Comparison of three rating scales for assessing pain intensity in an intensive care unit

Bir yoğun bakım ünitesinde ağrı yoğunluğunu değerlendirmede üç skalanın karşılaştırılması

Azize Karahan,[1] Asuman Ersayın,[2] Firides Yıldırım,[2] Aysel Abbasoğlu,[1] Gülcihan Akkuzu,[1] Necibe Akyüz[3]

[1]Departmant of Nursing and Health Services, Başkent University Faculty of Health Sciences, Ankara;
[2]Department of Cardiovascular Intensive Care Unit, Başkent University Ankara Hospital, Ankara;
[3]Department of Nursing Management, Başkent University Ankara Hospital, Ankara

Background: In this study, we aim to determine the preferences of the patients for three rating scales which are used to assess pain intensity.

Methods: The study included 64 patients who were hospitalized in the Cardiovascular Surgery Intensive Care Unit (ICU) between April 2007 and April 2008. A scale which was used in the hospital (Numeric Rating Scale) and two others which were not previously used Verbal Rating Scale and Visual Analog Scale were compared to assess their ability to measure pain intensity. Then, the patients were interviewed with a questionnaire to obtain the opinions of them. The first assessment was performed, after the patient was admitted to the ICU. The measurements were then repeated twice on the second and third days of ICU stay.

Results: A total of 81.3% of the patients reported that all scales were reliable for the assessment of the pain intensity. The majority (90.6%) reported Verbal Rating Scale, while very few (3.1%) reported Visual Analog Scale as an indicator of the assessment of the pain intensity.

Conclusion: Our results suggest that integration of the Verbal Rating Scale with the currently used rating scales, for the assessment of the pain intensity, pain attention to the preferences of the patients on rating scales, may be the convenient approach.

Key words: Numeric Rating Scale; Pain Assessment; Pain Scales; Verbal Rating Scale; Visual Analog Scale.

Amaç: Bu çalışmanın amacı, ağrı yoğunluğunun değerlendirilmesinde kullanılan üç skala için hastaların tercihlerinin belirlenmesidir.

Çalışma planı: Nisan 2007 ve Nisan 2008 tarihleri arasında gerçekleştirilen çalışmaya, Kalp Damar Cerrahisi Yoğun Bakım Ünitesi'nde (YBÜ) yatan 64 hastadan oluşan örneklem dahil edildi. Hastanede kullanılan Sayısal Oranlama Skalası ve daha önceden kullanılmayan iki skala (Sözel Oranlama Skalası ve Görsel Analog Skalası) ağrı yoğunluğunu ölçme yeteneklerinin değerlendirilmesi için karşılaştırıldı. Ardından soru formu aracılığı ile hastaların skalaya yönelik görüşleri değerlendirildi. İlk ağrı değerlendirilmesi, hasta YBÜ'ye kabul edildikten sonra yapıldı. Bu ölçümler, YBÜ'deki ikinci ve üçüncü günlerde iki kez daha tekrarlandı.

Bulgular: Hastaların %81.3'ü bu skalaların ağrılarını değerlendirmede güvenilir olduğuna inandıklarını belirtti. Hastaların neredeyse tamamı (%90.6), ağrının takibinde Sözel Oranlama Skalası'nı tercih ederken, çok az bir kısmı (%3.1) Görsel Ağrı Skalası'nı tercih etti.

Sonuç: Çalışma bulguları, ağrı yoğunluğunun değerlendirilmesine yönelik olarak, hasta tercihleri de dikkate alınarak, mevcut skalalar ile birlikte, sözel oranlama skalasının kullanılmasının uygun bir yaklaşım olacağını göstermektedir.

Anahtar sözcükler: Sayısal Oranlama Skalası; Ağrı Değerlendirmesi; Ağrı Skalası; Sözel Oranlama Skalası, Görsel Analog Skala.

The behavioral expression of pain and reporting its intensity are more prominent in those experiencing acute pain than in those suffering from chronic pain.[1] A convenient pain management plan for surgery patients would provide crucial information regarding early mobilization, shorter hospital stay periods, cost reduction, and increased patient satisfaction.[2-4] The awareness of doctors and nurses regarding patients'

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Correspondence: Azize Karahan, RN, PhD. Başkent Üniversitesi Sağlık Bilimleri Fakültesi Hemşirelik ve Sağlık Hizmetleri Bölümü, Bağlıca Kampüsü Eskişehir Yolu 20. km, 06810 Bağlıca, Ankara, Turkey. Tel: +90 312 - 246 66 75 e-mail: kazize@baskent.edu.tr

pain, their ability to let patients know that they are worried about the pain, and their efforts towards resolving the pain are factors which increase patient satisfaction.[5]

Effectively evaluating pain is a vital step,[2,6] and this can be more difficult for intensive care nurses. Pain can usually be overlooked, insufficiently evaluated, or given a low priority in intensive care unit (ICU) patients due to life-threatening conditions.[7] To have an effective pain evaluation procedure, the patient's own statements should be combined with observations (the significance and cause of the pain according to the individual) and the individual's special characteristics (past experiences, cultural background, age, gender, and education) to be effective. Various psychological factors such as fear, anxiety, and depression should also be noted.[8-10] It is possible to carry out a more effective pain evaluation procedure using appropriate scales,[10,11] useful tools for converting the intensity and features of the pain into a more objective form while preventing different interpretations by healthcare personnel.[11,12] One-dimensional scales are used to evaluate pain intensity. These scales should be easy to understand, use, and score as well as being sensitive to small variations in the intensity of the pain. They should not necessitate motor skills and equipment.[8,13,14] The scales most widely used to determine the intensity of pain and which are reported to have a high level of validity and sensitivity are the Verbal Descriptor Scale (VDS), the Visual Analog Scale (VAS), the Numeric Rating Scale (NRS), and the FACES Pain Rating Scale (FPRS).[4,6,10]

Considering conditions in the ICU, the need for scales which are effective in evaluating pain while being easy to understand and administer and which do not require a long assessment time for either the nurses of patients becomes obvious. Defining patient preferences regarding the use of various scales to measure the intensity of the pain experienced by these patients would be helpful.

PATIENTS AND METHODS

This descriptive study was performed with the aim of defining patient preferences for three different scales being used to determine the intensity of pain in patients undergoing surgery in the Cardiovascular Surgery (CVS)-ICU of Başkent University Ankara Hospital.

This study was approved by Baskent University Institutional Review Board and Ethics Committee (Project no: KA07/86).

Sample and setting

The hospital where the study was performed had a capacity of 300 beds. Its CVS-ICU had nine beds. Permission for this study was obtained from the ethics and research committee of the university.

Patients who were not under the effect of anesthesia, who were not diagnosed with dementia, and who were conscious were included in this study performed between April 2007 and April 2008. During that period, 411 surgeries were performed at the hospital, and the study sample consisted of 64 patients who had the aforementioned characteristics and agreed to be included in the study. The data regarding the diagnoses and surgeries of the patients who were included in the study was examined. While 85.9% of the patients had received a diagnosis of coronary artery disease, 14.1% had been diagnosed with cardiac valve deficiency. Median sternotomy had been performed on all patients. Elective surgical intervention was performed in 89.1% of the patients with bypass, cardiac valve surgery, and cardiac transplantation being performed in 87.5%, 6.2%, and 6.3% of the patients, respectively. The mean surgery time was 4.8±0.7 hours, and 54.7% of the patients stayed in the ICU longer than 48 hours.

None of the patients refused to be included in the study or wanted to quit during the course of the study. Verbal and written permission for the study was obtained from the patients after the researchers determined that there was no condition which could prevent communication, such as dementia, confusion, or loss of sight or hearing.

Instruments

Based on the views of the patients, a comparison was made between the NRS which was being used at the hospital and two other scales which were not being used, the Verbal Rating Scale (VRS) and the VAS. The NRS which consists of numbers from 0 to 10, the VRS composed of six descriptors, and the 100 mm VAS were used for this purpose. The NRS was included in the nurse observation form, and the nurses wrote an explanation of its usage to the patients after they were admitted to the hospital.

Three forms were used in the study. The first form, consisting of 24 questions, asked about the demographic characteristics, disease, and past pain experiences of the patients. In the second form, three sections inquiring about the patient's experiences with pain and their responses to the pain as well as three sections inquiring about the nurses' views on the application and comprehensibility of the scale were included. In the third

and last form, five questions inquiring about the patients' views regarding the scales were included. Options for these questions were provided in four categories as "very difficult, difficult, easy, and very easy".

Data collection and analyses

The mean patient stay time in the CVS-ICU was two to three days. Patients who participated in this study had no previous ICU experience. Analgesics administered ranged from strong narcotic analgesics to non-narcotic ones. Patient-controlled analgesia (PCA) was started in the operating theatre, and a combination of morphine-marcaine or fentanyl was administered during the pain management procedure within the intubation period. The PCA device stayed on the patients for two days on average. Taking into account the severity of pain, meperedine or paracetamol was administered after extubation. Pain evaluations of the patients were performed using the three scales after the effects of the anesthesia had passed, and the scales were administered respectively. The scales for evaluating the intensity of pain were administered by two researchers.

After the first administration, the scales were repeated at 24-hour intervals, and the patients were asked about their views regarding the scales after the third administration. The first administration was performed in the service unit where the patient was transferred if the patients included in the study were taken there earlier than the third day. During the administration of each scale, both the patients and the two researchers administering the scales and conducting the study were asked about any difficulties in the administration and comprehensibility of the scales, and the answers were found to be in accordance. The data was evaluated using descriptive statistics, chi-square tests, and t-test methods after being transferred to the Statistical Package for Social Sciences (SPSS Inc., Chicago, Illinois, USA) for Windows version 11.5 software for analysis.

Table 1. Demographic characteristics of the patients (n=64)

Characteristics	n	%
Age		
<65	43	67.2
≥65	21	32.8
Gender		
Female	20	31.3
Male	44	68.8
Education		
Primary school	35	54.7
High school	16	25.0
College	13	20.3
Occupation		
Self-employed	17	26.6
Retired	25	39.1
Civil servant	9	14.1
Housewife	12	18.8
Worker	1	1.6
Place of residence		
Urban	23	35.9
Rural	41	64.1
Area of residence		
City center	48	75.0
Town	9	14.1
Village	7	10.9

RESULTS

It was noted that 67.2% of the patients were under the age of 65, and the mean age was 58.2±12.6 (range 20 to 90); 68.8% were male, 54.7% were primary school graduates (8 years), 39.1% were retired, 64.1% were from rural areas, and 75% lived in city centers (Table 1).

Although not included in the tables, the views of the patients regarding their ability to express their pain through the scales were evaluated, and 81.3% stated that they did not have any difficulty while 18.8% stated that they did.

Views of the patients about the suitability of the scales for intensity of the pain assessment are shown in Table 2. Concerning their views regarding the suitability of the scales in assessing the intensity of pain, the VRS was the most suitable scale of all. On the other hand, the VAS was not considered to be suitable. The difference was statistically significant for all groups (Table 2).

Table 2. Suitability of scales for intensity of pain assessment according to the patients

Scales	Mean±SD	(min.-max.)	F	*p*
VRS	3.39±0.49	(3-4)		
NRS	3.08±0.51	(2-4)	27.434	0.000
VAS	2.64±0.64	(2-4)		

VRS: Verbal Rating Scale; NRS: Numeric Rating Scale; VAS: Visual Analog Scale; [a]: Scoring 1 to 4; 1: Very difficult; 4: Very easy.

Table 3. Patients' preference priorities regarding the scales in determining the intensity of the pain

Scales	n	%
Verbal Rating Scale	58	90.6
Numeric Rating Scale	4	6.3
Visual Analog Scale	2	3.1

Table 4. Patients' scale preference by descriptive characteristics (n=64)

Characteristics	NRS			VRS			VAS		
	n	%	*p*	n	%	*p*	n	%	*p*
Gender									
Female	2	10.0	p>0.05	17	85.0	p>0.05	1	5.0	p>0.05
Male	2	4.5		41	93.2		1	2.3	
Age									
<65	3	7.0	p>0.05	38	88.4	p>0.05	2	4.7	p>0.05
≥65	1	4.8		20	95.2		–	–	
Education									
<High school	2	5.7	p>0.05	33	94.3	p>0.05	–	–	p>0.05
≥High school	2	6.9		25	86.3		2	6.9	
Living area									
City center	3	6.3	p>0.05	43	89.6	p>0.05	2	4.2	p>0.05
Town/willage	1	6.3		15	93.7		–	–	

NRS: Numeric Rating Scale; VRS: Verbal Rating Scale; VAS: Visual Analog Scale.

Patients were asked to sort the scales used to assess the intensity of pain based on their priority of preference. The VRS was chosen by 90.6% of the patients as the best scale, the NRS was chosen by 6.3% as the second most preferred scale, and the VAS was chosen by only 3.1% (Table 3).

Comparisons made between females and males, those who failed to graduate from high school graduates versus those with higher education levels, and those living in towns/villages versus those living in city centers did not show any statistically significant difference, but it was found that the latter group in each of the aforementioned comparisons had less difficulty in expressing their pain through these scales. However, no statistically significant difference was detected in the scale preferences of the patients based on characteristics such as gender, age, education level, and place of residence (Table 4).

DISCUSSION

The views of 64 patients being treated in the ICU and undergoing open-heart surgery toward the three different scales was recorded. The majority of the patients stated that they were able to express their pain through the scales, but some reported that the scales were not sufficiently convenient for this purpose. Similarly, Carey et al.[15] reported that the majority of patients (85.8%) stated that the scales were helpful in expressing their pain while 13.6% of patients felt that they required further explanation.

In this study, the majority of patients rated the VRS as number one. Verbal Descriptor Scale (VDS) is preferred by patients.[6,16-18] In a study carried out by Briggs et al.[13] it was observed that patients found the VRS better than the VAS. Ersoz et al.[19] found that elderly patients who had a low education level had difficulty in understanding the VAS, but no difficulty was encountered with Descriptive Pain Intensity Scale composed of six descriptors. Gagliese et al.[6] compared four scales in postoperative young and elderly patients (n=504) and found the least difficulty with the VDS. Similarly, Peters et al.[20] found patients over 75 years old preferred the VDS at a higher rate (42.9%).

According to Farsi and Gitto,[21] the VRS provides a better assessment of pain immediately following surgery because it improves the confidential relationship between the patient and healthcare professional. The preference for the verbal scales may result from their ability to allow for the patients to express themselves better and for their convenience of administration and comprehensibility. Cultural effects and cultural backgrounds are reported to be the most important factors affecting pain behavior and pain expression.[4] Verbal scales have been demonstrated to be preferred by Caucasians.[4] English-speaking patients preferred the NRS over the Word Descriptor Scale (WDS), and Spanish-speaking patients preferred the WDS over the NRS.[22] In a study conducted in Turkey, the VRS, NRS, FPRS, VAS 10 and VAS 100 were evaluated in postoperative patients (n=200), and the first choice (58%) was the FPRS while the second (23.5%) was the VRS.[23]

In this study, patients reported that they had the most difficulty with the VAS, and it was the least preferred scale. Other studies have also found that patients had difficulties in understanding the VAS resulting in an inability to express their pain sufficiently.[4,17] The VAS is not preferred by patients due to reasons such as a

failure on the part of patients to adapt to the numbers, a failure to understand, visual impairments, physical constraints, and hearing disorders.[6,13-14]

In contrast to this study, some studies have reported that other scales such as the NRS and face expression scales were preferred by patients at a higher rate compared to the verbal scales.[1,6,24,25] Li et al.[4] reported their patients' preferred the Faces Pain Scale-Revised (FPS-R) followed by the NRS, VDS and VAS, respectively. On the other hand, Carey et al.[15] found that patients preferred the Wong-Baker FACES Pain Rating Scale (48.6%), the NRS (35.3%), and the VAS (16.1%).

Although patients had a preference for verbal scales, these scales have also been criticized. Scales consisting of fewer options or points affect the reliability of the scale negatively. Using a combination of the NRS and VRS is recommended to avoid this problem. The most important advantage of the NRS is its ease of administration, scoring, and use.[6,18]

In conclusion, although some of the patients had difficulties in expressing their pain through the scales in this study, almost all of the patients preferred the VRS to express the intensity of pain. They had difficulties in understanding the VAS. Based on these results, we believe that it would be appropriate to consider patient characteristics when selecting scales in order to perform a more comprehensive study regarding the patients who have difficulties in expressing their pain. It is also recommended to use the NRS in combination with the VRS to plan a comparative study with different cultures in order to reveal the effects of the cultural factors and to perform a study encompassing a wider patient group consisting of patients in other ICUs and inpatient clinics.

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