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Evaluation of Patient Safety Culture Perceptions of Nurses Working in University Hospitals in Turkey

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ABSTRACT

ABSTRACT: Ensuring patient safety is an important home section that shows health care services in all health facilities. Nurses are the most important health professionals in establishing and maintaining patient safety in health care packages.

OBJECTIVE: This study was conducted with the aim of evaluating the patient safety culture evaluations and examination criteria of the staff working in university hospitals.

METHODS: This study was conducted with 420 cross-sectional images working in three university hospitals. The research data were collected using a questionnaire that determines the nurses' introductory information and patient safety status, and the The Hospital Survey on Patient Safety Culture. Descriptive statistics, t-test, Mann Whitney U test, analysis of variance and Kruskall-Wallis test were used to evaluate the data.

RESULTS: In the study, the overall score of the nurses' Hospital Survey on Patient Safety Culture (HSOPSC) was found to be 43.3%. In this study, the sub-dimension of HSOPSC with the highest positive response percentage was "team work within the units(68.5%)", and the sub-dimensions that were identified as problematic and needed to be developed first were "staffing (26.9%)","handoffs and transitions(28.3%)", "frequency of events reported(29.4%)" and "communication openness(37%). The difference between the positive response percentage average of the "HSOPSC- overall perceptions of safety " sub-dimension of women (46.56±22.64) and men (35.71±26.73) in the sample was found to be statistically significant (p=0.027). The difference between the average percentage of positive responses of male participants (45.24±45.55)and female participants (28.23±39.92) for the "HSOPSC-" frequency of events reported" sub-dimension was statistically significant (p=0.037). According to the education level of the nurses, the difference between the groups in the "HSOPSC-"frequency of events reported" sub-dimension positive response percentages was statistically significant (p=0.021).

CONCLUSION: These results show that in ensuring and maintaining patient safety, they should primarily take responsibility at the administrative level and create a permanent patient safety culture in the health care stages.

KEYWORDS: Nursing, patient safety, safety culture.

INTRODUCTION

Patient safety, which is an important indicator of quality in health care services, has emerged after the Institute of Medicine (IOM) report titled "To Err Is Human: Building A Safer Health System" published in 1999. has attracted the attention of health systems in many countries (IOM, 1999; Kohn et al., 2000). The concept of patient safety is expressed as "protecting patients from health care-related errors and undesirable situations" or "being independent from unintentional mistakes by establishing institutional systems and processes that will minimize the possibility of errors in institutions and detect errors when errors occur" (Kohn et al. ,2000; WHO 2016).

Medical errors are at the forefront of the problems that threaten patient safety. Medical error is the unexpected results that occur unintentionally during the health care provided to the patient. Medical errors occur in hospitals where health services are provided, day care units, polyclinics, doctor's offices, pharmacies, nursing homes and patient homes (Grober and Bohnen, 2005; Ilan and, Fowler 2005; IOM, 1999, Natarajan and Hoffmeister, 2009). It is accepted that most of the medical errors are preventable human errors caused by system failure (Leape, 2009). These mistakes directly affect the patients who are harmed, as well as their relatives

and health workers. (Warburton, 2009). 98,000 people die annually due to maintenance errors in health care, and this number is higher than motor vehicle accidents, breast cancer and AIDS (Kohn et al., 2000). The World Health Organization has reported that patient safety-related expenditures consist of prolonged hospital stay, nosocomial infections, medical costs, litigation costs and loss of income, and the annual cost is 6-29 billion dollars (WHO, 2008).

One of the recommended practices to improve patient safety in health institutions is to establish a patient safety culture. Patient safety culture defines the health and safety style as a product of the values, attitudes, perceptions, competencies and behavioral patterns of individuals and groups that determine their competence and commitment (Health and Safety Executive, 2005; The Joint Commission ,2016). According to another definition, safety culture in health institutions is the sharing of norms, beliefs, attitudes and values towards patient safety (Atan et al.2013;Probst, et al.2015).

The International Council of Nursing (ICN) reports that patient safety is the basic principle for health and nursing care quality and that nurses have the responsibility to consider patient safety at all stages of care (Johnstone and Kanıtsakı 2007; ICN 2002, Mitchell, 2008). To improve ICN patient safety, take comprehensive measures in the areas of environmental safety and risk management, including the recruitment, training, protection, improvement of performance of healthcare personnel, infection control, safe use of drugs, equipment safety, safe clinical practices and care environment; and states that the infrastructure that will support the development with scientific knowledge should be established (ICN 2002).

It is seen that the efforts for safer structuring of health care systems continue at the global level and within the scope of these studies, nurses have an important place in the safety and quality studies in health care. Nurses have important responsibilities in preventing medication errors, surgical errors, patient falls, hospital infections and pressure sores, which are within the scope of patient safety, and ensuring material safety (Anderson and Webster 2001; Australian Nursing Federation 2009; Karahan, 2008, Gündoğdu and Bahçecik 2012). In addition, nurses are responsible for protecting their patients from possible dangers in the areas they serve, preventing or minimizing the undesirable results of the procedures and treatments to be applied.

In order for nurses to fulfill these responsibilities, they should be careful about the factors affecting patient safety, evaluate patients and take care to protect and improve patient safety in their practices (Türkmen et al., 2011). In this context, it is accepted that nurses have a key role in establishing a patient safety culture, preventing medical errors and ensuring patient safety (Hughes and Clancy 2009, Al -Ishac 2008, Vogelsmeir and Scott-Cawiezell 2007, Turunen et al. 2013).

In studies on nurses' perception of patient safety culture in Turkey, it has been determined that nurses' perception of safety culture is at a moderate level and this situation is lower for nurses working in public hospitals compared to private hospitals. In addition, the results of these studies show that nurses' patient safety culture perception scores are high in teamwork, but very low in reporting (Gündoğdu and Bahçecik 2012; Bodur and Filiz. 2015). It was decided to conduct this study because it is thought that more studies are needed to reveal nurses' practices and perceptions about patient safety in Turkey. It is thought that the results obtained will guide the current situation in health institutions, eliminating the deficiencies, increasing the awareness of nurses about patient safety culture and making institutional and national plans in this regard.

Purpose of the Study: This study was conducted to evaluate nurses' perceptions of patient safety culture and the factors affecting it.

MATERIALS AND METHODS

Type of Research

The research was conducted in cross-sectional design.

Setting

The research was carried out with nurses working in three university hospitals in the Aegean and Mediterranean regions of Turkey between 01 March and 31 May 2015. These hospitals had a total bed capacity of 1740. All hospitals have internal medicine, surgery, emergency aid, traumatology, reanimation, intensive care, operating room and organ transplant units.

Study Population

The population of the study consisted of a total of 1576 nurses working in the university hospitals included in the study. 580 nurses determined by stratified sampling method were included in the sample of the study. The minimum number of individuals to be sampled was calculated with a known sampling calculation and found to be 309. Considering possible case losses, 580 nurses were invited to this study and a questionnaire was distributed. Fifty of these nurses subsequently refused to participate in the study, 110 filled the data collection forms incompletely, and 420 nurses were included in the study.

Instruments

The research data were collected by using the socio -demographic characteristics questionnaire of variables that are thought to affect the patient safety culture of nurses prepared by the researcher and the Hospital Survey on Patient Safety Culture (HSOPSC) of the questioned questions.

Questionnaire

A total of 37 questions are included in this form, which was prepared by the researchers using the literature. In the first part of this form, the age, gender, marital status, the presence and number of children of nurses, the nursing school he graduated from, the place where he spent the majority of his life and the questions aimed at determining the income status are included. In the second part, the presence of chronic diseases in nurses, the status of inpatient treatment in the hospital, exposure to medical errors during any treatment, the exposure of a family member to medical errors and what the institution is doing about the error are questioned. Nurses and nurses working in the clinic also in this section, the average number of inpatient, patient safety culture, training/information retrieval conditions in working life, making a medical error status, error notification form to the presence of error reporting and nurses who have made the most common mistake in the opinion of the number of health care workers, questioning the causes of medical errors questions are included.

In order to ensure the scope validity of this form, the opinions of three faculty members who are experts in their field were taken. In addition, the applicability and usability of the questionnaire form was improved by making a preliminary application.

Patient Safety Culture Hospital Questionnaire

The Hospital Survey on Patient Safety Culture (HSOPSC), developed by Sora and Nieva, consists of 44 items. This survey, published in 2004 by the Agency for Healthcare Research and Quality (AHRQ), which works in the field of health in the United States, was developed to evaluate the views of healthcare professionals on patient safety, medical error and incident reporting (Nieva and Sora). 2003). The validity and reliability study of HSOPSC in Turkish was conducted by Bodur and Filiz (2009), and the number of items was reduced to 42 (12 sub-dimensions) and the Cronbach Alpha value was found to be 0.86 (Bodur & Filiz, 2010). Sub-dimensions of the questionnaire and the number of items; (i) manager expectations and actions promoting patient safety (4 items), (ii) organizational learning and continuous improvement (3 items), (iii) teamwork within units (4 items), (iv) communication openness (3 items), (v) feedback and communication about error(3 items), (vi) non-punitive response to error (3 items), (vii) staffing (4 items), (viii), management support for patient safety (3 items), (ix) dimensions that safety culture measures at the hospital level: a)teamwork across units (4 items), (b) handoffs and transitions(4 items), (x) issues covering outcome variables: (a)overall perceptions of safety (4 items) item), (b)frequency of events reported (3 items), (xi) degree of patient safety in the hospital unit (1 item), (xii) number of reported incidents (1

item). The items A5, A7, A8, A10, A12, A14, A16, A17, B3, B4, C6, F2, F3, F5, F6, F7, F9 and F11 in this five-point Likert-type questionnaire are reverse questions. In answering, the statements "1=strongly disagree", "2=disagree", "3=neither agree nor disagree", "4=agree", "5=strongly agree" in sections A, B and F, and "1= strongly disagree" in sections C and D. never", "2=rarely", "3=sometimes", "4=often", "5=always". In Part E, the degree of patient safety is evaluated as "excellent", "very good", "acceptable", "poor" and "failed". Evaluation of the Patient Safety Culture Hospital Questionnaire is made only on the basis of positive responses to the items; After the reverse-scored items are translated, the percentage of the score scores of the "agree/often" and "strongly agree/always" answers given to each item is calculated (Bodur and Filiz 2010). Evaluation of the questionnaire is made only according to the average score of the positive response percentages (Sorra and Nieva 2004).

In order to evaluate the comprehensibility and applicability of the forms developed for the collection of research data, a preliminary application was made with 35 nurses working at Burdur State Hospital after the necessary permissions were obtained, and necessary arrangements and corrections were made on the incomprehensible and incomplete issues in the forms.

Data collection

In the collection of the research data, after the necessary permissions were obtained, after the nurses were informed about the purpose of the research and the data collection forms by the researcher with the help of the hospital administrator nurses, the data collection forms were distributed to the nurses who volunteered to participate in the study in a closed envelope and the nurses filled the forms with the self-report method. collected later. It took approximately 30-40 minutes to fill out the data collection forms.

Ethical Considerations

Approval was obtained from the Hacettepe University Non-Interventional Clinical Research Ethics Committee (dated 17.12.2014 and numbered GO 14/585-2). Then, written permission was obtained from the managers of the university hospitals where the study data were collected. In addition, written consent was obtained from the nurses included in the sample of the study, with a voluntary informed consent form prepared in accordance with the Declaration of Helsinki and containing the information about the purpose of the study, that the participation will be voluntary, and that the personal information and confidentiality of the participants will be protected.

Evaluation of Data

Research data were analyzed with SPSS (Statistical Package for Social Sciences) 18.0 package program. Nurses' information about the characteristics of the presentation, the factors affecting the patient safety culture, and descriptive statistics for each item of the HSOPSC were used. In addition, the percentage positive for each item of HSOPSC and the mean for each sub-dimension were calculated. T-test or Mann Whitney U test, Kruskall-Wallis Test or analysis of variance (ANOVA) were used to evaluate statistical differences between groups. Bonferroni Adjusted Mann-Whitney test and Tukey HSD (Honestly significant difference) were used as further analysis to determine which group caused the difference between the groups. The $p<0.05$ value was accepted for the significance level of statistical tests.

RESULTS

The mean age of the participants was 30.44±6.51 (Min -Max=19-49) and 93.3% were female, 63.6% were married, and 77.4% were undergraduate and graduate graduates. 41.9% of the nurses worked in surgery, 4.8% in internal medicine clinics, 60.2% worked more than 40 hours a week, and 39.8% of them worked in the profession for 1-5 years. 64.8% of the participants reported that they received information/training on patient safety and 5.5% reported that they were exposed to medical errors (Table 1).

It was determined that the HSOPSC general score of the nurses in the sample group was 43.3%. When the total positive response percentages of all sub-dimensions of the questionnaire are examined,

Table 1. Distribution of characteristics affecting nurses' sociodemographic and patient safety culture perceptions (n =420).

Sociodemographic characteristics	**n**	**%**
Mean age ±SD[1]= 30.44±6.51 (Min-Maks=19-49)		
Age (years)		
≤30	235	56.0
≥31	185	44.0
Gender		
Female	392	93.3
Male	28	6.7
Characteristics that affect patient safety culture perceptions		
Education level		
High School+Pre-bachelor's degree[2]	95	22.6
Bachelor's degree+ Postgraduate[3]	325	77.4
Experience in nursing Mean±SS1= 8.8 ±6.61 (Min-Maks=1-29)		
1-5	167	39.8
6-10	120	28.6
11+	133	31.7
Weekly working time (hours)		
40	146	34.8
41-49	253	60.2
50+	21	5.0
Working unit		
İnternal units	146	34.8
Surgical units	176	41.9
Critical areas (intensive care units/Operating room)	98	23.3
Receiving information/training on patient safety culture		
Yes	272	64.8
No	148	35.2
Having regular health checkups		
Yes	57	13.6
No	363	86.4
Exposure to medical error		
Yes	23	5.5
No	397	94.5
Responsible for the error (n=23)		
Doctor	13	56.5
Nurse	6	26.1
Another (physiotherapist, pharmacist)	4	17.4

[1]SD= standard deviation
[2]29'u Pre-bachelor's degree
[3]13'ü Postgraduate

"overall perceptions of safety" 45.8%, "frequency of events reported"29.4%," teamwork across units" 41.2%,"handoffs and transitions" 28.3%, "manager expectations and actions promoting patient safety"37.3%, "organizational learning and continuous improvement" 50.2%, "teamwork within units " 68.5%, " communication openness" 37.0%, "feedback and communication about error" 59.4%, "non-punitive response to error" while 57.6%, "staffing" had the lowest positive response percentage with 26.9% and "management support for patient safety" with 38.3% (Table 2).

When the mean patient safety culture perceptions of the nurses in the sample were compared with the

Table 2. Percentages of positive responses of nurses to HSOPSC items and mean percentage of composite dimensions (n=420).

Patient safety culture dimensions and items	Positive response (%)	Sub-dimension composite percentage mean (%)
1- Overall perceptions of safety		**45.8**
A 10 It is just by chance that more serious mistakes do not happen around here	15.7	
A 15 Patient safety is never sacrificed to get more work done.	81.7	
A 17 We have patient safety problems in this facility	24.0	
A 18 Our procedures and systems are good at preventing errors from happening.	61.9	
2- Frequency of events reported		**29.4**
D 1 When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?	30.0	
D 2 When a mistake is made, but has no potential to harm the patient, How often is this reported?	26.9	
D 3 When a mistake is made that could harm the patient, but does not, how often is this reported?	31.2	
3-Teamwork across units		**41.2**
F 2 Units do not coordinate well with each other	36.2	
F 4 There is good cooperation among units that need to work together	46.2	
F 6 It is often unpleasant to work with staff from other units.	31.4	
F 10 Units work well together to provide the best care for patients	51.0	
4-Handoffs and transitions		**28.3**
F 3 Things 'fall between the cracks' when transferring patients from one unit to another.	30.7	
F 5 Important patient care information is often lost during shift changes	35.5	
F 7 Problems often occur in the exchange of information across units	32.9	
F 11 Shift changes are problematic for patients in this facility.	14.0	
5- Manager expectations and actions promoting patient safety		**37.3**
B 1 Manager says a good word when he/she sees a job done according to established patient safety procedures.	38.6	
B 2 Manager seriously considers staff suggestions for improving patient safety	43.6	
B 3 Whenever pressure builds up, my manager wants us to work faster, even if it means taking shortcuts.	47.9	
B 4 My manager overlooks patient safety problems that happen over and over.	19.0	
6- Organizational learning and continuous improvement		**50.2**
A 6 We are actively doing things to improve patient safety	65.2	
A 9 Mistakes have led to positive changes here	20.5	
A 13 After we make changes to improve patient safety, we evaluate their effectiveness.	64.8	

Table 2.(Continue) Percentages of positive responses of nurses to HSOPSC items and mean percentage of composite dimensions (n=420).

Patient safety culture dimensions and items	Positive answer (%)	Sub-dimension composite percentage mean (%)
7- Teamwork within units		**68.5**
A 1 People support one another in this facility.	82.1	
A 3 When a lot of work needs to be done quickly, we work together as a team to get the work done	30.7	
A 4 In facility, people treat each other with respect	84.5	
A 11 When one area in this unit gets really busy, others help out	76.9	
8- Communication openness		**37.0**
C 2 Staff will freely speak up if they see something that may negatively affect patient care	66.4	
C 4 Staff feel free to question the decisions or actions of those with more authority.	29.0	
C 6 Staff are afraid to ask questions when something does not seem right.	15.7	
9- Feedback and communication about error		**59.4**
C 1 We are given feedback about changes put into place based on event reports.	47.4	
C 3 We are informed about errors that happen in the facility.	70.7	
C 5 In this facility, we discuss ways to prevent errors from happening again.	60.2	
10- Non-punitive response to error		**57.6**
A 8 Staff feel like their mistakes are held against them	75.0	
A12 When an event is reported, it feels like the person is being written up, not the problem	50.2	
A16 Staff worry that mistakes they make are kept in their personnel file	47.6	
11- Staffing		**26.9**
A 2 We have enough staff to handle the workload.	36.2	
A 5 Staff in this facility work longer hours than is best for patient care.	35.5	
A 7 We use more agency/temporary staff than is best for patient care.	17.9	
A14 We work in 'crisis mode' trying to do too much, too quickly	18.1	
12- Management support for patient safety		**38.3**
F 1 Management provides a work climate that promotes patient safety	42.4	
F 8 The actions of management show that patient safety is a top priority.	43.3	
F 9 Management seems interested in patient safety only after an adverse event happens.	29.3	
Overall	**43.0**	**43.3**

AHRQ scores, it was determined that teamwork within units (82.4%) and non-punitive response to error (57.6%) were higher in two sub-dimensions and lower in other subgroups. However, among these sub-dimensions, according to the AHRQ, the greatest decrease was determined in the sub-dimensions of "staffing" and " handoffs and transitions" and "frequency of events reported", "manager expectations and actions promoting patient safety" and "management support for patient safety"(Figure 1). It was determined that 41.7% of the nurses included in the study evaluated the patient safety level of the units they work as "acceptable", 40.7% as "very good" and 8.1% as "excellent".The difference between the positive response percentage average of the " HSOPSC- overall perceptions of safety " sub-dimension of women (46.56±22.64) and men (35.71±26.73) in the sample was found to be statistically significant (p=0.027). The difference between the average percentage of positive responses of male participants (45.24±45.55) and female participants (28.23±39.92) for the "HSOPSC- frequency of events reported" sub-dimension was statistically significant (p=0.037). There was a statistically significant difference between the groups in the " HSOPSC- frequency of events reported" sub-dimension positive response averages according to the education levels of the nurses (p=0.021). The difference between the " HSOPSC -frequency of events reported" sub-dimension positive response percentage average in internal units (29.00±39.39), surgical units (34.66±43.40) and critical departments (20.41±35.05) was statistically significant (p=0.042). The difference between the " HSOPSC manager expectations and actions promoting patient safety" sub-dimension positive response percentage average was found to be statistically significant according to the units they work in (p=0.001). However, the difference between the mean positive response percentages of the other sub-dimensions of HSOPSC according to the nurses' gender, education level and the units they work in was not statistically significant (p>0.05). (Table 3). The difference between the " HSOPSC

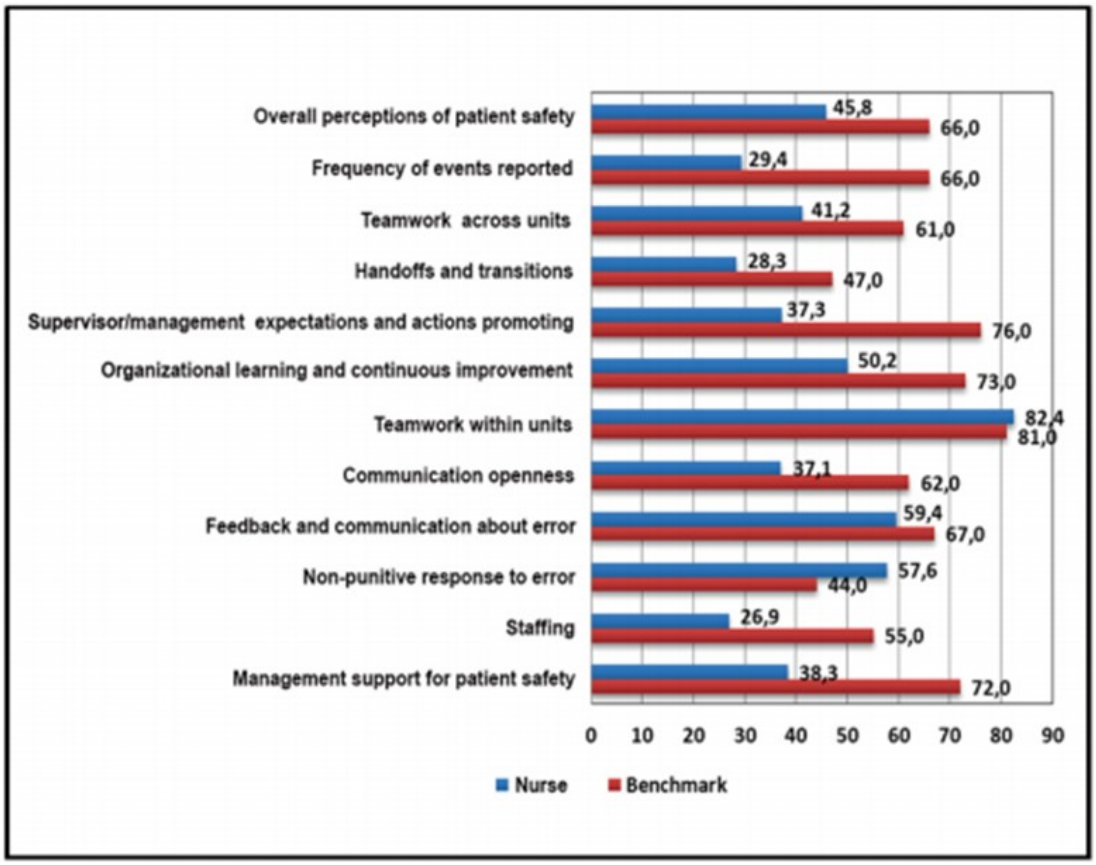

Figure 1. Comparison of nurses' positive score averages of HSOPSC sub-domains with the benchmark score

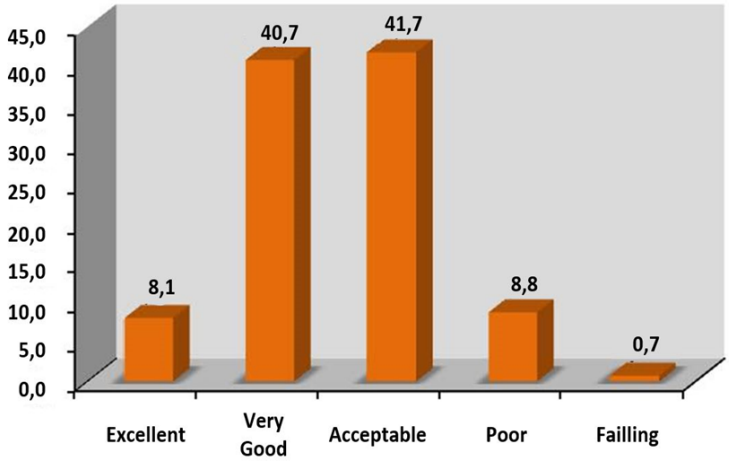

Figure 2. The result of nurses'assesment on the patient safety of their working units

overall perceptions of safety" sub-dimension positive response percentage averages of those who have worked in the profession for 11 years or more (50.56 ± 20.75), 1-5 years (44.91 ± 21.87) and 6-10 years (41.88 ± 26.16). was found to be significant (p=0.006). Likewise, participants who worked for 11 years or more (45.36±37.00), participants who worked for 1-5 years (31.54 ± 32.98) and those who worked for 6-10 years (40.00±35.79)) had the sub-dimension of " HSOPSC management support for patient safety". The difference between the percentage of positive responses of the participants was found to be statistically significant (p=0.004). The mean percentage of positive response to the " HSOPSC "organizational learning and continuous improvement" sub-dimension of those who received training on patient safety was 53.57±26.83 and 42.96±30.16 for those who did not, and the difference between them was statistically significant (p=0.001). In the study, it was determined that nurses who received training on patient safety had higher and more significant percentages of positive response to the "organizational learning and continuous improvement" sub-dimension than the group who did not receive any training (p=0.001). According to the statistical analyzes performed, the difference between the percentages of positive responses in all sub-dimensions of the HSOPSC between the participants who were exposed to medical errors and those who were not exposed to medical errors was not found to be statistically significant (p>0.05) (Table 4).

DISCUSSION

This cross-sectional study was conducted with 420 nurses in order to evaluate the perceptions of patient safety culture of nurses working in university hospitals in Turkey. In the study, important information about nurses' perceptions of patient safety culture and affecting factors were revealed in three university hospitals located in the Aegean and Mediterranean regions of Turkey. In this study, it was determined that the nurses constituting the sample group had a low level (43%) of the sub-dimension composite percentage of HSOPSC. This result was found to be similar to the study of Filiz (2009) (44%), but lower than the studies of Güneş et al. (2015), Ballangrud et al. (2012), and Chen and Li (2010), respectively (52%, 55% and 64%). These results show that healthcare professionals' perceptions of patient safety culture vary according to the health institution where the study was conducted. It was determined that the percentage of positive responses given by the nurses participating in the study to the " overall perceptions of safety " sub-dimension of the HSOPSC was 45.8%. Again, in this study, it was determined that the percentages of positive responses to the overall perceptions of safety sub-dimension were moderate, but the positive response percentages of the female participants' HSOPSC " overall perceptions of safety " sub-dimension were higher and more significant than male nurses. This

Table 3. Statistical analysis of percent averages of positive response to HSOPSC's dimensions according to gender, education level and work units of nurses (n=420).

Patient safety culture dimensions	Gender			Education level			Working unit			
	Female (n=392)	Male (n=28)	p	High school+ Pre-bachelor's (n=95)	Bachelor's + Postgraduate (n=325)	p	İnternal units (n=146)	Surgical units (n=176)	Critical area (n=98)	***p***
Overall perceptions of safety	46.56±22.64	35.71±26.73	**0.027[1]**	47.11±23.59	45.46±22.92	0.624	46.75±23.72	45.88±23.01	44.39±22.28	0.615
Frequency of events reported	28.23±39.92	45.24±45.55	**0.037[1]**	37.54±42.73	26.97±39.55	**0.021[1]**	29.00±39.39	34.66±43.40	20.41±35.05	**0.042[1]**
Teamwork across units	40.69±25.78	48.21±30.37	0.182	43.68±28.00	40.46±25.56	0.360	41.27±27.00	41.90±25.95	39.80±25.34	0.862
Handoffs and transitions	28.00±27.85	32.14±35.91	0.843	28.16±28.54	28.31±28.44	0.974	26.20±26.80	28.98±29.25	30.10±29.37	0.634
Manager expectations and actions promoting patient safety	36.80±26.09	43.75±28.57	0.209	34.74±27.84	38.00±25.80	0.139	31.68±24.96	42.76±25.79	35.71±27.34	**0.001[1]**
Organizational learning and continuous improvement	50.00±28.90	52.38±19.09	0.713	50.53±27.87	50.05±28.52	0.955	50.23±29.36	50.95±28.04	48.64±27.57	0.807
Teamwork within units	82.33±28.19	83.04±28.10	0.757	83.68±26.49	82.00±28.65	0.779	84.42±25.45	81.53±29.76	80.87±29.12	0.684
Communication openness	36.90±26.31	39.29±28.77	0.753	39.30±27.06	36.41±26.27	0.429	36.30±26.53	36.93±25.81	38.44±27.64	0.856
Feedback and communication about error	59.35±36.51	60.71±36.35	0.867	60.00±37.22	59.28±36.29	0.813	61.87±35.01	59.09±36.59	56.46±38.41	0.614
Non-punitive response to error	57.65±32.66	57.14±32.53	0.976	51.93±33.94	59.28±32.08	0.065	56.16±32.93	59.28±32.89	56.80±31.82	0.662
Staffing	26.59±22.95	31.25±27.74	0.440	28.95±23.15	26.31±23.33	0.284	26.54±22.02	27.13±23.58	27.04±24.79	0.975
Management support for patient safety	38.61±35.69	34.52±33.31	0.611	42.46±33.49	37.13±36.04	0.127	39.04±36.38	41.67±36.60	31.29±31.32	0.097

Table.4 Statistical analysis of percent averages of positive response to HSOPSC's dimensions according to nurses's work experience, patient safety training and exposure of health care recipients to medical error (n=420).

Patient safety culture dimensions	Work experience				Patient safety training			Exposure to medical error		
	1-5 years (n=167)	6-10 years (n=120)	≥11 years (n=133)	p	Yes (n=285)	No (n=135)	p	Yes (n=23)	No (n=397)	p
Overall perceptions of safety	44.91±21.87	41.88±26.16	50.56±20.75	**0.006**[1]	45.53±22.69	46.48±23.89	0.605	52.17±18.33	45.47±23.26	0.137
Frequency of events reported	29.74±40.25	31.67±41.64	26.82±39.88	0.605	31.23±41.53	25.43±38.03	0.264	34.78±43.2	29.05±40.36	0.467
Teamwork across units	38.02±26.01	43.13±25.72	43.42±26.45	0.101	40.61±24.95	42.41±28.53	0.393	35.87±23.63 5)	41.5±26.27	0.351
Handoffs and transitions	26.35±26.92	29.79±30.8	29.32±28.12	0.643	28.77±29.17	27.22±26.88	0.792	34.78±27.94	27.9±28.45	0.183
Manager expectations and actions promoting patient safety	37.57±26.87	36.67±28.43	37.41±23.56	0.772	37.89±26.25	35.93±26.38	0.613	33.7±19.38	37.47±26.63	0.603
Organizational learning/ continuous improvement	50.50±29.01	45.83±29.33	53.63±26.22	0.128	53.57±26.83	42.96±30.16	0.0011	46..38±21.88	50.38±28.68	0.436
Teamwork within units	82.34±28.03	80.63±31.16	84.02±25.44	0.856	83.42±27.5	80.19±29.47	0.250	77.17±29.11	82.68±28.11	0.184
Communication openness	34.73±25.7	40.28±29.28	37.09±24.5	0.316	37.54±26.79	36.05±25.77	0.695	40.58±19.99)	36.86±26.78	0.446
Feedback and communication about error	59.08±37.25	58.33±37.73	60.90±34.45	0.933	60.82±36	56.54±37.38	0.289	47.83±35.99	60.12±36.42	0.102
Non-punitive response to error	54.69±31.52	58.61±33.19	60.40±33.37	0.241	56.73±32.24	59.51±33.43	0.346	47.83±31.5	58.19±32.62	0.113
Staffing	26.35±22.84	26.67±23.31	27.82±23.97	0.900	27.11±23.17	26.48±23.61	0.684	27.17±23.73	26.89±23.29	0.985
Management support for patient safety	31.54±32.98	40.00±35.79	45.36±37.00 (33.33)	**0.004**[1]	40.12±36.27 (33.3)	34.57±33.68 (33.3)	0.166	31.88±35.5 (33.3)	38.71±35.52 (33.3)	0.348

rate was lower than the results reported in other studies (51.0 - 66.0%) (Sora et al., 2014; El-Jardali et al., 2014; Atan et al., 2013; Güneş et al., 2015; Wang et al., 2014). This shows that female nurses' perception of patient safety is better and varies depending on the characteristics of the sample group. In the study, it was determined that the nurses had a low percentage of positive responses (29.4%) among all sub-dimensions of the " frequency of events reported" of HSOPSC. In addition, the "frequency of events reported" was identified as one of the problematic areas in this study that should be developed first. While similar results were reported (28%) in a study conducted in Turkey (Güneş et al. 2015), it was observed that the percentage of positive responses to this sub-dimension was lower (15.0, 23%, and 6.0%) in some studies (Filiz, 2009 ; Atan, et al., 2013; Özkan, 2012). In studies conducted in the US, Riyadh and China, the percentage of positive responses for this sub-dimension was higher (66.0%, 59.4% and 44.2%, respectively) (Sorra, et al., 2014; El-Jardali, et al. et al.,2014; Wang et al.,2014) and a lower rate (18%) in a study conducted in Norway (Ballangrud et al.,2012). This can be explained by the fact that the results vary according to the sample groups of the studies and the different attitudes of the hospital managements on error reporting. The low frequency of reporting errors in this study, we can say that there is still an accusatory culture about medical errors in the research institutions, and that nurses are afraid of losing their job, being excluded by their colleagues and facing a legal problem. In order to improve patient safety in an institution, it would be beneficial for institution managers to create a working environment where employees can report errors without shame and fear of punishment. In this study, it was determined that the percentage of positive responses to the teamwork across units sub-dimension was 41.2%. In other studies conducted in Turkey, the percentages of positive responses to this sub-dimension are 79% (Güneş et al., 2015), 48% (Filiz, 2009), 18% (Özkan, 2012) and 32% (Atan et al. 2012) has changed. In studies conducted in Riyadh, US and China, the percentage of positive responses for this sub-dimension is higher than the results of this study (61.6%, 61.0% and 51.1%, respectively) (El-Jardali et al., 2014; Sorra, et al. et al., 2014; Wang, et al.,2014) was found to be lower (37.5%) in a study conducted in Norway (Ballangrud, et al.,2012). According to these results, it is thought that the generally low percentage of positive responses to this sub-dimension may be due to the differences in teamwork approach in the hospitals where the research was conducted, according to countries and institutions. In the study, it is seen that the percentage of positive answers given to the sub-dimension "handoffs and transitions" is low (28.3%). This sub-dimension has also been identified as another problematic area that needs improvement. In some studies conducted in Turkey, the percentage of positive responses to this sub-dimension ranged from 10.0 to 54.0% (Güneş et al. 2015; Filiz, 2009; Özkan, 2012; Atan et al. 2012). In studies conducted in other countries, this rate ranged from 47.0% to 68.1% (Ballangrud, et al.,2012; El -Jardali, et al., 2014; Wang et al.,2014; Sorra, et al.,2014). In this study, the low percentage of positive answers given to the " handoffs and transitions" sub-dimension of the HSOPSC suggests that there are problems with communication between nurses during shift changes and when patients are sent to other units in the hospitals where the research was conducted. In this regard, it can be suggested that the management of the institutions should focus on training to ensure communication safety. In the study, it was determined that the percentage of positive answers given to the sub-dimension of " manager expectations and actions promoting patient safety " was 37.3%. In other studies conducted in Turkey, the percentages of positive responses to this sub-dimension are 48.0% (Güneş, et al., 2015), 43.0% (Filiz, 2009). It has been reported to differ between 8.0% (Özkan, 2012) and 39% (Atan et al., 2013). In studies conducted in the US, China, Norway and Riyadh, it was reported that the percentages of positive responses for this sub-dimension were higher than the results of this study (76.0%, 73.8%,

73.1% and 60.6%, respectively) (Sorra et al., 2014; Ballangrud, et al., 2012; Wang et al., 2014; El-Jardali, et al., 2014). These results are remarkable in that they show that the percentages of positive responses given to the sub-dimension of " manager expectations and actions promoting patient safety " are lower in Turkey than in other countries. In addition, it can be said that the hospital administrations do not have sufficient support for the establishment of a patient safety culture in the institutions included in the research. In this study, it was determined that the percentage of positive answers given to the sub-dimension of "organizational learning and continuous improvement " was at a moderate level (50.2%) In some studies conducted in Turkey (Güneş et al., 2015; Atan et al., 2013), the positive response to this sub-dimension was determined. While it was reported that the percentage was higher (68.0% and 52.0%) in the others, it was lower (49.0% and 9.0%) (Filiz 2009; Özkan 2012). In some studies conducted in other countries, it was observed that the percentages of positive responses for this sub-dimension were higher (51.3% - 89.7%) (Sora et al., 2014; El-Jardali et al., 2014; Ballangrud et al., 2012; Wang et al. et al., 2014). These results suggest that there is no desired level of interaction between management and employees in establishing a patient safety culture in the health institutions where the research was conducted. In the study, it was determined that the average percentage of positive answers given to the sub-dimension " teamwork within units " was the highest among all subgroups (68.5%). While the percentage of positive responses given to this sub-dimension is lower than some studies conducted in Turkey (79.0%, 71.0%, respectively) (Güneş et al.,2015; Filiz, (2009), Özkan (2010), Atan et al. 2012) compared to those reported in studies. were found to be higher (18.0% and 60%). It is seen that the average percentage of positive response for this sub-dimension is higher (81.0%, 80.6% and 86.5%, 78.5%) in other countries (Sora et al., 2014; Ballangrud, et al., 2012). Wang, et al., 2014; Al-Jardali, et al., 2014). According to these results, it can be said that healthcare professionals attach importance to teamwork within the units, but they still need to be supported. In the study, it was determined that the percentage of positive answers (37.0%) given to the sub-dimension of "communication openness " was at a low level. The sub-dimension communication openness was determined as the third sub-dimension to be improved in this study. This result is consistent with studies conducted both in Turkey (Güneş et al., 2015; Filiz, 2009; Özkan, 2012; Atan et al., 2013) and in other countries (Sorra, et al., 2014; Ballangrud et al., 2012). ; Wang, et al., 2014; El-Jardali et al., 2014). not similar to. These results can be explained by the fact that health institutions have different characteristics in terms of communication. In the literature, communication problems among healthcare professionals are accepted as an important factor in the occurrence of undesirable events that threaten patient safety. In this study, it was determined that the percentage of positive responses given to the " feedback and communication about error " sub-dimension of the HSOPSC was at a moderate level (59.4%). In another study conducted in Turkey, the percentage of positive responses to this sub-dimension (57.0%) was similar (Güneş et al., 2015), while it was lower (40.0%, 40.0%, and 9.0%) in other studies (Filiz, 2009; Atan et al. et al., 2013; Özkan, 2012). While this rate is higher in studies conducted in US, China and Riyadh (67.0%, 69.4%, 63.3%, respectively) (Sorra et al., 2014; Wang et al., 2014; El-Jardali et al., 2014) . It was reported to be lower (42.1%) in a study conducted in Norway (Ballangrud et al., 2012). In this study, it was determined that the percentage of positive responses given to the "non-punitive response to error" sub-dimension of the HSOPSC was at a moderate level (57.6%). In other studies conducted in Turkey, the percentage of positive responses to this sub-dimension was reported to be lower (6.0 - 24.0%) (Güneş et al., 2015; Atan et al., 2013; Filiz, 2009). While this rate was lower in studies conducted in US, China and Riyadh (44.0%, 32.0%, 26.8%, respectively) (Sorra et al., 2014; Wang et al., 2014; El-Jardali et al., 2014) , was

reported to be higher (78.8%) in a study conducted in Norway (Ballangrud et al., 2012). These results show that my non-punitive response approach to fault varies by institution and is generally not sufficient. By improving the non-punitive approaches of the institutions, it can be contributed to increase the error notifications and to take the necessary precautions. In this study, it was determined that the percentage of positive responses given to the "staffing" sub-dimension of HSOPSC was 26.9%. At the same time, it was determined that the sub-dimension of staffing was the fourth problematic sub -dimension in this study. This rate was determined by Güneş et al. While it was higher (35.0%, 38.0%, respectively) in the studies of 2015 and Filiz, 2009, Atan et al. (2013) reported that it was similar (26%) in the study and lower (8%) in the study of Özkan (2012). Again, this rate was higher in studies conducted in the US and Norway (55.0% and 62.2%, respectively) (Sorra et al., 2014; Ballangrud, et al., 2012). It was reported to be lower (23.6% and 35.1%) in studies conducted in China and Riyadh (El-Jardali et al., 2014; Wang et al., 2014). The low rate of staffing sub-dimensions can be explained by the high workload due to the insufficient number of nurses in the hospitals where the study was conducted. The high workload of nurses will lead to medical errors that threaten patient safety due to reduced time allocated per patient, fatigue, and distraction. For this reason, it can be recommended that hospital administrations increase the number of nurses in institutions and adjust their working hours appropriately. In the study, it was determined that the percentage of positive answers given to the sub-dimension of " management support for patient safety " was 38.3%. In some studies, it has been observed that the percentage of positive responses to this sub-dimension varies between 10.0 and 52.0% (Filiz, 2009; Atan et al., 2013; Özkan, 2012; Güneş et al., 2015). In some studies conducted in other countries, this rate was found to vary between 26.3-72.0% (Sora et al., 2014; El-Jardali et al., 2014; Wang et al., 2014; Ballangrud et al., 2012). According to this result, it can be said that the support of hospital administrations differs in ensuring patient safety in the hospitals where the research is conducted. In the study, when the average percentage of positive responses given to HSOPSC items according to the university hospitals where the nurses work is examined, the " manager expectations and actions promoting patient safety" sub-dimension positive response percentage averages and " management support for patient safety" sub-dimension positive response percentage of the HSOPSC according to the universities they work at. A statistically significant difference was found between the averages. In the study of Gündoğdu and Bahçecik (2012), in which they compared private hospitals and training and research hospitals, the difference between the groups in the two sub-dimensions and other sub-dimensions in this study was found significant (Gündoğdu and Bahçecik 2012). In the study of Filiz (2009), it was determined that the difference between hospitals in the sub-dimensions of " handoffs and transitions ", “communication openness" and "staffing" was statistically significant (Filiz 2009). In the study by Chen and Li (2010) in which they compared the results of the research involving teaching hospitals in Taiwan and the average percentage of positive responses obtained from the database of 2007 AHRQ, the only sub-dimension that showed similarities with this study was “manager expectations and actions promoting patient safety” and the others were teamwork across units, organizational learning and continuous improvement and staffing (Chen and Li 2010). According to these results, it can be said that the patient safety culture in the university hospitals included in the research is not adequately addressed on the basis of management. It was found that female nurses who agreed to participate in this study had a statistically significant higher percentage of positive response in the "overall perceptions of safety" sub-dimension of HSOPSC than male nurses, and female nurses' " frequency of events reported" sub-dimension positive response averages were lower than male nurses detected. Nordin (2015) reported that the average percentage

of positive responses given to the sub-dimensions of " frequency of events reported", " feedback and communication about error", "management support for patient safety" and " handoffs and transitions" were higher than men (Nordin, 2015). In the study of Göz and Kayahan (2011) there was a similarity with this study only in the sub-dimension of " frequency of events reported ", and in the studies of Güneş et al., (2015), Aboul-Fotouh et al., (2012) there was no sub-dimension in terms of gender indicated that there was no difference. According to these results, it can be said that female nurses attach more importance to patient safety, while male nurses attach more importance to reporting errors. It was determined that the mean percentage of positive answers for the " frequency of events reported " nurses with undergraduate degrees was lower than those of high school and pre-bachelor's degree nurses, and this result was statistically significant. In the study of Gündoğdu and Bahçecik (2012), the sub-dimension average of " management support for patient safety " sub-dimension of associate degree nurses working in training and research hospital, vocational high school and undergraduate nurses, " manager expectations and actions promoting patient safety " sub-dimension It has been reported that the average percentage is higher than that of health vocational high school graduates. Again, in this study, it was stated that the percentage of the sub-dimension " frequency of events reported " of the nurses who graduated from health vocational high schools working in private hospitals was higher than those of associate degree graduates. These results suggest that education level is not effective in improving the perception of patient safety culture. It was determined that the mean percentage of positive response in the " overall perceptions of safety " sub-dimension of the nurses with a working period of 11 years or more was statistically significantly higher than the other groups (1-5 and 6-10 years). It was also found that nurses with a working time of 6-10 years and 11 years or more had higher positive response percentages for the " management support for patient safety " sub-dimension than those with 1-5 years. In the study of Nordin (2015), the sub-dimensions of the health workers with a working period of 10 years or more are " frequency of events reported ", " overall perceptions of safety", "staffing", "hospital management support for patient safety", "team work between hospital units". It has been reported that the average percentage of positive responses is higher than the other groups (0-5 and 6-9 years) (Nordin, 2015). Gündoğdu and Bahçecik (2012) also stated that nurses with a working time of 6-10 years and 11 years or more had higher positive response percentages in the sub-dimension " management support for patient safety " than those with 1-5 years. According to these results, it can be said that working experience has a positive effect on the development of patient safety culture perception. In this study, it was found that nurses working in surgical units, " frequency of events reported " sub-dimension positive response averages were significantly higher than those working in critical areas, and " manager expectations and actions promoting patient safety" sub-dimension positive response percentage averages of those working in surgical units were significantly higher than those working in internal units and critical areas. detected. Contrary to this study, in the study of Filiz (2009), the positive response percentage of nurses working in surgical units was lower in the sub-dimension of "frequency of events reported", whereas in the study of Gündoğdu and Bahçecik (2012), nurses working in the internal units of two training and research hospitals did not. positive response averages for two sub-dimensions were found to be higher than those working in other units (Gündoğdu & Bahçecik, 2012). Sun et al. (2015), on the other hand, it was stated that the positive response percentages of the nurses working in the intensive care unit for this sub-dimension were higher than those working in the operating room and internal units (Güneş, et al., 2015). Nordan (2015) reported similar results (Nordin, 2015). These results are important in terms of revealing that the units studied do not affect the perception of patient safety culture. According to the

results obtained from the research, it was determined that nurses who received patient safety training had higher positive response percentages for only the "organizational learning and continuous improvement" sub-dimension, among the sub-dimensions of the HSOPSC. It can be said that this result is important in terms of showing that nurses participate in patient safety improvement studies in the health institutions included in the research, but that the perception of patient safety culture is not much different from those who did not receive education. In the study, it was observed that the nurses' exposure to medical errors did not affect the average percentage of positive responses in all sub-dimensions of the HSOPSC. According to this result, it can be stated that the experience of medical error does not affect the perception of patient safety culture.

Limitations of study

This is cross-sectional study in three university hospitals in different cities of West of Turkey. The relatively small number of respondents could be a limitation. Consequently, further research incorporating larger numbers of participants is required. This study is also limited by fact that data were collected by means of retrospective self-report in a questionnaire. This inevitably relies on participants' personal statement, which may not always accurate. So, the findings of this study can't be generalized. However, this study may be reference for future studies related to this issue.

Conclusion

The findings of the study show that nurses working in three university hospitals in Turkey have a low level of patient safety culture perception. In the institutions where the research was conducted, it is recommended that the administrators identify the needs, initiate the necessary studies, determine the changes that need to be made on the basis of institutions and units, and take the necessary precautions in order to improve their perceptions of patient safety culture.

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