Determining the pressure injury and staging knowledge of nurses at a hospital in Turkey

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ABSTRACT

Aim: The aim of this research is to examine the nurses's knowledge level regarding pressure injury and its staging.

Materials and methods: The research was conducted in descriptive type. The data were collected at a hospital in Konya between September 1 and November 30, 2021. The sample of the study consisted of 158 nurses working in internal clinics, surgical clinics and intensive care units. "Sociodemographic Questionnaire Form" and "Modified Pieper Pressure Wound Knowledge Test (PUKT)" were used to collect data. Percentage, frequency, arithmetic mean, independent sample *t*-test and ANOVA tests were used to analyze the data.

Results: It was found that 77.2% of the nurses had encountered pressure injuries and 63.1%had received training on pressure injuries. It was determined that 55.1% of them received this training as in-service training in the hospital. 96.8% of the nurses stated that pressure injury could be prevented with nursing care. The mean PUKT score of the nurses was 30.70 ± 7.15; staging mean score was 4.79 ± 1.87, wound description mean score was 4.43 ± 1.88; prevention/risk assessment score mean was determined as 20.78 ± 3.93. The average score obtained with the correct response rates to the test was 62.67%. There was no significant difference between nurses' education levels, years of employment and PUKT, wound description, staging and prevention/risk scores ($p > .05$). There was a significant difference between the mean PUKT score and staging mean score between those who received training on pressure injury and those who didn't, and between the units where the nurses worked and the mean PUKT score, wound description, staging and prevention/risk scores ($p < .05$).

Conclusion: It was found that the nurses's knowledge level was below satisfactory. It's recommended for nurses to attend trainings on pressure injury, to check the effectiveness of their training, to participate in scientific meetings and to encourage nurses to make research.

1. Introduction

A pressure injury (PI) is defined as a "localized injury on the skin and/or underlying soft tissue, usually over a bone prominence, associated with medical or other devices" [1]. PIs are an important health problem, although they can be prevented through good nursing care. They can negatively affect patient quality of life and increase the cost of health care by prolonging patient hospital stay [2]. Immobile patients, the elderly, patients undergoing long-term surgery, and patients hospitalized in the intensive care unit are at risk of developing PIs [3]. In studies conducted in Turkey, PI incidence was reported as 35.3% in general intensive care units [4], 3.5%–29.5% in surgical clinics [5],

20.5% in surgical intensive care units [6], and 6% in mixed (internal and surgical) clinics [7]. The incidence of PIs in hospitals in Europe has been reported to range from 18.1% to 23.9% [8]. Rates among particular countries have been reported as up to 20% in the United States, 18.2% in Norway, 19.9% in Belgium, 24.5% in Germany, and up to 50% in Australia [8,9].

PIs are the quality indicators for a health care system and require good nursing care [10]. Study results differ, but some studies show that nurses' level of knowledge regarding PIs are inadequate [11–15]. Fulbrook et al. (2019) found that the general average knowledge scores of nurses (n = 306) on PIs were 65%, an inadequate level. The lowest scores were related to the wound description [16]. Jiang et al. (2020)

found that 41.7% of nurses (n = 1086) did not have an adequate knowledge of prevention and risk evaluation, and 46.6% had incorrect attitudes on PI prevention [17]. Yılmazer et al. (2019) showed 65.3% of nurses (n = 124) did not have adequate level of knowledge to prevent PIs [18].

Prevention of PIs, assessment of risk factors, wound descriptions, and determination of stages contribute to the planning of appropriate nursing interventions for patients. Adequate knowledge of nurses on PIs is of great importance for improving patient care outcomes [2]. For this reason, it is essential to evaluate what nurses know about PIs, the stages of PIs, and the challenges related to the subject to prevent PIs and provide appropriate treatment and care. This study investigates the levels of knowledge of nurses about PIs and their staging.

1.1. Research questions

1. What is the mean PUKT scores of the nurses?
2. What are the means wound description, staging and prevention/risk scores of the nurses?
3. Is there a statistically significant difference between the socio-demographic and clinical features of the nurses and the mean score of PUKT and wound description, staging and prevention/risk?

2. Material and method

2.1. Study design and setting

The study had a descriptive and cross-sectional design. The data were collected by the researchers at a private hospital in Konya between September 1 and November 30, 2020.

2.2. Sample

The study population consisted of all the nurses (n = 300) working at the hospital. The sample of the study consisted of 168 nurses who were determined by using sample calculation formula with a known universe (confidence interval of 95%, an error rate of 5% and an incidence of 50%). Using convenience sampling, 158 nurses who were not on leave or without duties, volunteered to participate in the research with their consent during the research period were included in the study.

The inclusion criteria were as follows:

- Volunteering to participate in the research
- Literate in Turkish
- Working in internal clinics, surgical clinics (inpatient and nursing care units), and intensive care units

2.3. Data collection tools

The Sociodemographic and Descriptive Characteristics Information Form and the Modified Pieper Pressure Ulcer Knowledge Test (Modified PUKT) were used as data collection tools.

2.3.1. Sociodemographic and Descriptive Characteristics Information Form

This form was prepared by the researchers based on the literature. It included 12 closed-ended questions on age, gender, marital status, level of education, and clinic of the nurses, their encounter with PIs cases, their years in the profession, and training on PIs.

2.3.2. Modified PUKT

The Pieper PUKT was developed by Pieper and Mott in 1995 and modified by Lawrence et al., in 2015. The Modified PUKT consists of 49 items. It was designed to measure knowledge of PI prevention/risk (33 questions), staging (nine questions), and wound description (seven questions). The possible responses to each item are True and False. Correct answers receive 1 point, and incorrect responses receive

0 points. A test result higher than 70% indicates an adequate level of knowledge, scores higher than 80% indicate a good level of knowledge, and those higher than 90% indicate a very good level of knowledge. A Turkish validity and reliability study of the Modified PUKT was conducted by Gül et al. (2017). The Cronbach's alpha value of the scale was reported as 0.81 [19]. In our study, the Cronbach's alpha value of the scale was found as 0.84.

2.4. Data statistical analysis

The Statistical Package for Social Sciences software program version 25 (IBM SPSS 25) was used to analyze the data. The Shapiro-Wilk test was utilized to determine whether the data were normally distributed. The descriptive statistics of number, percentage, mean, standard deviation, minimum, and maximum were used, and the independent sample *t*-test and ANOVA were to create comparisons due to the normal distribution of the data. The p-value was set at α = 0.05. The number of correct answers was divided by the total number of items and multiplied by 100 to calculate the percentage of correct answers.

2.5. Ethical considerations

Ethical approval (no: 2020/011) was obtained from the Ethics Committee of XXX University Medicine Faculty, and permission was obtained from the chief medical officer of the studied institution. The nurses were informed that they could leave the study at any time, and their informed consent was obtained.

2.6. Limitations

This study had two limitations; the first is its use of the convenience sampling method and second is that the results of the research are limited to nurses working in a private hospital in the province of Konya, Turkey between September 1 and November 30, 2020. The results could not be generalized to all nurses.

3. Results

The mean age of the nurses was 23.50 ± 3.493 years, 79.7% were female, 71.5% were graduates of a vocational high school of health, 55% were working in the intensive care unit, 38.0% had been working for 0–22 years, and 40.5% had been working for 2–5 years. 77.2% of nurses had experience with PIs before, and 63.1% had received training on PIs. 55.1% of those who received this training had received it as in-service training at the hospital. 96.8% of the nurses reported that PIs can be prevented by a good nursing care (Table 1).

The mean score on the Modified PUKT was 30.70 ± 7.15, for the staging subscale it was 4.79 ± 1.87, for the wound description subscale it was 4.43 ± 1.88, and for the prevention/risk assessment subscale it was 20.78 ± 3.93. The mean score obtained with the correct response rates to the whole test was found to be 62.67% (Table 2). For the total PUKT score, nurses below on the scored 70%.

Analysis of PUKT items indicated that 99.4% of the nurses correctly answered, "Some risk factors for development of PUs include immobility, incontinence, impaired nutrition, and altered level of consciousness." 94.3% of them correctly answered the question, "Every person assessed to be at risk for developing pressure ulcers should be placed on a pressure-redistribution bed surface" 91.1% of them correctly answered the item, "To minimize the skin's exposure to moisture from incontinence, skin, and continence products should be correctly applied." The lowest percentage of correct answers were to "Bunny boots and gel pads relieve pressure on the heels" (5.7%), "Persons who can be taught should shift their weight every 60 min while sitting in a chair" (7.0%), and "It is important to massage bony prominences" (17.7%) (Table 3).

A comparison of some descriptive and clinical characteristics of the nurses and their scores from the Modified PUKT is presented in Table 4.

Table 1
Participants' sociodemographic and descriptive characteristics (n = 158).

	n	%
Gender		
Female	126	79.7
Male	32	20.3
Education		
Health Vocational High School	113	71.5
Bachelor degree	30	19.0
Above of bachelor degree	15	9.5
Years of Employment		
0–2 years	60	38.0
2–5 years	64	40.5
5–10 years	25	15.8
10–15 years	4	2.5
15–20 years	3	1.9
20 years or more	2	1.3
Working Units		
Surgical Clinics	37	23.4
Internal Clinics	34	21.5
Intensive Care Units	87	55.1
Previous Experience with PIs in Clinic		
Yes	122	77.2
No	36	22.8
Receiving PIs Training		
Yes	99	62.7
No	59	37.3
Sources of Training Received		
In-Service Training	87	55.1
Course	11	7.0
Congress	1	0.6
Not Received Any Training	59	37.3
Thinking About That PIs Could Prevent with A Good Nursing Care		
Yes	153	96.8
No	5	3.2

Table 2
Modified PUKT total and subscale score means (n = 158).

Scale and Subscales	Mean ± SD	Percent
Modified PUKT	30.70 ± 7.15	% 62.67
Wound Description Subscale	4.43 ± 1.88	
Staging Subscale	4.79 ± 1.87	
Prevention/Risk Subscale	20.78 ± 3.93	

There were no statistically significant differences between the level of education of the nurses and the mean scores for the total Modified PUKT and subscales means (p > .05). However, when the working units of the nurses were compared, a statistically significant difference was found between the means Modified PUKT score means between surgical clinics, internal clinics, and intensive care units in terms of the score obtained in wound description, staging, and prevention/risk assessment (p < .05). The mean score of the nurses working in intensive care regarding the correct response to wound description, staging, and prevention/risk assessment was found to be significantly higher than that of nurses working in surgical and internal clinics (p < .05). The lowest scores for the total Modified PUKT and the subscales means were found in nurses working in internal medicine clinics. There were no statistically significant differences between nurses' working years of the nurses and the Modified PUKT total and subscale score means (p > .05). There was no significant difference between nurses new in the clinic and those who had been working for many years in terms of the correct response score means regarding wound description, staging, and prevention/risk assessment. Nurses who had received training on PIs had significantly higher Modified PUKT score means, and staging score means than nurses who did not receive such training (p < .05). The correct responses and means scores for the whole scale and staging were higher in nurses who

Table 3
Distribution of some PUKT items by most correct and most incorrect responders (n = 158).

PUKT Items	Correct responders		Incorrect responders	
	n	%	n	%
It is important to massage bony prominences	28	17.7	130	82.3
Some risk factors for development of pressure ulcers include immobility, incontinence, impaired nutrition, and altered level of consciousness	157	99.4	1	0.6
Stage 1 pressure ulcers are described as intact skin with nonblanchable redness of a localized area usually over a bony prominence	139	88.0	19	12.0
A Stage 3 pressure ulcer is a partial-thickness skin loss involving the epirdermis and/or dermis	38	24.1	120	75.9
Transparent dressings (eg, Tegaderm, Opsite), and hydrocolloid dressings (eg, DuoDerm, Restore) don't protect against the effects of friction.	33	20.9	125	79.1
All individuals should be assessed on admission to a hospital for risk of pressure ulcer development	141	89.2	17	10.8
A Stage 4 pressure ulcer is a full-thickness tissue loss with exposed bone, muscle, or tendon	139	88.0	19	12.0
Bunny boots and gel pads relieve pressure on the heels	9	5.7	149	94.3
It is necessary to assess the patient and a turning regime should be determined and noted at the bedside	142	89.9	16	10.1
Ring cushions do not help to prevent pressure ulcers	37	23.4	121	76.6
Persons who can be taught should shift their weight every 60 min while sitting in a chair	11	7.0	147	93.0
Stage 2 pressure ulcers are a partial-thickness skin loss or blister	122	77.2	36	22.8
To minimize the skin's exposure to moisture from incontinence, skin, and continence products should be correctly applied	144	91.1	14	8.9
Bony prominences should not have direct contact with one another	142	89.9	16	10.1
Every person assessed to be at risk for developing pressure ulcers should be placed on a pressure-redistribution bed surface	149	94.3	9	5.7

had received training on PIs (Table 4).

4. Discussion

PIs are among the most important health problems for patients, health care professionals, and institutions, in spite of the developments that have occurred in the health care system. The rate of PIs in hospitals is among the most important indicators of the quality of nursing care [20–22]. Therefore, it is extremely valuable for nurses to have an adequate level of knowledge of how to identify PI risk factors, their prevention, and planning and implementing related care [19,23–27]. We obtained a mean score for the Modified PUKT of 62.67%, which is below the average (70%). The result of the study indicated that the level of knowledge of nurses about PIs and staging was inadequate. In the studies conducted, a range of results has been reported regarding the level of knowledge of nurses on PIs. Some studies have found that nurses' levels of knowledge on PIs are inadequate [27,28]. Studies conducted using both similar and different scales in the literature have found that nurses' levels of knowledge were inadequate [29–35]. Çelik et al. (2017) and Kim and Lee (2019), however, reported that nurses' knowledge of PI prevention was found to be at a moderate level [28,36]. In other studies, higher levels of knowledge are reported among nurses on the prevention of PIs [37,38]. Our results are similar to those found in other studies, but additional work should be done to increase nurses' knowledge of PIs, as their knowledge level is below satisfactory.

Our study found no statistically significant difference between the level of education of the nurses and the Modified PUKT total and subscale score means (p > .05). In the literature, the study results regarding the level of education of nurses and the level of knowledge about PIs differ. Although Andsoy (2021), Yılmazer et al. (2019), and Alsharari

Table 4
Comparison of descriptive characteristics of the nurses and modified PUKT scores according to some variables (n = 158).

Variables	Wound Description	Staging	Prevention/ Risk	Modified PUKT
	Mean ±SDmin-max	Mean ±SDmin-max	Mean ±SDmin-max	Mean ±SDmin-max
Education				
Health Vocational High School	4.38 ± 1.93 (1–7)	4.89 ± 1.85 (1–8)	20.64 ± 3.95 (11–26)	30.61 ± 7.15(15–42)
Bachelor Degree	4.56 ± 1.81 (1–7)	4.53 ± 1.79 (1–8)	21.36 ± 3.44 (15–27)	31.10 ± 6.70(19–41)
Above of Bachelor Degree	4.53 ± 1.76 (1–7)	4.53 ± 2.16 (1–8)	20.66 ± 4.82 (12–28)	30.66 ± 8.40 (16.41)
Statistical analysis	[a]F = .125; p = .88	[a]F = .59; p = .55	[a]F = .40; p = .67	[a]F = .055; p = .94
Working Units				
Internal Clinics	3.41 ± 1.32 (1–6)	4.02 ± 1.24 (2–7)	18.02 ± 2.91 (13–25)	25.76 ± 4.79(19–38)
Surgical Clinics	3.72–1.55 (1–7)	4.21 ± 1.37 (1–7)	20.48 ± 3.70 (11–26)	29.08 ± 5.55(16–37)
Intensive Care Units	5.13–1.91 (1–7)	5.33 ± 2.08 (1–8)	21.98 ± 3.84 (12–28)	33.33 ± 7.34(15–42)
Statistical analysis	[a]F = 16.27; p = .000*	[a]F = 9.05; p = .000*	[a]F = 14.68; p = .000*	[a]F = 18.21; p = .000*
Years of Employment				
0–2 years	4.30 ± 1.91 (1–7)	4.63 ± 1.98 (1–8)	20.06 ± 4.27 (12–28)	29.65 ± 7.79(15–42)
2–5 years	4.42 ± 1.96 (1–7)	4.70 ± 1.94 (1–8)	20.75 ± 3.93 (11–27)	30.54 ± 7.22(16–41)
5–10 years	4.64 ± 1.68 (2–7)	5.60 ± 1.38 (3–8)	22.08 ± 2.91 (16–26)	33.08 ± 5.33(24–41)
10–15 years	4.50 ± 2.51 (1–7)	3.75 ± 1.70 (2–6)	21.00 ± 4.69 (14–24)	30.25 ± 8.18(18–35)
15–20 years	5.66 ± 1.52 (4–7)	4.66 ± .57 (4–5)	23.66 ± 1.52 (22–25)	35.00 ± 1.00(34–36)
20 years or more	4.50 ± .70 (4–5)	4.50 ± .70 (4–5)	22.50 ± .70 (22–23)	32.50 ± .70 (32–33)
Statistical analysis	[a]F = .37; p = .86	[a]F = 1.32; p = .25	[a]F = 1.35; p = .24	[a]F = 1.06; p = .38
Receiving PIs Training				
Yes	4.63 ± 1.78 (1–7)	5.04 ± 1.70 (1–8)	21.24 ± 3.79 (12–28)	31.65 ± 6.83 (16–42)
No	4.05 ± 2.02 (1–7)	4.31 ± 2.05 (1–8)	19.98 ± 4.08 (11–26)	28.98 ± 7.38 (15–41)
Statistical analysis	[b]t = 1.87; p = .063	[b]t = 2.37; p = .019*	[b]t = 1.94; p = .054	[b]t = 2.28; p = .024*

*p < .05.
[a] F = ANOVA test.
[b] t = Independent-samples *t*-test, PIs = Pressure Injuries.

et al. (2017) did not find a statistically significant difference in level of knowledge regarding level of education, similar to our research findings, Lawrence et al. (2015), Aydın et al. (2019), Nuru et al. (2015), and Aydın and Karadağ (2010) did find a statistical significant relationship between the level of education of nurses and the means of knowledge scores, such that the knowledge scores increase as level of education increases [11,15,34,40,42,49,50]. However, a statistically significant difference was found between the Modified PUKT score means between surgical clinics, internal clinics, and intensive care units (p < .05). The average score of nurses working in intensive care regarding the correct response to wound description, staging, and prevention/risk assessment was found to be significantly higher than nurses working in surgical and internal clinics. The Modified PUKT total and subscale score means were highest in nurses working in intensive care units, followed by nurses working in surgical clinics. As with our research findings, Chianca et al. (2010) found that the mean scores for correct responses of nurses working in surgical and intensive care clinics were higher than those for

nurses working in outpatient and private clinics [39]. Aydoğmuş Ünlü and Andsoy (2021) found that the Modified PUKT score means of the nurses working in intensive care were statistically higher than those working in surgical clinics [40]. A cross-sectional study by Iranmanesh et al. (2013), which measures the level of knowledge of PIs in nurses who works in the orthopedic clinics in Iran, indicated that nurses working in the intensive care unit were more knowledgeable of PIs than nurses working in orthopedics [15]. According to Karabağ Aydın et al. (2019), the knowledge and practice mean scores for PIs of nurses working in intensive care and surgical clinics were higher than those of nurses working at other clinics [41]. The findings of this study are consistent with the results of previous studies. The literature indicates that PIs is most commonly found in immobile patients and inpatients in intensive care units [48]. Nurses plan and implement the same nursing interventions for patients, regardless of their level of education, and nurses increase their level of knowledge as the incidence of PIs increases.

We found no statistically significant difference between the working years of the nurses and the Modified PUKT total and subscale score means (p > .05). There were no significant differences between nurses who are new in the clinic and nurses who have been working for many years in terms of the correct response score means regarding wound description, staging, and prevention/risk assessment. In parallel with our research findings, a study by Barakat Johnson et al. (2018) reported no relationship between nursing experience and the knowledge of PIs [43]. Ilesanmi et al. (2012) evaluated the level of knowledge of nurses in Nigeria regarding PIs and found no statistically significant difference between the working years and the level of knowledge of nurses [45]. A study conducted by Ercan Ekim and Sabuncu (2018) showed that total work experience in nursing does not affect the attitude toward PI pre-vention [46]. Contrary to our research findings, there are also studies that have found that the level of knowledge of nurses about PIs increases as the time of work in the clinic increases. A study conducted by Nuru et al. (2015) of the practices and knowledge levels of nurses working at a university hospital for the prevention of PIs found that the knowledge levels were higher in nurses with more than 10 years of professional experience. Habiballah (2017) in which intensive care nurses' attitudes toward PIs prevention were measured, it was stated that nurses' knowledge level score means increase as their experience increases. Lawrence et al. (2015) conducted a study on the procedures followed by nurses in Australia following a procedure regarding the management of PIs and their knowledge and reported a statistically significant rela-tionship between nurses' working experience and means [11,34,44]. It is believed that number of the nurses working in the hospital for many years is small, and the in-service training they receive in hospitals is the reason behind the lack of difference between the working year and the level of knowledge in our study findings.

It was found that nurses who received training on PIs had signifi-cantly higher mean scores for Modified PUKT and staging than nurses who did not receive such training. In the literature, nurses who had received in-service training had significantly higher levels of knowledge about PIs than those who have not [10,15,34,47]. According to Yılmazer et al. (2019), the knowledge score means of nurses participating in scientific programs were higher [49]. Similarly, other studies that measured the level of knowledge of PI prevention among nurses, it was found that the mean scores of those participating in scientific programs were higher than those who did not participate [34,38]. The results of this study are in line with the literature. These results are likely due to the fact that the participation of nurses in scientific programs such as in-service trainings, congresses, and symposia allows them to access up-to-date information. This suggests that in-service training is impor-tant, and the provision of this training regularly will increase nurses' knowledge about PIs and will help them to perform PIs staging easily.

5. Conclusion

The result of the study indicated that the level of knowledge of nurses

about PIs and staging was inadequate. Increasing the participation of nurses in in-service training programs on PIs and staging and the evaluating of the effectiveness of this training, ensuring the attendance of nurses in scientific meetings, symposia, conferences, or courses, encouragement of individual research on the topic, and their inclusion in the PI prevalence and incidence studies conducted in hospitals are of great importance.

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Declaration of competing interest

The authors have no conflicts of interest to disclose.

Declarations

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