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Effect of Professionalism Level on Tendency to Make Medical Errors in Nurses

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ABSTRACT

Aim: The aim of the present study was to examine the relationship between the occupational professionalism level of hospital nurses and their tendency to make medical errors. This was a descriptive, correlational, and cross-sectional study.

Method: The study was conducted between June 2013 and January 2015 in four hospitals providing general diagnosis, treatment, and care services. Four hundred fifty-nine nurses were included in the study. A questionnaire including a Personal Information Form, Professional Manner in Occupation Inventory, and Tendency to Medical Error in Nursing Scale was used to collect data. The study was approved by the hospitals' ethics committees and institutions. Data were analyzed using Cronbach's alpha analysis, frequency and percentage distributions, descriptive statistics, Pearson product-moment correlation coefficient, Dunnett T3 Post Hoc test, simple linear regression analysis, and t-test.

Results: Nurses' occupational professionalism levels were high (M=137.06±15.23), and tendency to medical error levels were low (M=223.24±25.28). The majority of the nurses considered themselves quite professional and had not made any medical errors previously. There was a strong and highly significant negative relationship ($p<0.001$) between their occupational professionalism and their tendency to medical error. There was a difference between the occupational professionalism levels of nurses who made and did not make an occupational error ($p<0.05$), as well as significant differences between their tendency to medical error according to their perception of themselves as professionals ($p<0.05$). The occupational professionalism manner of the nurses was determined to be 30% effective in their tendency to medical error.

Conclusion: The occupational professionalism manner of the nurses was found to negatively affect their tendency to medical error.

Keywords: Medical errors, nursing, nurse, professionalism

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INTRODUCTION

Professionalism, considered an important subject by contemporary communities, is defined as "being adequately qualified" or "the expertise, knowledge, ability, and behavior shown in a specific area" (Karaçam & Güleç, 2016; Saraçoğlu, 2010). Occupational professionalism serves to transform personal professionalism into institutional professionalism (Erbil & Bakır, 2009).

Today's rapid social change and technological developments require occupational professionalism (Sabancıoğulları & Doğan, 2012). A professional is a person who regularly performs an occupation or a duty with minimal error (Karamanoğlu, Özer & Tuğcu, 2009). Professional people are expected to be competent in applying the rules of their occupation, to act rationally and ethically, to evaluate any social rule according to the needs of the individuals affected by it, to be steady and disciplined, and not to obey the rules automatically (Orak & Alpar, 2012). They should also have the ability to freely control the work they do (autonomy) and a sense of responsibility to their colleagues and society. The fact that the members of this occupation perform their duties professionally both increases the value referred to the occupation by the society and other occupations and ensures the continuity of the occupation (Karamanoğlu et al., 2009).

Occupational professionalism, which has an indisputable role in maintaining a healthy life for the individual, gains an increasing importance in nursing, one of the occupations most affected by social, technological, legal, and economic changes. The rapid changes in the health sector give increasing prominence to the need for professional nurses (Adıgüzel, 2010).

A professional nurse is defined as a person who can integrate the scientific and intellectual knowledge, skills, and manner that s/he obtained from higher education into his/her theoretical knowledge; produce scientific information by means of his/her studies and use this information in healthcare studies; get to the root of problems; judge, decide, and solve problems; give good care; contribute to the development, promotion, and recognition of this occupation autonomous; and who is a researcher, educator, and director (Özel, 2010; Özkaraca, 2009; Sezer, Esenay & Korkmaz, 2017). A professional nurse is also someone who protects the occupation's ethical values, is highly autonomous, follows scientific developments, participates in occupational activities, acts appropriately according to professional ethics, participates in occupational organizations, and is loyal to the occupation (Sabancıoğulları & Doğan, 2012).

If nurses do not have adequate knowledge of occupational practices, do not continuously improve themselves, cannot perform their duties independently, do not perform their duties based on scientific proof, do not support the development of the occupation, or do not act professionally in this complex service area, then healthcare services are hindered and delayed, quality of care decreases, the people they serve become dissatisfied, and medical errors can occur that can cause disability or death (Karamanoğlu et al., 2009).

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) defines medical error as "the patient's being damaged due to inappropriate and unethical behavior, and inadequate and negligent action of a professional providing health services in occupational practices" (JCAHO, 2006). Most errors in nursing occur due to unprofessional behaviors, such as not performing the required service and care, performing their

occupational duties incompletely or badly, performing a service or procedure that they must not perform, not having adequate skills and behaving negligently, and lack of knowledge and experience. These errors cause great damage to served individuals, their relatives, serving healthcare workers, and serving institutions and countries (Ertem, Oksel & Akbıyık, 2009; İntepeler & Dursun, 2012). The World Health Organization (WHO) emphasized that as many as 1 in 4 patients is harmed while receiving primary and ambulatory healthcare, and 134 million adverse events occur each year in hospitals in low- and middle-income countries, contributing to 2.6 million deaths annually due to unsafe care (WHO, 2018).

Nurses are an inseparable part of health staff; therefore, they should try to protect, improve, and recover individual, family, and community health and try to avoid mistakes and to work in a professional manner. They should work to prevent irremediable medical errors resulting from unprofessional performance of both their own duties and other team members' duties (Adıgüzel, 2010). However, no studies in the literature on the effect of nurses' occupational professionalism levels on their tendency to make a medical error were found. This raised the thought that this important subject should be studied and added to the literature. The present study was conducted based on this need and aimed to determine the effect of the occupational professionalism level of hospital nurses on their tendency to make a medical error.

Research Questions

- What is the occupational professionalism level of hospital nurses?
- What is the tendency to make medical error of hospital nurses?
- Does the level of occupational professionalism of nurses have an impact on their tendency to make medical error?

METHOD

Study Design

This was a descriptive, correlational, and cross-sectional study.

Sample

The study was conducted in four public hospitals providing general diagnosis, treatment, and care. Of the four hospitals, two were research and training hospitals, and two were state hospitals. The population of the study consisted of all nurses working in the four hospitals (n=1291).

All nurses who were available, were not on leave or sick leave, etc., within the study period, and were accepted to participate (n=550) were included in the study. A total of 459 nurses provided usable data, and 42% of the population and sample were achieved.

Data Collection

Personal Information Form, Professional Manner in Occupation Inventory (PMOI), and Tendency to Medical Error in Nursing Scale (TMENS) were used for data collection.

Personal Information Form: This form was prepared by the researchers. It includes 13 questions on age, gender, marital status, unit, position, educational status, occupational experience, weekly working hours, the number of patients, self-perception as a professional, reasons for not feeling professional, making medical errors, and noticing other nurses making medical errors.

PMOI: This inventory was developed by Erbil and Bakır (2009) based on the nursing-specific professionalism of Miller. Erbil

and Bakır tested its validity and reliability (Adams & Miller, 2001; Erbil & Bakır, 2009; Miller, Adams & Beck, 1993). The components of professionalism in Miller's nursing model include education, publication, research, participation in occupational organizations, social service, ethical codes, theory, autonomy, sufficiency, and continuous education (Adams & Miller, 2001; Miller et al., 1993). PMOI is a single-scale inventory consisting of 32 questions and answered in a 5-point Likert type (5-entirely applies to me, 4-slightly applies to me, 3-I'm undecided, 2-does not apply to me, and 1-does not apply to me at all). It is evaluated over the total score obtained by adding the scores of each question. The minimum and maximum scores of the inventory are 32 and 160, respectively. The higher the scores of the participants, the higher their professionalism levels. The Cronbach's alpha coefficient by Erbil and Bakır (2009) was found to be 0.89 and 0.90, respectively.

TMENS: This scale was developed by Altunkan (2009) to determine the tendency to make medical errors of the nurses directly charged with patient care. Its validity and reliability were tested. It consists of 5 subscales (Medication and Transfusion Applications-18 questions, Hospital Infections-12 questions, Patient Follow-up/Material Safety-9 questions, Falls-5 questions, and Communication-5 questions) and 49 questions and is answered in a 5-point Likert type (1-never, 2-rarely, 3-sometimes, 4-usually, and 5-always). It is evaluated over the total score and subscale scores obtained by adding the scores of each question. The higher the total score, the lower the tendency to make a medical error; the lower the total score, the higher the tendency to make a medical error (Altunkan, 2009). In Altunkan's (2009) study, the Cronbach's alpha coefficient of TMENS was found to be 0.95, but it was found to be 0.97 in total and between 0.79 and 0.95 in subscales.

Statistical Analysis

Data for the present study were collected between June 2013 and January 2015. A statistician evaluated the data. Data were evaluated using IBM Statistical Package for the Social Sciences for Windows 22 software. Data were analyzed using Cronbach's alpha analysis, frequency and percentage distributions, descriptive statistics, Pearson product-moment correlation coefficient, Dunnett T3 Post Hoc test, simple linear regression analysis, and t-test.

Ethical Considerations

Permission from the authors who developed PMOI and TMENS was obtained via email before starting the study so they could be used for data collection. The study was approved by the ethics committee of Atatürk University Faculty of Health Sciences (approval date: 06.10.2013) and the written official permission of the institutions where data would be collected. The nurses were informed about the study during data collection. Oral informed consent was obtained from the nurses volunteering to participate in the study.

RESULTS

A total of 459 nurses were included in the study. Of the 459 nurses, 38.3% were between the ages of 23 and 27 years, 81.7% were female, 51% were single, 62.5% were in internal units, 92.4% were service nurses, and 51.2% had a bachelor's degree. Furthermore, 61.2% of the nurses had 0–5 years of occupational experience, and 54.2% were working sometimes in the daytime and sometimes at night for 43 h/week on average and were

giving care to 19 patients/day on average. In addition, 51.4% of the nurses considered themselves professional, 30.7% considered themselves a little professional, and 15.3% considered themselves as completely professional. Moreover, 21.1% of the nurses had made a medical error previously, 78.9% had not made a medical error before, and 50.5% noticed medical errors made by the nurses they work with.

The nurses' PMOI score was M=137.06±15.23 on average, and their TMENS score was M=223.24±25.28 on average (Table 1). The highest average score of the subscales of TMENS was obtained from the "Medication and Transfusion Applications" (M=84.73±9.16) subscale; the lowest average scores were obtained from the "Falls" (M=21.61±3.79) and "Communication" (M=21.99±2.60) subscales. These findings indicate that the nurses' occupational professionalism manner was high on the scale. The medical errors that the nurses most tended toward were falls and errors in communication, and the medical errors they least tended to make were in medications and transfusions (Table 1). The professional manner or PMOI scores of nurses who said that they had made a medical error before were lower (M=133.81±15.56) than those of nurses who said that they had not made a medical error (M=137.93±15.04), and a significant differ-

Table 1. Nurses' PMOI and their average scores of TMENS

PMOI	Scales	n	Min.	Max.	M	SD
		459	66	160	137.06	15.23
TMENS	Medications and transfusion	459	22	90	84.73	9.16
	Falls	459	3	25	21.61	3.79
	Hospital infections	459	15	60	54.54	7.49
	Patient follow-up/material safety	459	16	45	40.42	5.60
	Communication	459	11	25	21.99	2.60
	Total score	459	97	245	223.24	25.28

Min: minimum; Max: maximum; SD: standard deviation

Table 2. Comparison of the TMENS scores of the nurses according to how professional they considered themselves

TMENS Subscales Status of Considering Tthemselves Professional	Medication and Transfusion Applications	Falls	Hospital Infections	Patient Follow-up/Material Safety	Communication	TMENS Total Score
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Considers self not professional at all (n=12)	83.33±11.61	20.25±4.20	52.17±11.57	37.75±6.12	20.83±3.53	214.33±33.89
	83.82±9.48	20.80±4.00	53.11±7.71	39.38±5.25	21.49±2.65	218.46±24.91
Considers self a little professional (n=141)	85.94±7.00	22.00±3.47	55.73±6.01	41.21±4.78	22.18±2.36	227.07±20.24
Considers self very professional (n=236)	82.70±13.22	22.13±4.07	53.77±9.82	40.29±7.90	22.57±2.87	221.46±35.92
Considers self completely professional (n=70)	KW=10.610 p=0.014*	KW=16.209 p=0.001**	KW=14.677 p=0.002*	KW=19.570 p=0.000**	KW=15.263 p=0.002*	KW=20.092 p=0.000**

*p<0.05, **p≤0.001.

ence was found between these two groups (p=0.018, t=2.374). There was no significant difference (p=0.680, t=0.412) between the PMOI scores of the two groups regarding the fact that nurses notice the medical errors of the other nurses they work with.

The average scores of the nurses who considered themselves very professional and completely professional in all subscales of TMENS were higher. The more the nurses considered themselves professional, the higher their TMENS scores and the lower their tendency to make a medical error. There were significant differences between the groups in all subscales ($p<0.05$ and $p\leq0.001$). Dunnett T3 Post Hoc test revealed that these differences are generally due to the nurses who consider themselves quite professional (Table 2).

The correlation analysis showed a positive, very strong, and extremely significant relationship ($p<0.001$) between the total scores and all subscale scores of PMOI and TMENS (Table 3). These findings indicate that the higher the professional manner, the higher the scores on the tendency to medical error scale-in other words, the lower the tendency of nurses to medical errors.

Simple linear regression analysis was performed to determine the effect of nurses' professional manner on their tendency to make a medical error (Table 4). Medium and extremely significant relationships were found between occupational professionalism manner and "Medication and Transfusion Applications" ($R=499$, $R^2=0.249$, $p<0.05$), "Falls" ($R=0.429$, $R^2=0.184$, $p<0.05$), "Hospital Infections" ($R=0.481$, $R^2=0.232$, $p<0.05$), "Patient Follow-up/Material Safety" ($R=0.524$, $R^2=0.275$, $p<0.05$), and "Communication" ($R=0.430$, $R^2=0.185$, $p<0.05$).

Nurses' occupational professionalism was found to explain 25% of their tendency toward medical error in "Medication and Transfusion Applications," 18% of their tendency toward medical error in "Falls," 23%

Table 3. Correlation values of the relationship between the PMOI and TMENS scores

		1	2	3	4	5	6	7
1. Professional Manner in Occupation Inventory	r	–						
	p							
2. Medication and Transfusion Applications	r	0.499	–					
	p	0.000*						
3. Falls	r	0.429	0.650	–				
	p	0.000*	0.000*					
4. Hospital Infections	r	0.481	0.796	0.700	–			
	p	0.000*	0.000*	0.000*				
5. Patient Follow-up/Material Safety	r	0.524	0.733	0.672	0.735	–		
	p	0.000*	0.000*	0.000*	0.000*			
6. Communication	r	0.430	0.563	0.585	0.619	0.720	–	
	p	0.000*	0.000*	0.000*	0.000*	0.000*		
7. Total Score of the Tendency to Medical Error Scale	r	0.550	0.917	0.804	0.920	0.880	0.741	–
	p	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	

*p<0.001.

of their tendency toward medical error in "Hospital Infections," 28% of the tendency toward medical error in "Patient Follow-up/ Material Safety," and 19% of the tendency toward medical error in "Communication" (Table 4).

Finally, a medium and extremely significant relationship (R=0.550, R^2=0.303, p<0.05) was found between occupational professionalism manner and tendency to medical error. The occupational professionalism of nurses is determined to affect their tendency toward medical error and explains 30% of their tendency.

DISCUSSION

Occupational professionalism plays an important role in creating occupational standards and providing quality care. The low profes-

Table 4. The results of simple linear regression analysis to determine the effect of occupational professionalism on tendency to medical error

Variable	Beta	Standard error	Beta	t	p
Stable	43,562	3363		12,953	0.000
Medication and Transfusion Applications subscale	0.300	0.024	0.499	12,316	0.000
R=0.499	R2=0.249				
$F_{(1,457)}$=151.691, p=0.000					
Stable	6961	1455		4785	0.000
Falls subscale	0.107	0.011	0.429	10,127	0.000
R=0.429	R2=0.184				
$F_{(1,456)}$=102.562, p=0.000					
Stable	22,110	2780		7953	0.000
Hospital Infections subscale	0.237	0.020	0.481	11,736	0.000
R=0.481	R2=0.232				
$F_{(1,457)}$=137.722, p=0.000					
Stable	14,006	2020		6933	0.000
Patient Follow-up/Material Safety subscale	0.193	0.015	0.524	13,153	0.000
R=0.524	R2=0.275				
$F_{(1,457)}$=173.003, p=0.000					
Stable	11,930	0.993		12,012	0.000
Communication subscale	0.073	0.007	0.430	10,195	0.000
R=0.430	R2=0.185				
$F_{(1,457)}$=103.938, p=0.000					
Stable	98,046	8941		10,966	0.000
Total	0.913	0.065	0.550	14,088	0.000
R=0.550	R2=0.303				
$F_{(1,457)}$=198.470, p=0.000					

sionalism of the members of this occupation negatively affects the other members of the occupation, the served individuals, and the institution; hinders care; and reduces the quality of care, hurting the people who give and receive service and leading to institutional problems (İntepeler & Dursun, 2012; Özlük & Sur, 2017). The most significant problem is medical errors (Bari, Khan & Rathore, 2016; Özata & Altunkan, 2010).

The occupational professionalism levels of nurses are not at the desired level (Kavaklı, Uzun & Arslan, 2009; Yılmaz & Vermişli, 2016). In addition to many other factors that increase the nurses' risk of making a medical error, their low occupational professionalism levels also increase this risk (Adıgüzel, 2010; Er & Altuntaş, 2016). One of the reasons for conducting the present study is that no research was found on this subject.

The nurses participating in the present study were generally young, single, and childless women with a bachelor's degree and a low level of experience who were in charge in internal services and as service nurses, were working for 43 h/week on average in shifts, and were caring for an average of 19 patients/day.

The majority of the nurses stated that they considered themselves professional. This may be because the majority of the participants work in training and research hospitals, have a bachelor's degree, and are at the start of their career so their knowledge is still new, they have not lost their occupational excitement, and they consider nursing a professional occupation. Previous studies have indicated that a high level of education affects the professionalism levels of nurses, and the nurses working in hospitals for educational purposes have higher professionalism levels (Adıgüzel, Tanrıverdi & Sönmez, 2011; Altıok & Üstün, 2014; Çelik & Hisar, 2012; Dikmen, Karataş, Gürol Arslan & Ak, 2016; İntepeler & Dursun, 2012). Furthermore, studies showed a statistically significant difference between the nurses' education levels, the hospital they work in, and the occupational professionalism average scores (Bayraktar, Yılmaz & Khorshid, 2016). These findings support the findings of the present study. The rapid developments in Turkey, especially in nursing, recently also contribute to nurses' seeing themselves as professional. Recent updates to the legal definition of nursing jobs, recognition of the specialization in nursing, and increasing interest in university level nursing education may also contribute to nurses' considering themselves professional in Turkey.

The occupational professionalism manners were quite high. Studies on the occupational professionalism levels of nurses also determined that the professional manner scores of nurses were high, similar to the results of the present study (Çelik, Ünal & Saruhan, 2012; Dikmen et al., 2014; Erbil & Bakır, 2009; Karadaş, Duran & Ergün, 2018; Karamanoğlu et al., 2009; Kaya, 2011; Özpekin & Erdim, 2016; Reyhanoğlu, 2011; Yüksekol, 2010). The findings that nurses consider themselves professional are in parallel with these findings. Recent developments and improvements, such as raising the vocational education to university level, increasing research and publication rates, stronger theoretical knowledge, and especially increasing membership in occupational associations, are considered to positively affect nurses' occupational professionalism.

The tendency to medical errors was generally low. Other studies on the tendency of nurses to medical errors also indicated that nurses' tendency to medical error was low (Altunkan, 2009; Cebeci, Gürsoy & Tekingündüz, 2012; Kıymaz & Koç, 2018; Öztürk & Özata, 2013). Considering that the majority of the nurses in the present study were

working 43 h/week and caring for 19 patients/day on average, this is a pleasing finding. The statements of 78.9% of the nurses that they had not made a medical error before also support the findings of low tendency to medical errors. Approximately half of the nurses (50.5%) noticed the medical errors made by other nurses. Altunkan (2009) also found in his study that 93.8% of the nurses state that they have not made a medical error that would endanger patient safety, and that these statements are similar to the findings of the present study.

The nurses were determined to make the least medical errors in medication and transfusion applications and the most medical errors in falls and communication. More than half of the nurses had recently received their bachelor's degree, and their knowledge was still fresh, which may have led to their high level of occupational professionalism and low tendency to make medical errors. The further knowledge and experience of the nurses gained from their education may have contributed to their making fewer errors in medication and transfusion applications, which are among the applications that they perform most frequently. These findings comply with the findings of other studies, which found that nurses make fewer errors in medication and transfusion applications, and the higher the education levels of nurses, the lower the number of medication errors (Altunkan, 2009; Başer & Manav, 2018; Öztunç, 2012).

The tendency of nurses to make errors in falls and communication also complies with the literature. Previous studies have showed that the most frequently observed error types with regard to patient safety are problems with falls and communication. The highest rate of errors is found in falls (Altunkan, 2009; Cebeci et al., 2012; Gökdoğan & Yorgun, 2010; İntepeler, Soydemir & Güleç, 2014; Öztunç, 2012; Teixeira & Cassiani, 2014; Zencirci, 2010). One of the main reasons for complaints and cases against hospitals is patient injury due to falling, indicating that nurses have difficulty in preventing falls (Hempel et al., 2013; Young et al., 2008; Zencirci, 2010).

Occupational professionalism has a strong, positive, and extremely significant relationship with the general tendency to medical error and all types of medical errors according to the correlation analysis. This finding indicates that as occupational professionalism increases, the tendency to medical error decreases. Furthermore, nurses who considered themselves very or completely professional were found to have a low tendency to medical errors; the tendency to make medical errors decreased as occupational professionalism increased, and there were significant differences between the groups. These findings and the findings of the high occupational professionalism scores of the nurses who stated that they had not made a medical error before are considered to support each other and show the effect of occupational professionalism on decreasing the tendency to make medical errors.

The regression analysis showed that 25% of the tendency to medical errors in the area of medication and transfusion applications, 18% of the tendency to medical errors in the area of falls, 23% of the tendency to medical errors in the area of Hospital Infections, 28% of the tendency to medical errors in the area of Patient Follow-up/material safety, 19% of the tendency to medical errors in the area of communication, and 30% of the general tendency to medical errors are due to issues of occupational professionalism. These rates of effect are high and show that the effect of occupational professionalism on the tendency to medical errors is quite strong.

These findings indicate that nurses' occupational professionalism should be kept at maximum level, and that nurses should be supported by their managers.

Study Limitations

Our study has limitations. First, the study is limited to public hospitals in a certain region. Second, the findings of the present study were based on the nurses' own statements. Finally, the lack of studies directly on this subject in the literature further limited discussion of the data.

CONCLUSION AND RECOMMENDATIONS

To the best of our knowledge, this is the first study on the effect of occupational professionalism on the tendency to medical errors both in the field of health and in the field of nursing. This will guide future studies on this subject and hopefully create institution managers' awareness of the importance of professional nurses in preventing medical errors.

The occupational professionalism levels of the nurses in the present study were found to be high, the majority of the nurses had not made a medical error but had tended to make the fewest medical errors in "medication and transfusion applications" and the most in "communication" and "falls," and there were differences between the occupational professionalism levels of the nurses who had made and had not made medical errors before. Moreover, there were significant differences in nurses' tendencies to medical errors according to how professional they considered themselves, and their tendency to medical errors decreased as their occupational professionalism levels increased.

Based on these results, we suggest periodically evaluating the occupational professionalism of nurses to keep it at a high level and thereby decrease their tendency to medical errors and performing activities that will decrease nurses' tendency to medical errors, especially in the areas of falls and communication. In addition, we suggest using different methods to evaluate the occupational professionalism of nurses in future studies since the findings of the present study were obtained from the nurses' own statements and to repeat the study using different sampling groups as, to our knowledge, this is the first study on this subject.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Atatürk University Faculty of Health Sciences (approval date: 06.10.2013).

Informed Consent: Oral informed consent was obtained from the nurses volunteering to participate in the study.

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