ORIGINAL ARTICLE

The Turkish form of psychometric properties of opioids questionnaire

Opiyoid ölçeğinin Türkçe formunun psikometrik özellikleri

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Summary

Objectives: This study was performed to conduct The Psychometric Properties of Nurses' Mental Models About Opioids Questionnaire in the Turkish Language.

Methods: This was a validation study in which the sample consisted of 86 nurses working in surgical clinics and agreed to participate in the study. Data were collected using the data collection form, examining nurses' demographic characteristics (10 items) and the questionnaire (14 items).

Results: In this study, the interclass correlation coefficient was calculated as 0.80. Items' suitability was assessed using the experts' opinions, and the internal consistency was examined considering the Cronbach's alpha value. Cronbach's alpha value ranged from 0.78 to 0.81 for the items in the scale. This value was 0.81 for all 14 items on the scale, and the reliability was found to be high. The questionnaire was entitled "Nurses' Perception of Administering Opioids"in Turkish, believing that this Turkish title would be suitable.

Conclusion: Nurses' Perception of Administering Opioids was a valid and reliable tool, and the items represented nurses' perceptions of administering opioids in Turkish nurses.

Keywords: Nurse; opioid administration; pain; questionnaire; validity, and reliability.

Özet

Amaç: Bu çalışmanın amacı, Türkçe karşılığı "Hemşirelerin Opiyoidlere Yönelik Zihinsel Modellerinin Psikometrik Özellikleri" olan İngilizce ölçeğin psikometrik çalışmasını Türkçede yapmaktır.

Gereç ve Yöntem: Bu araştırma, cerrahi kliniklerde çalışan ve çalışmaya katılmayı kabul eden 86 hemşirenin katılımıyla gerçekleştirilen bir geçerlilik çalışmasıdır. Veriler, hemşirelerin demografik özellikleri (10 madde) ile ölçek sorularından oluşan (14 madde) bir form kullanılarak toplandı.

Bulgular: Bu çalışmada, sınıflar arası korelasyon katsayısı (ICC) 0,80 olarak hesaplandı. Maddelerin uygunluğu uzman görüşleri kullanılarak değerlendirildi ve iç tutarlılığı Cronbach alfa değeri dikkate alınarak incelendi. Ölçekte yer alan maddeler için Cronbach alfa değeri 0,78 ile 0,81 arasında değişmekteydi. Ölçekte yer alan 14 maddenin tamamı için bu değer 0,81 ve güvenilirliği yüksek olarak değerlendirildi. Ölçeğin Türkçe formu, "Hemşirelerin Opiyoid İlaçları Uygulamaya Yönelik Algısı" olarak adlandırıldı.

Sonuç: Hemşirelerin Opiyoid İlaçları Uygulamaya Yönelik Algısı ölçeği, Türk hemşirelerin bu konudaki algılarını belirlemede kullanılabilecek geçerli ve güvenilir bir ölçektir.

Anahtar sözcükler: Ağrı; anket; geçerlilik ve güvenilirlik; hemşire; opiyoid uygulaması.

Introduction

Opioids are the analgesics used to control the acute pain that emerges following surgical procedures. [1–3] They are even used for terminally ill patients.[4] Although opioids provide a proper analgesic effect, they have some side effects such as constipation, nausea, vomiting, cognitive disorder, tolerance, and respiratory depression.[2,5] The concerns arising from side effects largely prevent the use of opioids[1] and increase the pain prevalence.[6,7] Respiratory depressions are one of the most feared side effects of opioids, but this is not seen that often with the administration of correct doses.[8]

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Healthcare staff's perspectives regarding the administration of opioid medications vary greatly. Studies indicate that nurses administered inadequate doses of analgesics in pain management due to knowledge-based deficiencies, cultural backgrounds, experiences, and misunderstandings that they abstained from administering opioids,[9,10] and that they were not sure about administering opioids.[11] The respiratory depression related to opioids,[12] concerns associated with the presence of side effects,[13] and fears of causing psychological addiction[14] are common among nurses. Likely, physicians (44.9%) are reluctant to prescribe opioids as they don't want to face legal issues.[6] Guest et al.[11] (2017) found that 48.5% of nurses did not fear administering opioids and that possibility of judicial investigations did not influence their practice (40.9%). Even some studies show that nurses usually related opioids with addiction,[10,14] some of them do not represent any findings on this issue.[13] Demir Dikmen et al.[15] (2012) reported that opioids should not be administered to relieve their pain (92.1%) on patients with substance addiction history.

The management of patient's pain is an important topic that should not be left to the healthcare staff's perceptions and practices. Therefore, considering and implementing the suggestions of the latest guidelines on administering opioids is critical. While rapidly absorbed opioids can be preferred for chronic pain, benefits and harms should be assessed. This should also apply to opioids used in the perioperative period. That medication is stopped when the patients tolerate the pain.[16] It should be noted that the administration of opioids requires teamwork, and all aspects of this process, including prescribing and administering the medication, informing the patients, and storing the medication, should be evaluated.[17] As an outstanding member of the health care team, nurses should be aware of the concept of pain management and types of pain relievers to ensure the patients' safety.[2,10,18,19] Nurses' knowledge of the side effects of opioids was reported as high as 68.9% in Guest et al.,'s[11] study (2017) Some of the medication-related errors are related to physicians' prescriptions, especially illegible prescriptions and unknown abbreviations increase the number of medication errors.[2,20–22] Most of the medication-related failures arise during the administration process done by nurses.[23] Not only the administration of medications

also storing them inwards requires special knowledge and attention so abuse of all kinds of medications particularly opioids can be reduced.[24,25] As nurses' knowledge improve, their self-esteem, skills in clinical decision making, planning, and accurate interventions tend to improve.[26] The number of studies related to opioid administration and performed in Turkey was limited.[1,10] To the best of our knowledge, there are no scales or studies that determine nurses' perceptions of administering opioids. The present study aimed to adapt to the "Opioid Questionnaire" developed by Guest et al.[11] (2017) in Turkish.

Material and Methods

Study Design and Sample

The data were collected between November 2017 and January 2018. There were 130 nurses employed in surgical wards of the university hospital where this study was conducted in this study. Nurses who were on paid or sick leave, the ones unwilling to participate were excluded from the study. The sample consisted of 86 nurses working in the surgical wards of the hospital. According to the literature, it was suggested that the sample size should be five or ten times higher than each item included in the original scale examined for validity and reliability.[27] The sample size is considered appropriate for the study.

Instruments

The "Data Collection form of demographic variables of nurses" and "Nurses' Mental Models About Opioids: A Questionnaire" was used.

Data Collection Form of Demographic Variables of Nurses

This form included ten questions (age, gender, working experience, years of work in the current ward, educational level, working hours, training on opioids and the place of training, frequency of administration of opioid medications, adverse effects related to opioids) related to nurses demographic variables developed by researchers.

Nurses' Mental Models About Opioids: A Questionnaire

The Opioid Questionnaire that was developed by Guest et al.,[11] consisted of 14 items. The original form of the questionnaire aimed to explore nurses' mental models about opioids. The questionnaire included

the statements to measure whether nurses can make conscious decisions about administering opioids and nurses' opioid-related fears, practical observations, and definition of risks. The items were scored with the following statements: (1) Strongly agree, (2) Agree, (3) Undecided, (4) Disagree, and (5) Strongly Disagree. There was no total score for the original questionnaire, thus each item was evaluated solely.

Ethics

The study was conducted with the nurses working in a university hospital's surgical wards after the ethical committee (Ref Number: 2017–19/30) approval. The permission to adapt the instrument was received from Dr. Carsten Bantel – one of the authors who developed the questionnaire – through email.

Intervention and Data collection

The study objective was mentioned to the participating nurses. Their verbal and written consent was obtained for the study. The data collection form and questionnaires were delivered by one of the researchers to the nurses in closed envelopes, and these tools were returned to the same researcher by hand a week later. Participating nurses' names were not recorded to protect privacy. The duration of completion for the data collection form was 10 or 15 min for each participant.

Translation of the Questionnaire and Cultural Adaptation

Linguistic validity of the scale

For validation studies, it is recommended to translate the instrument into the target language as a first step. Then the scale items should be retranslated into the original language by a bilingual person to ensure linguistic validity. Following the comparison between the final and original text and the researchers' agreement, the validity study is completed.[27] In this study, desired phases were followed; the first items were translated into Turkish by three lecturers who were able to speak both languages fluently. Translated items were checked by researchers, and then they were back-translated from Turkish to English by two academic staff (one bilingual and one native speaker). The Turkish form of the items was compared to those in the original form of the instrument. The final form of the questionnaire was reviewed by researchers, the final adjustments were completed, and linguistic validity was achieved.

The context validity of the questionnaire

For the draft scale, the opinions of eight experts (three faculty members employed in the nursing department, and five nurses working in surgical clinics) were consulted. Experts were asked to assess the scale items from a linguistic and content-related aspect. They evaluated each item's understandability on a scale with scores ranging from 1 to 4 (1=Not suitable, 2=Partially suitable, 3=Suitable, 4=Completely Suitable).[28] According to experts' opinions, items' goodness of fit, and experts' answers were examined in terms of validity calculated through the interclass correlation coefficient (ICC).[29] The pilot study regarding the scale was performed with ten nurses who were not included in the sample.

The reliability of the questionnaire

Cronbach's alpha value was considered while testing reliability.[29] No changes were performed as the total score was not calculated in the original form of the questionnaire, and as it did not have any sub-dimensions, and no factor analysis was performed.

Data Analysis

IBM Statistical Package for the Social Sciences Statistics 23.0 was used to statistically analyze the data. Whether the data displayed normal distribution was assessed using the Shapiro-Wilk test. To examine the relationships between the variables, Spearman's correlation was used, while Pearson's Chi-square test and Fisher-Freeman-Halton test were used to analyze the categorical data. The significance level was accepted as $\alpha=0.05$.[30]

Results

Nurses' Demographic Characteristics

The essential characteristics of nurses are presented in Table 1. All nurses were employed in surgical wards (100%). Most of the nurses (89.5%) were female, and their mean age was calculated as 33.56±7.21 years. Seventy-eight percent (78%) of the nurses had a bachelor's degree, and 71% were working in rotating shifts. Their working experience in current wards was 7.49±6.27 years. More than half of the nurses (62.8%) did not contribute to any training related to opioid medications, 60.5% of the nurses reported administering opioids to patients in their daily practice.

Table 1. Descriptive features of surgical nurses (n=86)

Features of nurses	Mean±SD	
Mean age (years)	33.6±7.2	
Duration of working in current ward (years)	7.5±6.3	
Experience in nursing profession (years)	11.0±7.2	
	n	**%**
Gender		
Female	77	89.5
Male	9	10.5
Education level		
Vocational school	1	1.2
BSN	78	90.7
MSc and PhD in Nursing	7	8.1
Working shifts		
Between 08:00 and 16:00	25	29.0
Rotating shifts	61	71.0
Receiving training on opioid medications		
Yes	32	37.2
No	54	62.8
Place of training		
Nursing school	21	65.6
Seminar	3	9.4
Other (congress, in service training)	8	25.0
Frequency of administering opioid medications to patients on daily practice		
Often	52	60.5
Sometimes	17	19.8
Rarely	12	14.0
Never	5	5.8
Adverse effects experienced by patients due to opioids		
None	70	81.4
Dyspnea and hypotension	2	2.3
Hypotension	8	9.3
Fear of addiction	3	3.5
Nausea-vomiting, constipation	3	3.5
Total	86	100

SD: Standart deviation.

Context Validity and Reliability of the Scale

The ICC value that was found to be 0.80 in this study was considered to measure the observers' reliability. Following the experts' opinions, the suitability of each item was separately assessed, and compliance was found with ICC. The reliability of the questionnaire was tested with Cronbach's alpha value.[29] Cronbach's alpha values ranged from 0.78 to 0.81 for the questionnaire items, and this value was 0.81 for the entire instrument. Table 2 presents Cronbach's alfa value for each item in the questionnaire.

Table 3 represents the nurses' answers given to each item in the questionnaire. Nurses agreed and strongly agreed with some items (2, 3, 9, 10, 12, 13, and 14) of the questionnaire over 50%. Nurses want to trust the doctor who makes the request (68.6%), their fear of administering such drugs to patients with addiction history was also high (64%).

Table 4 shows a comparison between the nurses' demographic characteristics and scale items.

No correlation was found between the nurses' age, years of working, duration of working in the unit, and frequency of administering opioids, and questionnaire items (p>0.05) (Table 4).

Female nurses were more sensitive to trust a physician who requesting the administration of opioids (p=0.017). Male nurses were more reluctant than female nurses in administering opioids (p=0.002) (Table 5).

Discussion

Context Validity and Reliability

All items in the questionnaire consisted of statements assessing nurses' conscious decisions while administering opioids, their fears related to opioids, observations based on practices, and definitions regarding the risks. The questionnaire was entitled "Nurses' Perception of Administering Opioids" in Turkish after permission from the author(s) developed the questionnaire, believing that this Turkish title would be suitable.

Performing the linguistic, context, and content validity studies is the basic step to be taken in adapting a scale into a different language.[27,29] The context validity stage assesses the consistency between the scale and the property to be measured.[29,30] This stage was performed consulting experts in the field, and Davis' method was applied for this pur-

Table 2. Cronbach's alpha values of each item in the questionnaire

Questionnaire items	Cronbach's alpha value if item delated
1. The huge variety of new opioids available makes administration more difficult	0.79
2. I require more knowledge about opioids (e.g., morphine) compared to other medications (e.g., blood pressure medications or insulin) to give them safely.	0.78
3. When giving opioids (e.g., morphine) I need to monitor patients more closely in comparison to giving other medications (e.g., blood pressure medications or insulin).	0.78
4. Opioids (e.g., morphine) scare me which means I am less likely to want to administer them.	0.79
5. When giving opioids (e.g., morphine) I am afraid of overdose.	0.80
6. Prescribing errors are a common barrier to nurses administering opioids (e.g., morphine).	0.79
7. Opioids (e.g., morphine) are dangerous because they are controlled drugs and require double signing.	0.80
8. Nurses often associate giving opioids (e.g., morphine) with helping patients to die.	0.81
9. Familiarity with an opioid (e.g., morphine) gives me more confidence when administering this opioid.	0.80
10. When giving opioids (e.g., morphine) I am constantly aware of side effects.	0.80
11. Nurses associate opioids (e.g., morphine) with drug abuse.	0.80
12. When using opioids (e.g., morphine) I don't want to make mistakes because I am afraid of criminal investigations.	0.80
13. When administering opioids (e.g., morphine) I am more concerned about patients with a history of drug abuse (IVDU).	0.80
14. I need to trust the prescribing doctor in order to be comfortable with giving an opioid (e.g., morphine).	0.79
Cronbach's Alpha value: (n=14)	0.81

pose.[30] The draft questionnaire was presented to a group of experts (8 people), and they were asked to grade each item using scores 1–4 for comprehensibility.[28] To measure the observers' reliability, the ICC that was found to be 0.80 in this study was considered convenient. The suitability of each item was separately assessed, and answers were found to be compliant with ICC.[31] As this questionnaire has yet to be adapted into different languages, context validity could not be compared to the results of other studies. The reliability concept indicates how well a scale measures a property that it aims to assess. [32] Cronbach's alfa value ranged from 0.78 to 0.81 for the items in the questionnaire in this study. This value was 0.81 for all 14 items on the questionnaire, and the reliability was found to be high (Table 2). Cronbach's α coefficient is the weighted standard difference found by using the ratio of the total variances regarding each item in the scale to the general variance. The α value obtained for all items in a scale indicates the total reliability of that scale. The literature indicates that the α value higher than

0.70 and close to 1.00 increases the scale's reliability.[33] This result resembles the original English form of the questionnaire where the reliability value was calculated as 0.80.[11] Accordingly, it is appropriate to state that each item in the questionnaire was suitable, and represents nurses' perceptions toward the administration of opioids. Each item in the original form was scored and assessed with the following scores: (1) Certainly agree, (2) Agree, (3) Undecided, (4) Disagree, and (5) Certainly disagree. The total score to be obtained from the questionnaire was not specified.[11] Thus, the Turkish form of the questionnaire did have a total score as well. However, whether the instrument is suitable for performing a factor analysis should be assessed by reconducting another study with a broader sample. Calculation of total score and subscale scores will facilitate the use of it for future studies. Although this was a validity and reliability study, nurses' responses to scale items (Table 3) and comparisons of the demographic characteristics with answers to the scale items were discussed (Table 4).

Table 3. Nurses' response to questionnaire items

Items	Strongly agree		Agree		Undecided		Disagree		Strongly disagree	
	n	%	n	%	n	%	n	%	n	%
Item 1	6	7.0	19	22.1	33	38.4	24	27.9	4	4.7
Item 2	14	16.3	37	43.0	14	16.3	18	20.9	3	3.5
Item 3	18	20.9	40	46.5	13	15.1	13	15.1	2	2.3
Item 4	1	1.2	7	8.1	19	22.1	43	50.0	16	18.6
Item 5	1	1.2	27	31.4	12	14.0	33	38.4	13	15.1
Item 6	7	8.1	27	31.4	32	37.2	14	16.3	6	7.0
Item 7	11	12.8	30	34.9	15	17.4	23	26.7	7	8.1
Item 8	2	2.3	4	4.7	12	14.0	36	41.9	32	37.2
Item 9	26	30.2	43	50.0	11	12.8	3	3.5	3	3.5
Item 10	16	18.6	50	58.1	12	14.0	6	7.0	2	2.3
Item 11	5	5.8	25	29.1	25	29.1	24	27.9	7	8.1
Item 12	16	18.6	36	41.9	12	14.0	15	17.4	7	8.1
Item 13	12	14.0	43	50.0	14	16.3	11	12.8	6	7.0
Item 14	14	16.3	45	52.3	18	20.9	5	5.8	3	3.5

Nurses' Response to Questionnaire Items

Fear of side effects associated with the administration of opioids is quite common.[12,13] Ferreira et al. (2013)[13] stated that nurses were afraid of the side effects of opioid drugs and were unwilling to administer them. In this study, fear of administering opioid drugs was determined as 68.6% (Item 4, Table 3), and the rate of thinking that opioid drugs are dangerous is 47.7% (Item 7, Table 3). However, it was observed that nurses (53.5%) were not afraid of giving an overdose (Item 5, Table 3). In the study of Guest et al.,[11] the fear of administering opioid drugs (4.3%) and the rate of those who find opioid drugs dangerous is relatively low (29.2%). These differences may have resulted from the differences in nurses' education on the subject. In this study, another factor that caused nurses to be hesitant about opioid drug administration is administering these drugs to patients with substance addiction history (64%) (Table 3). As a consequence, nurses' intent to trust the doctor who prescribes (68.6%) can be explained by their fear of administering such drugs (Item 13 and 14, Table 3). In various studies, it has been reported that nurses abstain from administering opioids to patients with a history of substance abuse.[11,34] It is an essential responsibility of nurses to have sufficient information about the safe use, and storage of opioids to prevent unwanted medication incidents.[25] On the other hand, it is predictable that effective intra-team communication solves many problems, especially medication errors.[2,35] Therefore, the desire to trust the requesting doctor may have come indispensable.[11]

In the hospital wards, the administration of medications is one of the duties of the nurses. Nurses are responsible for monitoring the compliance of the patient with the treatment, and the administration of the desired dose of medication as well as observing the effects and side effects of medications.[5] Opioid drugs, when not used appropriately, cause repeated hospitalizations and increase the cost, morbidity, and mortality[2] In this study, the tendency to observe patients closely who were administered opioids was high (67.4%) (Item 3, Table 3), and was similar to the Guest et al.'s[11] study. In this study, the anxiety of the nurses (39.5%) about the possible prescription errors related to the medication may cause them to experience problems in the administration of opioid drugs (Item 6, Table 3). Prescribing errors that withhold nurses from administering opioids are lower (25.2%) in the Guest et al.'s[11] study.These differences may be related to the nurses' perceptions about the opioids and working conditions of the nurses in their countries where the studies were conducted. Nurses do not associate opioid drug practices with helping patients die (79.1%) (Table 3). A similar result is available

Table 4. Correlations of nurse' features (age, experience, and frequency of administering opioids) with their answers to questionnaire items

Items	Age (years)	Experience in the nursing profession (years)	Experience in a current ward (years)	Frequency of administering opioids
Item 1	r=−0.003	r=0.009	r=−0.041	r=−0.140
	p=0.977	p=0.933	p= 0.706	p=0.199
Item 2	r=0.056	r=0.048	r=0.083	r=−0.077
	p=0.610	p=0.663	p=0.450	p=0.479
Item 3	r=0.155	r=0.117	r=0.100	r=0.045
	p=0.154	p=0.283	p=0.358	p=0.680
Item 4	r=−0.024	r=0.007	r=0.055	r=−0.134
	p=0.827	p=0.952	p=0.615	p=0.219
Item 5	r=−0.002	r=0.005	r=−0.072	r=−0.007
	p=0.987	p=0.961	p=0.511	p=0.947
Item 6	r=−0.089	r=−0.080	r=−0.105	r=0.067
	p=0.416	p=0.462	p=0.335	p=0.539
Item 7	r=−0.046	r=−0.094	r=−0.078	r=−0.085
	p=0.671	p=0.390	p=0.474	p=0.434
Item 8	r=0.066	r=0.019	r=0.026	r=−0.190
	p=0.547	p=0.860	p=0.813	p=0.080
Item 9	r=0.167	r=0.101	r=0.070	r=−0.021
	p=0.124	p=0.354	p=0.522	p=0.849
Item 10	r=−0.038	r=−0.064	r=−0.027	r=0.083
	p=0.725	p=0.555	p=0.802	p=0.450
Item 11	r=−0.133	r=−0.155	r=−0.071	r=0.048
	p=0.222	p=0.155	p=0.514	p=0.660
Item 12	r=0.039	r=0.021	r=−0.104	r=0.028
	p=0.719	p=0.846	p=0.342	p=0.798
Item 13	r=−0.143	r=−0.191	r=−0.094	r=0.030
	p=0.188	p=0.079	p=0.391	p=0.787
Item 14	r=0.042	r=0.053	r=−0.030	r=0.038
	p=0.705	p=0.628	p=0.786	p=0.733

r: Spearman's correlation; significance at p<0.05.

in Guest et al.[11] (2017), where nurses did not associate (86.9%) opioid administration with helping patients die. Studies have shown no relationship between the administration of standard doses of opioid drugs and death. The mortality rate is high in abuse, high dose intakes, and drug interactions.[36–38] One study stated that opioids have the addictive potential[14] where others do not link opioid drugs with substance addiction.[10,11] Guest et al.[11] (2017) and Çelik et al.[10] (2018) did not associate opioid drugs with addiction in 71.6% of nurses and 82.7% of nurses, respectively. In this study, 36% of the nurses stated that they did not correlate

opioids with addiction, and some were indecisive (29.1%) (Table 3). The difference in these results may be related to nurses' cultural differences. Many nurses consider opioid drug administrations as a risk (60.5%) and associate it with forensic investigations (Item 12, Table 3). A study conducted in Iran stated that 40% of nurses avoid making mistakes, and do not report medication errors due to fear of legal consequences[23] Similar concerns exist among doctors prescribing these medications and avoid prescribing them (44.9%).[6] In contrast to these studies, Guest et al.[11] (2017) stated that 40.9% of nurses stated that fear of

Table 5. Comparisons of nurses' features with answers they gave to questionnaire items

Questionnaire items	Gender Female/ Male	Education level BSN/ Msc+PhD	Working hours Day Shifts/ Rotating shifts	Training received on opioids Yes/No	Place of training Nursing school/ Seminar/ Other	Facing adverse drug reactions after opioid administration Yes/No
Item 1						
Strongly agree	4/2	6/0	0/6	3/3	2/0/1	3/3
Agree	18/1	18/0	6/13	8/11	8/0/0	3/16
Undecided	29/4	30/3	10/23	11/22	5/1/5	4/29
Disagree	23/1	20/4	7/16	8/16	5/1/2	6/18
Strongly disagree	3/1	4/0	2/3	2/1	1/1/0	0/4
Test/p value	χ^2=5.182 p=0.157	χ^2=3.567 p=0.411	χ^2=3.388 p=0.504	χ^2=1.588 p=0.847	χ^2=10.107 p=0.155	χ^2=5.474 p=0.194
Item 2						
Strongly agree	10/4	13/0	5/9	4/10	4/0/0	2/12
Agree	34/3	34/3	10/26	9/28	7/0/2	9/28
Undecided	13/1	14/0	4/10	6/8	3/1/2	0/14
Disagree	18/0	15/3	4/14	12/6	6/2/4	4/14
Strongly disagree	2/1	2/1	2/1	1/2	1/0/0	1/2
Test/p value	χ^2=8.194 p=0.046	χ^2=5.735 p=0.139	χ^2=2.820 p=0.603	χ^2=9.761 p*=0.034	χ^2=6.340 p=0.725	χ^2=5.446 p=0.221
Item 3						
Strongly agree	14/4	17/1	5/13	9/9	8/0/1	5/13
Agree	38/2	36/3	15/24	11/29	7/1/3	7/33
Undecided	11/2	12/1	3/10	4/9	2/0/2	1/12
Disagree	13/0	11/2	0/13	7/6	3/2/2	3/10
Strongly disagree	1/1	2/0	2/0	1/1	1/0/0	0/2
Test/p value	χ^2=8.409 p*=0.043	χ^2=1.820 p=0.901	χ^2=11.953 p*=0.011	χ^2=5.070 p=0.266	χ^2=7.592 p=0.498	χ^2=2.436 p=0.662
Item 4						
Strongly agree	0/1	1/0	1/0	0/1	0/0/0	1/0
Agree	6/1	6/0	1/6	2/5	2/0/0	1/6
Undecided	18/1	19/0	7/12	7/12	5/0/1	1/18
Disagree	42/1	38/5	13/30	18/25	11/2/5	9/34
Strongly disagree	11/5	14/2	3/12	5/11	3/1/1	4/12
Test/p value	χ^2=14.791 p*=0.002	χ^2=3.662 p=0.471	χ^2=3.857 p=0.428	χ^2=1.404 p=0.911	χ^2=2.808 p=0.956	χ^2=6.354 p=0.153
Item 5						
Strongly agree	1/0	1/0	0/1	0/1	0/0/0	0/1
Agree	24/3	23/3	7/20	9/18	7/0/2	5/22
Undecided	11/1	11/1	5/7	6/6	4/0/2	1/11
Disagree	30/3	33/0	10/23	14/19	8/3/3	7/26
Strongly disagree	11/2	10/3	3/9	3/10	2/0/1	3/10
Test/p value	χ^2=1.582 p=0.959	χ^2=8.249 p=0.052	χ^2=1.670 p=0.871	χ^2=3.026 p=0.568	χ^2=3.751 p=0.797	χ^2=1.616 p=0.839
Item 6						
Strongly agree	4/3	7/0	1/6	3/4	2/1/0	2/5

Table 5 (cont.). Comparisons of nurses' features with answers they gave to questionnaire items

Questionnaire items	Gender Female/ Male	Education level BSN/ Msc+PhD	Working hours Day Shifts/ Rotating shifts	Training received on opioids Yes/No	Place of training Nursing school/ Seminar/ Other	Facing adverse drug reactions after opioid administration Yes/No
Agree	24/3	26/0	10/17	8/19	5/0/3	3/24
Undecided	31/1	28/4	8/24	15/17	8/2/5	5/27
Disagree	13/1	12/2	4/9	4/10	4/0/0	4/10
Strongly disagree	5/1	5/1	2/4	2/4	2/0/0	2/4
Test/p value	χ^2=8.278 p=0.046	χ^2=5.375 p=0.172	χ^2=1.899 p=0.775	χ^2=2.589 p=0.646	χ^2=6.683 p=0.565	χ^2=4.024 p=0.375
Item 7						
Strongly agree	8/3	9/2	1/9	4/7	3/1/0	3/8
Agree	29/1	28/1	7/23	5/25	3/1/1	5/25
Undecided	12/3	15/0	7/8	8/7	4/0/4	2/13
Disagree	22/1	20/3	6/17	12/11	9/1/2	4/19
Strongly disagree	6/1	6/1	4/3	3/4	2/0/1	2/5
Test/p value	χ^2=7.276 p=0.077	χ^2=4.907 p=0.222	χ^2=6.803 p=0.136	χ^2=9.799 p*=0.039	χ^2=6.730 p=0.550	χ^2=1.764 p=0.809
Item 8						
Strongly agree	2/0	2/0	0/2	1/1	1/0/0	1/1
Agree	4/0	4/0	1/3	0/4	0/0/0	0/4
Undecided	11/1	12/0	3/9	4/8	1/0/3	2/10
Disagree	31/5	32/3	13/23	14/22	10/1/3	5/31
Strongly disagree	29/3	28/4	48/23	13/19	9/2/2	8/24
Test/p value	χ^2=1.000 p=0.945	χ^2=1.923 p=0.753	χ^2=1.624 p=0.881	χ^2=2.749 p=0.638	χ^2=6.720 p=0.364	χ^2=3.477 p=0.427
Item 9						
Strongly agree	21/5	23/3	2/23	9/17	6/2/1	7/19
Agree	41/2	38/4	17/26	16/27	10/1/5	7/36
Undecided	10/1	11/0	3/8	5/6	3/0/2	1/10
Disagree	3/0	3/0	0/3	1/2	1/0/0	1/2
Strongly disagree	2/1	3/0	3/0	1/2	1/0/0	0/3
Test/p value	χ^2=5.875 p=0.150	χ^2=1.493 p=0.852	χ^2=14.922 p*=0.002	χ^2=0.808 p=0.971	χ^2=6.107 p=0.809	χ^2=2.896 p=0.521
Item 10						
Strongly agree	13/3	13/3	3/12	6/10	5/1/0	4/12
Agree	47/3	45/4	16/34	20/30	12/2/6	11/39
Undecided	10/2	12 (0	4/8	5/7	3/0/2	1/11
Disagree	6/0	6/0	0/6	0/6	0/0/0	0/6
Strongly disagree	1/1	2/0	2/0	1/1	1/0/0	0/2
Test/p value	χ^2=6.439 p=0.104	χ^2=3.244 p=0.435	χ^2=6.959 p=0.110	χ^2=4.270 p=0.356	χ^2=4.856 p=0.684	χ^2=2.549 p=0.644
Item 11						
Strongly agree	4/1	5/0	0/5	2/3	2/0/0	2/3
Agree	23/2	22/2	5/19	9/16	6/1/2	5/20
Undecided	24/1	23/2	9/16	11/14	5/1/4	4/21

Table 5 (cont.). Comparisons of nurses' features with answers they gave to questionnaire items

Questionnaire items	Gender Female/Male	Education level BSN/Msc+PhD	Working hours Day Shifts/Rotating shifts	Training received on opioids Yes/No	Place of training Nursing school/Seminar/Other	Facing adverse drug reactions after opioid administration Yes/No
Disagree	22/2	22/2	9/15	8/16	5/1/2	4/20
Strongly disagree	4/3	6/1	2/5	2/5	2/0/0	1/6
Test/p value	χ^2=7.695	χ^2=1.150	χ^2=3.888	χ^2=1.043	χ^2=3.571	χ^2=2.011
	p=0.063	p=0.897	p=0.420	p=0.931	p=0.984	p=0.790
Item 12						
Strongly agree	13/3	14/2	4/12	5/11	4/1/0	5/11
Agree	33/3	32/3	11/25	11/25	6/1/4	7/29
Undecided	11/1	12/0	3/9	4/8	2/0/2	0/12
Disagree	15/0	14/1	5/10	9/6	6/1/2	2/13
Strongly disagree	5/2	6/1	2/4	3/4	3/0/0	2/5
Test/p value	χ^2=5.325	χ^2=2.139	χ^2=0.649	χ^2=4.362	χ^2=5.760	χ^2=5.342
	p=0.173	p=0.758	p=0.979	p=0.358	p=0.735	p=0.233
Item 13						
Strongly agree	10/2	9/3	4/7	2/10	1/0/1	4/8
Agree	42/1	40/2	12/31	15/28	11/0/4	10/33
Undecided	12/2	13/1	4/10	7/7	4/1/2	1/13
Disagree	9/2	10/1	2/9	6/5	4/2/0	0/11
Strongly disagree	4/2	6/0	3/3	2/4	1/0/1	1/5
Test/p value	χ^2=8.85	χ^2=4.633	χ^2=2.332	χ^2=4.693	χ^2=8.891	χ^2=5.779
	p*=0.029	p=0.233	p=0.699	p=0.320	p=0.287	p=0.184
Item 14						
Strongly agree	11/3	13/1	2/12	4/10	3/1/0	3/11
Agree	44/1	40/4	12/32	15/30	10/1/4	12/33
Undecided	14/4	17/1	7/11	10/8	6/0/4	1/17
Disagree	5/0	4/1	1/4	2/3	1/1/0	0/5
Strongly disagree	2/1	3/0	3/0	1/2	1/0/0	0/3
Test/p value	χ^2=10.306	χ^2=1.898	χ^2=8.371	χ^2=3.474	χ^2=8.223	χ^2=4.639
	p*=0.017	p=0.786	p=0.057	p=0.483	p=0.405	p=0.281

χ^2=Pearson's chi-square and Fisher-Freeman-Halton tests; significance at $p<0.05$ level r: Spearman's correlation; significance at $p<0.05$ level. p* values indicate significance at $p<0.05$ level.

forensic investigations did not influence their practice. Nurses must possess legal regulations in their clinical practice. Overlooking some practices and ignorance of laws can lead to legal issues.[39] In this study, nurses' risk perception of administering opioids may be due to their knowledge related to legal practices.

Although the nurses did not believe that number of new opioid drugs (32.6%) (Item 1, Table 3) causes them difficulty, they highlight the importance of knowing (59.3%) (Item 2, Table 3). Being familiar with

opioids increases confidence (80.9%) and knowledge on side effects is high (76.7%) among nurses (Items 9 and 10; Table 3). This result suggests that nurses are aware of the need to know drug administration. Like this study, it was determined in Guest et al.[11] (2017) that 85.1% of the nurses believed that they should know the drug. In a study conducted to determine the knowledge of healthcare staff about analgesic drugs, it was stated that 65% of the nurses were partially knowledgeable.[14] Avoidance of administration is usually linked to insufficient knowl-

edge about the administration of medications, and their side effects.[9,13,14,40]

Comparisons of the Demographic Characteristics of Nurses with Answers to the Questionnaire Items

No correlation was found between the nurses' age, years of work, work experience in the current ward, and frequency of administering opioids in daily practice, and questionnaire items (Table 4). Similarly, the education received on opioids, place of education concerning opioids, and unfavorable experiences after opioid administration did not influence their response (p>0.05, Table 5).

This study indicated that male nurses needed more information to administer opioids than female nurses (Item 2, Table 5). The gender influenced nurses' attitudes on observing the patients more closely when administering opioids (Item 3, Table 5), but no difference was found between them during the pairwise comparisons. Male nurses' were less willing the administer opioids (Item 4, Table 5) could be related to cultural differences and participants' characteristics. Certain studies indicate a relationship between gender and pain management.[41,42] The study conducted by Criste (2003)[42] with the anesthesia nurses indicated that male nurses tend to administer analgesics more than female nurses. Nurses accepted that prescription-related mistakes prevented medications and relevant processes, but this was linked to gender.[43] The results of the study were similar to those of the literature.

Of the female nurses who administered medication to the patients of substance addiction, 54.5% were more concerned in the administration process, while 11.1% of the male nurses had the same concerns (Item 13, Table 5). The literature had no studies on the relationship between gender, medication procedures, and substance addiction. Çelik et al.[10] (2018) reported that gender did not influence nurses' knowledge and attitudes concerning the concept of pain. This is linked to female nurses' professional concerns.[44] The present study indicated that female nurses were more sensitive in the prescribing process done by physicians (Item 14, Table 5). To provide more details, female nurses stated that they wanted to trust in the physicians' knowledge and manner of

requesting the process of opioids. Accordingly, it is fair to express that nurses prioritize being in direct contact with the physician in the administration process. The relationship between nurses and practitioners impresses patients' safety.[45] No studies examining the relationship between nurses' gender and nurses' relay on physicians were found. According to many studies, the teamwork between the nurses and physicians, and the effective communication between them solves many issues, including the ones related to the medication administrations.[2,35]

Long working hours of nurses and attention deficit cause several problems in decision making.[46] This study reported that nurses working in dayshift (08:00–16:00) needed to observe the patients more closely when administering opioids and that 21.7% of the nurses working in rotating shifts revealed no need for close monitoring (Item 3, Table 5). Failing to monitor patients following a medical procedure is referred to as medical wrongdoing.[46] Insufficient monitoring of patients in many countries is the most frequent form of improper practice.[47] The study by Cebeci et al.[48] (2012) indicated that 88.2% of nurses had a higher rate of making mistakes as their working hours increased while the study by Feleke et al. (2015)[49] reported that the probability of making mistakes in monitoring patients was higher during the night shifts. Working for longer than 12 h increases nurses' likelihood of making mistakes.[50] Nurses working in dayshift (76%) reported that sufficient knowledge on opioids gave them confidence during the administration of them (Item 9, Table 5). This rate is higher in nurses working on rotating shifts (81.6%); while some of the day shifts working nurses (12%) disagree with the statement. This study showed that nurses (working in day shifts and rotating shifts) needed some knowledge in administering opioids (p=0.002, Table 5) which is believed to have arisen from nurses' knowledge deficiency on opioids and their side effects.[9,13,14] Additionally, a higher rate of nurses working in rotating shifts, the obligation to be on guard duty alone during night shifts, a limited number of assisting staff, and inadequate supplies might have caused nurses to be more sensitive in improving their knowledge in this regard.

While 28.1% of those who received training on opioids stated the need for more knowledge than any

other medications as well as a not trained group of nurses (51.9%). Also, 37.5% of those who trained reflect the need for more information (Item 2, Table 5). Results indicate that uneducated nurses needed more information. Inadequate knowledge drives them to abstain from administering these medications.[9,13,14] Relevant studies showed that nurses had knowledge-related deficits in assessing and managing pain.[3,7,25] The study by Karakaya (2007)[14] on administering opioids reported that 81% of healthcare staff were not trained on opioids and thus had inadequate knowledge; 6.7% had sufficient expertise although they were not educated, and 10.6% had inadequate knowledge despite the education. Two different studies indicated that there was progress in the knowledge and attitudes of nurses who were trained about opioids and that they managed patients' pain more effectively.[25]

Results indicate that receiving training about opioids increases the nurses' attention and they are more attentive to obtain double signatures (Item 7, Table 5). The difference arose from the trained nurses who considered this process as dangerous (15.6%) and from the untrained nurses (46.3%) who considered opioid administration as non-dangerous. It is believed that the nurses in this study did not know about the obligation of using double signatures to prevent the abuse of opioids because they were not trained. Guest et al.[11] (2017) noted that 48.5% of nurses did not consider opioids as dangerous. Nurses knew that opioids had legal procedures and could create unwanted effects and that a control system should be used during the administration not to risk the patients' safety, which can be associated with the training they had. Abuse of opioids[24] and administration-related mistakes is an essential threat against nursing and the healthcare industry. Therefore, nurses should be careful in terms of safely administering and storing opioids.[25] Nurses should be reminded during the training sessions performed within nursing programs or future training that they might be sentenced due to performing procedures without knowing the relevant laws.[39]

Limitations

This study was conducted only with nurses who were employed in surgical wards. Another limitation was that the total score could not be obtained from the questionnaire in the current form, which complicates the findings' interpretation.

Conclusion

According to the results of this study, the Turkish form of the questionnaire of Nurses' Perception of Administering Opioids was a valid and reliable tool, and the items represented nurses' perceptions of administering opioids. The questionnaire can be used to determine the perceptions of nurses working in different wards toward the administration of opioids. As the total score was not calculated in the original questionnaire, whether it suits the factor analysis in a separate sample can be analyzed by obtaining the authors' permission who developed the original work as the second phase to facilitate the process of analyzing the data in the future studies.

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