

Patient Safety Culture and Associated Factors among Health Care Providers in Public Hospitals of Bahir dar City, Amhara, Northwest Ethiopia

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Abstract

Introduction: Patient safety culture is fundamental principle of health care and it is one component of quality health care. Safety culture refers as “a set of values, attitudes, competencies and behaviors that determine commitment to health management. This study determined the level of patient safety culture and associated factors at public hospitals in Bahirdar city, Northwest Ethiopia.

Methods: An Institution based cross-sectional survey was conducted at three public hospitals, in Bahirdar city, Ethiopia from April to May in 2020. To measure PSC we have been used (HSOPSC) version 1. HSOPSC was developed by AHRQ of United States in 2004. HSOPSC which contains 42 items and 12 dimensions, Self-administered questionnaires were distributed to the 421 health care providers. Simple and multiple linear regression were done using 95% CI and significance was determining at $P < 0.05$. Assumption of linear regression were checked.

Result: The overall level of patient safety culture was 50.78% (95% CI of 49.96, 51.57) with a response rate of 97.3%. Associated factors such as working experience (6-10) years ($\beta = -2.85$, 95%CI: -5.256, -.451), experience (16-20) years ($\beta = -6.156$, 95%CI: - 11.792, - .519), experience above 20 years ($\beta = -5.940$, 95% CI: - 10.647, - 1.234), other professionals ($\beta = 5.040$, 95% CI: 1.335, 8.745).

Conclusion: The overall level of patient safety culture was low. Other professionals, working experience ranging; 6-10 years, 16-20 years and above 20 years were significantly associated with patient safety culture. Therefore; interventions of professionals having better working experience were needed to improve the level of patient safety culture. Necessary patient safety culture guidelines will prepare and implement it.

Keywords: Patient safety culture, Dimension of patient safety, public Hospitals, Bahirdar City.

Introduction

Patient safety defines as “reduction of risk of unnecessary harm associated with health care to an acceptable minimum”. Safety culture: refers the product of individuals and group values, attitudes, perceptions, competence, pattern of behaviors that determine the commitment, the style and proficiency of an organizational health and safety management [1].

On, 2019, health survey on patient safety culture guide refers “patient safety” as beliefs, values, and norms shared by health care practitioners

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and staff throughout the organization that influence their action and behaviors [2].

On the other hand, safety culture defines as “a set of values, attitudes, competencies and behaviors that determine commitment to health management and safety replacing blame and punishment with the opportunity to learn with mistakes and improve health care [3]”.

“Patient safety” is defined as the avoidance and prevention of patient injuries or adverse events resulting from the processes of healthcare delivery. A “patient safety event” is defined as any type of healthcare-related error, mistake, or incident, regardless of whether or not it results in patient harm [4].

Recently, global health facilities have paid strong focuses about the important of developing the culture of safety. To implement patient safety culture, it is important to know about the standards, principles, attitudes, related to the health institutions and what characterizes as well as working environments, organizational cultures and values, beliefs that are related to patient safety culture [5].

In developing regions most countries have no national policies on safe health care service. They have Misbalanced funding system, lack of critical support system, absence of strategies, guidelines, tools and patient safety standards were still now it is the major concern of the region. In addition to this, weak health care delivery system with suboptimal infrastructure, poor management capacity and under equipped health facilities brought the situation where medical error or adverse events related to patient safety culture is high. Furthermore, access to quality medicine remains a challenged. Making evidence based decision or understanding of patient safety culture is harmed by lack of constructed data [6].

Various factors influence patient safety culture in different categories of countries including, inadequate competence and skills, lack of appropriate knowledge, and latent organizational failures respectively, (developing countries, countries in transitions, and developed countries). From this we can understand that the cause of poor patient safety culture is highly different in low level, middle level and high level countries [7].

Recent study shows that there are multiple factors for unsafe health care in low income countries such as understaffing, lack of health care commodities, overcrowding, inadequate structures, shortage of basic equipment's poor sanitation and hygiene are some of leading factors. This factors diminish the health outcome of the countries [8].

However, patient safety culture is the component of health care quality and there is less evidence that shows level of patient safety culture in the study area as well as in Ethiopia. Therefore, this study aimed to measure the level of patient safety culture and its associated factors among health care providers working at public hospitals in Bahirdar city, Northwest Ethiopia [9-18].

Method and Materials

Study area

The study would be conducted in Bahirdar city at Amhara Regional states; Bahirdar is located in Northwest part of Ethiopia at a distance of 565 KM from Addis Ababa, capital city of Ethiopia. Its astronomical location is 11°, 38” North latitude and 37°, 15” East longitudes the city is found in 1922. Based on the data from Bahirdar city administration health office the total population of the city is estimated to be 345085. Bahirdar city has 9 sub city administrations and in the administration there are three public hospitals. These Hospitals are Felegehiwot comprehensive specialized hospital, Tibebe-Gion specialized comprehensive specialized Hospital, Addis alem General Hospital. In these three hospitals there are a total of 1444 health care providers [19-27].

Study design and period

Institutional based cross sectional was conducted from April to May 2020

Source of population

All health care providers who were working at public Hospitals in Bahirdar city

Study population

All health care providers who were working at public hospitals in Bahirdar city during data collection period who fulfilled inclusion criteria.

Inclusion Criteria

All health care providers were working direct contact with patient treatment and more than six month work experience at public hospitals.

Sample size

The sample size would be calculated based on a single population proportion formula and taking (47%) prevalence of positive safety culture previously done in oromia.(95% confidence interval, 10% response rate, 5% margin of error. Then total sample size calculated was 421 [28-32].

Sampling procedure and participant selection

There were a total of 843, 502 and 99 health care professionals in Felegehiwot comprehensive specialized hospital, TibebeGion comprehensive specialized hospital and Addis alem general hospital respectively. The total number of health care providers would be determining by using proportion allocation formula. Next, two main probability sampling techniques have been used to address required sample size, first, Stratified sampling technique would be used to get health care providers in each profession (total number of Nurses=778, physician= 230, Laboratories=113, pharmacies=103, midwife=135 and others=85), second Simple random sampling (lottery method by preparing boxes) would be used to select the final 421 sample size in each public hospitals based on the allocated sample [33-35].

Data collection Instrument

Hospital survey on patient safety culture (HSOPSC)

version 1.1 was tool to measure patient safety culture; HSOPSC contains 42 items that categorized in to 12 dimensions [36]. Many countries were used HSOPSC of AHRQ (USA, Saudi Arabia, Canada, the United Kingdom, Belgium, Denmark, Norway, Ethiopia and Taiwan). In this study the questionnaire was prepared by clear English language and translated to Amharic language (local language) even though; English language was the working language of health care providers in the study area.

On the other hand, five point Likert scale of agreement (strongly disagree, disagree, neutral, agree and strongly agree) were used. Similarly, to assess frequency (never, rarely, sometimes, most of the time, and always) were used to ask respondents about patient safety culture. Structured and pre-tested questionnaire were distributing to 421 health care providers; including Nurses, Laboratories, Pharmacist, Physicians, Midwives and other professionals who have fulfill the inclusion criteria in each public Hospitals [37].

Data measurement and analysis

The questionnaires were editing, coded and entered to Epi info-7 then export to statistical package for social science (SPSS) software version 23 for analyze and summarized as percentage, mean, tables and standard deviation. Variables had P- value of 0.25 or less were identified by using bivariate analysis then all variables with P-values 0.25 or less were entered to multivariate linear regression analysis. P value less than 0.05 would be considered as significantly associated with patient safety culture.

Operational definitions

Patient safety culture: is the absence of preventable harm or free from unnecessary harm to a patient during the processes of health care.

Patient safety culture was measured by using 5 point Likert scale with 32 total item, the maximum score was $32 \times 5 = 160$, the minimum score $1 \times 32 = 32$ and that would be measured how people feel opinions about working hours, experience, safety culture dimensions by expressing strongly disagree=1, disagree=2, neutral=3, agree=4 and strongly agree=5 And would be treated as a continuous variable. Through the above impute we calculate the total score of each respondent then we found the overall level of Patient safety culture as follows [35].

$$\%MS = \frac{(\text{Actual score} - P. \text{Minimum score}) \times 100}{P. \text{Maximum} - P. \text{Minimum}}$$

Ethical consideration

Ethical approval was obtained from Bahir Dar University College of Medicine and Health Science Institutional Review board. Official permission letters were obtained from the three hospitals. Study participants would have the right to participate or refuse participation in this study. Consent was taken in written from each participant by explaining the objective of the study. Record secretly and confidentiality no name or personal identification was used and confidentiality of individual information would not disclose to other party.

Results

Socio-Demographic characteristics

Four hundred ten health care professionals were interviewed to response rate of 97.3%. Two hundred twenty (53.7%) interviewed participants were females. The mean age of the participants was 25 years ± 4.85 . The majority of participants (61.0%) were below thirty years. Three-hundred-twenty-five 79.3% of the participants were first degree holders. Two-hundred-twenty-four (54.6%) of the participants were nurses. Among the study participants, 182(44.4%), 89(21.7%) and 60(14.6%) were worked in inpatient, multiple and outpatient units respectively. From all participants, 205(50%), 188(45.9%), 9(2.2%) and 8(2.0%) were married; single, widowed and divorced respectively (Table 1).

Individual factors (working experience and working hours)

Among all participants; (43.7%) and 9(2.2%) of them had 1-5 and 16-20 years of experiences respectively. And majority of study participants (36.8%) were working 40-59 hours per week (Table 2).

The overall level of patient safety culture

In this study, the overall patient safety culture was 50.8 % (95%CI:49.96 – 51.57). And the 12 patient safety culture dimensions ranged from 36.3% to 71.8%. The dimension with the highest average percentage positive responses was “teamwork within unit” (71.8%), Team across hospital department (56.8), were the highest positively contributing dimensions for overall patient safety culture while the two lowest average percentage positive responses were “Non-punitive response to error” (36.3%) and “Communication openness” (42.8%) which were negative effect on the patient safety culture (Table 3).

Factors associated with patient safety culture

In multivariate linear regression; working experience in the range of 6-10 years was significantly associated with patient safety culture as compared with 1-5 years (B=2.853, p=0.02). This indicates that participants whose experience ranged from 6-10 years were 2.853times higher than 1-5 years of working experiences (B= -0.972, p=0.328) and CI (-2.921, 0.978).

Working experience in the range of 16-20 years was significantly associated with patient safety culture as compared with 1-5 years (B= 6.156, p=0.032). This implies that participants whose experience ranged from 16-20 years were 6.156 times higher than 1-5 years of working experiences (B= -0.972, p=0.328) and CI (-2.921, 0.978).

Another working experience in the range of above 20 years also significantly associated with patient safety culture as compared with 1-5 years (B= -5.940, 95% CI: -5.256-.451 p= 0.014). This implies that participants whose experience ranged from above 20 years were -5.940 times higher than 1-5 years of working experiences (B= -0.972, p=0.328) and CI (-2.921, 0.978).

Variable	Category	Frequency (n)	Percent (%)
Sex	Male	190	46.3
	Female	220	53.7
Age in years	<30	250	61.0
	30-50	144	35.1
	>50	16	3.9
Marital status	Single	188	45.9
	Married	205	50.0
	Divorce	8	2.0
	Widow	9	2.2
Educational level	Diploma	42	10.2
	Degree	325	79.3
	Master	38	9.3
	Specialist+	5	1.2
Professional Category	Physician	64	15.6
	Nurse	224	54.6
	Pharmacy	29	7.1
	Laboratory	30	7.3
	Midwives	39	9.5
	Others	24	5.9
Most of your work time	Multiple unit	89	21.7
	Outpatient unit	60	14.6
	Inpatient unit	182	44.4
	Laboratory unit	26	6.3
	Pharmacy	21	5.1
	Other units	32	7.8
Types of hospitals	FHCSH(A)	243	59.3
	TGSH(B)	138	33.7
	Addis Alem Hospital(C)	29	7.1

Table 1: Socio-demographic characteristics of health care providers at Bahir dar city public hospitals, Amhara, North west Ethiopia, 2020 (n=410).

Variable	Category	Frequency (n)	Percent (%)
Experiences	<1 year	99	24.1
	1-5 years	179	43.7
	6-10 years	86	21.0
	11-15 years	24	5.9
	16-20 years	9	2.2
	20+ years	13	3.2
Working hours/week	<20	36	8.8
	20-39	70	17.1
	40-59	151	36.8
	60-79	74	18.0
	80-99	38	9.3
	100+	41	10.0

Table 2: Working experience of participants at three public hospitals in Bahir dar City administration, Amhara, North West Ethiopia, 2020 (N=421).

With regarding to professionals; others professionals had significantly affects the patient safety culture (B=5.040,95% CI: (1.335, 8.745) p=0.008) (Table 4).

Discussion

Patient safety is a well-recognized global public issue. Even in developed countries as many as one in 10 patients is harmed while receiving hospital care [38].

In this study overall level of patient safety culture at public hospital in Bahirdar city was 50.8 % (95% CI: 49.96, 51.57). This result showed that the hospitals had poor/low patient safety culture and needs improvement. This result is comparable with the study finding 51.75% in Japan [39]. The possible reason for this similarity might be due to the

similarities of hospital infrastructure and staffing between the countries. However, the overall level of patient safety culture of this study was lower when compared with the study findings, 52.8% in Iran, 52.9% in Taiwan, 53.7 % in Nigeria, 62% in USA, 62.7% in Srilanka and 65% in China [21,25,29,39,40,41]. The possible reason for this difference those courtiers have skilled leadership, good management, and strong staff relationship within the hospital.

Study done in Jimma University specialized Hospital revealed that the socio-demographic characteristics of the respondents showed not significantly associated with patient safety culture [38]. However, in this study socio-demographic variables like work experience ((6-10) years, (16-20) years, above 20years) and other professionals

No	Patient safety culture dimensions	Number of Items	Positive safety culture score (%)
1	Team work with in hospital units	4	71.8
2	Team across hospital department	4	56.8
3	Supervisor expectation and action promoting safety	4	54.4
4	perception of patient safety	4	53.8
5	Organizational learning- continuous improvement	3	47.9
6	Communication openness	3	42.8
7	Hospital management support for patient safety	3	44.9
8	Hospital handoffs and transitions	3	53.8
9	Level of Staffing	4	49.3
10	Feedback and communication about error	3	54.3
11	Frequency of event reporting	3	42.8
12	Non-punitive response to error	3	36.3
	Overall level of patient safety culture	42	50.8

Table 3: Patient safety culture dimensions at three public hospitals Bahir dar town, Amhara, northeast, Ethiopia in 2020 (N = 421).

Variables	Unstandardized Coefficients		Sig.	95.0% CI for B	
	B	Std. Error		Lower Bound	Upper Bound
(Constant)	51.293	1.076	.000	49.178	53.408
Age group (30-50) years	-1.442	.941	.126	-3.292	.408
Work experience	-2.853	1.222	.020*	-5.256	-.451
Inpatient working unit	1.490	.860	.084	-.201	3.182
Professions	5.040	1.884	.008**	1.335	8.745

* Indicates significance, ** strong significance

Table 4: Multiple Regression results showing the relationship between all variables and frequency of events reported score of patient safety culture at Bahirdar city public hospitals, Amhara, North West 2020 (N=421).

were significant associated with patient safety culture. The possible reason might be knowledge acquired through experience and better patient-provider relationship. In this study other professionals in the hospital were found to be the most important predictors of patient safety culture. The possible explanation for this might be sample size effect.

In this study working hours per week was not significantly associated with patient safety culture. However, study done in Brazil working hours per week was significantly associated with patient safety culture. The possible explanation might be inappropriate working hour's leads to tiredness which decrease attention and quality of patient care.

Study participants those having working experience ranged 6-10 years were significantly associated with patient safety culture. This finding is in line with the finding of study conducted at public hospitals in Southern Nation's Nationalities and People Region (SNNPR) showed study participants having work experience ranged with 6-10 years were significantly associated with patient safety culture [33]. This might be study participants increase their working experience leads to concurrent increments of concepts on patient safety culture.

Limitations of the Study

There were no study participants from none medical staffs in the study area, which may not reflect the whole picture of patient safety culture in Bahirdar city public hospitals. This study was limited to only public hospitals in Bahirdar city; therefore, the result cannot address to other categories of health care organizations such as health centers, private

health facilities and other health professionals in different offices. This research design was quantitative but it needs qualitative study.

Conclusion

The finding of this study showed that the overall level of patient safety culture in Bahirdar city public hospitals was lower than the classification of agency for health Research and Quality (AHRQ) recommended standard. The trends of hospital adverse events or errors were poor. Most dimensions of patient culture scores were low. The most contributing factors like Working experience (6-10) years, Experience from (16-20) years, experience above 20years and other professionals were factors significantly associated with the patient safety culture. In addition to this finding, well-designed patient safety interventions are needed to be integrated with developing patient safety guideline, organizational policies, particularly the pressing need to address all dimensions of patient safety culture are recommended.

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Availability of Data and Materials

The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Contributions

WM was the one who came up with the study's concept and handled data collection. WM and MB were in charge of the text and data analysis. WM was in charge of the project and offered comments on the paper's modifications. MB, MT, and WM critically reviewed, commented on, and revised the manuscripts. MB was mostly responsible for the manuscript's final substance. All of the authors read and approved the final manuscript.

Declarations

Ethical approval and consent of participants

The Institutional Review Board of Bahir Dar University's College of Medicine and Health Sciences (ERC 2345/2020) granted ethical approval. Each hospital medical director office provided a permission letter. After being instructed on the goal of the study, benefit and risk, anonymity, confidentiality, and their right to refuse to answer any question or withdraw from the discussion or interview at any point, caregivers gave their informed oral consent to proceed with the data collection process. The participants' confidentiality and privacy were respected to the fullest extent possible. Because of the primary caregivers' low reading levels, verbal agreement was preferable in our situation without breaking ethical norms, and the ethical review committee allowed it.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests in this work.

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