

The Effect of Video Based Online Learning on Nurses' Knowledge of Pressure Ulcers: A Quantitative Quasi-Experimental Study

Videoya Dayalı Çevrimiçi Eğitimin Hemşirelerin Basınç Yarası Bilgi Düzeyine Etkisi: Yarı Deneysel Bir Çalışma

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This study was prepared based on the findings of Tuba Etik's thesis study titled "The Effect of Digital Education on Nurses' Knowledge Level and Care Practices About Pressure Ulcers" (İstanbul: Okan University; 2022).

ABSTRACT Objective: Pressure ulcers a significant burden impacting patients, their families, and healthcare system. It is crucial for nurses to be knowledgeable about the prevention and successful treatment of pressure ulcers. The purpose of this study is to determine the effect of video based online learning on increasing nurses' pressure ulcer knowledge. **Material and Methods:** This study was a quantitative quasi-experimental and adopted a single-group, pretest-posttest design. The research was conducted between 01.10.2021 and 31.12.2021 in the intensive care unit (ICU) of a university hospital. The sample consisted of 70 nurses working in the ICU. Data were collected online using a personal information form (17 items), a Knowledge Level Measurement Form (KLMF; 18 items), and a Care Practices Identification Form (CPIF; 22 items). Participants attended a video tutorial program about pressure ulcers and their care. The data were collected online before and after the intervention. The data were analyzed using the Statistical Package for Social Sciences (SPSS, v. 24.0) at a significance level of 0.05. **Results:** Participants had a significantly higher mean posttest KLMF score than the pretest score. However, age, gender, education, work experience in general, and work experience in the ICU did not affect their KLMF scores. **Conclusion:** Vide based online learning approach is an effective educational method that helps nurses learn more about pressure ulcers.

ÖZET Amaç: Basınç yarası; hastaları, ailelerini ve sağlık sistemlerini etkileyen önemli bir sorundur. Bu sorunun önlenmesinde ve etkin tedavisinde hemşirelerin bilgili olması oldukça önemlidir. Bu çalışmanın amacı, dijital eğitimin hemşirelerin basınç yarası bilgi seviyesini artırmadaki etkisini belirlemektir. **Gereç ve Yöntemler:** Yarı deneysel araştırma tasarımında olan bu çalışma tek grupta ve ön test-son test desende yürütüldü. Çalışma 01.10.2021-31.12.2021 tarihleri arasında bir üniversite hastanesinin yoğun bakımında çalışan 70 hemşire ile yapıldı. Araştırmada katılımcıların sosyodemografik özellikleri ile ilgili 17 soru ve ifadeden oluşan Veri Toplama Formu, araştırmacı tarafından literatüre dayanarak hazırlanan 18 sorudan oluşan Bilgi Düzeyi Ölçme Formu ve 22 ifadeden oluşan Bakım Uygulamalarını Belirleme Formu kullanıldı. Çalışma, basınç yarasıyla ilgili bilgi ve bakım uygulamalarını içeren video eğitimi verilerek yapıldı. Veriler çevrimiçi ortamda ve eğitimden önce ve sonra olmak üzere iki aşamada toplandı. Veriler SPSS 24.0 programı ile analiz edildi. Tüm analizlerde $p < 0,05$ değeri anlamlı kabul edildi. **Bulgular:** Hemşirelerin eğitim öncesi bilgi düzeylerinin eğitim sonrası bilgi düzeylerinden daha düşük olduğu ve verilen dijital eğitim ile bilgi düzeylerinde anlamlı derecede artış olduğu, hemşirelerin yaş, cinsiyet, eğitim, çalışma süresi ve yoğun bakımda çalışma süresinin bu çalışmada bilgi düzeyi ile ilişkisinin bulunmadığı saptandı. **Sonuç:** Bu çalışmadan elde edilen sonuçlara göre dijital eğitim hemşirelerin basınç yarası bilgi düzeyini artırmak için kullanılabilecek etkili bir eğitim yöntemidir.

Keywords: Nursing education; online learning; pressure ulcer

Anahtar Kelimeler: Hemşirelik eğitimi; dijital eğitim; basınç yarası

Pressure ulcers develop when pressure exceeds capillary blood flow, causing ischemia and subsequent tissue necrosis.¹ Bony prominences (the coc-

cyx, sacrum, heels, buttocks, and elbows) are most susceptible to pressure ulcers.^{1,2} However, they can also develop in any region where the skin is damaged

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by abrasion, friction, or moisture. Tissue ischemia and necrosis can occur within as little as two hours, contingent upon the patient's overall health, mobility, and the firmness of the surface they are seated or lying on.¹⁻³ To assess pressure ulcers, we need to identify intrinsic factors that alter skin integrity and extrinsic factors that damage skin integrity. Experts employ reliable measurement methods to assess pressure ulcers and identify associated risk factors.¹⁻⁴

Pressure ulcers a significant economic burden on the healthcare system by extending patients' recovery periods and hospital stays, diminishing their quality of life, and leading to complications.¹⁻⁴ Therefore, it is important to prevent pressure ulcers. The critical point in preventing pressure ulcers is the holistic, accurate, and continuous assessment of risk factors. Nurses should evaluate the risk factors and perform the right care practices to prevent pressure ulcers from developing.^{3,4} Intensive care units (ICU) are areas where pressure ulcers are encountered, and therefore, intensive care nurses in particular must be knowledgeable and equipped regarding pressure ulcer prevention and care.⁵

Few researchers have investigated what Turkish nurses think about the risk factors associated with pressure ulcers. Moreover, our clinical observations show that Turkish nurses know little about pressure ulcers. The international literature suggests that more research is warranted to strengthen the association between training and pressure ulcer knowledge. Moreover, researchers argue that we need to conduct further research to elucidate the impact of education and age on the effectiveness of pressure ulcer training.⁵⁻¹⁵ Nurses can prevent or treat pressure ulcers by assessing their knowledge about them and bridging gaps through tailored educational programs. The proper training method is essential for effective training. Advances in technology allow us to replace classical education methods with digital ones. Several studies have indicated that pressure ulcer training delivered through online education methods enhances knowledge acquisition and is more advantageous than traditional training, as it eliminates the need for a specific time and physical classroom setting.^{16,17}

The studies report that nurses' knowledge regarding pressure ulcers is generally low but improves significantly among those who receive training or attend courses on the subject.^{18,19} Studies utilizing online education methods have demonstrated that such training is effective, with high levels of participant satisfaction.²⁰⁻²² However, there is a limited number of studies assessing the effectiveness of online education specifically within a sample group of graduate nurses, highlighting the need for further research in this area. Therefore, this paper examined the impact of video based online learning on nurses' knowledge of pressure ulcers. Based on this information, the following hypotheses were formulated:

H0: Video-based online education has no effect on nurses' knowledge of pressure ulcers.

H1: Video-based online education is effective in enhancing nurses' knowledge of pressure ulcers.

MATERIAL AND METHODS

DESIGN AND SETTING

This study adopted a single-group, pretest-posttest design to determine how the intervention affected nurses' knowledge of pressure ulcers. The research was conducted between 01.10.2021 and 31.12.2021 in the ICU of a university hospital.

ETHICAL CONSIDERATIONS

The study was approved by Istanbul Okan University ethics committee (date: May 05, 2021, no: 23). Permission was obtained from İstanbul University (date: September 22, 2021, no: E-46143867-044-487268). All nurses were briefed about the research purpose and procedure. Written informed consent was obtained from all participants. The study adhered consistently to the principles of the Helsinki Declaration and ethical guidelines, ensuring a steadfast commitment to ethical conduct throughout the research.

POPULATION AND SAMPLE

The ICU has 16 beds and 80 nurses. No sampling was performed because the goal was to recruit all nurses. The inclusion criteria for the study were defined as being a nurse and working in an ICU. However, ten

nurses were excluded for various reasons (coronavirus disease-2019, vacation, sick leave, etc.). All nurses were briefed about the research purpose and procedure. Informed consent was obtained from those who volunteered to participate. The sample consisted of 70 participants.

DATA COLLECTION TOOLS

The data were collected online using a personal information form (17 items), a Knowledge Level Measurement Form (KLMF; 18 items), and a Care Practices Identification Form (CPIF; 22 items). The KLMF form comprised questions assessing theoretical knowledge on topics pressure ulcer definition, causes, classification, and pathophysiology. The CPIF form consisted of questions evaluating practical knowledge related to the prevention and nursing care of pressure ulcers.

The researchers conducted a literature review and consulted with four experts to develop the data collection tools.²³⁻²⁶ Experts were consulted to assess the relevance and measurement accuracy of each item in the data collection form. The content validity ratio for each item was calculated, and inter-rater agreement was established. Items with a content validity ratio between 0 and 1 were retained in the final data collection form.

The researchers used two different forms to measure participants' knowledge of pressure ulcers and used a separate form for questions on care practices. After all, they hypothesized that participants might have more practical knowledge than theoretical knowledge because they interact with experienced staff.²⁷ Thus, separate assessment of the theoretical and practical knowledge has obtained much more detailed knowledge about pressure ulcer for nurses. The CPIF and KLMF had Cronbach's alpha scores of 0.828 and 0.731, respectively.

ONLINE LEARNING INTERVENTION AND DATA COLLECTION

The data were collected online before and after the intervention. The intervention was a 45-minute video tutorial on the (1) definition, incidence, and etiology of pressure ulcers, (2) risk assessment and risk factors, (3) stages of pressure ulcers, (4) pressure ulcer

prevention and nursing interventions (5) evidence based nursing care on pressure ulcers. The intervention was presented to the participants online and asynchronously. A separate communication network was created for question and answer sessions.

The research had four stages: (1) sending an online link to all participants, (2) administering the pretest, (3) performing the intervention, and (4) administering the posttest. All participants were asked to complete Stages 2, 3, and 4 on the same day. The pretest and posttest consisted of questions answered as 0 (false) or 1 (true).

STATISTICAL ANALYSIS

The data were analyzed using the Statistical Package for Social Sciences (SPSS, v. 24.0) at a significance level of 0.05 and confidence interval of 95%. Numbers, percentages, means, and standard deviations were used for descriptive characteristics. Normality was tested using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The results showed that the data were nonnormally distributed. Therefore, nonparametric tests were used for analysis.

RESULTS

Participants had a mean 27.41 ± 6.12 years of age. More than half of the participants were women (62.9%). Most participants had bachelor's degrees (78.6%). Participants had more than four years of work experience in general (4.93 ± 6.3). They had more than four years of work experience in the ICU (4.43 ± 6.24) (Table 1).

TABLE 1: Descriptive characteristics.

			$\bar{X} \pm SD$
Age (year)	Number	Percentage	27.41 ± 6.12
Gender			
Woman	44	62.9	
Man	26	37.1	
Education (degree)			
High school	11	15.7	
Bachelor's	55	78.6	
Master's/Ph.D.	4	5.7	
Work experience in general (year)			4.93 ± 6.3
Work experience in the intensive care unit (year)			4.43 ± 6.24

SD: Standard deviation.

Participants had a significantly higher mean posttest KLMF score than the pretest score, suggesting they answered significantly more questions correctly after the intervention than before ($p<0.05$). They had almost 60% of knowledge level before the intervention, whereas they had 90.1% of knowledge level after the intervention (Table 2).

Participants had a significantly higher mean posttest CPIF score than the pretest score, suggesting

they answered significantly more questions correctly after the intervention ($p<0.05$). They answered 73.5% of the questions correctly before the intervention and 90.1% correctly after the intervention (Table 3).

The results showed that education levels did not affect participants' KLMF and CPIF scores ($p>0.05$) (Table 4). Age, work experience in general, and work experience in the ICU did not affect participants' KLMF and CPIF scores ($p>0.05$) (Table 5).

TABLE 2: Knowledge Level Measurement Form.

		Group		χ^2	*p
		Pretest	Posttest		
How much protein should a patient with pressure ulcers consume?	False	40 (57.1%)	16 (22.9%)	17.143	<0.001
	True	30 (42.9%)	54 (77.1%)		
Which of the following is not one of the pressure zones in the lateral position?	False	13 (18.6%)		14.331	<0.001
	True	57 (81.4%)	70 (100%)		
Which of the following is not one of the static tools used to reduce pressure?	False	58 (82.9%)	28 (40%)	27.132	<0.001
	True	12 (17.1%)	42 (60%)		
Which of the following is true about pressure ulcers?	False	22 (31.4%)		26.102	<0.001
	True	48 (68.6%)	70 (100%)		
Which of the following is not a risk factor for pressure ulcers?	False	6 (8.6%)		6.269	0.014
	True	64 (91.4%)	70 (100%)		
Which of the following is first encountered in the early stages of pressure ulcers?	False	60 (85.7%)	29 (41.4%)	29.641	<0.001
	True	10 (14.3%)	41 (58.6%)		
Which of the following is an incorrect statement for Stage III pressure ulcers?	False	34 (48.6%)		44.906	<0.001
	True	36 (51.4%)	70 (100%)		
Which of the following is not a scale used to assess pressure ulcers?	False	6 (8.6%)		6.269	0.014
	True	64 (91.4%)	70 (100%)		
Which of the following is not one of the stages of wound healing?	False	13 (18.6%)		14.331	<0.001
	True	57 (81.4%)	70 (70%)		
Which of the following is a local treatment for pressure ulcers?	False	62 (88.6%)	23 (32.9%)	45.549	<0.001
	True	8 (11.4%)	47 (67.1%)		
Which of the following is a nursing care for pressure ulcer prevention?	True	70 (100%)	70 (100%)	-----	-----
Which of the following are the most common sites of pressure ulcers?	False	37 (52.9%)		50.291	<0.001
	True	33 (47.1%)	70 (100%)		
Which of the following statement is false?	False	28 (40%)		35	<0.001
	True	42 (60%)	70 (100%)		
What should be the serum albumin level for wound healing?	False	55 (78.6%)	24 (34.3%)	27.919	<0.001
	True	15 (21.4%)	46 (65.7%)		
Which of the following is a complication after surgical treatment of pressure ulcers?	False	4 (5.7%)	1 (1.4%)	1.867	0.183
	True	66 (94.3%)	69 (98.6%)		
Which of the following is not a goal of wound care?	False	12 (17.1%)	1 (1.4%)	10.26	0.002
	True	58 (82.9%)	69 (98.6%)		
Which of the following surgical wound types is false?	False	33 (47.1%)	2 (2.9%)	36.61	<0.001
	True	37 (52.9%)	68 (97.1%)		
Which of the following is not a local factor affecting the healing of surgical wounds?	False	32 (45.7%)		41.481	<0.001
	True	38 (54.3%)	70 (100%)		

*Fisher's exact test.

TABLE 3: Care Practices Identification Form.

		Group		χ^2	*p
		Pretest	Posttest		
Most pressure ulcers develop within 24-48 hours following immobilization.	False	6 (8.6%)		6.269	0.014
	True	64 (91.4%)	70 (100%)		
Patients with neurological diseases (stroke, ataxia, MS, etc.) are at risk groups for mobilization.	False		1 (1.4%)	1.007	0.5
	True	70 (100%)	69 (98.6%)		
Malnutrition and anemia do not play a role in pressure ulcers.	False	16 (22.9%)	2 (2.9%)	12.495	<0.001
	True	54 (77.1%)	68 (97.1%)		
In the acute phase, redness develops on the compressed skin, followed by induration, bullae, cyanosis, and tissue necrosis.	False	5 (7.1%)	2 (2.9%)	1.353	0.221
	True	65 (92.9%)	68 (97.1%)		
Deep tissue destruction (skin, subcutaneous, fat, fascia, and muscle) is not observed in chronic pressure ulcers.	False	30 (42.9%)	2 (2.9%)	31.759	<0.001
	True	40 (57.1%)	68 (97.1%)		
Air mattress should be used to prevent pressure ulcers in bedridden patients.	False	2 (2.9%)	3 (4.3%)	0.207	0.5
	True	68 (97.1%)	67 (95.7%)		
Bedridden patients should be repositioned every three hours to prevent pressure ulcers.	False	27 (38.6%)	2 (2.9%)	27.182	<0.001
	True	43 (61.4%)	68 (97.1%)		
The Braden scale is used to assess the risk of pressure ulcers.	False	3 (4.3%)	1 (1.4%)	1.029	0.31
	True	67 (95.7%)	69 (98.6%)		
We must assess the nutritional needs of patients at risk of pressure ulcers.	False	1 (1.4%)	1 (1.4%)	---	---
	True	69 (98.6%)	69 (98.6%)		
We must assess all patients for the risk of pressure ulcers.	False	66 (94.3%)	21 (30%)	61.483	<0.001
	True	4 (5.7%)	49 (70%)		
We must use moisturizing cream to protect the reddened skin.	False	64 (91.4%)	18 (25.7%)	62.288	<0.001
	True	6 (8.6%)	52 (74.3%)		
When we position a patient, we should spread the body weight over the widest possible area.	False	5 (7.1%)	1 (1.4%)	2.786	0.104
	True	65 (92.9%)	69 (98.6%)		
We must give a patient a right or left lateral position at a 30-degree angle.	False	34 (48.6%)	17 (24.3%)	8.914	0.002
	True	36 (51.4%)	53 (75.7%)		
We should not use supportive gels or pillows on areas subjected to pressure.	False	16 (22.9%)	4 (5.7%)	8.4	0.003
	True	54 (77.1%)	66 (94.3%)		
We must avoid skin friction during transfer or positioning.	False	2 (2.9%)	3 (4.3%)	0.207	0.5
	True	68 (97.1%)	67 (95.7%)		
Surgery is the treatment of choice for Stage III and IV pressure ulcers.	False	9 (12.9%)	4 (5.7%)	2.12	0.122
	True	61 (87.1%)	66 (94.3%)		
Pressure ulcers in the hospital usually develop in the first two weeks after hospitalization.	False	31 (44.3%)	2 (2.9%)	33.345	<0.001
	True	39 (55.7%)	68 (97.1%)		
We should place a pillow on the lower back of the lower leg (from below the knee to the ankle) to prevent the heels from touching the mattress.	False	7 (10%)	2 (2.9%)	2.969	0.083
	True	63 (90%)	68 (97.1%)		
Patients at risk for pressure ulcers should eat less protein and calories.	False	5 (7.1%)	2 (2.9%)	1.353	0.221
	True	65 (92.9%)	68 (97.1%)		
In a Stage I pressure ulcer, there is a partial depth of tissue loss affecting the epidermis or upper layer of the dermis.	False	22 (31.4%)	3 (4.3%)	17.579	<0.001
	True	48 (68.6%)	67 (95.7%)		
Stage I pressure ulcers with intact skin do not require any special treatment.	False	35 (50%)	22 (31.4%)	5.001	0.019
	True	35 (50%)	48 (68.6%)		
No debridement is performed in Stage II, Stage III, and Stage IV pressure ulcers.	False	21 (30%)	1 (1.4%)	21.572	<0.001
	True	49 (70%)	69 (98.6%)		

*Fisher's exact test.

TABLE 4: The effect of education levels on pretest and posttest KLMF and CPIF scores.

	Education (degree)	n	Pretest			Posttest		
			$\bar{X}\pm SD$	χ^2	p value	$\bar{X}\pm SD$	χ^2	p value
KLMF	High school	11	10.73±3.35	1.596	1.255	17.1±1.2	4.408	0.11
	Bachelor's	55	10.73±2.2			16.04±1.65		
	Master's/Ph.D.	4	9.25±2.21			16.75±1.25		
CPIF	High school	11	16.36±1.56	0.45	0.534	20.9±1.85	2.431	0.297
	Bachelor's	55	16.25±2.13			20.23±1.75		
	Master's/Ph.D.	4	14.75±2.98			21±0.816		

χ^2 : Kruskal-Wallis test; SD: Standard deviation; KLMF: Knowledge Level Measurement Form; CPIF: Care Practices Identification Form.

TABLE 5: The effect of age, work experience in general, and work experience in the ICU on pretest and posttest KLMF and CPIF scores.

		Age	Work experience in general	Work experience in the ICU
Pretest				
KLMF	r	-0.025	-0.017	0.065
	p	0.840	0.886	0.591
CPIF	r	-0.024	0.004	0.048
	p	0.847	0.972	0.696
Posttest				
KLMF	r	-0.180	-0.034	-0.022
	p	0.135	0.782	0.858
CPIF	r	-0.073	0.096	0.116
	p	0.547	0.429	0.337

Spearman's correlation test; KLMF: Knowledge Level Measurement Form; CPIF: Care Practices Identification Form; ICU: Intensive care unit.

DISCUSSION

This study investigated the impact of a video based online learning approach on nurses' knowledge of pressure ulcers. Nurses must have accurate and up-to-date information about pressure ulcers to prevent them or provide effective treatment and care. Advances in technology pave the way for more effective training methods. Our findings offer valuable insight into the effectiveness of video based online learning approach on nurses' knowledge of pressure ulcers.

Our participants answered six out of ten questions correctly before the intervention. However, they answered nine out of ten questions correctly after the intervention. Research shows that training programs help healthcare professionals learn more about complications, such as pressure ulcers.^{6,13,20,23,27,28} Nuru et al. conducted an institution-based cross-sectional survey to determine nurses' knowledge regarding pressure ulcer prevention. They recruited 248 nurses

divided into intervention and control groups. The intervention group attended a training session on pressure ulcers. The researchers found that the intervention group knew significantly (four times) more about pressure ulcer prevention than the control group.²⁷ Feng et al. set up a steering group to develop a campaign to increase nurses' (n=275) knowledge of pressure ulcers.²⁸ The researchers reported that the campaign significantly enhanced the participants' knowledge of pressure ulcers and improved their ability to evaluate PU risks.²¹ Doğu also documented that the training programs improved nurses' knowledge of pressure ulcers.^{16,23} All these studies investigate the impact of face-to-face training programs on nurses' knowledge of pressure ulcers. Lopez and Cleary focused on the effect of social media on nursing education. They found that nurses who used social media more were better at concentrating and learning new information than those who did not.²¹ All in all, research indicates that digital platforms are effective and efficient teaching tools for

nursing students. Both theoretical and skill-oriented online training programs make nursing students more interested and motivated.^{22,29,30} Our findings also indicate that video based online learning approach help nursing learn more about pressure ulcers.

Work experience in the ICU did not affect our participants' knowledge levels, which is consistent with the literature.^{7,8} On the other hand, a few study reported that nurses with 11-20 years of work experience had higher knowledge levels than those with 1-10 years of work experience.^{27,31} Our findings suggest that hospitals can provide video based online learning approach to all nurses, regardless of their work experience in ICUs, to enhance their knowledge of pressure ulcers.

Education levels did not affect our participants' knowledge levels, which is consistent with the results of earlier studies.^{7,26} On the other hand, a few study documented that nurses with bachelor's degrees knew significantly more about pressure ulcers than those with high school degrees.^{27,31} Most of our participants were nurses with bachelor's degrees. Moreover, they had a moderate knowledge of pressure ulcers before the intervention. Therefore, our results indicate that hospitals can offer video based online learning approach to all nurses, regardless of their education levels, to enhance their knowledge of pressure ulcers.

LIMITATIONS

The results may not be applicable to nurses outside of this designation. The training outcomes were assessed shortly after the intervention, while long-term results, such as retention of knowledge and recall, were not evaluated. The inability to determine the long-term effects of the training represents a limitation of the study. The data collection form used in the study was developed by the authors through a com-

prehensive literature review and was further refined with input from experts. However, as the form has not undergone a validity and reliability assessment, it is not suitable for use in other studies. This limitation represents a constraint of the current study.

CONCLUSION

In conclusion, video based online learning approach helps nurses learn more about pressure ulcers, regardless of work experience and educational levels. Video based online learning tools can be used for graduate nursing education. Compared to classical education in online education would be possible to provide education to much more nurses. Also online education is favorable because of unnecessary for classes. Future studies can be focused on optimise of online education contents and to be determined of fruitful and quality online education methods.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Sevim Akbal, Tuba Etik; **Design:** Sevim Akbal, Tuba Etik; **Control/Supervision:** Sevim Akbal; **Data Collection and/or Processing:** Tuba Etik; **Analysis and/or Interpretation:** Tuba Etik, Sevim Akbal; **Literature Review:** Tuba Etik, Sevim Akbal; **Writing the Article:** Tuba Etik, Sevim Akbal; **Critical Review:** Tuba Etik, Sevim Akbal; **References and Fundings:** Sevim Akbal, Tuba Etik.

REFERENCES

1. Monica AS, Garcia EFW-C, Aimée D. Pressure injuries. In: Warshaw GA, Potter JF, Flaherty E, McNabney MK, Heflin MT, Ham RJ, eds. *Ham's Primary Care Geriatrics*. 7th ed. Elsevier; 2022. p.297-305.
2. Spruce L. Strategies to help prevent hospital-acquired pressure injuries. *AORN J*. 2020;111(2):241-2. [[Crossref](#)] [[PubMed](#)]
3. Alshahrani B, Sim J, Middleton R. Nursing interventions for pressure injury prevention among critically ill patients: a systematic review. *J Clin Nurs*. 2021;30(15-16):2151-68. [[Crossref](#)] [[PubMed](#)]
4. Lovegrove J, Fulbrook P, Miles S. Prescription of pressure injury preventative interventions following risk assessment: an exploratory, descriptive study. *Int Wound J*. 2018;15(6):985-92. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
5. Hassan N, Afzal M, Sehar S, Gilani A. Effect of educational program on pressure ulcer prevention intervention among nurses of intensive care units at a public hospital, Pakistan. *Clin Soc Work Heal Interv*. 2020;11(4):38-45. [[Crossref](#)]
6. Yan B, Dandan H, Xiangli M. Effect of training programmes on nurses' ability to care for subjects with pressure injuries: a meta-analysis. *Int Wound J*. 2022;19(2):262-71. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
7. Awali ZM, Nagshabandi EA, Elgmail A. The effect of implementing pressure ulcer prevention educational protocol on nurses' knowledge, attitude and practices. *Nur Prim Care*. 2018;2(4):1-7. [[Crossref](#)]
8. Jeengar M. The effectiveness of Structured Teaching Programme regarding knowledge on prevention of pressure sores among staff nurses: a pre-experimental study. *Asian J Nurs Educ Res*. 2018;8(4):467. [[Crossref](#)]
9. Ibrahim MM, Mokhtar IM. Effect of nursing training on identification, prevention and management of pressure ulcer among stroke patients and its outcomes. *Egypt J Heal Care*. 2020;11(3):391-416. [[Crossref](#)]
10. Awad WHA, Hafez SAH. Effect of pressure ulcer preventive nursing interventions on knowledge, attitudes and practices of nurses among hospitalized geriatric patients in Alexandria, Egypt. *IOSR J Nurs Heal Sci*. 2020;9(2):1-12. [[Crossref](#)]
11. Seo Y, Roh YS. Effects of pressure ulcer prevention training among nurses in long-term care hospitals. *Nurse Educ Today*. 2020;84:104225. [[Crossref](#)] [[PubMed](#)]
12. Delmore B, Smith DJ, Savage E, Ayello EA. Evaluating the impact of an innovative educational program for skin care champions using the pieper-zulkowski pressure ulcer knowledge test. *Adv Skin Wound Care*. 2020;33(5):252-9. [[Crossref](#)] [[PubMed](#)]
13. Liu L, Li M, Zheng Q, Jiang H. The effects of case-based teaching in nursing skill education: cases do matter. *Inquiry*. 2020;57:46958020964421. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
14. Gaballah S, Salah El-Deen D. Pressure injury care program effects on nurse's performance and patients' pressure injury wound healing outcomes. *Am J Nurs Res*. 2021;9(3):76-84. [[Crossref](#)]
15. Kim G, Park M, Kim K. The effect of pressure injury training for nurses: a systematic review and meta-analysis. *Adv Skin Wound Care*. 2020;33(3):1-11. [[Crossref](#)] [[PubMed](#)]
16. Bredesen IM, Bjørø K, Gunningberg L, Hofoss D. Effect of e-learning program on risk assessment and pressure ulcer classification - a randomized study. *Nurse Educ Today*. 2016;40:191-7. [[Crossref](#)] [[PubMed](#)]
17. Militello LK, Gance-Cleveland B, Aldrich H, Kamal R. A methodological quality synthesis of systematic reviews on computer-mediated continuing education for healthcare providers. *Worldviews Evid Based Nurs*. 2014;11(3):177-86. [[Crossref](#)] [[PubMed](#)]
18. Aydoğmuş Ünlü A, Işık Andsoy I. Cerrahi hemşirelerin basınç yaralanması, risk faktörleri ve önlenmeye ilişkin bilgilerin incelenmesi [Examination of surgical nurses' pressure ulcer, risk factors and knowledge related to prevention]. *Genel Tıp Derg*. 2021;31(2):168-74. [[Crossref](#)]
19. Barakat-Johnson M, Barnett C, Wand T, White K. Knowledge and attitudes of nurses toward pressure injury prevention: a cross-sectional multisite study. *J Wound Ostomy Continence Nurs*. 2018;45(3):233-7. [[Crossref](#)] [[PubMed](#)]
20. Clifton A, Mann C. Can YouTube enhance student nurse learning? *Nurse Educ Today*. 2011;31(4):311-3. [[Crossref](#)] [[PubMed](#)]
21. Lopez V, Cleary M. Using social media in nursing education: an emerging teaching tool. *Issues Ment Health Nurs*. 2018;39(7):616-9. [[Crossref](#)] [[PubMed](#)]
22. San Martín-Rodríguez L, Escalada-Hernández P, Soto-Ruiz N. A themed game to learn about nursing theories and models: a descriptive study. *Nurse Educ Pract*. 2020;49:102905. [[Crossref](#)] [[PubMed](#)]
23. Doğu Ö. Yoğun bakım hemşirelerinin bası yarası, bakımı ve bakım ürünleri kullanımına ilişkin bilgi ve uygulamalarının değerlendirilmesi [Evaluation of intensive care nurses' knowledge and practices regarding pressure sore care and use of care products]. *J Hum Rhythm*. 2015;1(3):95-100. [[Link](#)]
24. Kıraner E, Terzi B, Uzun Ekinci A, Tunalı B. Yoğun bakım ünitemizdeki basınç yarası insidansı ve risk faktörlerinin belirlenmesi [Chaceretretetric of patients with pressure in the intensive care unit]. *Yoğun Bakım Hemşireliği Derg*. 2016;20(2):78-83. [[Link](#)]
25. Tanrıku F, Dikmen Y. Yoğun bakım hastalarında basınç yaraları: risk faktörleri ve önlemler [Pressure ulcers in intensive care patients: risk factors and precautions]. *J Hum Rythm*. 2017;3(4):177-82. [[Link](#)]
26. Yılmaz T, Tüzer H, Tarla A. Basınç yarasının önlenmesinde hemşirelerin bilgi düzeylerinin incelenmesi [Examination of pressure ulcer prevention knowledge of nurses]. *Sağlık Akad Kastamonu*. 2019;4(3):211-24. [[Crossref](#)]
27. 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;14:34. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
28. Feng H, Li G, Xu C, Ju C. Educational campaign to increase knowledge of pressure ulcers. *Br J Nurs*. 2016;25(12):S30-5. [[Crossref](#)] [[PubMed](#)]
29. Roman P, Rodríguez-Arrastia M, Molina-Torres G, Márquez-Hernández VV, Gutiérrez-Puertas L, Ropero-Padilla C. The escape room as evaluation method: a qualitative study of nursing students' experiences. *Med Teach*. 2020;42(4):403-10. [[Crossref](#)] [[PubMed](#)]
30. Gómez-Urquiza JL, Gómez-Salgado J, Albendín-García L, Correa-Rodríguez M, González-Jiménez E, Cañadas-De la Fuente GA. The impact on nursing students' opinions and motivation of using a "Nursing Escape Room" as a teaching game: a descriptive study. *Nurse Educ Today*. 2019;72:73-6. [[Crossref](#)] [[PubMed](#)]
31. Grešš Halász B, Bérešová A, Tkáčová L, Magurová D, Lizáková L. Nurses' knowledge and attitudes towards prevention of pressure ulcers. *Int J Environ Res Public Health*. 2021;18(4):1705. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]