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Reliability and Validity of the Turkish Version of the Attitude Questionnaire Regarding Medical Device-Related Pressure Injuries (AQMDRPI)

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ABSTRACT

Objective: Nurses' attitudes toward medical device-related pressure injuries is an important subject which needs to be determined in order to provide qualified nursing care. This methodologically designed study was conducted to evaluate the validity and reliability of the Turkish version of the Attitude Questionnaire Regarding Medical Device-Related Pressure Ulcer among nurses. Materials and Method: The sample of the methodological study consisted of 183 nurses. Analysis of the data was carried out with the usage of the programs SPSS v.24.0 and AMOS package. Descriptive statistics, content validity index, Kendall fit test, Confirmatory Factor Analysis, descriptive factor analysis, Item Total Score Correlation and Scale Response Bias tests were used to evaluate the gathered data. Results: The content validity index of the AQMDRPI was found to be 0.95. The Cronbach Alpha coefficient of the questionnaire was found to be 0.76. The confirmatory factor analysis fit indexes of the questionnaire were examined and it was determined that the x2 /df, CFI, NFI, NNFI indices were acceptable. Conclusion: The Turkish version of the AQMDRPI was found to be a valid and reliable questionniare for the Turkish population.

Key words: Attitude, Medical device, Pressure injuries, Reliability, Validity.

Tıbbi Cihazlara Bağlı Basınç Yaralanmasına İlişkin Tutum Anketi (TCBBYTA)'nin Türkçe Versiyonunun Güvenilirliği ve Geçerliliği

ÖZ

Amaç: Hemşirelerin tıbbi cihaz ilişkili basınç yaralanmalarına yönelik tutumları, nitelikli hemşirelik bakımı için belirlenmesi gereken önemli bir konudur. Metodolojik desenli çalışma, Tıbbi Cihazlara Bağlı Basınç Yaralanmasına İlişkin Tutum Anketi'nin Türkçe versiyonunun hemşireler arasında geçerlilik ve güvenilirliğini değerlendirmeyi amacıyla yürütüldü. Yöntemler: Çalışmanın örneklemini 183 hemşire oluşturdu. Verilerin analizi SPSS 24.0 programı ve AMOS paket programları kullanılarak değerlendirildi. Araştırmada verilerin değerlendirilmesinde tanımlayıcı istatistikler, kapsam geçerlilik indeksi, Kendall uyum testi, Doğrulayıcı Faktör Analizi, açıklayıcı faktör analizi, madde toplam puan korelasyonu ve ölçek yanıt yanlılığı testleri kullanıldı. Bulgular: Anketin içerik geçerlilik indeksi 0,95 olarak bulundu. Anketin Cronbach Alpha katsayısı 0,76 olarak bulunmuştur. Anketin doğrulayıcı faktör analizi uyum indeksleri incelenmiş ve x2 /df, CFI, NFI, NNFI indekslerinin kabul edilebilir olduğu belirlendi. Sonuç: Tıbbi Cihazlara Bağlı Basınç Yaralanmasına İlişkin Tutum Anketi'nin Türkçe versiyonun Türk toplumu için geçerli ve güvenilir olduğu bulundu.

Anahtar kelimeler: Basınç yaralanması, Geçerlik, Güvenirlik, Tıbbi araç, Tutum.

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INTRODUCTION

In addition to pressure injuries which tend to occur due to inactivity, Medical Device-Related Pressure Injuries (MDRPIs), which are induced through the widespread use of medical devices in diagnosis and treatment; raises concerns among health services and health professionals (Erbay et al., 2019; Owens et al., 2018). The incidence of MDRPIs is also increasing, especially in intensive care clinics where medical devices are used more frequently (Rashvand et al., 2020). In many studies which were conducted to assess the prevalence and risk factors of the development of MDRPIs, it has been reported that the prevalence ranges from 1.7% to 8.6% (Galetto et al., 2020; VanGilder et al., 2009). While it is known that pressure injury is mainly caused by immobility and by the support surface equipment used, it is now known today that it also occurs depending on the position and shape of the medical device (Erbay et al., 2019; Kara & Arıkan 2020). Pressure injury caused by devices that form the basis of the diagnosis and treatment processes is instead observed on the skin and mucosa, and not from the bony area, unlike classical pressure injuries (Coyer et al., 2014; Jackson et al., 2019; Johnson et al., 2017). MDRPIs cause prolonged hospitalization time, increased cost of care, and decreased quality of life as a result of the manifestation of pain, infection, and tissue necrosis (Behnammoghadam et al., 2020; Erbay et al., 2019; Hu et al., 2020; Kara & Arıkan, 2020; Kayser et al., 2018; Rasvand et al., 2020; Zhang et al., 2021). Health professionals, especially nurses, have critical importance in preventing pressure injury during the entire process, from identifying patients at risk of developing such injuries, to providing the appropriate preventive care (Gül, 2014; Avşar & Karadağ, 2016). In a study, it was stated that evidence-based implementation of the effects of pressure injury on nursing care could reduce the occurrence of these injuries by up to 50%. At the same time, it is stated that the most critical factor in preventing pressure injury is qualified nursing care (Sycamore et al., 2018; Kalmann & Suserud., 2008; Pancorbo et al., 2007). In the relevant studies, it has been revealed that nurses should adopt a positive attitude in order to give adequate care with regards to about pressure injuries (Aslan & Giersbergen, 2016; Kalman &Suserud, 2008; Ustun & Sycamore, 2013). Research indicates that while positive attitudes and the effective utilization of available resources facilitate the application of newly acquired knowledge to care practices, negative attitudes can pose significant barriers to preventive care (Aslan &Giersbergen, 2016; Beeckman et al., 2010; Moore & Price, 2004). When we look at the literature on the subject, there is no attitude scale with regards to medical device-related pressure injuries in Turkey. Measuring attitudes towards medical devices is essential in order to understand the awareness and behaviors that support the correct and effective usage of these devices. This contributes to enhanced patient safety and improved quality of care (Behnammoghadam et al. 2020; Üstün & Yücel, Ş, 2013).

For this reason, Attitudes Toward the Medical Device-Related Pressure Ulcer Questionnaire (AQMDRPI), which was developed to evaluate the knowledge levels of nurses on the prevention of MDRPIs, was formed in Iran by Behnammoghadam et al. (2020), validated in Persian and an English language version was made. The scale has advantages, such as the absence of a substitute scale on the relevant subject and such as the fact that it can be answered in a swift manner. This study aimed to translate, validate and explore the psychometric properties of the AQMDRPI in Turkish. The research questions are as follows;

Q1: Is the Turkish version of the AQMDRPI a valid tool for the Turkish society?

Q2: Is the Turkish version of the AQMDRPI a reliable tool for the Turkish society?

MATERIAL AND METHOD

Research Type and Purpose

The methodological study was carried out in a single center between June and September 2022 in order to adapt the AQMDRPI to Turkish and to examine its validity and reliability.

Sample

The population of the study consisted of nurses working in intensive care units, internal and surgical services located in a training and research hospital in Turkey. A total of 183 nurses were included in the sample, with the Power Analysis

(G*Power 3.1.9.2) performed via referring to similar studies to be calculated for the sample size in which the research will be conducted, and the deviation margin of 5% (d=0.05) (Üstün & Çınar, 2013). Before beginning the investigation, the ethical permission which was required was granted by the Okan University Clinical Ethic Board with decision number 2022-154. The criteria for inclusion in the study were to work as an active nurse, to volunteer to be a participant, and to fill out the data collection forms thoroughly. No participant attrition occurred during the study, and none of the nurses withdrew from the research.

Measurement Tools

"Nurse Identification Form" and "Attitude Questionnaire Regarding Pressure Injury Due to Medical Devices Questionnaire (AQMDRPI)" were used to obtain the research data. The data was collected by the researchers by making use of the face-to-face interview method. In the study, within the scope of the reliability analysis of the scale, the time constancy (test-retest) reliability was performed with 45 nurses in a time period three weeks after the first responses. As shown in the study process illustrated in Figure 1, the interview time for each questionnaire lasted an average of 10-15 minutes.

The Nurse Descriptive Form

The Nurse Descriptive Form contained questions which served to determine the sociodemographic characteristics of nurses; such as age, education level and sex, as well as questions regarding the experienced encounters of Medical Device Related Pressure Injuries and the nurses' professional competence in this regard. The form consisted of 14 questions in total.

The Attitude Questionnaire of Medical Device Related Pressure Injury (AQMDRPI)

The questionnaire was studied by Behnammogdaham in Iran, validated in Persian, and finalized in English. The AQMDRPI consists of 11 questions and two sub-dimensions: prevention of medical device related pressure injury and care of medical device-related pressure injury. While the 1st, 2nd, 3rd, 5th, 6th, and 7th questions constitute the dimension of prevention in terms of medical device-related pressure injury, the dimension of care of medical device-related pressure injury were evaluated by the "4th, 8th, 9th, 10th", and 11th questions. There are no reverse-coded items in the scale. The scale is in the 5-point Likert type and is evaluated as follows; "I Absolutely Agree (1 point)", "I agree (2 points)", "I am undecided/neutral (3 points), "I Disagree (4 points)" and "I Strongly Disagree (5 points)". In the original version of the scale, the scope validity index (CVI) was found to be "0.89," and the Cronbach alpha value was found to be (α=0.77). The scores obtained in the questionnaire range from "11-55". In terms of categorizing and interpreting total scores; the scores between "11-25" indicate a negative attitude, a score of "26-40" indicate a neutral attitude, and finally, a score of "41-55" indicate that nurses have a positive attitude towards the phenomena (Behnammogdaham et al., 2020).

Statistical analyses

The program of SPSS (Statistical Package for Social Sciences) v. 24.0 for Windows and The AMOS package program was used for the data analysis process. In the evaluation of the data, Kendall W coefficient of agreement and The Davis Technique Method was used to determine the content validity index (CGI) for language validity. The construct validity of the Turkish form of the questionnaire was evaluated with exploratory and confirmatory factor analysis. The suitability of the obtained data for exploratory factor analysis was examined by the Kaiser-Meyer-Olkin (KMO) coefficient and the Bartlett test. The minimum factor load for factor analysis was accepted as 0.30 (Büyüköztürk, 2022); Tavsancil, 2018). In the study, Cronbach's alpha reliability coefficient, item-total score correlation coefficients and Hotelling T2 test were used to examine the scale's internal consistency within the scope of the reliability studies of the scale. The minimum value for the item total score correlation coefficient was taken as 0.25 (Büyüköztürk, 2022).

The Linguistic Validity, Content and the Face Validity of the Scale

The adaptation of the AQMDRPI to Turkish society was carried out according to the Guidelines for the Process of Cross-Cultural Adaptation of Beaton et al. (Beaton et al., 2000). The items of the AQMDRPI were translated into Turkish by two different faculty members who are considered experts

in the English and Turkish languages. The questionnaire was translated from English to Turkish, considering the use of appropriate sentence structures and replacing items that do not fit the language structure. In the next stage, the translation of the questionnaire from Turkish to English was carried out by two other experts of the field. Later on in language validity, a standard Turkish text was created after the researchers and following the expert opinions, the statements included in the scale were edited accordingly. The first version of the AQMDRPI, its Turkish, and the original language form was submitted for expert opinion in order to determine the validity of the language and scope. An expert group comprised of seven individuals was formed for the scope validity; including five faculty members, experts on wound care, and two wound care nurses. The experts' opinions on the first Turkish version of the questionnaire were evaluated using the Davis technique. In this technique, each expert was asked to evaluate the statements in the scale by examining the CVI values of the questionnaire, grading them as A-Appropriate' (4 points), "B-Should be slightly revised' (3 points), "C-Should be seriously revised' (2 points), and "D-Not appropriate' (1 point). In this technique, the "Scope Validity Index" related to the item is obtained by dividing the number of experts who mark options A (4 points) and B (3 points) by the total number of experts. A CVI minimum of 0.80 is accepted for items (Ayre & Scally, 2014; Yeşilyurt et all., 2018). Accordingly, the scope validity index (SCI) was calculated, and the Kendall W compliance coefficient was used to evaluate the compliance level of the scores given by the experts. As a result of the analysis, it was found that there was no difference in the scoring of expert opinions, and a significant compliance was found (Kendall W= 0.072; p= 0.676). After the expert opinion, the scale was applied to 10 nurses within the scope of the pilot study. Since all of the items very fully and clearly understood by the participants in the pilot application, no changes were made to the scale, and the validity/reliability analyses were performed. Nurses participating in the pilot study were not included in the research sample.

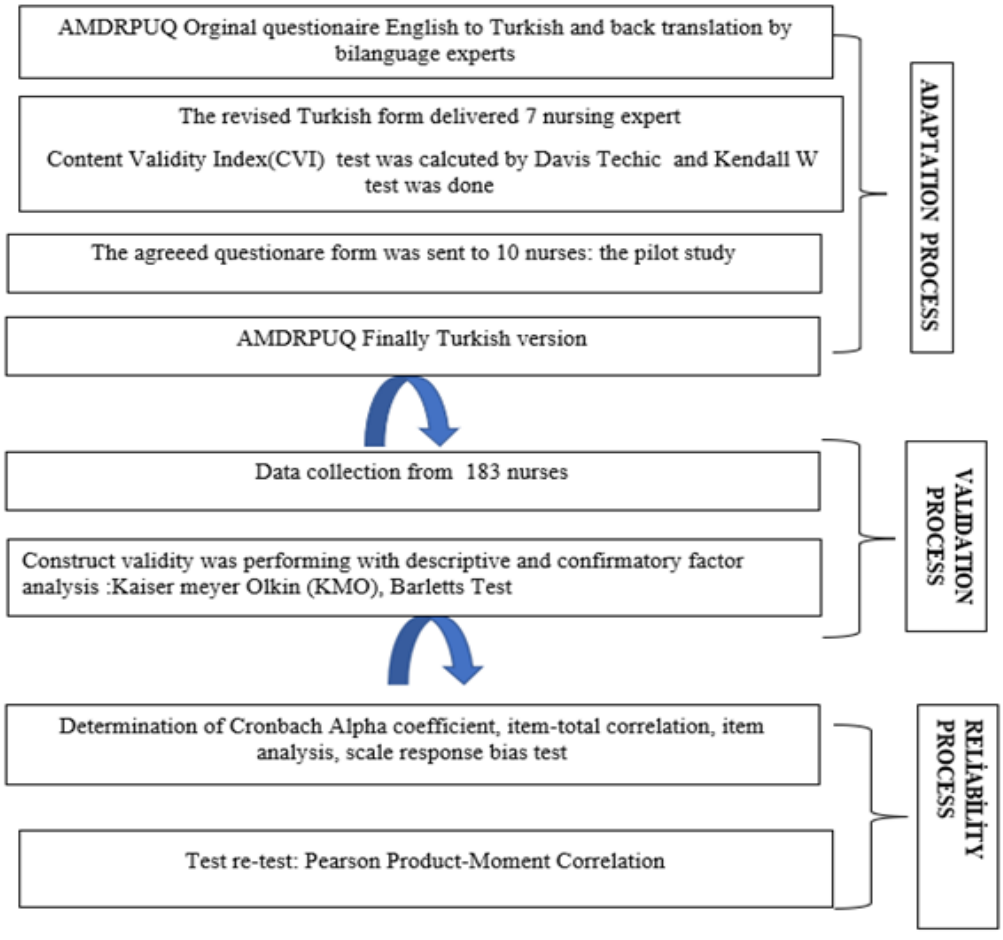

Figure: Study Process

Prodecure

After the process of language and content validity of the questionnaire in which the final Turkish form was created, the questionnaire form was applied with a total of 183 face-to-face interviews, and subsequently, the research data was collected. After the data collection phase of the study, the content-item analysis of the scale was carried out and the exploratory and confirmatory factor analysis was performed. The test-retest technique was used for the invariance of the scale against time. Three weeks after the first application of the scale, the questionnaires were reapplied over 45 nurses for retest. In order to match the answers, the nurses in the group in which the test-retest method would be applied were asked to determine a code so that the answers were matched 100%. In the research, the internal consistency analysis of the scale was performed within the scope of the reliability studies of the scale. The study procedure is shown as Figure 1.

RESULTS

Socio-Demographic Characteristics

It was found that 84.6% of the nurses were in the 18-30 age group, 78.7% were Bachelor degree, 66.1% were working in intensive care units, 26.8% were in surgical units, and 90.7% were working as nurses for 0-5 years. When the nurses participating in the study were asked the question related to "Specific training in prevention on pressure injuries", it was found that 86.8% were trained, 15.8% encountered medical device-related pressure injuries frequently, and 56.3% encountered pressure injuries infrequently (Table 1).

Table 1. Socio-demographic and Profession characteristics of the nurses

Characteristics	N=183	
	N	%
Age Group		
18-30 age	155	84.6
31-40 age	20	10.9
41 age and over	8	4.5
Academic degree		
Vocational high school	18	9.8
Associate degree	8	4.4
Bachelor degree	144	78.7
Master degree	13	7.1
Work experience		
0-5 years	166	90.7
6-10 years	14	7.7
11 years and	3	1.6
Worked Unit		
Insentive care unit	121	66.1
Surgical unit	49	26.8
Internal medicine unit	13	7.1
Do you encounter medical pressure injuries in the clinics you work for?		
Hardly ever	46	25.1
Sometimes	103	56.3
Often	34	18.6
Did you have any spesific training in prevention on pressure injuries?		
Yes	126	68.8
No	57	31.2

The Validity Analysis of the Attitude Questionnaire of medical device-related pressure injuries

Within the scope of the validity studies of the scale, content validity, and structure validity were examined. Language and structure scope validity was performed to analyze the scale's content validity. The expert opinions received for the scale's content validity were evaluated using the Davis technique, and the CVI was calculated. According to the Davis technique, and within the scope of validity, "1.00-0.80" values for each item deemed acceptable. In our study, it was calculated that the content validity indexes of the items were between 0.85-1.00 and the CVI for the whole scale was 0.95, which was a value

in line with the scores obtained from the experts. Since the CVI values of all items were found acceptable, no changes were made to the items. Kendall's Coefficient of Concordance was determined by applying the Kendall W test to evaluate the concordance between expert opinions on the construct validity of the items of the AQMDRPI. As a result of the analysis, it was found that there was no difference in the scores given by the relevant experts, and there was a significant agreement (Kendall's W:0.072, p: 0.669, p>0.05)

After testing the scale's language and content validity, construct validity analysis was performed for further validity evaluations. The findings related to the scale's construct validity were obtained by exploratory and confirmatory factor analysis. In order for the data to be suitable regarding factor analysis, the Kaiser-Meyer Olkin (KMO) value must be higher than 0.70. Since the KMO value resulted as = "0.81>0.70" from the analysis, it was determined that the data size was suitable for factor analysis. Furthermore, since the result of the Bartlett's Test of Sphericity was significant, it was observed that there was a highly significant relationship between the variables (χ2=1628.497; df=66; p=<0.05) (Table 2). The original version of the AQMDRPI scale has two factors, and the eigenvalue of each factor was found to be above the value of "1.00". In the study, in terms of the analysis of the two-factor scale, the eigenvalues were found as Factor 1= 3.948 and Factor 2= 2.546, respectively. Two factors explain 75.153% of the total variance. The factor loads of the items vary between 0.369 and 0.736 (Table 2).

The conformity of the factor structure of the Turkish version of the AQMDRPI to the original scale was evaluated by the Confirmatory Factor Analysis (CFA). As a result of the CFA, the ratio of χ2 value to the obtained degrees of freedom was determined as 3.74. It was found that 0.07 of root mean square error (RMSEA) from other fit indices, 0.94 of goodness fit index (GFI), 0.91 of comparative fit index (CFI), 0.87 of normed fit index (NFI), and 0.88 of non-normed fit index (NNFI). (Figure 2). It was determined that all of the coefficients obtained were statistically significant (p<0.001 (Table 3).

Table 2. AQMDRPI exploratory factor analysis results

	Factor Loads	
Items	**Factor 1**	**Factor 2**
I1	0.582	
I2	0.372	
I3	0.686	
I4		0.480
I5	0.486	
I6	0.736	
I7	0.628	
I8		0.369
I9		0.656
I10		0.586
I11		0,667
Kaiser Meyer Olkin Measure Of Sampling Adequacy		0.819
Barlett's Test Of Sphericity x2/df/p		1628.497
p	0.00	

Table 3. AQMDRPI confirmatory factor fit index results

Fit indices	AMDRPUQ	Acceptable value
x 2 /df	3.74	<5
GFI	.940	≥90 good fit
CFI	.912	≥90 good fit
NFI	.875	≥90 good fit
NNFI	.881	≥90 good fit
RMSEA	.073	<80 good fit

x 2 /df: Ratio of chi-square to degrees of freedom, **RMSEA:** Root mean square of approximate errors **GFI:** Goodness of fit index, **CFI:** Comparative fit index, **NFI:** Normed fit index, **NNFI:** Non-normed fit index.

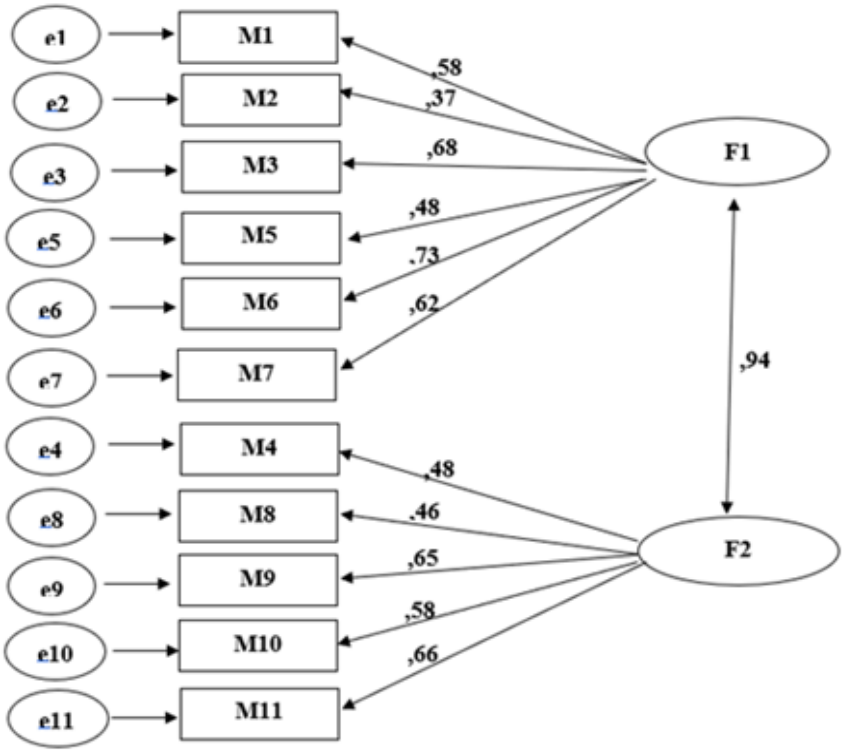

Figure 2. Confirmatory factor analysis for the Turkish version of the Attitudes Toward the Medical Device-Related Pressure Ulcer with the PATH diagram (F1=Prevention dimension; F2: Care Dimension)

The Reliability analysis

Reliability, one of the main qualities that measurement tools should have, indicates the stability of the measurement values obtained in repeated measurements under the same conditions and using the same measurement tool. Moreover, reliability is not only a property belonging to a measurement tool. It is also a property which belongs to the results obtained by this measurement tool (Aksayan & Gozum, 2000; Çurik et al., 2018; Beaton et al., 2000). In order to carry out the reliability analysis in the research, Cronbach Alpha Coefficient, item-total score correlation, item analysis, invariance of internal consistency across time, and scale response bias tests were performed. According to the statistical analyses performed, it was determined that the average AQMDRPI item score received values between "4.30-1.61". According to the answers given by the nurses participating in the study to the AQMDRPI; while the average score of preventing medical device-related pressure injuries was 21.44+3.32, the average score of the preventing medical device-related pressure injuries care dimension was 19.79+ 4.38 (Table 4).

When the AQMDRPI's item questionnaire total correlations were examined, there was a statistically significant difference between 0.332 and 0.550 correlation values (Hotelling T2= 54,756, p=0.02). No item was removed from the scale since no item had a total correlation score below 0.20. (Table 4).

Cronbach alpha coefficient was calculated to evaluate the internal consistency of the Turkish form of the AQMDRPI. It was found that the total Cronbach Alpha Coefficient of the questionnaire was 0.76, the prevention dimension Cronbach Alpha Coefficient was 0.754, and the maintenance dimension was 0.813. In the internal consistency analysis performed with item removal, no item changed Cronbach Alpha. In the original form of the questionnaire, it was determined that

each Cronbach Alpha number was (α=0.77)(Table 4).

Finally, the invariance of the internal consistency against time for the final stage of the analysis was evaluated by the test-retest reliability measurement. The questionnaire was applied again after 3 weeks with 45 nurses. Pearson moments multiplication value was examined for the test-retest reliability coefficient in testing the invariance of the questionnaire over time. The test-retest correlation coefficient obtained from measurement invariance over time of the AQMDRPI was determined to be 0.745. When the AQMDRPI sub-dimensions were evaluated, it was found that the test-retest correlation coefficient obtained as a result of Pearson moments multiplication of the "prevention" sub-dimension was 0.772, and the test-retest correlation coefficient obtained as a result of Pearson moments multiplication of the "maintenance" sub-dimension was 0.610 (Table 5). According to the test-retest analysis results, it was seen that there was no statistically significant difference between the mean scores of the scale factors and the total of the scale. (p>0.05) In line with these results, it can be said that the scale is a very reliable measurement tool.

Table 4. AQMDRPI reliability analysis results of the scale

Sub-scales	Items	Mean± SS	Corrected Item Total Correlation	Cronbach's Alpha If The Item Is Deleted	Cronbach's Alpha
Pressure injury prevention dimension for medical devices	I1.In many cases, it is not possible to prevent MDRPIs	1.61±0.66	0.358	0.362	0.498
	I2.It is more difficult to prevent MDRPUs than conventional PUs, such as those that occur in the patient's sacrum due to lying on the bed for long periods of time.	3.66±0.91	0.371	0.354	0.474
	I3.The MDRPIs are less important than the conventional PIs, such as those in the patient's sacrum due to lying on the bed for long periods of time	3.36±1.08	0.324	0.490	0.440
	I5. Preventing MDRPIs is not a nurse's priority.	4.28±1,08	0.383	0.383	0.570
	I6. There is no need to use prevention protocols for MDRPI prevention	4.30±0,83	0.626	0.626	0.696
	I7. It is a physician's duty to prevent MDRPUs	4.21±0,88	0.512	0.537	0.630
	Prevention dimension		21.44±3,32		0.794
Pressure injury care dimension for medical devices	I4. Nurses do not play an important role in the care of MDRPIs.	3.84±0,99	0.332	0.475	0.593
	I8. MDRPUs never deepen	3.44±0.99	0.388	0.311	0.446
	I9.MDRPIs occur only in patients admitted to special wards, such as intensive care unit (ICU)	4.16±0.80	0.560	0.547	0.631
	I10. MDRPIs do not need any treatment and heal on their own	4.08±1,12	0.332	0.423	0.580
	I11. There is no need for recording and reporting the MDRPIs in the patient's medical record	4.24±0,80	0.566	0.550	0.633
	Care dimension	19.79±4.38			0.886
	Hotelling T^2 /p	54.756 p=0.02			
	AQMDRPI Meanı	21.61±2.38			0.761

Table 5. AQMDRPI test-retest statistical analysis findings

Factors	N	Pretest Mean±SD	Re test Mean±Sd	t*	p	r**	p
1.Dimesion of Prevention	45	21.44±3.32	21.67±0.84	-1.268	0.875	0.772	0.002*
2. Dimesion of Care	45	19.79±4.38	20.82±1.92	-0.763	0.254	0.610	0.049*
Total	45	41.23±7.70	42.49±2.76	-1.042	0.103	0.745	0.03*

P<0,05 *Depented groups t test, **Pearson Corelation Korelasyon coefficient

DISCUSSION

Medical devices related pressure injuries should be prevented since they occur as a severe complication and that these injuries negatively affect prognosis in patient groups in which medical instruments are part of their treatment (Coyer et al., 2014; Galetto et al., 2019). Determining nurses' knowledge and attitudes is therefore essential to prevent such pressure injuries effectively. In our country, there is also a need for validated and reliable measurement tools which evaluate the attitude of nurses to prevent MDRPIs. Therefore, this methodological study aimed to adapt the AQMDRPI, which evaluates nurses' attitudes towards MDRPIs, to the Turkish language and to examine its psychometric properties in order to ensure cross-cultural adaptation.

The examination of the psychometric properties of the scale should first be started by conducting analysis on the validity of language and content. The CVI values of the scale items were calculated for the scale's content validity. The fact that the CVI obtained from the opinions received from experts using the Davis technique is higher than 0.80 means that the items are at a sufficient level in terms of scope validity (Ayre & Scally, 2014; Yeşilyurt & Çapraz, 2018). While the CVI of the questionnaire items received values between "1-08.5", it was determined that the total CVI of the scale items was "0.95".

Exploratory and confirmatory factor analysis were performed to evaluate the scale's validity. The KMO coefficient was calculated to determine the adequacy of the sample size to perform factor analysis. The fact that the obtained KMO value is less than 0.50 indicates that factor analysis cannot be performed with the data obtained from the sample. Since the KMO=0.606 and Barlett's test=628.497 (p=0.000) were calculated in the study, it was decided that the data was suitable for factor analysis. In the original study of the AQMDRPI, two factors were obtained due to the exploratory factor analysis performed by Behnammogdaham et al. (2020). Similarly, the study found two factors explaining 75.153% of the total variance. In the factor analysis, it is considered sufficient that the variance ratio explained by the factors in the scale is between 40% and 60%. The explained variance being 50% or more, indicates that it measures the related concept in a strong fashion. (Costello & Osborne, 2005). The conformity of the factor structure in the Turkish form of the scale with that in the original form was evaluated by confirmatory factor analysis. In the confirmatory factor analysis, $\chi 2$, degree of freedom, RMSEA, CFI, GFI, NFI, and NNFI compliance indices are evaluated to determine model compliance. $\chi 2$ is not a statistic considered alone but evaluated based on the degree of freedom. If the value obtained in this ratio is below 3, it indicates perfect compliance; if it is below 5, it indicates moderate compliance. However, RMSEA values should be 0.08 and below, and CFI, GFI, NFI, and NNFI values should be 0.90 and above in the evaluation of compliance (Çapık et al., 2018). In the study, $\chi 2$/df was 3.74, CFI was .912, and GFI was .940, NFI was .875, and NNFI was .881. When the CFA compliance indices were examined, it was found that the acceptability criteria of the $\chi 2$/df /df, CFI, GFI, and NFI indices were met. This result explains that the scale adapts well to the model.

One method that reveals a scale's reliability is an item-total correlation. The relevant literature states that items with a value lower than "0.20" of the item total correlation coefficient, should be removed from the scale to ensure reliability (Çokluk et al., 2014; Çolakoğlu and Büyükekşi, 2014; Henson and Roberts, 2006). In the study, the item total score correlations of the AQMDRPI were found to be between "0.44-0.88". Since the AQMDRPU item-total score correlations were good and not lower than 0.20, no items' removal was necessary. The study evaluated whether the nurses' responses to AQMDRPI items were equal to Hotelling's T2 test (Ayre & Scally, 2014; Costello & Osborne, 2005). As a result of the analysis, it was determined that the Hotelling T2 value, calculated to determine whether the participants perceived the questionnaire items similarly, was at a significant level (Hotelling T2: 54,756, p=0.02). This test result shows that the AQMDRPI determines nurses' attitudes toward MDRPIs. Therefore, the Turkish adaptation of the AQMDRPI can be considered as a solid and original scale consisting of questions with a similar homogeneous structure.

Cronbach Alpha Coefficient is the reliability method used to determine the internal consistency in scale development and adaptation studies. The basic principle of this method is that the items should be logically compatible with each other (Costello & Osborne, 2002; Büyüköztürk, 2002). The Cronbach Alpha coefficient takes a value between the "0 and/or 1" range. The fact that the Cronbach alpha coefficient approaches the value of "0" indicates that the scale is unreliable, and that this coefficient is close to the value of "1" indicates reliability (Tavşancıl, 2014; Henson & Roberts, 2006).

Statistical analysis was performed in order to assess the validity and reliability of the Attitudes Toward the Medical Device-Related Pressure Ulcer Questionnaire (AMDRPUQ) in the Turkish language. Based on these evaluations, it was concluded that the Turkish version of the scale did not differ from the original version in terms of lingual equivalence and was comparable in assessing the nurses' attitudes towards the prevention of MDRPIs. This alignment underscores the cross-cultural applicability and consistency of the scale, ensuring that it effectively measures the intended constructs in both versions.

In terms of determining the Cronbach Alpha coefficient for the internal consistency analysis, the total Cronbach Alpha coefficient of the AQMDRPI was found to be 0.76, the prevention dimension Cronbach Alpha Coefficient was 0.754, and the maintenance dimension was 0.813. Regarding the internal consistency analysis performed with item removal, no item changed Cronbach Alpha. In the original form of the questionnaire, each Cronbach Alpha number was calculated as (α=0.77). Since the Cronbach Alpha value of the AQMDRPI is 0.60≤ α< 0.80, it can be said that the scale is reliable. The intra-class correlation coefficient (ICC) of the AQMDRPI, which shows invariance against time, was determined to be 0.979. According to this result, it can be said that the scale makes a reasonably reliable measurement.

CONCLUSION AND RECOMENDATION

It was found that the Attitudes Toward the Medical Device-Related Pressure Ulcer Questionnaire (AMDRPUQ) was a tool with high validity and reliability in terms of measuring the knowledge of preventing pressure injuries in nurses. However, with the findings obtained, it can be said that more studies are needed to assess the applicability of the scale to different cultural populations and different occupational groups. It is thought that it would be appropriate to use more scales with validity and reliability within application areas in order to assess the training needs of nurses, to organize them, and to evaluate the effectiveness of education with regards to pressure ulcer prevention.

LIMITATIONS OF THE RESEARCH

The limitation of the study was that the study was conducted in a single center and only with participants working as nurses. The original scale study was not tested in this respect and therefore, this was acknowledged as a limitation of the study.

AUTHOR CONTRIBUTION

Idea/Concept: E.Z; Design: E.Z, A.B; Data Collection and/or Processing: E.Z; Analysis and/or Interpretation: : A.B; Writing the Article: E.Z, A.B.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

FINANCIAL DISCLOSURE

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ETHICAL STATEMENT

Before the data collection process, ethics committee approval (Okan University Clinical Researches Ethics Board, approval number: 27/04/2022-154), study permission and permission to use of the scale were obtained from the authors of the scale by e-mail by the Ethics Committee of the relevant university. Oral and/or written consent of the nurses was obtained before the study. The research was conducted in line with the principles of the Declaration of Helsinki.

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