



Evaluating Nurses' Knowledge of Pressure Injury Prevention: A Descriptive Study

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ABSTRACT

OBJECTIVE: To evaluate nurses' knowledge on pressure injury (PI) prevention.

METHODS: Four hundred six nurses in Turkey participated in this descriptive study between January and February 2020. Participants completed an information form and the Pressure Ulcer Prevention Knowledge Assessment Instrument (PUPKAI). The PUPKAI contains 26 items across six themes: (1) development, (2) classification and observation, (3) risk assessment, (4) nutrition, (5) interventions to reduce the amount of pressure/rupture, and (6) interventions to reduce the duration of pressure/rupture.

RESULTS: The mean age of the nurses was 26.93 ± 6.72 years. The mean total PUPKAI score was 11.80 ± 3.28 . Almost all participants (91.6%) had insufficient knowledge on PI prevention. Male nurses scored higher on themes 1 and 2 than female nurses ($P = .046$, $P = .029$, respectively). Nurses with a postgraduate degree scored higher in total and on themes 2, 3, 5, and 6 ($P = .001$, $P = .006$, $P = .011$, $P = .044$, $P = .029$, respectively), and nurses with more than 10 years of service scored higher in total and on themes 4, 5, and 6 ($P = .001$, $P = .002$, $P = .001$, $P = .026$, respectively).

CONCLUSIONS: The nurses who participated in this study do not have enough knowledge on PI prevention.

KEYWORDS: knowledge, nursing, patient safety, pressure injury, prevention, Pressure Ulcer Prevention Knowledge Assessment Instrument, Turkey

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INTRODUCTION

Pressure injuries (PIs)—localized skin or deep tissue damage caused by continuous exposure to pressure—pose risks to patient safety, affect patients' quality of life, and increase the cost of healthcare. These wounds are also preventable, and nurses are primarily responsible for PI prevention.¹⁻³ Pressure injury incidence is an important criterion in determining healthcare quality of institutions providing inpatient treatment services.^{4,5} Therefore, PI prevention is important for both ensuring patient safety and increasing care satisfaction.⁶⁻⁸ When evaluated in terms of quality, cost, and nursing care, preventing PIs is easier and cheaper than treating them.^{9,10} Nurses have the most important role and responsibility in evaluating the risk of PIs, determining risk factors, and planning and implementing preventive interventions.^{11,12} Previous research has indicated that nurses' knowledge of PI risk factors and positive attitude toward prevention measures play key roles in reducing the incidence of PIs.^{11,13}

In this study, the authors evaluated the knowledge level of nurses working in private and public hospitals in a province in the southeast of Turkey regarding preventing PIs.

METHODS

Setting and Study Sample

This descriptive, cross-sectional study was conducted in January and February 2020. Nurses working in one state training and research hospital and four private hospitals located in the Southeast Anatolia region of Turkey were recruited for the study. A total of 936 nurses working at the five hospitals formed the population of the study; the sample was composed of 406 nurses (43.37% of the population) who volunteered to participate in the study. In the Turkish health system, nurses can work at various educational levels depending on the duration of their education. Of the nurses participating in the study, 144 had a bachelor of science degree in nursing (4 years' education after high school), 252 had an associate degree in nursing (2 years' education after high school), and 10

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were postgraduate nurses. In line with the study by Sengül and Karadağ,¹⁴ the authors calculated the sample size before the data collection phase by using the G*Power (RRID:SCR_013726) version 3.1.9.2 software program (Heinrich Heine University, Düsseldorf, Germany). The authors performed *t* tests to evaluate whether descriptive characteristics of the nurses correlated with mean scores on the Pressure Ulcer Prevention Knowledge Assessment Instrument (PUPKAI). Accordingly, by taking the impact size of the study as 0.320, α value as .05, and theoretical power as 95%, the goal sample size of the study was 424 nurses. In post hoc power analyses, the impact size was found to be 0.380, and the theoretical power of the study was determined to be 95%.

Data Collection Tools

Two instruments were used: the Nurses' Identifying Information Form, which the authors prepared following a literature review, and the PUPKAI (see Tülek et al¹⁵ for information on PUPKAI validity and reliability in Turkey). The authors obtained permission via email from Tülek et al¹⁵ to use the PUPKAI scale in this study.

Nurses' Identifying Information Form. This form, which was created by the researchers in line with the literature,¹⁵⁻¹⁸ consisted of 17 demographic questions including age, sex, education status, duration of professional experience, number of patients cared for on a daily basis, PI training status, and experience in the care of patients with a PI.

PUPKAI. This scale was developed by Beeckman et al¹⁹ in 2010 and adapted to Turkish in 2016 by Tülek et al.¹⁵ It consists of 26 items across 6 themes: theme 1, development (six items); theme 2, classification and observation (five items); theme 3, risk assessment (two items); theme 4, nutrition (one item); theme 5, interventions to reduce the amount of pressure/rupture (seven items); and theme 6, interventions to reduce the duration of pressure/rupture (five items). The highest score that can be obtained from the scale is 26, and the minimum acceptable score for knowledge adequacy is 16 (60%).

Data Collection and Analysis

Participants completed the two forms alone in the clinic seminar room to prevent them from consulting colleagues or the literature. Filling out the forms took an average of 15 minutes.

The authors used IBM SPSS 22 (IBM Corporation, Armonk, New York) to analyze the data. Descriptive data were presented with the number, percentage, mean, SD, and minimum and maximum values. The normality of the variables was examined with the Shapiro-Wilk test. In comparing the mean scores of the scale, Student *t* test was used to compare two independent groups; one-way analysis of variance was used to compare three or more groups, and post hoc Bonferroni correction analysis was

used to determine from which group the difference originated. The significance level was accepted as $P < .05$ in all analyses.

Ethical Considerations

Necessary institutional permissions were obtained from Hasan Kalyoncu University Faculty of Health Sciences Non-Interventional Research Ethics Committee (date: June 11, 2019, Decision no. 2019/105) and from the hospitals where the study was conducted. All participants gave informed written/verbal consent and were told that they could quit the study at any time. The authors adhered to the provisions of the Declaration of Helsinki at all stages of the research.

Research Questions

- (1) Do the nurses' mean PUPKAI scores indicate sufficient knowledge of PI prevention practices?
- (2) What factors correlate with the PUPKAI mean scores?
- (3) Do the sociodemographic characteristics of the nurses correlate with their PUPKAI scores?
- (4) Is there an association between nurses' working conditions and their PUPKAI score?

RESULTS

More than three quarters of the participants (76.6%) were women; only 37.1% of them had a bachelor's degree, and 78.3% of them worked in private hospitals. Their mean age was 26.93 ± 6.72 years (range, 20–70 years). More than half of the participants (67.5%) had 1 to 5 years of professional experience, 47.8% worked as intensive care nurses, and 74.6% worked in day/night shifts (Table 1). More than half of the participants (61.1%) had received training on preventing PIs, and 33.0% of them had attended scientific programs related to PIs (Table 1). The training programs that the nurses attended were compulsory, in-service training programs on several topics in line with the quality management regulations of their institutions. The scientific programs attended by nurses were voluntary courses, symposiums, or conferences organized by occupational organizations dealing with training activities on PIs.

The mean PUPKAI scale score of the nurses was 11.80 ± 3.28 . The mean scores by theme were as follows: theme 1: 2.47 ± 1.09 , (range, 0–6); theme 2: 2.30 ± 1.21 (range, 0–5); theme 3: 1.13 ± 0.72 (range, 0–6); theme 4: 0.70 ± 0.45 (range, 0–1); theme 5: 2.89 ± 1.35 (range, 0–7); and theme 6: 2.29 ± 1.23 (range, 0–5). The vast majority of participants (91.6%) had insufficient PUPKAI scores (score < 16; Table 2).

Significant relationships were found between the nurses' PUPKAI knowledge level and their sex, education level, and years of service. Men scored higher in theme 1



(2.47 ± 1.09) and theme 2 (2.30 ± 1.21) than did women ($P = .046$, $P = .029$, respectively). In addition, nurses with postgraduate degrees scored higher in total and in themes 2, 3, 5, and 6 ($P = .001$, $P = .006$, $P = .011$, $P = .044$, $P = .029$, respectively), and nurses with more

Table 1. SOCIODEMOGRAPHIC CHARACTERISTICS OF THE NURSES (N = 406)

Descriptive Characteristics	Mean \pm SD	
Age, y	26.93 \pm 6.72 (range, 20–70)	
Professional experience, y	5.70 \pm 6.04 (range, 1–50)	
Sex	n	%
Female	315	77.6
Male	91	22.4
Age, y		
20–30	312	76.8
31–40	73	18.0
41 or older	21	5.2
Education level		
Associate degree in nursing	252	62.0
Bachelor of science in nursing	144	35.5
Postgraduate degree in nursing	10	2.5
Professional experience, y		
1–5	274	67.5
6–10	74	18.2
>10	58	14.3
Hospital type		
Private hospital	318	78.3
Public hospital	88	21.7
Wards		
ICU	194	47.8
Surgical wards	73	18.0
Internal medicine wards	50	12.3
Other	89	21.9
Shifts		
Always at night	85	20.9
Always during the daytime	18	4.5
Night/daytime shifts	303	74.6
Education about PI prevention		
Yes	248	61.1
No	158	38.9
Participation in scientific programs about PIs		
Yes	134	33.0
No	272	67.0
Caring for patients with PIs		
Yes	256	63.1
No	150	36.9

Abbreviation: PI, pressure injury.

Table 2. TOTAL AND SUBDIMENSION PUPKAI SCORES (N = 406)

Scores	n	%
Sufficient ≥ 16 (60%)	34	8.4
Insufficient	372	91.6
Themes	Mean \pm SD	Range
Theme 1: Etiology and development	2.47 \pm 1.09	0–6
Theme 2: Classification and observation	2.30 \pm 1.21	0–5
Theme 3: Risk assessment	1.13 \pm 0.72	0–2
Theme 4: Nutrition	0.70 \pm 0.45	0–1
Theme 5: Preventive measures to reduce amount of pressure	2.89 \pm 1.35	0–7
Theme 6: Preventive measures to reduce duration of pressure	2.29 \pm 1.23	0–5
Total score	11.80 \pm 3.28	2–24

Abbreviation: PUPKAI, Pressure Ulcer Prevention Knowledge Assessment Instrument.

than 10 years of service scored higher in total and in themes 4, 5, and 6 ($P = .001$, $P = .002$, $P = .001$, $P = .026$, respectively; Table 3).

A statistically significant difference was also found between the hospitals and clinics where the participants worked and their PUPKAI knowledge level. After Bonferroni correction, the authors determined that the source of the difference in theme 1 was the nurses working in ICUs; in theme 2, the source of the difference was the nurses working in surgical clinics, and in themes 3 and 5, the source of the difference was the nurses working in internal clinics ($P < .005$ for all). Nurses working in public hospitals scored higher on the PUPKAI in total, on theme 3 (1.13 ± 0.72), and on theme 5 (2.89 ± 1.35) in comparison with nurses working in private hospitals (Table 3).

There was a strong correlation between the nurses' training on PI prevention and their PUPKAI knowledge level. The total PUPKAI score and the scores on themes 2, 3, and 6 were higher for the nurses who received training than for the nurses who did not receive training ($P \leq .001$). The nurses who participated in scientific programs on PIs had higher PUPKAI total scores and scores on themes 1, 2, 4, and 6 compared with nurses who did not participate in such programs ($P = .000$, $P = .031$, $P = .000$, $P = .014$, $P = .002$, respectively; Table 3).

DISCUSSION

Previous research has found links between nurses' attitudes toward and/or knowledge of PI risk factors and preventive measures and their PI prevention attempts.^{11,17,19–23} The mean PUPKAI score of the nurses who participated in this study was quite low, and only 8.4% of the participants had adequate PI knowledge as determined by

Table 3. COMPARISON OF PRESSURE ULCER PREVENTION KNOWLEDGE ASSESSMENT INSTRUMENT SCORES BY NURSE CHARACTERISTICS

Characteristic	Total Score	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6
Sex							
Female	11.55 ± 3.12	2.41 ± 1.11	2.17 ± 1.16	1.13 ± 0.73	0.69 ± 0.45	2.88 ± 1.33	2.25 ± 1.22
Male	12.65 ± 3.68	2.69 ± 0.98	2.74 ± 1.27	1.10 ± 0.70	0.72 ± 0.44	2.93 ± 1.42	2.45 ± 1.27
<i>P, t</i>	.108, 2.845	.046 , 2.156	.029 , 4.035	.329, 0.307	.307, 0.497	.718, 0.319	.78, 0.780
Education level							
Associate degree ^a	11.55 ± 3.22	2.46 ± 1.11	2.36 ± 1.24	1.04 ± 0.69	0.68 ± 0.46	2.82 ± 1.31	2.17 ± 1.15
Bachelor degree ^b	11.97 ± 3.23	2.44 ± 1.04	2.13 ± 1.12	1.25 ± 0.77	0.72 ± 0.44	2.93 ± 1.37	2.48 ± 1.35
Advanced practice nurses (postgraduate) ^c	15.50 ± 3.53	3.30 ± 1.05	3.30 ± 1.05	1.40 ± 0.51	0.90 ± 0.31	3.90 ± 1.72	2.70 ± 1.05
<i>P, F</i>	<.001 , 7.470 ^(c-a,b)	.054, 2.947	.006 , 5.188 ^(c-a,b)	.011 , 4.582 ^(c-a,b)	.296, 1.221	.044 , 3.155 ^(c-a,b)	.029 , 3.580 ^(c-a,b)
Professional experience, y							
1-5 ^a	11.42 ± 3.17	2.42 ± 1.07	2.30 ± 1.23	1.08 ± 0.72	0.69 ± 0.46	2.72 ± 1.23	2.19 ± 1.19
6-10 ^b	12.20 ± 2.97	2.40 ± 0.99	2.32 ± 1.09	1.16 ± 0.75	0.59 ± 0.49	3.32 ± 1.33	2.39 ± 1.40
>10 ^c	13.06 ± 3.84	2.79 ± 1.26	2.27 ± 1.26	1.31 ± 0.68	0.87 ± 0.32	3.15 ± 1.72	2.65 ± 1.16
<i>P, f</i>	<.001 , 6.826 ^(c-a,b)	.057, 2.889	.975, 1.026	.090, 2.423	.002 , 6.601 ^(c-a,b)	<.001 , 7.227 ^(c-a,b)	.026 , 3.664 ^(c-a,b)
Wards							
ICUs ^a	11.38 ± 3.25	2.27 ± 0.93	2.54 ± 1.23	1.00 ± 0.71	0.69 ± 0.46	2.71 ± 1.15	2.16 ± 1.09
Surgical clinics ^b	12.09 ± 3.78	2.53 ± 1.31	2.06 ± 1.20	1.09 ± 0.78	0.72 ± 0.44	3.12 ± 1.66	2.54 ± 1.13
Internal medicine clinics ^c	12.70 ± 3.85	2.62 ± 1.27	2.28 ± 1.14	1.48 ± 0.67	0.64 ± 0.48	3.34 ± 1.52	2.34 ± 1.50
Other (outpatient diagnosis and treatment clinics, emergency services) ^d	11.96 ± 2.36	2.78 ± 1.02	1.98 ± 1.13	1.24 ± 0.66	0.75 ± 0.43	2.84 ± 1.30	2.34 ± 1.40
<i>P, f</i>	.54, 2.572	.002 , 5.116 ^(a-d,c,b)	<.0001 , 5.566 ^(c-a,b,d)	<.0001 , 7.057 ^(c-a,b,d)	.508, 0.775	.011 , 3.734 ^(c-a,b,d)	.142, 1.824
Hospital type							
Private hospital	11.50 ± 3.09	2.45 ± 1.06	2.30 ± 1.24	1.06 ± 0.70	0.68 ± 0.46	2.77 ± 1.25	2.23 ± 1.21
Public hospital	12.86 ± 3.73	2.55 ± 1.20	2.28 ± 1.09	1.37 ± 0.76	0.78 ± 0.41	3.34 ± 1.58	2.52 ± 1.30
<i>P, t</i>	.001 , 3.465	.431, 0.788	.870, 0.164	<.001 , 3.617	.065, 1.854	<.001 , 3.548	.051, 1.955
Level of sufficiency							
Insufficient	11.22 ± 2.67	2.36 ± 1.03	2.19 ± 1.17	1.08 ± 0.72	0.68 ± 0.46	2.71 ± 1.17	2.16 ± 1.18
Sufficient	18.17 ± 2.58	3.64 ± 1.01	3.44 ± 1.10	1.61 ± 0.55	0.91 ± 0.28	4.88 ± 1.60	3.67 ± 0.87
<i>P, t</i>	<.001 , 14.559	<.001 , 6.884	<.001 , 5.944	<.001 , 4.163	<.001 , 2.787	<.001 , 9.974	<.001 , 7.224
Education about pressure injury prevention							
Yes	12.52 ± 3.06	2.50 ± 1.03	2.47 ± 1.23	1.24 ± 0.67	0.73 ± 0.44	2.98 ± 1.33	2.58 ± 1.17
No	10.64 ± 3.36	2.39 ± 1.18	2.05 ± 1.12	0.95 ± 0.77	0.65 ± 0.47	2.75 ± 1.37	1.83 ± 1.21
<i>P, t</i>	.000, 5.651	.349, 0.938	<.001 , 3.390	.000, 3.880	.099, 1.652	.111, 1.596	.000, 6.050
Participation in scientific programs about pressure injuries							
Yes	12.89 ± 3.35	2.64 ± 0.96	2.78 ± 1.25	1.09 ± 0.63	0.78 ± 0.41	3.02 ± 1.30	2.56 ± 1.17
No	11.26 ± 3.12	2.39 ± 1.14	2.06 ± 1.12	1.14 ± 0.76	0.66 ± 0.47	2.83 ± 1.37	2.16 ± 1.24
<i>P, t</i>	<.001 , 4.826	.031, 2.160	<.001 , 5.818	.515, 0.652	.014, 2.465	.181, 1.341	0.002, 3.142

Note: Theme 1: Etiology and development, theme 2: Classification and observation, theme 3: Risk assessment, theme 4: Nutrition, theme 5: Preventive measures to reduce the amount of pressure, theme 6: Preventive measures to reduce the duration of pressure. After post hoc Bonferroni corrections: (c-a, b), variable marked "c" had statistically significance difference from variables marked "a" and "b"; (c-a, b, d), variable marked "c" marked had statistically significance difference from variables marked "a," "b," and "d"; (a-b, c, d), variable marked "a" had statistically significant difference from variables "d," "c," and "b."

the scale. Similarly, Sengül and Karadağ¹⁴ found that nurses in Turkey had a mean score of 11.1 on the PUPKAI, and Tülek et al¹⁵ emphasized that nurses lack knowledge

about PIs. A study in Jordan found that nurses' mean score on the PUPKAI was 10.84.²⁴ Gunningberg et al⁶ similarly showed in Sweden that prevention knowledge for all

levels of staff was unacceptable or borderline, and nurses' PI and prevention knowledge levels were low. Kim and Lee¹³ reported in their study in Korea that nurses had a moderate level of knowledge regarding preventing PIs. These results show that nurses' knowledge about the prevention of PIs is only moderate or insufficient in many different countries. Moderate or insufficient PUPKAI mean scores might be related to nurses' failing to follow the latest developments and evidence in PI prevention, rather than reflecting their theoretical knowledge about the care environment, or perhaps the institutional culture of the healthcare environments in which they work does not promote preventive practices.

When examining the participants' scores on the PUPKAI subdimensions, the authors determined that, although scores were insufficient in all dimensions, participants earned the highest scores on themes 3 (risk assessment) and 4 (nutrition) and the lowest scores on theme 5 (preventive measures to reduce the amount of pressure; Table 2). Nurses are obliged to use PI risk assessment scales as required by the quality standards of the ministry of health, and themes 3 and 4 explore more general information about PI risk assessment and nutrition. Literature results on this topic vary, however. In the study by Aydoğan et al,²⁵ participants received the lowest scores on themes 1 and 2. In the study by Fulbrook et al,²⁶ participants scored lowest on theme 2, and in the study by Tülek et al,¹⁵ participants scored lowest on themes 4 and 5. These differences across subdimension scores may relate to differences in education, as well as different qualities of care and institutional cultures at the facilities where the nurses work.

Whereas some researchers found no relationships between the sociodemographic and working characteristics of nurses and PUPKAI knowledge levels,^{16,18,23} in this study, male nurses' mean scores on themes 1 and 2 were higher than those of female nurses (Table 3). Doğu²⁷ also observed that male nurses' PUPKAI scores were higher, but the difference was not statistically significant. The number of male nurses has increased in recent years, and almost all of them have bachelor degrees, which might help explain the present findings.²⁸ In addition, perhaps because male nurses are likely to have greater physical strength, they preferentially work with bedridden patients who are likely to develop PIs.

The authors also found relationships between education and experience and nurses' PUPKAI scores. Nurses with postgraduate education evidenced greater knowledge of PI prevention than did nurses with less education. Previous findings on this topic have been mixed, with some research showing that education level is not related to knowledge level or has a weak association^{29,30} and other evidence indicating that the educational status of nurses positively affects their knowledge level.^{16,20}

Because nurses with postgraduate education received a more comprehensive education, they might be more familiar with, and thus more conscious about, PI prevention. In addition, the knowledge level of nurses with more than 10 years of experience was greater than that of less-experienced nurses. Thus, having greater professional experience correlated with knowledge of PI prevention.^{4,24,31}

The type of institution at which the nurses worked also correlated with PUPKAI mean scores: nurses working at public hospitals scored higher than did nurses working at private hospitals (Table 3). In a study conducted in Turkey in 2019 at a private hospital, the PUPKAI knowledge level of the participant nurses was low.²⁰ Perhaps private hospitals in Turkey more often employ nurses who are recent graduates and trying to gain experience, or those with a high school education or associate degree in comparison to state hospitals.

Training programs for PIs and their prevention positively affect the knowledge levels, prevention attempts, and attitudes of nurses.^{31,32} Feng et al³³ reported that regular training for 2 years increased nurses' knowledge of PI management and decreased the incidence of PIs. In this study, the PUPKAI mean scores were higher for nurses who received training on PIs and their prevention, participated in scientific programs on this subject, and had been following research developments (Table 3). Compulsory in-service training programs on PIs for training nurses do not have a standardized content or duration nationwide in Turkey. Each institution has its own training program content and duration. It is important for nurses to keep their postgraduation training up-to-date and have a high level of awareness of PIs to increase the quality of nursing care.

Limitations

This study was not observational; the responses to the PUPKAI scale were based on nurses' statements, and there are inherent limitations to self-reported data. This study indicates the level of knowledge of the nurses in the region where it was conducted and cannot be generalized to other populations.

CONCLUSIONS

Nurses' level of knowledge about PIs and preventive measures was found to be low. The results of this study and the literature indicate a need for greater nursing education and postgraduate training on PIs and their prevention. To prevent PIs and thereby reduce the cost of treatment and care and improve patients' quality of life, institutions should organize training programs and provide easy access to evidence-based information for nurses. The findings of this study suggest that institutions should develop standardized training programs that have evidence-based, scientific content regarding

skin assessment, defining PI risk factors, risk assessment, use of up-to-date risk assessment tools, choosing proper support surfaces in accordance with the risk assessment of the patient, explaining stages and characteristics of PIs, assessing factors affecting PI healing, choosing proper wound covering products, and proper recording and reporting; nurses' knowledge should be evaluated frequently. Nurses who receive training on the subject, attend scientific meetings, and follow up-to-date evidence on nursing practices have higher levels of knowledge; thus, awareness about the importance of following education/scientific developments should be promoted. ●

REFERENCES

- Ebi WE, Hirko GF, Mijena DA. Nurses' knowledge to pressure ulcer prevention in public hospitals in Wollega: a cross-sectional study design. *BMC Nurs* 2019;18:1-12.
- Biçer E. Knowledge and practices of nursing students on pressure ulcer prevention. *J Duzce Uni Health Sci Inst* 2021;11:1-7.
- National Pressure Ulcer Advisory Panel (NPUAP), European Pressure Ulcer Advisory Panel (EPUAP), Pan Pacific Injury Alliance (PPPIA). *Prevention and Treatment of Pressure Ulcers: Quick Reference Guide*. Haesler E, ed. Osborne Park, Australia: Cambridge Media; 2014:1-76.
- Nuru N, Zewdu F, Amsalu S, Mehretie Y. Knowledge and practice of nurses towards prevention of pressure ulcer and associated factors in Gondar University Hospital, Northwest Ethiopia. *BMC Nurs* 2015;14:1-8.
- Avşar P, Karadağ A. Adaptation of Waterlow pressure ulcer risk assessment scale to Turkish, validity-reliability study. *Hacettepe Uni Faculty of Health Sci Nurs J* 2016;3:1-15.
- Gunningberg L, Mårtensson G, Mamhidir AG, Florin J, Muntlin Athlin Å, Bååth C. Pressure ulcer knowledge of registered nurses, assistant nurses and student nurses: a descriptive, comparative multicentre study in Sweden. *Int Wound J* 2015;12:462-8.
- Özyürek P, Yavuz M. Prevention of pressure ulcers in the intensive care unit. *Clin Nurs Spec* 2015;29:210-7.
- Coyer F, Miles S, Gosley S, Fulbrook P, Sketcher-Baker K, Cook J L, Whitmore J. Pressure injury prevalence in intensive care versus non-intensive care patients: a state-wide comparison. *Aust Crit Care* 2017;30:244-50.
- Tirgari B, Mirshekari L, Forouzi MA. Pressure injury prevention: knowledge and attitudes of Iranian intensive care nurses. *Adv Skin Wound Care* 2018;31:1-8.
- Charalambous C, Koulouri A, Roupa Z, Vasilopoulos A, Kyriakou M, Vasiliou M. Knowledge and attitudes of nurses in a major public hospital in Cyprus towards pressure ulcer prevention. *J Tissue Viability* 2019;28:40-5.
- Tallier PC, Reineke PR, Asadoorian K, Choonoo JG, Campo M, Malmgreen-Wallen C. Perioperative registered nurses knowledge, attitudes, behaviors, and barriers regarding pressure ulcer prevention in perioperative patients. *Appl Nurs Res* 2017;36:106-10.
- Yılmaz T, Tüzer H, Erciyas A. Knowledge and attitudes towards prevention of pressure ulcer: intensive care units sample in Turkey. *Turk Klin J Nurs Sci* 2019;11:140-7.
- Kim JY, Lee YJ. A study on the nursing knowledge, attitude, and performance towards pressure ulcer prevention among nurses in Korea long-term care facilities. *Int Wound J* 2019;16:29-35.
- Sengül T, Karadağ A. Determination of nurses' level of knowledge on the prevention of pressure ulcers: the case of Turkey. *J Tissue Viability* 2020;29:337-41.
- Tülek Z, Polat C, Ozkan I, Theofanidis D, Togrul RE. Validity and reliability of the Turkish version of the pressure ulcer prevention knowledge assessment instrument. *J Tissue Viability* 2016;25:201-8.
- A, Yavuz van Giersbergen M. Nurses' attitudes towards pressure ulcer prevention in Turkey. *J Tissue Viability* 2016;25:66-73.
- Demarré L, Vanderwee K, Defloor T, Verhaeghe S, Schoonhoven L, Beeckman D. Pressure ulcers: knowledge and attitude of nurses and nursing assistants in Belgian nursing homes. *J Clin Nurs* 2012;21:1425-34.
- Ünver S, Fındık ÜY, Özkan ZK, Sürcü Ç. Attitudes of surgical nurses towards pressure ulcer prevention. *J Tissue Viability* 2017;26:277-81.
- Beeckman D, Defloor T, Demarré L, Van Hecke A, Vanderwee K. Pressure ulcers: development and psychometric evaluation of the Attitude Towards Pressure Ulcer Prevention Instrument (APuP). *Int J Nurs Stud* 2010;47:1432-41.
- Strand T, Lindgren M. Knowledge, attitudes and barriers towards prevention of pressure ulcers in intensive care units: a descriptive cross-sectional study. *Intensive Crit Care Nurs* 2010;26:335-42.
- De Almeida Tavares JP, da Silva AL, Sá-Couto P, Boltz M, Capezuti E. Portuguese nurses' knowledge of and attitudes toward hospitalized older adults. *Scand J Caring Sci* 2015;29:51-61.
- Uba MN, Alih FI, Kever RT, Lola N. Knowledge, attitude and practice of nurses toward pressure ulcer prevention in University of Maiduguri Teaching Hospital, Borno State, North-Eastern, Nigeria. *Int J Nurs Midwifery* 2015;7:54-60.
- Kaddourah B, Abu-Shaheen AK, Al-Tannir M. Knowledge and attitudes of health professionals towards pressure ulcers at a rehabilitation hospital: a cross-sectional study. *BMC Nurs* 2016;15:1-6.
- Qaddumi J, Khawaldeh A. Pressure ulcer prevention knowledge among Jordanian nurses: a cross-sectional study. *BMC Nurs* 2014;13:1-8.
- Aydoğan S, Caliskan N. A descriptive study of Turkish intensive care nurses' pressure ulcer prevention knowledge, attitudes, and perceived barriers to care. *Wound Manag Prev* 2019;65:39-47.
- Fulbrook P, Lawrence P, Miles S. Australian nurses' knowledge of pressure injury prevention and management: a cross-sectional survey. *J Wound Ostomy Continence Nurs* 2019;46:106-12.
- Doğu Ö. Yoğun Bakım Hemşirelerinin Bası Yarası, Bakımı ve Bakım Ürünleri Kullanımına İlişkin Bilgi ve Uygulamalarının Değerlendirilmesi [Evaluation of intensive care nurses' knowledge and practices regarding pressure sore, care and use of care products]. *J Human Rhythm* 2015;1:95-100.
- Göncü Savran T. Being a male nurse in Turkey: advantages and disadvantages. *Ankara Univ SBF J* 2017;72:35-76.
- Tubaishat A, Aljezawi M, Al Qadire M. Nurses' attitudes and perceived barriers to pressure ulcer prevention in Jordan. *J Wound Care* 2013;22:490-7.
- Aydın AK, Karadağ A. Assessment of nurses' knowledge and practice in prevention and management of deep tissue injury and stage I pressure ulcer. *J Wound Ostomy Continence Nurs* 2010;37:487-94.
- Iranmanesh S, Tafti AA, Rafiei H, Dehghan M, Razban F. Orthopaedic nurses' knowledge about pressure ulcers in Iran: a cross-sectional study. *J Wound Care* 2013;22:138-43.
- Saleh MY, Al-Hussami M, Anthony D. Pressure ulcer prevention and treatment knowledge of Jordanian nurses. *J Tissue Viability* 2013;22:1-11.
- Feng H, Li G, Xu C, Ju C. Educational campaign to increase knowledge of pressure ulcers. *Br J Nurs* 2016;25:S30-35.