Study unit

The study unit is individual nurse and physicians.

4.4 Sample Size

All nurses and physicians who fulfill the inclusion criteria were included giving total number of 509.

4.5 Study Variables

4.5.1 Dependent Variables

Perceived nurse-physician communication score

4.5.2 Independent variables

Participant's characteristics: socio-demographic characteristics (age, gender, marital status, educational level, salary, position at work, length of service).

Individual factors:

- **Work attitude related personal individual factors** (noncompliance with advice, negligence of duty, abuse (verbal, physical and sexual), poor attitude to work, uncooperativeness at work, gender difference).
- **Personal behavior related individual factors** (disruptive behavior, unfavorable attitude toward other professions (nurse or physician), poor interpersonal communication skill, disruptive behavior of nurse).

Organizational factors: (differential treating of nurse and physician in the hospital, absence of forum regarding nurse- physician communication, lack of shared vision between nurse and physician in the hospital, malfunctioning of equipments in unit, frequent supply shortage in the unit).

4.6 Operational definitions

Nurse-physician Communication: is the ability of the nurse and the physician to present information together to develop collaborative relationships between them to give quality patient care. This was measured by generating perceived nurse-physician communication score using factor analysis.

Nurse - physician relationship - The professional interaction, co- operation, communication and collaboration that exist between physicians and nurses in patient care.

Perceived nurse-physician Communication score: Measured by two subscales generated from an 18-item scale containing statements related to nurse-physician communication. The scales were named as **perceived professional respect and satisfaction, and perceived openness and sharing of patient information.** The higher the score indicated the higher perceived nurse- physician communication during patient care.

Perceived professional respect and satisfaction score with nurse-physician communication: Nurse-physician communication subscale containing by nine 5-point Likert scale items with minimum potential score of 9 and maximum potential score of 45. The mean percentage of the score was calculated as follows to facilitate comparison of the findings with the findings of studies with different number of items and response categories.

$$\%SM = \frac{(\text{Actual score} - \text{scale minimum score})}{(\text{scale maximum score} - \text{scale minimum score})} * 100$$

And the higher the score was the better the professional respect and satisfaction with nurse-physician communication. These scores lie between 0 and 100 (44).

Perceived openness and sharing of patient information score: Nurse-physician communication subscale containing nine 5-point Likert Scale items with minimum potential score of 9 and maximum potential score of 45. Mean score was calculated in the

same manner as above. And the higher the score indicates the better openness and sharing of patient information during nurse-physician communication in patient care. These scores lie between 0 and 100.

Organizational factors score: perceived nurse-physician communication factor subscale generated through PCA and measured by six items with agreement Likert scale and has minimum potential score of 6 and maximum potential score of 30. The higher the score indicates the more to be nurse-physician communication factor.

Personal behavior related individual factors score: perceived nurse-physician communication factor subscale generated through PCA and measured by four items with agreement Likert scale and has minimum potential score of 4 and maximum potential score of 20. The higher the score indicates the more to be nurse-physician communication factor.

Work attitude related individual factors score: perceived nurse-physician communication factor subscale generated through PCA and measured by six items with agreement Likert Scale and has minimum potential score of 6 and maximum potential score of 30. The higher the score indicates the more to be nurse-physician communication factor.

4.7 Data collection tools and data collection procedures

4.7.1 Instrument and measurement

Data was collected from the study participant using pre-tested Likert scale type self-administered English version questionnaires which had 3 parts:

Part –I: Participants characteristics (includes age, gender, marital status, educational level, salary, position at work, length of service).

Part –II: perception on communication between nurse and physicians in patient care with 19 items and participants were asked to rate each item on a 5-point scale which ranged from never (1) to always (5).

Part –III: perception of nurse and physician on nurse-physician communication factors which has 16 items and participants were asked to rate each factor on a 5-point agreement scale which ranged from strongly disagree (1) to strongly agree (5).

Communication scales questionnaire was adapted and modified from a study conducted in Iran, psychometric properties of the nurse–physician collaboration scale used in Japan and nurse-physician communication scale used in long-term care setting used in Connecticut (40,41,45) . In this study two communication subscales were emerged following principal component analysis (named as professional respect and satisfaction with inter-item reliability of $\alpha=0.901$, and openness and sharing of patient information inter-item reliability of $\alpha=0.91$ (**Annex IIA and Annex IIB**).

Moreover, questions on participants characteristics and nurse-physician communication factor were included after reviewing different literature (29,30). When the 16 item scale factors associated with nurse-physician communication was examined using exploratory factor analysis, three latent factors were emerged (named as organizational factors (6 items) with reliability of $\alpha=0.85$, work attitude related individual factors (6 items) with

$\alpha=0.83$ and personal behavior related individual factors (4 items) with item reliability of $\alpha=0.75$) (**Annex IIC and Annex IID**).

Questions were combined after testing for inter-item reliability using the Cronbach's alpha (which was $\alpha=0.89$ for communication scale items and $\alpha=0.94$ for communication factors items) score from the pretest data which was done in Woliso Hospital, making 5% of the study population, before the actual data collection. The clarity and cultural acceptance of each of the items was tested even if major revisions were required.

The perceived communication scores were standardized as the percentage of the maximum scale (%SM) scores to facilitate comparison. This enables future researchers to easily compare their findings with those in this study even if they make use of different number of items and/or response categories. These scores lie between 0 and 100 (44,46).

4.7.2 Data collection procedures

The data collection was facilitated by five diploma nurse who were given one day training to familiarize them on data collection procedure. Shift of the respondent were arranged in contact with shift leader for nurses and department head for physician. The data facilitators were distributed the self - administered questionnaires to the respondents to fill it and questionnaire was collected. When the respondents were not found on that day repeated revisit was done. The completeness of the data was checked in the field level.

4.8 Data processing and analysis procedures

Data were checked for completeness, edited and entered into EpiData version 3.1 and exported to SPSS version 16.00 for analysis. The data were explored using descriptive and frequencies to clean data. Scatter plots, skewness, and kurtosis were examined to determine the shape of the data distribution. On the basis of this information, data were determined to be fairly normally distributed, so no transformations were required.

To see the factors that were considered and to generate common factors that reflect perceived nurse-physician communication score, principal components analysis (PCA) was implemented on the communication scale. Prior to performing PCA, the suitability of data for factor analysis was assessed. The results revealed the presence of many coefficients of 0.4 and above, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.94, and a Barlett's test of Sphericity ($P < .001$). This indicates that the sampling adequacy and the matrix were suitable to perform factor analysis. To assist in the decision concerning the number of factors to retain, the following criteria were used: 1) An Eigen values of one or more for each factor. 2) An item-to-factor loading of 0.4 or greater, 3) A minimum of three items loading on a factor; a factor with fewer than three items was considered weak and unstable. 3) Catell's scree plot test which recommends retaining all factors above the elbow, or break in the plot, as these factors contribute the most to the explanation of the variance in the communication data set.

When the 19 communication scale items were entered into principal component analysis three latent/proxy-variables were extracted, nine items have contained in each of the two components. And only one item for component three. Because the third component has less than three items, it is discarded from the communication scale measurement items **(See total variance explained in App-IA and rotated component matrix in App-IB)**. Factor scores were created and were used in the subsequent analysis. Following that, one-way analysis of variance (ANOVA) and independent sample T-tests were used for comparing perceived communication scores across the categories.

Bi variate analysis was done to see the independent effect of predictors on the dependent variables and multiple linear regression analysis was conducted to identify final predictors of perceived communication after controlling other independent variables. Variables $p \leq 0.25$ in Bivariable analysis were entered in the final model. Participant's characteristics, individual related factors and organizational factors were entered independently. For respect and satisfaction with communication; first participant's characteristics were assessed while in the second organizational were included. For openness and sharing of patient information; first participant's characteristics were entered, in the second and third model factors related to individual work attitude and organizational factor were included respectively.

Finally, variables with $P \leq 0.05$ in the above models were entered to the final regression models. The assumptions of t-test, ANOVA and multiple linear regressions were checked.

And finally, the result were summarized and presented in tables and graphs.

4.9 Data quality management:

The quality of data was assured by; pre-testing the questionnaire on 5% of the actual sample size outside of the study area in Woliso Hospital one week before actual data collection, and appropriate modifications of questionnaire was done based on the result of the pre - test, proper training of the data facilitator on the data collection procedure, completeness of the data was checked on field level. Repeated revisits were done to get participants who were not found. Those incomplete were discarded during data entry. Proper categorization and coding were done during data cleaning.

4.10 Ethical consideration:

Before the actual work, the Ethical clearance and approval was obtained from the Ethical review Committee of the College of Public Health and Medical Sciences, Jimma University. Permission was obtained from Jimma Zone Hospitals to conduct the study in their institution. A letter of consent outlining the aim and giving further details about the study accompanied each questionnaire was attached with no participant names stated on the returned questionnaires. To assure anonymity the names of the participants were replaced by codes. The confidentiality of the information was assured. In addition, prior to administering the questionnaires, orally informed consent and was obtained from the participants.

4.11 Dissemination plan:

The final report of the paper will be presented as partial fulfillment of the degree of science in Masters of Adult health nursing to the department of nursing, college of public health and medical sciences, Jimma University.

Again the study findings will be disseminated to the Jimma University Specialized Hospital, Limu Genet hospital, Shinen Gibe hospital, and Jimma zone health office after the completion of the academic process at Jimma University. And finally, attempts will be made to publish the findings in scientific journals.

Chapter Five: Results

5.1: Characteristics of the Study Participants

In this study 509 participants were involved and 466 completely filled questionnaires were collected which gave the response rate of the study 91.55 %.

Out of 466 study participants, 295 (63.3%) were male, and 409 (87.8%) of the participants were from the referral hospital. The participants' ages ranged from 21 to 58 years with a mean age of 28.95 ± 6.82 years. The majority of the respondents were in the age group of 25 to 31 years. 257 (55.2 %) of them were single and 209 (44.8%) were ever married.

Regarding educational qualification, 196 (42.1%) of nurses were diploma holders and 92 (60.1 %) physicians were resident. They had work experience ranged from half year to 39 years with a mean work experience of 5.57 ± 6.085 years and 184 (39.5 %) of them worked from 3-5 years. The participant's monthly salary was ranged from 1033 birr to 10200 birr with a mean salary of 2824.72 ± 1738.55 birr.

Concerning positions currently hold in the hospital, 280 (60.1%) of nurses were staff while 82 (17.6%) physicians were resident. And 116 (24.9%) of the participants were working in OPD (24.9%) (Table 1).

Table 1: Characteristics of nurse and physicians working in public Hospitals of Jimma Zone, Southwest Ethiopia, 2014 (n = 466).

Participant characteristics		No	%
Professional category	Nurse	313	67.2
	Physician	153	32.8
Working hospital	Teaching /referral hospital	409	87.8
	District /non-teaching Hospitals	57	12.2
Sex	Male	295	63.3
	Female	171	36.7
Age category	18-24	107	23.0
	25-31	265	56.9
	32-38	49	10.5
	>38	45	9.7
Marital status	Single	258	55.4
	Ever married	207	44.6
Educational Qualification	Diploma nurse	196	42.1
	Bsc nurse	117	25.1
	Specialist and General practitioner (staff)physician	61	13.1
	Resident physician	92	19.7
Salary category	<1427	121	26.0
	1428-2250	171	36.7
	2251-3414.25	58	12.4
	>3414.26	116	24.9
Position presently hold in the hospital	Staff nurse	280	60.1
	Head nurse	26	5.6
	Supervisor nurse	4	.9
	Matron nurse	3	.6
	Clinical staff physician	52	11.2
	Department head physician	13	2.8
	Medical director physician	2	.4
	Resident physician	82	17.6
Lecturer physician	4	.9	
Service year	</=2	156	33.5
	3-5	184	39.5

Table-1 continued ...			
	6-8	54	11.6
	9-11	20	4.3
	>11	52	11.2
Working unit category	Medical ward	67	14.4
	Surgical ward	76	16.3
	ICU	18	3.9
	OR	25	5.4
	Obstetrics and gynecology ward	52	11.2
	Pediatrics ward	54	11.6
	Ophthalmology ward	16	3.4
	Psychiatry ward	9	1.9
	OPD	116	24.9
	Chronic illness	25	5.4
	Others(nursing director, administration, pathology)	8	1.7

5.2 Perceived nurse-physician communication in patient care

5.2.1 Description of nurse-physician communication sub scale items

Regarding perceived professional respect and satisfaction communication subscale items, the participants concern on “received correct information relevant to give care for the patient” and “feeling understood after nurse and physician interaction” scoring always while “Nurses and physicians have equal understanding during interaction”,” feeling satisfied after nurse - physician interaction” and “talking between nurse and physician is joyful” were scored rarely and never (**Table 3**).

Table 2: Frequency of perceived professional respect and satisfaction items during nurse-physician communication among nurses and physicians working in public Hospitals of Jimma Zone, Southwest Ethiopia, 2014 (n = 466).

Respect and satisfaction on communication subscale items ($\alpha=0.90$)	Always		Usually		Sometimes		Rarely		Never	
	No	%	No	%	No	%	No	%	No	%
Feeling not angry after nurse and physician interaction	35	7.5	121	26.0	180	38.6	111	23.8	19	4.1
Feeling not frustrated after nurse and physician interaction	37	7.9	114	24.5	174	37.3	109	23.4	32	6.9
Feeling understood after nurse and physician interaction	45	9.7	125	26.8	174	37.3	96	20.6	26	5.6
Feeling respected after nurse - physician interaction	39	8.4	130	27.9	185	39.7	77	16.5	35	7.5
Feeling pleased after nurse - physician interaction	36	7.7	112	24.0	177	38.0	106	22.7	35	7.5
Feeling satisfied after nurse - physician interaction	37	7.9	94	20.2	167	35.8	119	25.5	49	10.5
Nurses and physicians have equal understanding during interaction	19	4.1	69	14.8	169	36.3	145	31.1	64	13.7
Talking between nurse and physician is joyful	44	9.4	81	17.4	172	36.9	103	22.1	66	14.2
Received correct information relevant to give care for the patient	99	21.2	144	30.9	143	30.7	53	11.4	27	5.8

Regarding perceived openness and sharing of information 15.9% of nurse and physician showed concern always while 5.8% of them were not concerned on the “the nurse and the physicians show concern for each other when they are very tired”.(Table-3).

Table 3: Frequency of perceived openness and sharing of information items during nurse-physician communication among nurses and physicians working in public Hospitals of Jimma Zone, Southwest Ethiopia, 2014 (n = 466).

Openness & sharing of information subscale item score($\alpha = 0.91$)	Always		Usually		Sometimes		Rarely		Never	
	No	%	No	%	No	%	No	%	No	%
In the event of a change in treatment plan, the nurse and the physicians have a mutual understanding	46	9.9	106	22.7	161	34.5	105	22.5	48	10.3
The nurse and physicians discuss mechanism to maintain patient safety	58	12.4	111	23.8	152	32.6	100	21.5	45	9.7
The nurse & the physicians have the same understanding on patient's care	37	7.9	97	20.8	148	31.8	107	23.0	77	16.5
The nurse & the physicians take into account each other's schedule when making plans to treat a patient together	32	6.9	100	21.5	150	32.2	113	24.2	71	15.2
The nurse & the physicians can openly exchange information or opinion about matters related to work	47	10.1	72	15.5	160	34.3	115	24.7	72	15.5
The nurse and the physicians show concern for each other when they are very tired	74	15.9	145	31.1	151	32.4	69	14.8	27	5.8
The nurse and the physicians help each other	41	8.8	108	23.2	172	36.9	104	22.3	41	8.8
Physicians and nurse listen to each other	50	10.7	116	24.9	165	35.4	103	22.1	32	6.9
Receiving correct information or advice	30	6.4	82	17.6	161	34.5	128	27.5	65	13.9

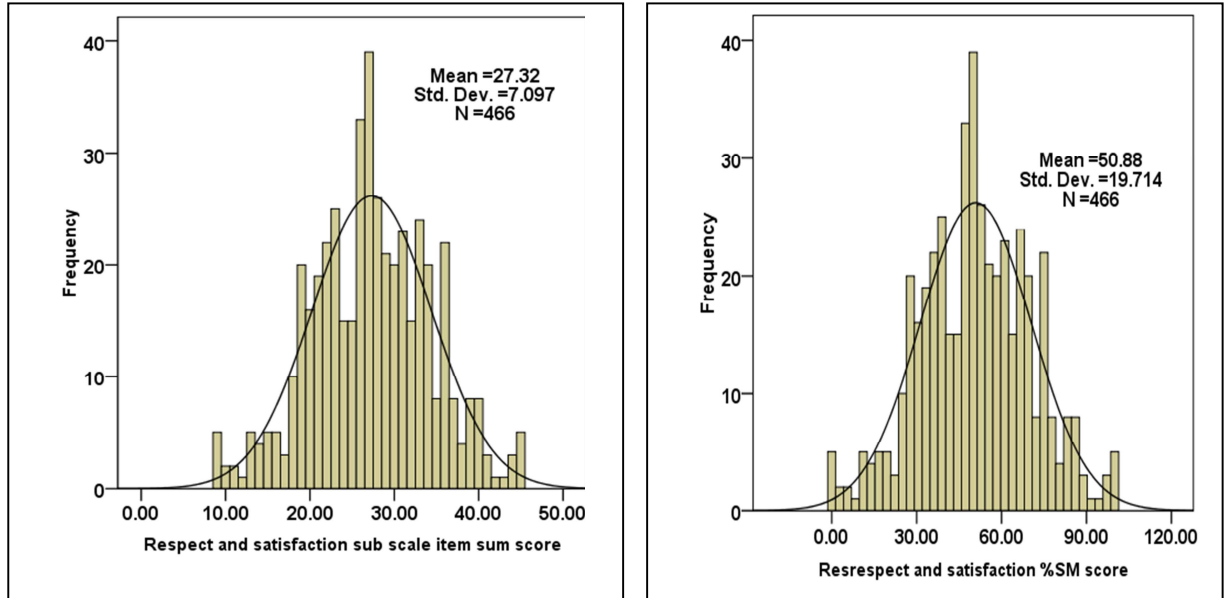
5.2.2 Perceived level of nurse-physician communication in patient care

The perceived level was measured by the two communication sub-scales in which the total variance explained 45.77% and 9.32 % for perceived professional respect and satisfaction, and perceived openness and sharing of patient information during nurse-physician communication respectively from the factor analysis. The accumulated explained variance percentage by the two communication sub-scales was 55.1 %(Table-4).

Table 4: Eigen values and the percentage of variance associated with each two components of communication sub-scales among nurses and physician working in public hospitals of Jimma zone, 2014 (n = 466).

Components name	Eigen Values	Percentage explained variance	of	Accumulated percentage of explained variance
Perceived professional respect and satisfaction	8.7	45.77		45.77
Perceived openness and sharing of patient information	1.77	9.32		55.09
Extraction Method: Principal Component Analysis.				

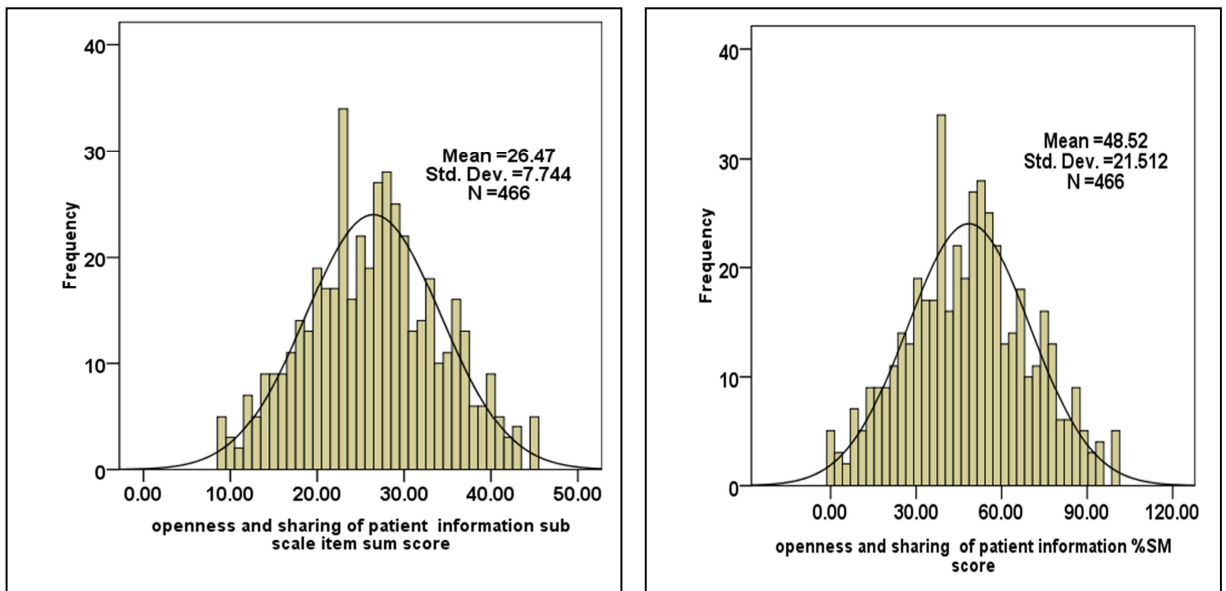
As shown in the figure below the perceived professional respect and satisfaction during nurse-physician communication had mean and maximum scale percentage mean score of 27.32 ± 7.1 (fig.2 left) and $50.88 \pm 19.7\%$ (fig.2 right), respectively.



**% SM score is the Standardized score as the percentage of possible maximum scale score and it lies between 0 and 100.*

Figure 2: Perceived professional respect and satisfaction mean and maximum scale percentage mean scores in patient care among nurses and physicians working in public Hospitals of Jimma Zone, Southwest Ethiopia, 2014 (n = 466).

In this study, the result on the perceived openness and sharing of information during nurse-physician communication showed mean and maximum scale percentages mean score of 26.47 ± 7.74 (fig.3 left) and $48.82 \pm 19.65\%$ (fig.3 right) respectively .



*(%SM) is the Standardized score as the percentage of possible maximum scale score, and it lies between 0 and 100.

Figure 3: Perceived openness and sharing of information mean and maximum scale percentage mean scores in patient care among nurses and physicians working in public Hospitals of Jimma Zone, Southwest Ethiopia, 2014 (n = 466).

5.2.3 Results of independent sample t-tests

Mean scores were compared between professional category, hospital category and sex using independent sample t-test in relation to the two communication sub scales.

In the perceived respect and satisfaction on communication scale, the physician's mean 28.8 (SD =6.9) was significantly higher than the mean of nurse's (mean=26.6, SD=7.1) at $t=-3.3$ and $p<0.001$. But there were no significant mean difference seen in hospital category and sex (Table 4).

Table 5: Independent sample t-test showing perceived nurse - physician communication as measured by respect and satisfaction in patient care among nurses and physicians working in public Hospitals of Jimma zone, 2014(n=466).

Variables category		Perceived Respect and satisfaction					
		N	Mean \pm SD	T-tests	P-value	95% CI mean Difference	
						Lower	Upper
Profession category	Nurse	313	26.6 \pm 7.1	-3.3	0.001	-3.62	-.89
	Physician	153	28.8 \pm 6.9				
Hospital category	District/non-teaching	57	29.23 \pm 5.79	2.18	0.03	.217	4.14
	Referral/teaching hospital	409	27.05 \pm 7.23				
Sex	Male	295	27.42 \pm 7.30	0.43	0.68	-1.06	1.63
	Female	171	27.13 \pm 6.74				

And also nurses and physicians who are working in district hospital had more Perceived openness and sharing of patient information (Mean=30.09±6.96) than referral hospital (Mean= 25.96±7.72) at t= 3.7and P=0.002). Females had higher perceived openness and sharing of patient information (27.4±7.16) than male (mean=25.93±8.02) at t=-2.04, p=0.048) (see Table 5).

Table 6: Independent sample t-test showing perceived nurse-physician communication as measured by openness and sharing of information among nurses and physicians working in public Hospitals of Jimma zone, 2014 (n=466).

Variable category		Perceived openness and sharing of information						
		N	Mean	Std. Deviation	T- test	P- valve	95% CI mean Difference	
							Lower	Upper
Profession category	Nurse	313	26.25±7.95	-	.39	-2.16	.84	
	Physician	153	26.9±7.3	0.86				
Hospital category	district/non-teaching	57	30.09±6.96	3.07	0.002	2.01	6.25	
	Referral/teaching hospital	409	25.96±7.72					
Sex	Male	295	25.93±8.02	-	0.048	-2.89	-.06	
	Female	171	27.4±7.16	2.04				

5.2.4 Results of ANOVA analysis

Mean scores in the perceived nurse-physician communication were tested using a one-way between-groups analysis of variance (ANOVA) and post hoc comparisons using the Tukey honestly significant different (HSD) test to explore the each group with regard to length of service category and educational qualification category to see in which category perceived nurse-physician communication difference was observed.

The ANOVA result showed that there was no mean difference seen among work experience groups in both perceived nurse-physician communication sub-scales at p-value of 0.34 and 0.78(table-8).

Table 8: Multiple comparison ANOVA table showed working experience and perceived nurse-physician communication as measured the two communication sub-scales among nurses and physicians working in public Hospitals of Jimma zone, 2014 (n=466).

Communication sub -scales	Experience category (in years)	N	Mean	Std. Dev.	F- statistics	P- value	95% CI for Mean	
							Lower Bound	Upper Bound
Respect and satisfaction score sum	≤ 2(Reference)	156	28.07	7.81	1.13	0.34	26.83	29.31
	3-5	184	27.11	6.62			26.15	28.08
	6-8	54	25.85	6.05			24.20	27.50
	9-11	20	26.55	7.58			23.00	30.1
	>11	52	27.58	7.25			25.56	29.59
Openness and sharing score sum	≤ 2(Reference)	156	26.93	8.52	.44	0.78	25.58	28.28
	3-5	184	26.21	7.62			25.10	27.32
	6-8	54	25.50	7.11			23.56	27.44
	9-11	20	26.65	7.31			23.23	30.07
	>11	52	26.90	6.56			25.08	28.73

In the educational qualification category specialists and staff general practitioner physicians mean score of 30.43 (SD =6.7) was significantly higher than the mean score for diploma nurses (mean =26.05, SD=6.86) at $p < 0.001$ regarding professional respect and satisfaction with nurse-physician communication in patient care .But in the openness and sharing of patient information there was no significant difference among study participants' educational qualification (see Table 9).

Table 9: Multiple comparison ANOVA table showed educational qualifications and perceived nurse-physician communication as measured the two communication scale among nurses and physicians working in public Hospitals of Jimma zone, 2014.

Communication Sub - Scales	Educational qualification category	N	Mean	Std. Dev.	F-statistics	P-value	95% CI for Mean	
							Lower Bound	Upper Bound
Perceived professional respect and satisfaction on communication	Diploma nurse(reference)	196	26.05	6.86	6.35	.000	25.08	27.01
	Bsc nurse	117	27.46	7.35			26.11	28.81
	Specialist and General Practitioner(staff) physician	61	30.43	6.65			28.72	32.13
	Resident physician (student)	92	27.77	6.94			26.34	29.21
	Total	466	27.32	7.1			26.67	27.96
	Perceived openness and sharing of patient information on communication	Diploma nurse(reference)	196	26.24			7.66	1.76
Bsc nurse	117	26.27	8.47	24.71	27.82			
Specialist and General Practitioner(staff) physician	61	28.54	7.67	26.58	30.51			
Resident physician (student)	92	25.83	6.85	24.41	27.25			
Total	466	26.47	7.74	25.76	27.17			
					07	06		

5.3. Predictors of perceived nurse- physician communication in patient care

In the nurse-physician communication factor description, the top six factors described strongly agree by nurses and physicians were absence of forum regarding nurse-physician communication (33.5%), frequent supply shortage in the unit (31.8%), malfunctioning of equipment in unit (29.2%), lack of shared vision between nurse and physician in the hospital (24.2%), lack of role and responsibility differentiation of nurse and physician in hospital (24 %) and unfavorable attitude toward other profession (22.1%) (Annex-III).

From perceived nurse-physician communication factors generated in the factor analysis the first component which was organizational factors explained 38.5% of the total variability and 58.1% was explained by the three components (table 7).

Table 7: Eigen values and the percentage of variance associated in the three nurse-physician communication factors among nurses and physicians working in public hospitals of Jimma zone, 2014 (n=466).

Components named	Eigenvalues	Percentage of explained variance	Accumulated percentage of explained variance
Organizational factors	6.16	38.52	38.52
Work attitude individual factors	2.00	12.53	51.05
Personal behavior individual factors	1.13	7.05	58.10
Extraction method: principal component analysis.			

The mean (21.9±5.4) and %SM score (66.26%) of organizational related factors were higher than personal behavior related individual factor and work attitude related individual factors (Table-10).

Table 8: Mean and %SM scores for factors related to perceived level of nurse-physician communication in patient care among nurses and physicians working in public Hospitals of Jimma Zone, Southwest Ethiopia, 2014 (n = 466).

Predictor sub scales or latent scales	Raw mean & %SM score	Nurse & physician
Organizational related factors	Mean score ± SD	21.9±5.4
	%SM*	66.26
Work attitude related individual factors	Mean score ± SD	18.08±5.59
	%SM*	50.34
Personal behavior related individual factors	Mean score ± SD	13.25±3.64
	%SM*	57.82

**(%SM) is the Standardized score as the percentage of possible maximum scale score, and it lies between 0 and 100, SD=standard deviation*

5.3.1 Results of linear regression analysis

Regression model was built in both Bivariable and multi variable linear regression order to find the significant predictors for the two nurse-physician communication subscales.

5.3.1.1 Predictor of perceived respect and satisfaction during nurse-physician communication in the Bivariable analysis

Thirteen predictors were entered independently to see their independent effect on respect and satisfaction. Among those entered variables five profession category, educational qualification category (diploma nurse and specialist and staff general practitioners), salary and organizational factors were found to have significant association with respect and satisfaction on nurse physician communication while four variables sex, age, resident physician and working unit were candidate for multiple variable linear regression analysis (Table 9).

Table 9: Bivariate linear regression predicting perceived respect and satisfaction during nurse-physician communication in patient care among nurses and physicians working in public Hospitals of Jimma zone, 2014(n=466).

Predictor variables		Unstd. Coeff.		Std. Coeff.	p-value	95% CI for B	
		β	Std. Error	β		Lower Bound	Upper Bound
Hospital category	Referral	-0.16	0.14	-0.051	0.27	-0.44	0.12
	District (R)						
Profession category	Physician	0.37	0.097	0.174	.000**	0.18	0.56
	Nurse(R)						
Sex category	Female	-0.16	0.096	-0.075	0.11*	-0.34	0.03
	Male(R)						
Age in years		-0.01	0.007	-0.056	0.23*	-0.02	0.01

Table-9 continued...							
Marital status category	Single(R)						
	Ever married	-0.08	0.09	-0.04	0.40	-0.26	0.11
Length of service in years		-0.01	0.01	-0.07	0.12*	-0.03	0.003
Educational qualification	Diploma nurse	-0.37	0.092	-0.18	.000**	-0.55	-0.191
	Bsc nurse	0.05	0.11	0.02	.650	-.162	0.26
	Specialist and staff GP	0.5	0.14	0.17	.000**	.232	0.77
	Resident	0.16	0.12	0.06	0.18*	-0.07	0.39
working unit category	Outpatient(R)						
	Inpatient	-0.13	0.1	-0.06	0.18*	-0.33	0.06
Position category	Without responsibility(R)						
	With responsibility	0.06	1.15	0.02	0.68	-0.24	0.36
Current salary		0.001	.00	0.17	0.00**	0.00	0.000
Work attitude factor		-0.02	0.05	-0.02	0.74	-0.11	0.08
Personal behavior factor		-0.05	0.05	-0.05	0.29	-0.14	0.04
Organizational factor		-.005	0.05	-0.005	0.047**	-0.1	0.09
*:Candidate for multivariable model **: Significant association in Bivariable linear regression, R=reference group							

5.3.1.2 Predictors of respect and satisfaction during nurse physician communication in the multiple linear regression analysis

Variables with p-value ≤ 0.25 in Bivariable analysis were entered in the final model. In the first model we entered participant's characteristics (profession category, sex, age, length of service, educational qualification category (diploma nurse, specialist and GP, resident) working unit category (inpatient), current salary, and organizational factor). Of these variables age and current salary were significant predictors of perceived respect and satisfaction with nurse physician communication. In the second model organizational factors were entered and found to be significant predictor of perceived respect and satisfaction with nurse physician communication. And finally, those variables found to be significant in the above two models were entered to the final model through entered method. Of these variables age, current salary and organizational factors were significant predictors of perceived respect and satisfaction with nurse physician communication and explains 8.1% of the variability in the dependent variable.

For a one year increase in age, showed 0.024 decrease in respect and satisfaction on nurse-physician communication score at $p=0.001$ and a unit increase in salary increased respect and satisfaction score during nurse-physician communication by 0.01 at $p<0.001$. For a unit increase in perceived organizational factor score, the perceived respect and satisfaction score decreased by an average of 0.094 at $p=0.02$ (Table 10).

Table 10: Multiple variables linear regression predicting perceived respect and satisfaction with nurse-physician communication in patient care among nurses and physicians working in public Hospitals of Jimma zone, 2014(n=466).

Predictor variables	Unstd. Coeff.		Std. Coeff.		T	p-value	95% CI for B	
	β	Std. Error	β				Lower Bound	Upper Bound
(Constant)	0.3	0.2			1.50	0.134	-0.09	0.69
Age in year	-0.02	0.01	-0.16		-3.2	0.001**	-0.04	-0.01
Current salary	0.01	0.00	0.24		4.76	0.00**	0.002	0.03
Organizational factors	-0.09	0.04	-0.11		2.34	0.020**	-0.17	-0.02

*Adjusted R² =0.081, Maximum VIF=1.41, Minimum VIF=1.04, **:significant for multivariable linear regression*

5.3.1.3 Predictor of openness and sharing of patient information during nurse-physician communication in the Bivariable analysis

Just like respect and satisfaction thirteen predictors were entered independently to see their independent effect on openness and sharing of patient information. Of these variables four variables hospital category, sex, work attitude factors and organizational factors were found to have significant association with openness and sharing of patient information in nurse physician communication, and Educational qualification (diploma nurses and resident physicians) were candidate for multiple linear regression (Table 11).

Table 11: Bivariate linear regression predicting perceived openness and sharing of patient information during nurse-physician communication in patient care among nurses and physicians working in public Hospitals of Jimma zone, 2014(n=466).

Predictor variables		Unstd. Coeff.		Std. Coef	P	95% CI for B	
		β	Std. Error	β		Lower Bound	Upper Bound
Hospital category	Referral	-0.51	0.14	-0.17	.000**	-0.78	-0.23
	District(R)						
Profession category	Physician	-0.08	0.1	-0.04	0.45	-0.27	0.12
	Nurse(R)						
Sex category	Female	0.29	0.1	0.14	.003**	0.1	0.47
	Male(R)						
Age in years		0.001	0.01	0.01	0.84	-0.01	0.02
Marital status category	Single(R)						
	Ever married	0.09	0.09	.046	0.32	-0.09	0.28
Length of service in years		0.004	0.01	0.02	0.61	-0.01	0.02
Educational qualification	Diploma nurse	0.12	0.09	0.05	0.22*	-0.07	0.30

		Table -10 continued...					
	Bsc nurse	-0.062	0.107	- 0.02 7	0.56	-0.27	0.15
	Specialist and staff GP	0.11	0.14	0.04	0.44	-0.16	0.38
	Resident	-0.18	0.12	-0.07	0.12*	-0.41	0.05
working unit category	Outpatient(R)						
	Inpatient	-0.07	0.1	-0.03	0.5	-0.26	.013
Position category	Without responsibility (R)						
	With responsibility	0.07	0.15	0.02	0.63	-0.23	0.37
	Current salary	-0.0014	0.00	-0.03	0.59	0.00	0.00
	Work attitude factors	-0.023	.008	-0.13	.006**	-0.04	-0.01
	Personal behavior factors	-0.022	.046	-0.022	.633	-0.11	0.07
	Organizational factors	-0.021	0.01	-0.11	0.017**	-0.037	-0.004
, **: significant association in Bivariable linear regression. *: Candidate for multivariable linear regression ,R-reference group							

5.3.1.4 Predictors of openness and sharing of patient information during nurse-physician communication in the multiple linear regression

In first model hospital categories, sex categories, educational qualification categories (diploma nurse, resident) were entered. Of these, hospital category and sex category were significant. In the second and third model work attitude and organizational factors were entered respectively and found significant. Finally, variables significantly associated with openness and sharing information in above models were entered in to the final model through entered methods. Sex was positively associated while, hospital category, work attitude individual factor and organizational factors were negatively associated with perceived openness and sharing of patient information during nurse physician communication. These predictors explain 10.4% variability of openness and sharing of patient information during nurse-physician communication.

Nurses and physicians who were working in referral hospital had 0.44 decrease in their perceived openness and sharing of patient information during nurse-physician communication than those working in district level hospitals ($p=0.002$). Being female had 0.23 increase in perceived openness and share patient information during nurse-physician communication in patient care than male at $p=0.017$. For a unit increase in perceived work attitude individual factors score, the perceived openness and sharing of patient information decreased by an average of 0.08, at $p=0.037$. Unit increase in perceived organizational factor score decreased openness and sharing of patient information during nurse-physician communication by 0.1, at $p= 0.025$ (Table 12).

Table 12: Multiple variables linear regression predicting perceived openness and sharing of patient information during nurse-physician communication in patient care among nurses and physicians working in public Hospitals of Jimma zone, 2014(n=466).

Predictor variables	Unstd. Coeff.		Std. Coeff. β	T	p-valve	95% CI for B	
	β	Std. Error				Lower Bound	Upper Bound
(Constant)	0.30	0.14		2.18	0.03	0.03	0.57
Hospital category(referral)	-0.44	0.14	-0.14	-3.15	0.002**	-0.71	-0.17
Sex category(Female)	0.23	0.1	0.11	2.4	0.017**	.04	0.42
Work attitude individual factors factor	-0.08	0.05	-0.08	-1.80	0.037**	-0.17	0.01
Organizational factor	-0.10	0.05	-0.10	-2.24	0.025**	-0.19	-0.01
<p><i>Adjusted R² =0.104, Maximum VIF=1.039, Minimum VIF=1.009, **: significant for multivariable linear regression, male and district hospitals were reference groups.</i></p>							

Chapter Six: Discussion

In the hospital setting, the common project that nurse and physician share is serving the patient. To achieve desired quality of patient outcome having the right nurse-physician communication is an important strategy and brings solutions for collaborative patient care by reducing major risk factors to patient safety such as lack of critical information, misinterpretation of information, medication errors and others(12,16).But the two professionals also have different perspectives on their interprofessional communication and factors affecting their communication.

In this study the result showed that nurses' and physicians' perceptions score of their interprofessional communication mean score were: 50.88% in perceived professional respect and satisfaction and 48.52% in perceived openness and sharing of patient information during nurse-physician communication in patient care. The scores indicate that nurse-physician interprofessional communication were closest to the standard mean (%SM =50), which shows that perceived level of nurses and physicians communication has attention seeking gap. Hence, the two scales represent the prioritized point of focus for nurse-physician communication intervention.

Although perceived nurse-physician communication mean score was half in both perceived nurse-physician communication sub-scales, current study showed that variation between nurse and physician perceived communication level which was less mean score among nurses than physicians. This finding is consistent with previous studies done in Texas ,VHA West Coast and West Indies which showed that physician' communication score was better than nurses (22,33–35). In contrast to this study regarding professional respect nurses had higher mean score than physicians in a study done in Egypt (30) and sharing of patient information were higher among nurses than physicians in a study done in USA (36). This discrepancy may be due to nurse's better autonomy on their practice in Egypt and USA than this study area. If there is no professional respect and proper patient information sharing between nurse and physician interprofessional communication, disregard between the professionals will occurred and the health care

team communication in turn affected which further affects the quality of care and patient outcomes. This is what the current study emphasizes.

In addition, this study showed higher means score in the perceived respect and satisfaction during nurse-physician communication among participants with higher educational level. Specialists had higher mean score in the perceived respect and satisfaction score than the others. The finding is supported by higher education levels were associated with greater perceptions of communication done in Midwestern Hospitals of Korea (17). This finding is likely explained by increasing role expectations as educational level increases as compared to others.

Although current study showed as there was no difference in the perceived professional respect and satisfaction during among nurse and physician during nurse-physician communication, there was a decrease in perceived openness and sharing of patient information among nurses and physicians working in referral hospital than those who were working at district level hospitals($p=0.002$). This difference could be district hospitals may have less patient flow than referral; however the referral hospital serves for clients who are coming from different health facilities by referral system which may add the burden to those nurses and physicians who are working in it and could affect openness and information sharing which might requires time to share among nurses and physicians.

Our study identified a significantly higher perceived nurse-physician communication in openness and sharing of patient information dimension by female than male during nurse-physician communication ($p=0.017$). Since there were no difference in evaluation of nurse –physician communication by the two genders and the order of communication scores remained identical between the genders. This indicates that there is no fundamental cross-gender difference in perceived nurse-physician communication. Therefore, similar intervention strategies are likely to work for both gender, but a higher focus on male would give up more effective. This finding is supported by a study done in Iran (41).

In this study increasing age had negative relation with respect and satisfaction among the study participants ($p=0.001$). This finding was consistent with a study done in Japan doctors with older age had negative perception of interprofessional collaboration and increasing age can lead to a breakdown in communication (37),and contradicts study done in Iran which showed as there were no difference in perception of nurse-physician communication among age groups(41).

In this study participants with higher monthly salary had a significant higher perceived respect and satisfaction during nurse-physician communication ($p<0.001$). This could be getting adequate money will help nurse and physician to concentrate in their work. We believe that adequate payment that balances the work done might be facilitating factor for good nurse-physician communication.

Almost one third of the study participants strongly agreed that absence of forum regarding nurse- physician communication in their institution was one of the major factors contributing that leads nurse-physician miscommunication in patient care. This finding is supported by interprofessional forum in the hospital can improve outcomes of patients, nurse-physician interprofessional relationships, and help to activate collaboration. Without interprofessional forum, health professionals tend to carry on working without realizing the advantages of interprofessional collaboration in a study done in Japan (37).

Moreover, regarding nurse –physician communication factors organizational factors were the first rated factor (66.26%) than personal behavior individual and work attitude individual factors .All factors were scored above 50% which showed that these factors affect the perceived nurse-physician communication in patient care. Previous studies in Flanders (Belgium) ,Japan, Connecticut, south Nigeria and Ethiopia however, identified factors such as poor interpersonal communication skills, roles misunderstanding, poor work attitude to the other profession, personal behavior and gender issues as potential barriers to effective nurse-physician communication (5,29,37,39,40) While the similar factors may underlie nurse-physician miscommunication in our study.

This study also identified, organizational factor affects both perceived respect and satisfaction ($p=0.02$), and perceived openness and sharing of patient information ($p=0.025$) during nurse- physician communication while perceived work attitude individual affects perceived openness and sharing ($p= 0.37$). Our finding is supported by study done in U.S and Ethiopia which suggests that individual work attitude and organizational factors influences the character of a communication (24,29).

Our results reflect the usefulness of dealing issues regarding nurse-physician communication and influencing factors help to enhance nurse-physician communication in the studied hospitals.

The findings in this report were subjected to respondents discussion with their colleagues to answer the question that might result in social desirability bias; since most physicians in the teaching hospital were resident student who came from different part of the country for education which might under estimate the result and finally, causal relationships might not be determined because of the cross-sectional study design. However, efforts were tried in pretesting questionnaires and involving both nurse and physician as study participant.

8.1 Implications for practice

As shown above and by different literature mentioned knowing level and factors of perceived nurse-physician communication are important to strengthen effective nurse – physician communication. These results reflect the usefulness of promoting nurse-physician communication and factors to improve nurse-physician communication in the studied hospitals. As we keep nurse-physician communication effective we can gain good quality patient care by preventing miscommunication mishaps in the hospital.

Chapter Seven: Conclusions and Recommendations

7.1 Conclusions

As this study assesses the perceived nurse-physician communication and associated factors and it is an essential element for the growth of nurse and physician profession. Ineffective communication between nurses and physicians resulted in delaying care, extending the length of a patient's stay in the hospital, and causing patient injury and death. It was therefore seen as important for the betterment of community survival as a whole and nations socioeconomic growth. Generally, the following points were identified from this study:

- The study populations in Jimma zone public hospitals are younger work force (mean age was 28.95 ± 6.82 years).
- The overall perceived level of nurse-physician communication was almost 50% for both perceived professional respect and satisfaction and perceived openness and sharing of patient information on nurse-physician communication which can be the prioritized point of focus for nurse-physician communication intervention.
- Communication level of nurse had lower mean score than physicians.
- Age, current monthly salary and organizational factors were the potential predictors for perceived respect and satisfaction while Sex, working hospital category, work attitude individual factors and organizational factors were predictors of perceived openness & sharing of patient information in nurse-physician communication during patient care.
- To improve the of quality patient care nurse-physician communication during patient care carried out in mutual respect satisfied way, and understandable manner.
- This finding showed as nurse-physician communication needs attention in to improve nurse-physician relation and bring quality patient of care in the studied hospitals.

7.2 Recommendations

The study showed as nurses and physicians need to assess their current state of nurse – physician communication in their institution. Finally, based on study findings the following points were suggested for respective groups.

Recommendations for nurses and physician:

Nurses and physician should strength their discussion about their communication level while giving care to the patient, communicate openly, in mutual professional respect, satisfied way, and share patient’s information to give better patient care, and show concern for each other.

Recommendations for Hospital management bodies:

The hospital management should have usual nurse-physician staff meetings regarding nurse-physician communication in patient care, support nurses and physician to communicate openly and frankly, facilitate extra financial benefit, discuss on the impact of nurse-physician communication in patient care and health care quality given in their institution and need to make sure that equipments are well functioned in the units.

Recommendations for nursing and medical school’s curriculum:

Support the department of nursing and medical schools to develop curricula regarding nurse-physician communication skills, better to organize nursing and medical student team which controls the flow of communication between them.

Recommendations for further researchers

On the impact of nurse-physician communication on staff, patient, organizational, and financial outcomes and hospital patient care quality should be conducted.

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Annexes

Annex-I: Questionnaire

Questionnaire Identification No. _____

Jimma University

College of Public Health and Medical Sciences

Department of Nursing

A **questionnaire** prepared to collect data on the Perceived nurse – physician communication in patient care and associated factors in public hospitals of Jimma zone, south west Ethiopia, 2014.

Information sheet

Dear Mr. /Ms. -----

I am ----- and currently undertaking MSC Degree in adult health nursing in Nursing Studies in Jimma University College of public health and medical sciences, Department of Nursing. This research topic is aimed to assess the nurse-physician communication and its associated factors from the perspective of nurse and physician. In public hospitals of Jimma zone nurse- physician communication for patient care may be at different levels. This is a situation that needs to be addressed. The results of this study will produce information that will be useful in implementing good nurse-physician communication skills in the delivery of patient care in the hospital. The study will involve you completing the questionnaire that is enclosed with this letter and it will not take more than 20 minutes to complete. Confidentiality and anonymity is fully assured, as your name is not required on the questionnaire and only the research team will have access to the results. It will not affect you in anyway, should you not take part in this study.

Consent Form

I have been informed that the purpose of this study is to assess Perceived nurse-physician communication and its associated factors in Jimma zone public Hospitals, South west Ethiopia, 2014.

I have understood that participation in this study is entirely voluntarily. I have been told that my answers to the questions will not be given to anyone else and no reports of this study ever identify me in any way. I have also been informed that my participation or non-participation or my refusal to answer questions will have no effect on me. I understood that participation in this study does not involve risks.

I understood that Chanyalew Worku Kassahun is the contact person if I have questions about the study or about my rights as a study participant.

Address of the principal investigator:

Name: Chanyalew Worku Kassahun

Cell phone: +251 921252375

E-mail: chanyalewworku@gmail.com

Respondent's Signature _____ **Date** _____.

Start your interview. Date: _____ **Time started:** _____ **Time finished:** _____.

Supervisor's name _____ **signature** _____

This questionnaire has **3 parts**: Part –I: **Participants characteristics**; part –II: **perception on communication between nurse and physicians in patient care**; part – III: **perception of nurse and physician on nurse-physician communication factors**.

1. Questionnaire for nurses

Part I: Demographic information for nurses (personal information)

Instruction: Please circle the number in front of the option you choose & fill in the blank space that best describe you on the right side of the table.

No.	Questions		Coding categories	
101	Sex		1. Male 2. Female	
102	Your Age in years		_____ years	
103	What is your current marital status?		1. Married 2. Single 3. Divorced 4. Widowed	
104	Length of service /Your working experience in nursing profession(in years)		_____ Years	
105	Your educational qualification		1. Diploma nurse 2. BSc nurse 3. MscN 4. Other(Specify _____)	
106	Your working unit	1. Medical ward 2. Surgical ward 3. Intensive care unit(ICU) 4. Major Operation room 5. Minor OR 6. Psychiatry OPD 7. Psychiatry Ward 8. Pediatrics OPD 9. Pediatrics Ward	10. Maternity/Obstetrics Ward 11. Gynecology OPD 12. Gynecology Ward 13. Ophthalmology OPD 14. Ophthalmology Surgical Ward 15. Ophthalmology Medical Ward 16. Dental unit	17. TB Rx Room 18. DM/Cardiac/HTN 19. Derma 20. Medical Emergency OPD 21. Surgical Emergency OPD 22. Medical Cold OPD 23. Surgical Cold OPD 24. Other(specify)
107	What is your title? Or Position that you presently hold within the hospital		1. Staff nurse 2. Head nurse 3. Supervisor nurse 4. Matron nurse	
108	Your current salary(EBR)		-----	
109	Your working hospital name		_____	

Part -II Perception on Communication between nurse and physicians in patient care

Instruction: There are statements about perception of nurse and physician on **nurse-physician communication**, and each statement has five alternatives with five point scale.

Read each item carefully and circle the corresponding number.

5= Always, 4= Usually, 3= Sometimes, 2= Rarely 1= Never						
S. No	Scales	Always (5)	Usually (4)	Sometimes (3)	Rarely (2)	Never (1)
201	Physicians do not ask frequent clarification in understanding what nurse say	5	4	3	2	1
202	In the event of a change in treatment plan, the nurse and the physicians have a mutual understanding	5	4	3	2	1
203	The nurse and physicians discuss mechanism to maintain patient safety	5	4	3	2	1
204	The nurse and the physicians have the same understanding on patient's care	5	4	3	2	1
205	The nurse and the physicians take into account each other's schedule when making plans to treat a patient together	5	4	3	2	1
206	The nurse and the physicians can openly exchange information or opinions about matters related to work	5	4	3	2	1
207	Physicians and nurse show concern for each other when they are tired	5	4	3	2	1
208	Physicians and nurse listen to each other	5	4	3	2	1
209	The nurse and Physicians help each other					
210	I receive correct information or advise from physician on patient care	5	4	3	2	1
211	Feeling not angry after nurse and physician interaction	5	4	3	2	1
212	Feeling not frustrated after nurse and physician interaction	5	4	3	2	1
213	Feeling understood after nurse and physician interaction	5	4	3	2	1
214	Feeling respected after nurse - physician interaction	5	4	3	2	1

215	Feeling pleased after nurse - physician interaction	5	4	3	2	1
216	Feeling satisfied after nurse - physician interaction	5	4	3	2	1
217	Nurses and physicians have equal understanding during interaction	5	4	3	2	1
218	Talking between nurse and physician is Joyful	5	4	3	2	1
219	Physician information are relevant for nurses to care patient	5	4	3	2	1

Part-III: Perception on nurse-physicians communication factors

Instruction: There are statements about factors affecting nurse- physician communication, and each statement has five alternatives with five point agreement scale.

Read each item carefully and circle the number you choose in front of the statement:

S.No	Factors	Strongly agree(5)	Agree (4)	Not agree or disagree (3)	Disagree (2)	Strongly disagree (1)
301	Disruptive behavior of physician	5	4	3	2	1
302	Disruptive behavior of nurse	5	4	3	2	1
303	Poor interpersonal communication skill.	5	4	3	2	1
304	Unfavorable attitude toward other professions	5	4	3	2	1
305	Noncompliance with advice.	5	4	3	2	1
306	Gender difference	5	4	3	2	1
307	Abuse (verbal, physical and sexual).	5	4	3	2	1
308	Poor attitude to work	5	4	3	2	1
309	Uncooperativeness at work	5	4	3	2	1

310	Negligence of duty	5	4	3	2	1
311	Differential treatment of professionals	5	4	3	2	1
312	Absence of forum to discuss the issue of nurse- physician communication	5	4	3	2	1
313	Lack of clarity in roles and responsibilities	5	4	3	2	1
314	Lack of shared vision	5	4	3	2	1
315	Frequent supply shortage	5	4	3	2	1
316	Malfunctioning of equipment	5	4	3	2	1

Thank you so much!!! You finished your work now!

2. Questionnaire for Physicians

Part 1: Demographic information for physicians (personal information)

Instruction: Please **circle** the number in front of the option or fill in the **blank space** that best describe you on the right side of the table.

No.	Questions		Coding categories	
101	Sex		1. Male 2. Female	
102	Your Age in years		_____ years	
103	What is your current marital status?		1. Married 2. Single 3. Divorced 4. Widowed	
104	Length of service /Your working experience in the profession(in years)		_____ Years	
105	Your educational qualification		1. Specialist 2. General practitioner 3. Resident 4. Other(Specify_____)	
106	Your working unit	1. Medical ward 2. Surgical ward 3. Intensive care unit(ICU) 4. Major Operation room 5. Minor OR 6. Psychiatry OPD 7. Psychiatry Ward 8. Pediatrics OPD 9. Pediatrics Ward	10. Maternity/Obstetrics Ward 11. Gynecology OPD 12. Gynecology Ward 13. Ophthalmology OPD 14. Ophthalmology Surgical Ward 15. Ophthalmology Medical Ward	16. Dental unit 17. TB Rx Room 18. DM/Cardiac/HTN 19. Derma 20. Medical Emergency OPD 21. Surgical Emergency OPD 22. Medical Cold OPD 23. Surgical Cold OPD 24. Other(specify)_____
107	What is your title? Or Position that you presently hold within the hospital		1. Clinical staff 2. Department head 3. Clinical director 4. Other(Specify)_____	
108	Your current salary(EBR)			
109	Your working hospital name		_____	

Part -II Perception on Communication between nurse and physicians in patient care

Instruction: There are statements about perception of **nurse and physician on nurse-physician communication**, and each statement has five alternatives with five point scale. Read each item carefully and circle the corresponding number.

5= Always, 4= Usually, 3= Sometimes, 2= Rarely 1= Never						
S. No	Scales	Always (5)	Usually (4)	Sometimes (3)	Rarely (2)	Never (1)
201	Nurses do not ask frequent clarification in understanding what nurse say	5	4	3	2	1
202	In the event of a change in treatment plan, the nurse and the physicians have a mutual understanding	5	4	3	2	1
203	The nurse and physicians discuss mechanism to maintain patient safety	5	4	3	2	1
204	The nurse and the physicians have the same understanding on patient's care	5	4	3	2	1
205	The nurse and the physicians take into account each other's schedule when making plans to treat a patient together	5	4	3	2	1
206	The nurse and the physicians can openly exchange information or opinions about matters related to work	5	4	3	2	1
207	Physicians and nurse show concern for each other when they are tired	5	4	3	2	1
208	Physicians and nurse listen to each other	5	4	3	2	1
209	The nurse and Physicians help each other					
210	I receive correct information or advise from physician on patient care	5	4	3	2	1
211	Feeling not angry after nurse and physician interaction	5	4	3	2	1
212	Feeling not frustrated after nurse and physician interaction	5	4	3	2	1
213	Feeling understood after nurse and physician interaction	5	4	3	2	1

214	Feeling respected after nurse - physician interaction	5	4	3	2	1
215	Feeling pleased after nurse - physician interaction	5	4	3	2	1
216	Feeling satisfied after nurse - physician interaction	5	4	3	2	1
217	Nurses and physicians have equal understanding during interaction	5	4	3	2	1
218	Talking between nurse and physician is Joyful	5	4	3	2	1
219	Nurse information is relevant for nurses to care patient	5	4	3	2	1

Part-III: Perception on nurse-physicians communication factors

Instruction: There are statements about **factors** affecting nurse- physician communication, and each statement has five alternatives with five point agreement scale. Read each item carefully and circle the number you choose in front of the statement:

5= Strongly agree,4= Agree,3=Not agree or disagree 2= agree,1= strongly disagree						
S.No	Factors	Strongly agree(5)	Agree (4)	Not agree or disagree (3)	Disagree (2)	Strongly disagree(1)
301	Disruptive behavior of physician	5	4	3	2	1
302	Disruptive behavior of nurse	5	4	3	2	1
303	Poor interpersonal communication skill.	5	4	3	2	1
304	Unfavorable attitude toward other professions	5	4	3	2	1
305	Noncompliance with advice.	5	4	3	2	1
306	Gender difference	5	4	3	2	1
307	Abuse (verbal, physical and sexual).	5	4	3	2	1
308	Poor attitude to work	5	4	3	2	1

309	Uncooperativeness at work	5	4	3	2	1
310	Negligence of duty	5	4	3	2	1
311	Differential treatment of professionals	5	4	3	2	1
312	Absence of forum to discuss the issue of nurse- physician communication	5	4	3	2	1
313	Lack of clarity in roles and responsibilities	5	4	3	2	1
314	Lack of shared vision	5	4	3	2	1
315	Frequent supply shortage	5	4	3	2	1
316	Malfunctioning of equipment	5	4	3	2	1

Thank you so much!!! You finished your work now!!!

Annex-II: principal component analysis tables

Annex-IIA: Eigen values and the percentage of variance *associated with each two components of communication sub-scales*

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.697	45.771	45.771	8.697	45.771	45.771	5.264	27.703	27.703
2	1.770	9.317	55.088	1.770	9.317	55.088	5.172	27.222	54.926
Extraction Method: Principal Component Analysis.									

Annex-IIB Rotated Component Matrix^a for communication scale items

Rotated Component Matrix^a			
	Component		
	1	2	Cronbach's Alpha
Do not ask frequent clarification in understanding what is said			
In the event of a change in treatment plan, the nurse and the physicians have a mutual understanding	.640		.905
The nurse and physicians discuss mechanism to maintain patient safety		.711	.899
The nurse & the physicians have the same understanding on patient's		.696	.904
The nurse & the physicians take into account each other's schedule when giving patient care		.753	.901
The nurse & the physicians can openly exchange information or opinion		.762	.896
The nurse and the physicians show concern for each other when they		.727	.901
The nurse and the physicians help each other		.739	.897
Physicians and nurse listen to each other		.670	.900
Receiving correct information or advice		.563	.908
Feeling not angry after nurse and physician interaction	.635		.894
Feeling not frustrated after nurse and physician interaction	.740		.892
Feeling understood after nurse and physician interaction	.814		.884
Feeling respected after nurse - physician interaction	.793		.885
Feeling pleased after nurse - physician interaction	.785		.883

Feeling satisfied after nurse - physician interaction	.758	.881
Nurses and physicians have equal understanding during interaction	.630	.892
Talking between nurse and physician is joyful	.648	.892
Recieved correct information relevant for to give care for the patient	.534	.903
Extraction Method: Principal Component Analysis.		
Rotation Method: Varimax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		

Annex-II C: Total Variance Explained by perceived communication factors

Component	Total Variance Explained								
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.16	38.52	38.52	6.164	38.52	38.52	3.81	23.81	23.81
2	2.00	12.53	51.05	2.005	12.53	51.05	2.97	18.56	42.37
3	1.13	7.05	58.10	1.128	7.05	58.10	2.52	15.73	58.10
4	.99	6.19	64.29						
5	.85	5.32	69.61						
6	.75	4.69	74.30						
7	.68	4.22	78.52						
8	.66	4.12	82.64						
9	.56	3.53	86.17						
10	.40	2.53	88.7						
11	.39	2.45	91.15						
12	.35	2.21	93.36						
13	.31	1.93	95.29						
14	.3	1.87	97.16						
15	.25	1.53	98.69						
16	.21	1.31	100.0						
Extraction Method:	Principal Component Analysis.								

Annex-IIID: Rotated Component Matrixa of perceived communication factor items.

Rotated Component Matrix^a				
	Component			Cronbach's Alpha
	1	2	3	
Disruptive behavior of physician			.793	.725
Disruptive behavior of nurse			.717	.737
Poor interpersonal communication skill			.631	.719
Unfavorable attitude toward other professions(nurse or physician)			.682	.706
Noncompliance with advice		.416		.828
Gender difference		.715		.832
Abuse (verbal, physical and sexual)		.717		.795
Poor attitude to work		.746		.766
Uncooperativeness at work		.685		.777
Negligence of duty	.421	.611		.800
Differential treating of nurse and physician in the hospital	.459			.859
Meeting availability regarding nurse- physician communication	.724			.821
Lack of role & responsibility differentiation of nurse & physician in the hospitals	.751			.817
Lack of shared vision b/n nurse and physician in the hospital	.762			.820
Frequent supply shortage in the unit	.807			.817
Malfunctioning of equipment in unit	.802			.816
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 5 iterations.				

Annex-III: Predictor items scores

Nurse-physician Communication predictors items($\alpha =0.89$)	Strongly agree		Agree		Neither agree or disagree		Disagree		Strongly disagree	
	No	%	No	%	No	%	No	%	No	%
Personal behavior related individual factor item scores ($\alpha=0.75$)										
Disruptive behavior of physician	79	17.0	149	32.0	103	22.1	90	19.3	45	9.7
Disruptive behavior of nurse	49	10.5	151	32.4	118	25.3	106	22.7	42	9.0
Poor interpersonal	81	17.4	188	40.3	78	16.7	80	17.2	39	8.4

communication skill										
Unfavorable attitude toward other professions(nurse or physician)	103	22.1	154	33.0	95	20.4	73	15.7	41	8.8
Noncompliance with advice	68	14.6	153	32.8	123	26.4	98	21.0	24	5.2
Gender difference	37	7.9	87	18.7	115	24.7	124	26.6	103	22.1
Abuse (verbal, physical and sexual)	51	10.9	119	25.5	85	18.2	102	21.9	109	23.4
Poor attitude to work	68	14.6	139	29.8	92	19.7	93	20.0	74	15.9
Uncooperativeness at work	69	14.8	149	32.0	82	17.6	97	20.8	69	14.8
Negligence of duty	77	16.5	140	30.0	99	21.2	83	17.8	67	14.4
Differential treating of nurse and physician in the hospital	82	17.6	150	32.2	103	22.1	82	17.6	49	10.5
Absence of forum regarding nurse- physician communication	156	33.5	163	35.0	59	12.7	53	11.4	35	7.5
Lack of role & responsibility differentiation of nurse &physician in t	113	24.2	190	40.8	66	14.2	70	15.0	27	5.8
Lack of shared vision between nurse and physician in the hospital	112	24.0	207	44.4	63	13.5	58	12.4	26	5.6
Frequent supply shortage in the unit	148	31.8	181	38.8	60	12.9	59	12.7	18	3.9
Malfunctioning of equipment in unit	136	29.2	179	38.4	66	14.2	57	12.2	28	6.0