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Research Article

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ABSTRACT

Background: Excellent working relationship between nurses and physicians is key to create a productive, safe, and satisfying practice environments. The patient and the patient's family benefit from care delivered by a team practicing within this environment. Decreased risk-adjusted mortality and length of stay, fewer negative patient outcomes, and enhanced patient satisfaction. The aim of this study was to assess Nurse-physician relationships and associated factors in public hospitals in Tigray, Northern Ethiopia.
Methods: Institutional based cross sectional study was carried out from February to March 2011 using both quantitative and qualitative methods of data collection. A total of 255 nurses was selected using simple random sampling method and key informants for the in-depth interview were selected conveniently from the two-third of the total hospitals in the region. Descriptive statistics, bivariate analysis and multivariable logistic regression analyses were employed to identify factors associated with Nurse-Physician work relationships.
Result: Result: Forty two percent of the participants were dissatisfied about their relationship with physicians. Greater than half of the nurses were dissatisfied with administrative support in nurse-physician relationships. Autonomy of nurses subscale was found to be positive predictors of the nurse satisfaction with their relation to physicians (AOR=0. 02, [95%CI=0.003,0.066]).
Conclusion: - The study showed that there was poor working relationship between nurses and physicians. Hospital leaders should focus on improving nurse-physician work relationships; team conferences and interdisciplinary round.

Keywords: Nurse-physician, relationships, Job satisfaction, Nurses.

INTRODUCTION

A positive nurse-physician work relationships and quality of patient care combined with autonomy, decision-making ability, control over practice, and quality relations with physicians and professional development opportunities are major determinants of the conducive work environment. The patients and the patients' family benefit from care delivered by the team practicing within this environment (1). Decreased risk-adjusted mortality and length of stay, fewer negative patient outcomes, and enhanced patient satisfaction have also been associated with better nurse-physician collaboration (2).

Communication and collaboration between nursing and medicine can have a profound effect on the workplace environment and patient care (3). One of the primary reasons nurses leaves the profession is dissatisfied with their practice environment. Integrated structure and processes that allow nurses and physicians to resolve their differences are likely to increase nurse satisfaction, recruitment, and retention (4, 5).

In general, smooth working relationships between doctors and nurses are pre-requisite for efficient delivery of health care (6). Findings indicate collaboration and communication as the key ingredients to improved nurse/physician relationships (7, 8). Collaborative nurse/ physician work relationships are associated with improved patient satisfaction and improved patient care and outcomes (9).

Patient outcome has been shown to depend on inter-professional collaboration in intensive care units. The two professions look at co-operation from different perspectives of patient care, different levels in the status hierarchy, and different sides of the gender gap (10). Communication between the professions does not flow as it should. In the classic study on the outcomes of intensive care, communication between nurses and physicians was the single factor most significantly associated with excess hospital mortality. In more recent research, verbal miscommunication between nurses and physicians was responsible for 37% of all errors (9, 11).

Almost in the world 40% nurses in hospitals had less satisfaction in relations with physicians. Nurse–physician relationships have been shown to have a significant impact on the job satisfaction and retention of nurses (12). Barriers to nurse-physician collaboration still exist in a variety of different health care settings. The barriers are reported to occur due to: role misunderstanding; real and perceived differentials in power, position and respect; and varying perceptions of decision-making input and autonomy (3, 4, and 13).

Negative nurse-physician relationships have proven to strain the role of the nurse, resulting in job dissatisfaction, and more nurses leaving the profession. Negative patient outcomes related to the decrease in nursing staff and/or lack of collaboration between nurses and physicians (14). The shortage of nurses does not affect only nurses, rather services have been reduced. Consequently, patient satisfaction has decreased, the quality of care and patient safety have been compromised, and the rate of medical errors has been risen (4). Current reports attest to a mild “acceptance” by some nurses that the power level between nurses and physicians will always be unequal because physicians generally have more education than most nurses. Nurses who have this attitude may be confusing differences in educational levels with differences in professional philosophy, roles, functions, professional knowledge, and clinical focus and experience between the two professions. The roles, functions, and kinds of expertise nurses and physicians have may be different, but they’re equally important to patient care. In many countries, doctors determine the scope of nursing practice and education, and can directly define the limits of nursing knowledge (6).

Conflict with physicians has been identified as one stressor in the nurse work environment (16). Nurses may face both verbal and physical abuse when conflict arises with physicians (5, 16, and 17). Physician behavior and adverse events, errors, and poor patient outcomes (12).

A study conducted in the United States, in 2002, showed that disruptive physician behavior was cited as a contributor to the nursing shortage. A survey of 1,200 nurses, physicians, and health care executives revealed that 92% of the respondents had witnessed "disruptive physician behavior, such as inappropriate conflict involving verbal or even physical abuse of nurse" (4). Similarly: approximately 60% say that physicians don’t communicate with them about their concerns for a patient, roughly 50% said that physicians don’t listen to what they have to say about patients (18).

A study conducted in Nigeria in 2006 about working relationships between nurses and doctors, showed that nurses (79.5%) were more likely than doctors (59.4%) to complain that staff shortage is a significant cause of poor doctor-nurse working relationships. Furthermore, more nurses than doctors wanted the post of the chief executive of hospitals to be open to all professionals in the health care system, in the belief that this will positively influence the conditions of service of health care workers and their sense of belonging (6, 19).

METHOD AND MATERIALS

The study was conducted in Tigray Region which is the northernmost region of Ethiopia. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), the Region has an estimated total population of 4,314,456, of whom 2,124,853 are men and 2,189,603 women. The region has 14 public hospitals with total number of 798 nurses, 92 physicians and 14 CEO in the hospitals. The study was conducted from February 28 to March 20, 2011.

The Study design was institution based cross-sectional quantitative and qualitative approaches. The Study subjects for the quantitative part were randomly selected nurses who were engaged in giving direct patient care, work as full time in public hospitals and who had 6 months and above work experience. For the in-depth interview: Physicians, Nursing directors, Medical directors and CEO of the hospitals were involved in the study. Two hundred and fifty five samples for the quantitative study were determined using single population proportion and correction formula. Eight in-depth interviews were conducted to collect the required information purposefully for the qualitative study. Two-third of 14 public hospitals in the region was selected using a lottery method and then, the required number of nurses to be included from each study hospital was proportionally selected. One CEO, two medical directors, five Nursing director, and two physicians were participated and redundancy/saturation of information was used to limit the number of in-depth interviews to eight. Data were collected using a structured questionnaire that was adopted and adapted from the Nursing Work Index-Revised (NWI-R) and from reviewing literatures of similar studies (5, 14 and 21**).** In the instruments of nurse-physician relationships responses , Likert scale was used . The

validity and reliability of the instrument were tested with pretest prior to main data collection time. Data were collected by using self-administrated questionnaire with the help of nine trained BSc nurse data collection facilitators and three supervisors were recruited from Mekelle town out of the student health institution. Anonymous of the participant was kept by informing them not to write their name. The in-depth interview had questions that could elicit information regarding the research objectives and used as a guide for semi-structured interview. Data were collected by principal investigator and the three supervisors from the key informants of the respected hospitals. Information was tape recorded and filled note was taken.

Formal letter was obtained from Jimma University Ethical Review Committee and Tigray Health Bureau and communicated with respective hospitals. All of the study participants were informed about the purpose of the survey, their right to participate or to terminate at any time if they want and respondents were ensured about the confidentiality of information obtained. Verbal consent was obtained for their participation.

In order to assure the quality of data, the questionnaire was initially prepared in English and translated into local language and was checked for its consistency by back translation to English. Pretest was also conducted at 10% of sample size in Qui ha zonal and ophthalmic hospital. The data collection facilitators and supervisors were recruited based on their experience in research and trained for two days on the objective of the study and about the questionnaire by the principal investigator. The PI and three recruited supervisors were responsible for supervision on the spot and on reviewing all filled questionnaires on a daily basis.

The collected data were checked for its completeness every day, coded, entered into a computer, cleaned and analyzed using Statistical Package for the Social Sciences (SPSS) version 16.0 analyzed accordingly. The data were summarized and descriptive statistics were computed for all variables according to type. Frequency, mean and standard deviation for continuous variables whereas categorical variables were assessed by computing frequencies. Nurse-physician relationships subscales were computed. Cross tabulation was used to see the frequency and percentage of social-demographic characteristics with nurse-physician relationship satisfaction. The mean scores were calculated for each respondent and the respondents as a group for each nurse-physician relationship satisfaction subscale and the overall satisfaction; those whose score were above the mean were considered as satisfied and those whose score were less than or equal to the mean were considered as dissatisfied focused on nurse-physician relationships. Regression models were estimated using the independent variables (subscales) performed two ways: as continuous variables (mean item scores for each subscale) and as categorical (dichotomous) variables. $P \leq 0.05$ was considered significant for all the independent variables in the model.

The tape-recorded qualitative data was transcribed and translated to English under selected themes based on the question guides and summarized manually. It was presented in the narratives triangulated with the quantitative results.

RESULT

Out of 255 participants from the total of nine hospitals 246 completed and returned the questionnaire and making a response rate of 96.5%.

The study subjects were predominately females 154 (63.6%). The mean age of the respondents was 32.72 (±8.58) years with minimum of 18 and maximum 58 years of age. About 46 % of participants were less than 30 years of age. Most of them were married 129 (53.3). The majority (91%) of the participants were followers of Orthodox Christianity. The respondents had an average working experience of 12.27 years in nursing, Majority of the study participants highest attained nursing education was a clinical nurse diploma 146(60.3%) followed by BSc. Degree nurse 43(17.8%) (Table1).

Table 1: Socio-demographic characteristics of nurses, Tigray Region, Public hospitals, 2011.

Socio-demographic characteristics	**Frequency**	**Percent**
Sex		
Male	88	36.4
Female	154	63.6
Age		
<30 years	111	45.9
30 to 39 years	72	29.8
40 and above years	59	24.3
Marital status		
Married	129	53.3
Single	88	36.4
Divorced/Widowed	25	10.3
Religion		
Orthodox	220	90.9
Muslim	16	6.6
Catholic	6	2.5
Work experience in Nursing		
< 10 years	140	57.9
10 to 19 years	54	22.3
>19 years	48	19.8
Highest attained nursing education		
Diploma clinical nurse	146	60.3
Diploma OR nurse	10	4.1
Diploma midwifery	32	13.2
BSc. Nurse	43	17.8
Others*	11	4.6

Others*:- Diploma anesthetic nurse=4, Diploma ophthalmic nurse=3, psychiatric=4

The attitude of nurses on hospital atmosphere and Administrative support of nurses in nurse- physician relationship have 41.53 $\pm$ 12.8 and 9.06 $\pm$ 3.195 mean scores respectively (Table 2).

Table 2: Descriptive statistics among units for nurse-physician relationship subscale mean score, Tigray Region, Public hospitals, 2011.

Subscales	**Minimum**	**Maximum**	**Mean**	**SD**
Attitude of nurses on hospital atmosphere	6	60	41.53	12.798
Nurses work environment	8	32	22.40	4.717
Clinical autonomy of nurses	6	30	20.00	6.118
Administrative support of nurses in nurse-physician relationship	3	15	9.06	3.195
Recognition of nurses work by physicians	3	15	10.11	2.863

Perception of nurses on general atmosphere of their working hospital

The mean rating of all respondents (n = 242) about the general atmosphere of their hospital by 10 Likert scale and 10 indicates the most positive as follows. Almost in all the items to be rated were rated as in a moderately positive aspects. The mean score of the overall atmosphere of nurse–physician relationships at the hospital was 7.2 ± 2.56. The mean rating of all respondents on the significance of nurse–physician relationships at their hospital was 7.71 ± 2.425. The mean rating of physician awareness of the importance of the nurse–physician relationship to nurses' satisfaction was 7.16±2.467. The mean rating of all respondents' physicians' value and respect for nurse input and collaboration was 7.25±2.702**.** The participants were asked to rate their perceptions of administrative support of nurses in conflicts with physicians. The mean response rate was 6.00±3.201 and this was the lowest mean score in the survey with this scale. And also they rate their perceptions of physician support of nurses in nurse–physician conflicts and the mean response rate were 6.22±3.034 the second lowest mean score among all scores in the survey (**Table 3**), in the in-depth interview, the inpatient nurse director stated" …. Actually the nurse-physician relationship here is not bad but good relationship is important for the quality of service delivered to clients and for the two professionals' job satisfaction. If the two professionals value and respect their collaboration and trust each other, their nurse-physician relationship will be good….., teamwork and collaboration will be increased….It results to job satisfaction of the two professionals, as a result good quality of care will be delivered to patients."

Table 3: Nurses perception on general atmosphere of their hospital descriptive statistical analysis Tigray Region public hospitals, 2011.

Nurses' general perceptions of	**N**	**Mean**	**SD**
Overall atmosphere of nurse-physician work relationships	242	7.18	2.555
Overall significance of nurse-physician work relationships	242	7.71	2.425
Physician awareness of nurses' job satisfaction			
Administrative support for nurses in case of conflict	242	7.16	2.467
Physician value and respect on nurses' input and collaboration	242	7.25	2.702
Physicians' support for nurses in case of conflict with physicians	242	6.00	3.201
	242	6.22	3.034

The mean score in the attitude of participants towards the general atmosphere of their working hospital were 41.53. Of the total participants 124(51.2%) had positive attitude towards the general atmosphere of the hospital but the remaining had a negative perception towards the general atmosphere of their working hospital. One hundred and forty (57.9%) respondents were satisfied with the general atmosphere of their hospital while the remaining respondent answered as they were dissatisfied with this aspect. Of these respondents 98 (40.5%) had a positive attitude and were satisfied but 76 (31.4) had a negative attitude and were dissatisfied. Of the 118 nurses who had a negative attitude around 60% of the respondents were dissatisfied with their relationship with physicians.

Nurses work environment subscale

Almost a majority (64%) of the respondents replied that they were satisfied with their relationship with physicians. About two-third (66%) of the respondents reported that physicians and nurses have good working collaboration or joint practices suggest that they were satisfied with their collaboration or joint practice. With respect to existence of teamwork between nurses and physicians, almost three in five nurses reported that there was a lot of teamwork or joint practices between nurses and physicians. Of the total participant nurses 208 (86%) of them reported that there was interred-professional relationship with their hospital. Of the total 242 respondents, 147 (60.7%) of them were satisfied with physicians' behavior in their hospital (Table 4).

Majority 109(45.1%) and 91(37.6%) of the study subjects said the facility is doing well to facilitate collaboration and team work between nurses and physicians by team conferences and interdisciplinary rounds respectively. And the remaining participants said nothing is done to increase the relationships between nurses and physicians. One of the key informant stated **" ….t**o improve an interdisciplinary relationship in our hospital…., just we use review meeting every two weeks in each case team mainly in their communication and relationships with their case team mates as well as adequacy of resources and we also introduced interdisciplinary round even if it is an infant…."

Most of the respondents 146 (60.4%) said the process is it's not at all effective but on the contrary based on the qualitative data **a nurse director of one hospital stated** "…..most of the physicians and nurses are senior and experienced no common disruptive behavior but …rare conflict might occur between the two professionals and it will be solved by the case team manager through discussion. If still cannot be solved the issue will be discussed in the nurse's director's office. Finally… if not solved will be reported to the administration office to discuss the case with task centered."

Table 4: Perception of nurse on the work environment, Tigray Region Public hospitals, 2011.

Nurses Work environment	**Frequency**	**Percent**
With Nurse-physician relationship		
isfied	87	36.0
Satisfied	155	64.0
Collaboration or joint practice with physicians		
sfied	83	34.3
Satisfied	159	65.7
With Inter-professional existence with physicians		
isfied	208	86
Satisfied	32	14
Extent of team work between nurse and physicians		
sfied	99	40.9
Satisfied	143	59.1
Physician behavior		
sfied	95	39.3
d	147	60.7
Facility uses to facilitate inter-disciplinary collaboration		
Team conferences	109	45.1
Interdisciplinary round	91	37.6
Nothing is done	42	17.4
Effectiveness with dealing physicians disruptive behavior		
Was not effective	146	60.4
Was effective	96	39.7

Here's how nurses characterize their relationships with physicians in their clinical settings, 98(40.5%) of the respondents said they have , had collegial relationships with physicians of these 22(51.2%) were BSc. nurses and followed by 91(37.6%) of the respondents who "believe that nurses are subordinates of physicians (**fig-1)**, **key informant (28 years) female said**"…… As a physician, if I accept the reality that I am employed here is to save lives…, with the auxiliary health personnel. Auxiliary health personnel are assistants to the physicians. This does not necessarily mean that they are the slaves of physicians. Their task is to assist physicians and work in accordance with this division of labor. ….nurses does not want to accept that they are subordinates of physicians…"But a nurse director stated"….nurses have equal power and position with physicians but physicians do not perceive this due to the culture that they adopted …"

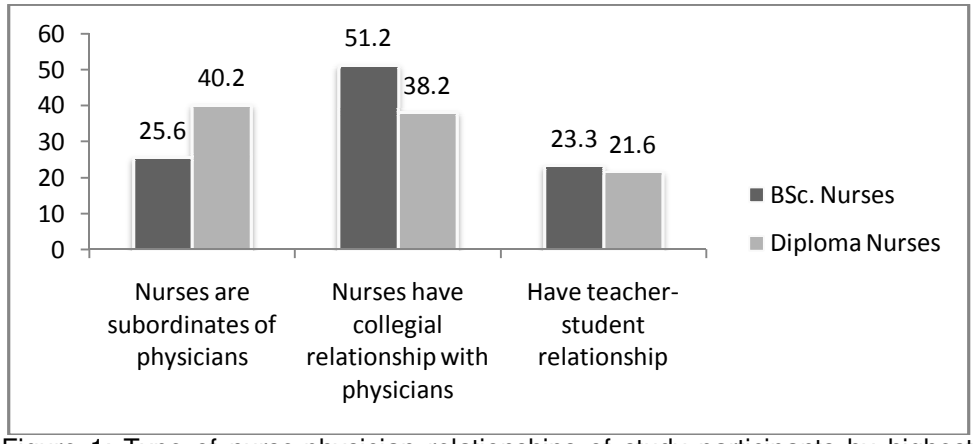

Figure 1: Type of nurse-physician relationships of study participants by highest attained nursing education, Tigray Region, Public hospitals, 2011.

Clinical autonomy subscale of nurses

Of the total 242 respondents who responded about the clinical autonomy of nurses, 164(67.8%) were consulted about nursing care by physicians suggest that they were satisfied with their consultation about nursing care by physicians. From the total nurses participated in the study, about 33.9% reported that; they did not have the right in decision making role about nursing care but most of the nurses were satisfied with this aspect. Of the 242 total respondents, three in five nurses believe that physicians with whom they work respect the nurses judgment about patient care and they feel satisfied. Greater than half of the respondents, 132(54.5%) reported that they were satisfied with physicians support nurses in decision making about patient care. About 55% of the respondents in the study were satisfied with physicians support to be fully accountable about nursing care to their patient. Around 57.9% of the nurses who participated in the study were given a freedom by physicians to be autonomous in decision making about patient care but the remaining percentage of nurses were not supported by physicians in decision making (Table 5).

Table 5: Perception of respondents in clinical autonomy of nurses given by physicians, Tigray Region public hospitals, 2011.

Clinical autonomy items	**Frequency**	**Percent**
Consultation of nurses about nursing care by physicians	78	32.2
Dissatisfied	164	67.8
Satisfied		
Right of nurses' in decision making about nursing care	82	33.9
Dissatisfied	160	66.1
Satisfied		
Physicians respect in nurses judgment about pt care	98	40.5
Dissatisfied	144	59.5
Satisfied		
Extent of physicians support for nurses in decision making	110	45.5
Dissatisfied	132	54.5
Satisfied		
Extent of support by physicians to nurses to make fully accountable on these nursing care decisions	109	45.0
Dissatisfied	133	55.0
Satisfied		
Freedom given to nurses by physicians to be autonomous in decision making about pt care		
Dissatisfied	102	42.1
Satisfied	140	57.9

Administrative support in nurse-physician relationships

Of the total respondents, 122 (50.4%) claimed that they were satisfied with administrative support to create nurse-physician relationships in their hospital. Of the total respondents 11(45.9%) and 130(53.7%) were dissatisfied about the extent of administrative support for personal growth in education and with conflict resolution in their hospitals respectively(**Table 6**).

Table 6: Respondent perception on administrative support in nurse- physician relationships, Tigray Region public, 2011.

Administrative subscale items	**Frequency**	**Percent**
Administrative support in nurse physician relationships		
Dissatisfied	120	49.6
Satisfied	122	50.4
Extent of administrative support for personal growth in education		
Dissatisfied	111	45.9
Satisfied	131	54.1
Conflict resolution		
Dissatisfied	130	53.7
Satisfied	112	46.3

In general, the total mean score of administrative support in nurse-physician relationship was 9.06(SD=3.2) with range of 3 to 15. Of the total respondents, 52.5% were dissatisfied with administrative support for their work relationship with physicians while the remaining 115(47.5%) of respondent answered as they were satisfied with this aspect. Out of the total 110 respondents less than 30 years of age (68%) were dissatisfied with their administrative support in nurse-physician relationships whereas from the 59 nurses (40 and above years) participated in the study around 66% of them were satisfied with administrative support in nurse-physician relationships (fig 2).

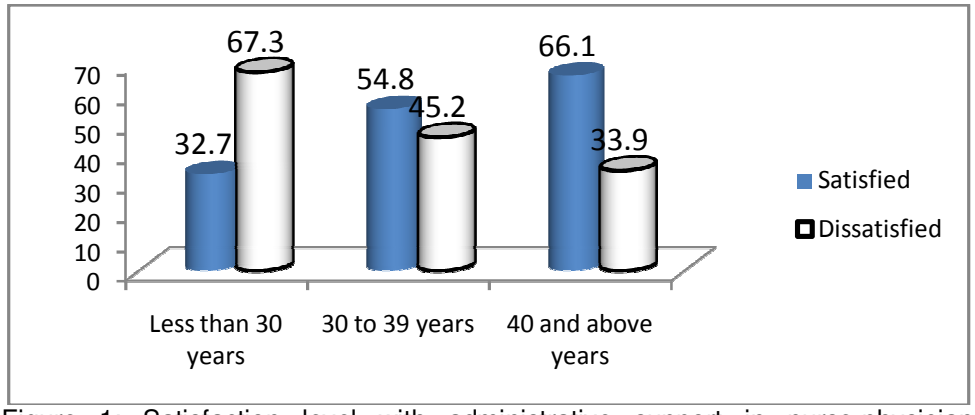

Figure 1: Satisfaction level with administrative support in nurse-physician relationship by age Tigray Region, Public hospitals, 2011.

Recognition of nurses' role by physicians in patient care

Of the 242 survey respondents, 109(45%) of them perceive a gap in physicians' understanding of nurses' roles and responsibilities as a nurse and cite ongoing problems with communication and collaboration which results this with dissatisfaction. Of the total participants in the study, 169(69.8%) were satisfied with the competency of nurses on their professional skill and knowledge of nurses who were working in their hospital. Regarding recognition of nurses' work by physicians, 147(60.7%) nurses reported that their work is recognized by physicians as satisfactory (Table 6). On the contrary, **one key informant nurse director of a hospital stated** "….I feel that some physicians don't always recognize the knowledge, and experience base that nurses have."

Table 6: Perception of respondent on recognition of nurses' role by physicians, Tigray Region Public hospitals, 2011.

Recognition items	Frequency	Percent
Most physicians' understanding about nurses' role		
Dissatisfied	109	45.0
Satisfied	133	55.0
Nurses' professional competency and knowledge		
Dissatisfied	73	30.2
Satisfied	169	69.8
Recognition of nurses works by physicians		
Dissatisfied	95	39.3
Satisfied	147	60.7

In general, the total mean score of recognition of nurses role and responsibilities by physician in patient care was 10.11(SD=2.86) with range of 3 to 15. From the total 242 respondent, almost half of the participants 122(50.4%) were dissatisfied with the lack of appreciation of nurses role and responsibilities in patient care by physicians while the remaining of respondent answered as they were satisfied with this aspect. Out of the 140 nurses participated having work experience less than ten years in nursing, about 65% of them were dissatisfied with recognition of their role by physicians whereas from 54 participants with work experience in nursing from the range of 10 to 19 years (74%) were satisfied with recognition of their role by physicians (**fig-8).** On the contrary on the qualitative analysis One CEO stated "….Some of the nurses are very competent with their professional skill and knowledge more than that of some of the physicians that we cannot get them elsewhere but doesnot mean that all the nurses are competent enough….."

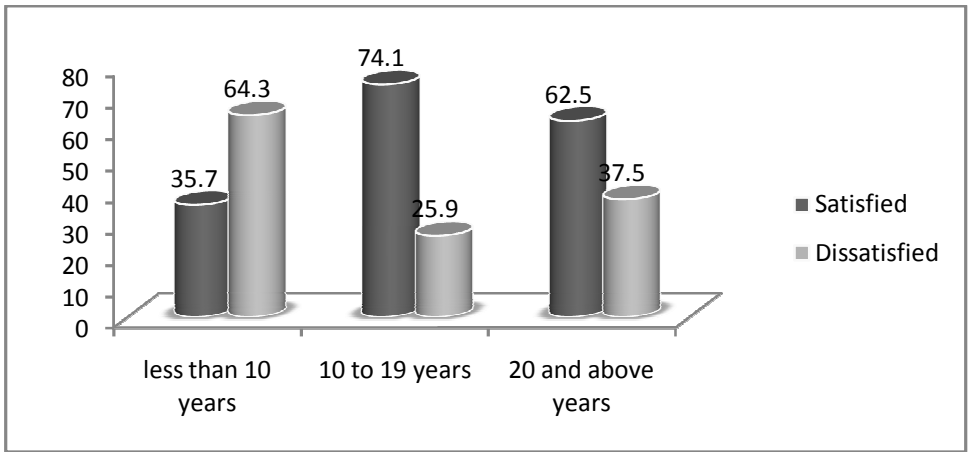

Figure 3: Satisfaction level of nurses with recognition of nurses' role by physicians subscale by work experience in nursing in Tigray Region, Public hospitals, 2011.

Predictors of nurse-physician work relationship

In the binary logistic regression analysis nurse-physician relationship was found to be associated with nurses work environment, nurses' clinical autonomy, administrative support in nurse-physician relationship, recognition of nurses' role by physicians.

Nurses who were not autonomous in decision making about patient care were 98% less likely to be satisfied as compared to those who were autonomous in decision making about patient care (AOR=0.02,[95%CI=0.003,0.066]).

Table 2: Binary and multiple logistic regression model predicting satisfaction with respect to nurse-physician relationships subscale, Tigray region, public hospitals,2011.

Job satisfaction subscale	COR(95% CI)	AOR(95% CI)
Nurses work environment		
Dissatisfied	0.022(0.01,0.047)**	0.06(0.014,0.24)**
Satisfied	1	1
Clinical autonomy of nurses		
Dissatisfied	0.006(0.002,0.016)**	0.02(0.003,0.066)**
Satisfied	1	1
Administrative support in nurse-physician		
Dissatisfied	1	1
Satisfied	16.28(8.3, 31.95)**	6.81(1.67,27.82)*
Recognition of nurses' role by physicians		
Dissatisfied	0.021(0.009,0.05)**	0.053(0.012, 0.237)**
Satisfied	1	1
Perceived alternative job/ education		
Dissatisfied	0.032(0.016,0.064)**	0.37(0.068,2.02)
Satisfied	1	1

N.B. ** Significant at P<0.001, CI=confidence interval, *significant at p<0.01 COR(Crude Odd Ratio), AOR(Adjusted Odd Ratios)

DISCUSSION

In the present study nurse-physician relationships was assessed because excellent working relationships between nurses and physicians are important in creating safe and satisfying practice environment to furnish quality of nursing care.

The mean age of nurses participated in the study was 32.72 years. This was lower than as compared with those working in United States with an average age of 45.2 years (4). This suggests that nurses who are working in Tigray public hospitals were young group of population. This could be due to government policy focus in increasing health service coverage and simultaneously producing large number of health professionals from both governmental and private colleges.

Nurses in the age group 40 and above years were 4 times more satisfied about their relationship with physicians as compared to those aged below 30 years (AOR=3.77, CI=1.02, 13.95). This finding also supported by the in- depth interview "….nurses in our hospital are senior and experienced…..and have an intimate relationship with physicians like a family and becomes more satisfied."This study is consistent with similar study conducted in South Africa in the Western Cape with nurses above age 40 were significantly more satisfied than their younger colleagues with vis-à-vis relationships with doctors ($p < 0.01$) (20).

Nurses who had work experience 10 to 19 years in nursing were over four times more likely to be satisfied than nurses with below 10 years work experience (AOR = 4.42, CI: 1.48, 13.22). But nurses who had work experience of 20 and above were not statistically significantly associated with job satisfaction of nurses in relation with nurse-physician relationship even if they were two times more satisfied with work experience less than 10years. This is inconsistent with similar study in South Africa hospitals, nurses with more than 20 years' experience were also significantly more satisfied than their less-experienced colleagues with physicians ($p<0.05$) (17). And study in Japan indicated that being inexperienced is exaggerated in environments where the majority of your co-workers are also inexperienced (20).This difference may be due to difference in socio-demographic and cultural difference.

Nurses who do not mention staff shortage as a factor that can affect nurse-physician relationship were more likely over four fold more satisfied as compared to those who mention staff shortage as a factor (AOR=4.24, ,[95%CI: 1.62, 11.10]). This is consistent with findings of other studies about nurse-physician relationship conducted in Nigeria which showed that this factor also plays an important role in poor nurse-physician relationship (p=0.004). (6).This is also supported by the in -depth interview "…one of the root cause of poor nurse-physician relationship is staff shortage….that results uncooperativeness due to work overload." Inadequate staff leads to inefficient health care

delivery, perceptions of uncooperative work attitude between nurses and physicians. This may increase the risk of disruptive behavior among health care workers.

Nurse–physician relations had a significant positive association with the satisfaction of nurses with their current job and the intention to stay on the current hospital (18). Physician-nurse relationships based on mutual power, trust, and respect are more instrumental in enabling quality patient care (19).

In this study finding on nurse-physician relationship showed that about two in three nurses who participated in the study were satisfied with their good working relationship with physicians in their hospitals. This is also supported by the finding of in -depth interview" ….the nurse-physician relationship is not bad in our institution….but is important for the quality of service delivered by our institution and for the two professionals' job satisfaction." This study finding were lower than a similar study conducted in four Belgian acute-care hospitals; over 3 in 4 nurses reported had good working relationship with physicians and associated with a 2.5 fold increase in the odds of reporting high job satisfaction. This might be due to difference in Scio-demographic characteristics, culture of the hospital.

About two-third of the respondents had good collaboration or joint practice with physicians. This is slightly lower as compared to study conducted in Belgium acute hospitals, approximately 75% of nurses reported that collaboration (joint practice) exists between nurses and physicians. Almost majority (86%) of the study participants were reported the existence of inter-professional relationship in their working hospital. This is higher than finding of study in 15 Norwegian hospitals which indicated that majority of nurses (71%) satisfied with the inter-professional relationships (9). This difference may be due to socio-demographic characteristics, culture of the study area difference.

The participants believe that nurses are subordinates of physicians (37.6%) and have collegial relationships with physicians (40.5%). This was supported by the qualitative study"… if I accept the reality that I am employed here is to save lives…, with the auxiliary health personnel. Auxiliary health personnel are assistants to the physicians. Their task is to assist physicians and work in accordance with this division of labor,….nurses do not want to accept that they are subordinates of physicians." This finding is lower than findings in the United States in 2008, 46% of the respondents said nurses are subordinates of physicians and 38% nurses have collegial relationship with physicians (18). This difference might be resulted from difference in understanding of their roles in the clinical settings and cultural difference and individual characterstics.

The team members function and coordinate to produce harmonized output. Improving team work between nurses and physicians may enhance satisfaction among nurses, physicians, and patients; increase the quality of care, and reduce costs. This can be facilitated by team conferences, interdisciplinary round, and morning session. About 45% of the study participants reported that their facility uses team conferences and also 37.6% interdisciplinary round to facilitate collaboration and team work between nurses and physicians and this was also supported by the qualitative study**"… t**o improve an interdisciplinary relationship in our hospital,…we use review meeting at least every two weeks in each case team mainly in their communication and relationships as well as adequacy of resources and also introducing interdisciplinary round even if it is an infant …."

About 31% of respondents perceive a gap in physicians' understanding of nurses' roles and responsibilities as a nurse and cite ongoing problems with communication and collaboration. This was also supported by the qualitative study"….I feel that some physicians don't always recognize the knowledge, and experience base that nurses have and often overlook it as a resource." This value was lower than similar study conducted in United States conducted in 2008 which was about 70% said that physicians don't understand their roles and responsibilities as a nurse (19). This could be due to difference in competency and culture of the study subjects.

Clinical autonomy was the other predictor of nurse-physician relationships in this study, nurses who were not autonomous in decision making about patient care were 98% less likely to be satisfied as compared to those who were autonomous in decision making about patient care (AOR=0.02,[95%CI=0.003,0.066]). This is consistent with the study conducted in Ain Shams University by H. Fatuma with P<0.001(20).

Most of nurses, 127(52.5%) were dissatisfied with administrative support in nurse-physician relationships and half of the nurses were dissatisfied 122(50.4%) with recognition of nurses role by physicians and Nurses who had not recognize their roles and responsibilities by physicians were 94% less likely to be satisfied with their current job as compared to those whose role were recognized (AOR=0.06,[95%CI=0.012,0.24]). This is consistent with study conducted in Nigeria as there was perception of lack of appreciation of the knowledge of the nurses by physicians (p=0.004) and Ain Shams University by H. Fatuma, (P<0.001). (6,20).

CONCLUSION

This study was designed to investigate the nurse-physician work relationships in public hospitals of Tigray region. Nurses who were working in Tigray public hospitals reported that they had low nurse-physician relationships , team

work and collaboration and poor conflict management methods and higher number of nurses replied that nurses were subordinates of physicians.

A considerable number of nurses indicated that they were dissatisfied with overall nurse-physician relationships. Greater than half of the nurses were dissatisfied with administrative support in nurse- physician relationships, recognition of nurses' role and responsibilities by physicians. Work environment, clinical autonomy of nurses, administrative support in nurse-physician relationship and recognition of nurses' role by physicians were the major predictors' nurse-physician relationships.

RECOMMENDATIONS

Based on the findings of the study the following recommendations are forwarded:

To Regional health bureau, Zonal health offices and hospital leaders

- Create more opportunities for collaboration and communication through open forums, group discussions, and collaborative workshops between nurses and physicians.
- Increase availability of training and educational programs for nurses and physicians that focus on improving teamwork and working relationships (for example, sensitivity training, assertiveness training, conflict management, and collaboration skills).
- Encourage team conferences, interdisciplinary round and morning session of nurses with different disciplines in the hospital.
- Improve organizational processes by requiring administrators to take a more proactive approach to avoiding potential confrontations related to staffing and equipment.
- Disseminate code-of-conduct policies, job descriptions in relation to the scope they practice to patient care and reporting guidelines to both nurses and physicians and apply policies consistently and quickly, providing feedback to all involved.
- The administrators should support creating a favorable environment for nurse physician relationship.

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