Agri 2015;27(3):132–138
doi: 10.5505/agri.2015.50103

ORIGINAL ARTICLE

Perceptions of pain levels among orthopedic surgery patients, their relatives, and nurses

Ortopedik cerrahi hastalarında ağrının hasta yakını ile hemşire tarafından algılanışı

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Summary

Objectives: This descriptive study investigated pain levels of orthopedic surgery patients, and how this pain is perceived by their relatives and nurses.

Methods: The study was carried out with 150 patients, 150 relatives and 50 nurses to determine pain intensity levels of orthopedic surgery patients and perceptions of this among their relatives and nurses. Intensity of pain was measured on a 0 to 10 visual analogue scale. Relatives and nurses were not allowed to see the patient's pain intensity score, and each nurse was allowed to participate in pain measurement three times. The data were analyzed by descriptive statistics, the Mann Whitney-U test, Paired Sample t-Test, Linear Regression and Spearman Correlation Analysis.

Results: The pain intensity scores given by nurses (t=9.136, p<0.001) were significantly lower than patients' own scores. There was no significant difference between relatives' and patients' pain scores. In the regression analysis, pain intensity scores given by relatives were approximately 40% lower than those given by patients, while nurses' scores were approximately 60% lower.

Conclusion: Education on pain management and the physical and emotional reactions of patients to pain should be provided for nurses working in surgical clinics. Meanwhile, as those who spend most time with the patient, relatives should be informed about possible pain behaviors in the postoperative period in order to prepare them for their role in the patient's care.

Key words: Nurses; orthopedic surgery; pain intensity; pain perception; patients' relatives.

Özet

Amaç: Bu tanımlayıcı araştırma, ortopedik cerrahi hastalarında ağrının hasta yakını ile hemşire tarafından algılanışının incelenmesi amacıyla gerçekleştirildi.

Gereç ve Yöntem: Araştırmanın örneklemini ortopedi kliniğinde yatan 150 hasta, hastaların yanındaki 150 hasta yakını ve hastanın bakımından sorumlu 50 hemşire oluşturdu. Her hemşire araştırmaya yalnızca üç kere katıldı. Ağrı düzeyi, Görsel Analog Skala ile değerlendirildi. Hasta yakını ve hemşirenin, hastanın ağrı skalasını görmemesi sağlandı. Verilerin değerlendirilmesinde; yüzdelik, ortalama, standart sapma, Mann-Whitney-U, Eşleştirilmiş Örneklem t-Testi, Lineer Regresyon ve Spearman Korelasyon Analizi kullanıldı.

Bulgular: Hemşirelerin puan ortalamasının, hastaların puan ortalamasından istatistiksel olarak anlamlı düzeyde düşük olduğu (t=9.136, p<0.001); hasta yakını ile hastanın verdikleri puanlar arasında istatistiksel olarak anlamlı bir fark olmadığı saptandı. Regresyon analizinde; hasta yakınlarının, hastanın verdiği ağrı puanının yaklaşık %40'ını verirken, hemşirelerin %60 kadarını tahmin edebildiği saptandı.

Sonuç: Hemşirelerin; ağrının hastadaki fiziksel ve emosyonel yansımalarını yorumlayabilmeleri için, ağrının fizyolojisi hakkında bilgilendirilmelerinin yanı sıra empatik becerilerinin geliştirilmesine yönelik eğitimlerin planlanması gereklidir. Bununla birlikte hastayla çokça vakit geçiren hasta yakınının da; cerrahi girişim sonrası hastanın gösterebileceği ağrı davranışları konusunda bilgilendirilmesi önerilmektedir.

Anahtar sözcükler: Hemşire; ortopedik cerrahi; ağrı şiddeti; ağrı algısı; hasta yakını.

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Submitted: 20.01.2014 Accepted after revision: 01.09.2014

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Introduction

Pain is a multidimensional subjective experience that the human beings try to describe for centuries.[1–3] International Association for the Study of Pain (IASP, 1979) defines pain as: "An unpleasant sensory and emotional experience associated with actual or potential tissue damage".[3] The general vision of algologists is that the pain is a subjective phenomenon and McCaffery underlines that pain is "whatever the experiencing person says it is, and exists wherever he says it does".[4–6] Therefore, the patient's verbal report of pain is essential and should be accepted as the single most reliable indicator of pain.[4,7–9]

Nurses are the health care professionals who spent most of time with the patients[10–12] and their role in pain management is essential. In addition; to ensure an effective pain management, there should be an effective pain assessment.[13–15] However; subjectivity of pain affects its assessment, and pain attitudes and beliefs of healthcare professionals may lead to underestimation and undertreatment of pain. Also inadequate knowledge about pain physiology and its assessment may lead to ineffective pain management.[14] Except these factors; there is another important factor in postoperative pain management which is patients' and also nurses' acceptance of postoperative pain as a normal result of surgery.[11] On the other hand, the pain rating scale used takes an important role on underestimation of pain. Usage of Verbal Rating Scales which the patient verbally describes the level of his pain is not sensitive enough to expose the change in pain level. The lack of sensitivity of the pain scale may lead to underestimation of pain. However, usage of Numeric Rating Scales or Visual Analog Scales are much more sensitive to show the increase or decrease in pain level. Therefore, in clinical practice the usage of highly sensitive pain rating scales should be used and patient's answer on the scale should be accepted and considered as the existing pain score.[12]

Previous studies show that nurses have tendency to underestimate their patients' pain.[8,11,16–25] Underestimation of pain may result with inadequate nursing care and treatment, certain physical and psychological problems and also brings greater annual economic costs.[6,19,26,27] There are many reasons behind the underestimation of pain by nurses. Inadequate knowledge in pain management, personal and cultural pain beliefs, own experiences are the main reasons of underestimation. In addition, it was reported that taking care of patients with pain for a long time may cause underestimation in relation with an unconscious defense mechanism which can be seen as minimizing the awareness of patient's pain and giving patient care as a ritual. This also can be explained by higher underestimation levels of more experienced nurses. In this way, the nurse may think that higher pain scores mean that the nurse can't give enough care to the patient; and in here underestimation of pain is used as an unconscious defense.[28,29]

The literature findings related to underestimation bring another research question which is how the relatives of the patients who share most of the time with the patient in hospital room could score the patient's pain level. Because; family members are responsible for patient's daily activities and needs;[30] and this role continues while their loved one is in the hospital. In this direction; besides nurses, the relatives were also included in this study and the pain perceptions of nurses and relatives are compared.

Materials and Methods

Design

A quantitative, descriptive and comparative design was used with three groups which are patients, relatives and nurses from the orthopedics clinics of 5 state hospitals in Istanbul, Turkey. Pain intensity scores of the patients were obtained and perceived pain intensity by the relatives and the nurses was questioned.

Participants

The target population of the study included the patients who had postoperative pain related to the orthopedic surgery, their relatives who stay in the hospital with the patient and nurses who were responsible for the patient's care. The sample included 150 patients, 150 relatives, and 50 nurses who have met the sample acceptance criteria. The sample acceptance criteria for the patients were having post-operative pain at the moment, for the relatives; staying with the patient at the moment, and for both patients and relatives, not being unable to communicate and see the pain scale and voluntary participation to study. Criteria for nurses were being responsible for the patients' care and voluntary participation to study. Every nurse

Table 1. Demographic characteristics of patients, relatives and nurses

	Patients (n=150)		Relatives (n=150)		Nurses (n=50)	
	n	%	n	%	n	%
Gender						
Women	83	55.3	114	76.0	46	92.0
Men	67	44.7	36	24.0	4	8.0
Marital status						
Married	102	68.0	121	80.7	25	50.0
Single	48	32.0	29	19.3	25	50.0
Income level						
Low	16	10.7	7	4.7	5	10.0
Moderate	124	82.7	128	85.3	41	82.0
High	10	6.7	15	10.0	4	8.0
Education level*						
Lower education	58	38.6	54	36.0	33	66.0
Higher education	92	61.4	96	64.0	17	34.0
Total	150	100	150	100	50	100

*For the patients and relatives; Elementary School and Secondary School were accepted as Lower Education Level (LEL), High School and higher degrees were accepted as Higher Education Level (HEL). For the nurses; Health High Schools (a 4-years program carried out in Turkey after Secondary Schools) and Associate Degrees were accepted as LEL. Bachelor of Nursing and higher degrees were accepted as HEL.

allowed participating to the study for three times.

Setting

The study was carried out in orthopedic clinics of five state hospitals in Istanbul, Turkey with written permission between October 10th and December 15th, 2010. Ethical approval was obtained from the Provincial Directorate of Health.

Data collecting

The data of the study were collected by a Data Collecting Form which is prepared by the researchers and Visual Analogue Scale (VAS).

Data Collecting Form is prepared by the researchers in accordance with the literature[8,11,16–25] and includes questions related to demographic characteristics, past hospital experiences, pain beliefs and attitudes.

Visual Analogue Scale is a widely accepted as a gold standard in pain assessment. It consists of a 10 cm vertical line. The bottom point of the line labeled as "0" and defines that the individual has "No Pain". The upper point of the line labeled as "10" and defines the "Worst Pain Imaginable".[7] The patients were asked to mark their pain intensity on VAS. Relatives and nurses were not allowed to see the score given by the patient and asked to enter to the patient room separately. Afterwards they were asked to look at the patient's facial expressions, behaviors and posture, and guess the patient's pain intensity score and mark it on VAS.

Data analysis

The data were evaluated using the Statistical Package for Science (SPSS) 15.0 for Windows by using descriptive statistics, Mann-Whitney U, Wilcoxon Signed Rank Test, Linear Regression and Spearman's Correlation Analysis.

Results

Demographic data

One hundred and fifty patients, 150 relatives and 50 nurses were participated in the study. The average age of the patients was 43.06±19.25 (ranged from 15 to 81). The ages of the relatives ranged from 19 to 69 with the average of 39.7±11.27. The average age of the nurses was 31.9±7.14 (ranged from 20 to 47) and the average working time of the nurses was 11.3±7.14 years.

Table 2. The attitudes of the patients, relatives and nurses when they have pain at home

	Patients (n=150)		Relatives (n=150)		Nurses (n=50)	
	n	%	n	%	n	%
I wait for the pain to relive, if not then I take a painkiller	96	64.0	68	45.3	37	74.0
I take a painkiller early before the pain increase	54	36.0	47	31.3	7	14.0
I try to sleep	–	–	24	16.0	6	12.0
I do nothing	–	–	11	7.3	–	–
Total	150	100	150	100	50	100

Pain beliefs and attitudes of the patients, relatives and nurses

The patients were asked how often do they think that the nurse can understand their pain and 46% (n=69) said "always" and while the same question asked to the patients about their relatives; 66% (n=99) said that their relatives "always" believe their pain. The relatives were asked do they always believe the patient when he/she complains about pain and 93.3% (n=140) said "yes". The same questions were asked to the nurses and 52% (n=26) of the nurses said that they don't believe the patients when he/she complains about pain.

As seen in Table 2; in patients, relatives and nurses, the most common attitude to a painful situation at home is waiting for the pain to relieve and taking painkillers in case of the pain doesn't relieve. On the other hand; the patients were asked what they do when they have pain in hospital; 50% (n=75) of the patients said that they wait for the pain to relieve before informing the nurse while 75.3% (n=113) relatives said that they inform the nurse early before their patient's pain increase.

The participants were asked for the way they describe their pain threshold and 47.3% (n=71) of the patients answered "mild" while this ratio increased to 50% (n=75) in the relatives and 60% of the nurses also described their pain threshold as "mild".

Pain behaviors showed by the patients

The researchers observed the pain behaviors showed by the patients and it was found that 68.7% (n=103) of the patients were showing at least one pain behavior. The most common pain behavior showed by the patients was found "grimacing" (Table 3).

The relatives and nurses were asked which of these pain behaviors are exaggerated in their opinion and 50.0% (n=75) of the relatives answered as "shouting" and this ratio was found 68.0% (n=34) in nurses (Table 4).

As shown in Table 5; the patients who were hospitalized before had significantly higher pain scores than the patients who had never been hospitalized before ($p<0.05$). The patients who show pain behaviors had significantly higher pain scores than the patients who don't show any pain behaviors ($p<0.05$). The pain scores of the patients who were moaning, crying and shouting were significantly higher ($p<0.05$).

The pain scores given by nurses were significantly lower than patients' pain scores ($p<0.001$), there were no significant differences found between the scores

Table 3. Pain behaviors showed by the patients (n=103)

	Yes		No	
	n	%	n	%
Grimacing	65	63.1	38	36.9
Shouting	12	11.7	91	88.3
Deep sigh	6	5.8	97	94.2
Rubbing	11	10.7	92	89.3
Moaning	16	15.5	87	84.5
Crying	6	5.8	97	94.2
Holding the painful area	4	3.9	99	96.1

Table 4. The exaggerated pain behaviors according to the relatives and nurses

	Relatives (n=150)				Nurses (n=50)			
	Yes		No		Yes		No	
	n	%	n	%	n	%	n	%
Grimacing	4	2.7	146	97.3	2	4.0	48	96.0
Shouting	75	50.0	75	50.0	34	68.0	16	32.0
Deep sigh	4	2.7	146	97.3	3	6.0	47	94.0
Rubbing	1	.7	149	99.3	–	–	50	100.0
Moaning	13	8.7	137	91.3	6	12.0	44	88.0
Crying	9	6.0	141	94.0	7	14.0	43	86.0
Holding the painful area	1	.7	149	99.3	–	–	50	100.0

of patients and their relatives (p>0.05) (Table 6).

The correlation of the pain scores between patients and their relatives were 0.704 (p<0.001); and the correlation of the pain scores between patients and their nurses were 0.407 (p<0.001). In the regression analysis; the pain scores given by the relatives can explain 52% of patients' pain score; while the scores given by the nurses explain only 22.7% of the patients' pain scores. Accuracy of the nurses' pain scores was unrelated to nursing experience and educational level (p>0.05).

Discussion

The assessment of -the 5th vital sign- pain is one of the most considerable parts of pain management and ineffective pain assessment may lead to inadequate treatment of pain.[9,27] Most of the studies comparing nurses' pain assessments with patients' pain ratings confirm that there is underestimation.[8,11,16–25] In the present study; it was found that the pain scores given by nurses were significantly lower than patients' pain scores. In addition; the second main purpose of this study was investigating the pain perception of the relatives in the hospital and was found no signifi-

Table 5. Pain scores of the patients according to certain variables

	n	Mean	Z	p
Being hospitalized before				
Yes	84	82.03	–2.096	0.036
No	66	67.19		
Showing any pain behaviors				
Yes	103	81.82	–2.662	0.008
No	47	61.65		
Moaning while in pain				
Yes	16	70.44	–2.710	0.007
No	87	48.61		
Crying while in pain				
Yes	6	84.00	–2.728	0.006
No	97	50.02		
Shouting while in pain				
Yes	12	67.71	–1.955	0.051
No	91	49.93		

Z: Mann-Whitney U Test.

Table 6. Mean score differences between pain scores given by the patients, relatives&nurses

	Mean score	Standard deviation	t	p
Patients	5.88	2.44	9.136	0.000
Nurses	4.16	2.00		
Patients	5.88	2.44	–0.506	0.614
Relatives	5.95	2.29		
Nurses	4.16	2.00	9.107	0.000
Relatives	5.95	2.29		

t: Wilcoxon Signed Rank Test.

cant differences between the pain intensity scores of patients and their relatives. The relatives are the ones who frequently have the caregiver role in daily life[30] and they are the ones who know the patients better than their nurses and also closer to them in a behavioral perspective. The close relationship between the relatives and the patients may result with less underestimation in comparison with nurses. The strong correlation (rs=0.704) between the scores of patients and their relatives and the moderate correlation (rs=0.407) between the nurses and the patients also confirms this fact.

The main reason of underestimation by nurses is not well explained yet; however the most likely cause of underestimation is seemed to be as trying to cope with their own stress.[26] Besides, underestimation may be related to fear of failing in successfully treating patient's pain.[25] According to Calvillo and Flaskerud (1993)[16] the scores given by the nurses may be affected by the patients' level of education, cultural origin, language and religious belief. In the present study; the pain intensity scores given by the nurses can only explain 22.7% of patients' pain scores. The relatives were found more successful in estimating their patients' pain intensity with 52 percent.

Ineffective pain assessment may be due to inadequate knowledge[24] and it can be considered that the underestimation of pain among nurses may be related to experience and education. In the present study; accuracy of the nurses' pain scores was found unrelated to nursing experience and educational level. Everett, et al. (1994),[14] was investigated the pain experienced during burn wound debridement and also found that nurses' ratings wasn't related to their experience and educational level.

The facial expression of pain is called as pain behavior.[31] Although pain behaviours are defined by the observer,[9] it should be noted that; they're non-verbal expression of the patient's actual pain. Therefore while assessing pain; pain behaviours should also be evaluated. However; nurses may accept certain pain behaviours as exaggerated and this may lead to underestimation and undertreatment of pain. In the study of McCaffery et al. (2000),[10] nurses were found less likely to increase a previously safe but ineffective dose of opioid for a smiling patient than a grimacing patient. In the present study; 68% of the nurses accepted "shouting" as exaggerated. However; the patients who show pain behaviours reported significantly higher pain intensity scores and the scores of patients who were moaning, crying and shouting were found significantly higher.

In the study of Watt-Watson et al. (2000);[3] patients' perception of their nurse's attention to their pain were found negative. In the present study; almost half (46%) of the patient sample were reported that their nurse "always" could understand their pain. However; 52% of the nurses stated that they don't believe their patients when he/she complains about pain. Myths and misbelieves of nurses regarding their patient's pain may result in underestimation and it is a common cause of inadequate pain treatment.

Implications for practice

To enable more effective pain management for pain patients; the nurses in the surgical clinics should be educated about pain physiology, pain management and physical and emotional reactions that a pain patient could have. Therefore, in addition to educations related to pain, empathic tendencies of the nurses should be determined and practical education programs should be done to improve their empathy skills, especially to improve their empathic attitudes to the pain patient. On the other hand; it should be noted that; the relatives are the ones who share most of the time with the patient in hospital room; therefore, it is very important to inform them about the possible pain behaviors than can be seen in post-operative period and prepare them to be a part of the patient's care.

Conflict-of-interest issues regarding the authorship or article: None declared.

Peer-rewiew: Externally peer-reviewed.

References

1. Eti Aslan F. The assessment methods of pain. Journal of Cumhuriyet University School of Nursing 2002;6(1):9–16.
2. Bergh I, Gunnarsson M, Allwood J, Odén A, Sjöström B, Steen B. Descriptions of pain in elderly patients following orthopaedic surgery. Scand J Caring Sci 2005;19(2):110–8.
3. Watt-Watson J, Garfinkel P, Gallop R, Stevens B, Streiner D. The impact of nurses' empathic responses on patients' pain management in acute care. Nurs Res 2000;49(4):191–200.
4. Bergh I, Jakobsson E, Sjöström B, Steen B. Ways of talking about experiences of pain among older patients following orthopaedic surgery. J Adv Nurs 2005;52(4):351–61.
5. Herr K, Coyne PJ, Key T, Manworren R, McCaffery M, Merkel S, et al. Pain assessment in the nonverbal patient: position statement with clinical practice recommendations. Pain Manag Nurs 2006;7(2):44–52.
6. Miller C, Newton SE. Pain perception and expression: the influence of gender, personal self-efficacy, and lifespan socialization. Pain Manag Nurs 2006;7(4):148–52.
7. Bergh I, Jakobsson E, Sjöström B. Worst experiences of pain and conceptions of worst pain imaginable among nursing students. J Adv Nurs 2008;61(5):484–91.
8 Puntillo K, Neighbor M, O'Neil N, Nixon R. Accuracy of emergency nurses in assessment of patients' pain. Pain Manag Nurs 2003;4(4):171–5.
9. Bergh I, Sjöström B. Quantification of the pain terms hurt, ache and pain among nursing students. Scand J Caring Sci 2007;21(2):163–8.
10. McCaffery M, Ferrell BR, Pasero C. Nurses' personal opinions about patients' pain and their effect on recorded assessments and titration of opioid doses. Pain Manag Nurs 2000;1(3):79–87.
11. Ene KW, Nordberg G, Bergh I, Johansson FG, Sjöström B. Postoperative pain management - the influence of surgical ward nurses. J Clin Nurs 2008;17(15):2042–50.
12. Williamson A, Hoggart B. Pain: a review of three commonly used pain rating scales. J Clin Nurs 2005;14(7):798–804.
13. Sloman R, Rosen G, Rom M, Shir Y. Nurses' assessment of pain in surgical patients. J Adv Nurs 2005;52(2):125–32.
14. Everett JJ, Patterson DR, Marvin JA, Montgomery B, Ordonez N, Campbell K. Pain assessment from patients with burns and their nurses. J Burn Care Rehabil 1994;15(2):194–8.
15. Duignan M, Dunn V. Barriers to pain management in emergency departments. Emerg Nurse 2008;15(9):30–4.
16. Calvillo ER, Flaskerud JH. Evaluation of the pain response by Mexican American and Anglo American women and their nurses. J Adv Nurs 1993;18(3):451–9.
17. Duignan M, Dunn V. Congruence of pain assessment between nurses and emergency department patients: a replication. Int Emerg Nurs 2008;16(1):23–8.
18. Guru V, Dubinsky I. The patient vs. caregiver perception of acute pain in the emergency department. J Emerg Med 2000;18(1):7–12.
19. Idvall E, Hamrin E, Sjöström B, Unosson M. Patient and nurse assessment of quality of care in postoperative pain management. Qual Saf Health Care 2002;11(4):327–34.
20. Idvall E, Berg K, Unosson M, Brudin L. Differences between nurse and patient assessments on postoperative pain management in two hospitals. J Eval Clin Pract 2005;11(5):444–51.
21. Teske K, Daut RL, Cleeland CS. Relationships between nurses' observations and patients' self-reports of pain. Pain 1983;16(3):289-96.
22. Rundshagen I, Schnabel K, Standl T, Schulte am Esch J. Patients' vs nurses' assessments of postoperative pain and anxiety during patient- or nurse-controlled analgesia. Br J Anaesth 1999;82(3):374–8.
23. Salmon P, Manyande A. Good patients cope with their pain: postoperative analgesia and nurses' perceptions of their patients' pain. Pain 1996;68(1):63–8.
24. Hovi SL, Lauri S. Patients' and nurses' assessment of cancer pain. Eur J Cancer Care (Engl) 1999;8(4):213–9.
25. Bergh I, Sjöström B. A comparative study of nurses' and elderly patients' ratings of pain and pain tolerance. J Gerontol Nurs 1999;25(5):30–6.
26 Goubert L, Craig KD, Vervoort T, Morley S, Sullivan MJ, de C Williams AC, et al. Facing others in pain: the effects of empathy. Pain 2005;118(3):285–8.
27. Staton LJ, Panda M, Chen I, Genao I, Kurz J, Pasanen M, et al. When race matters: disagreement in pain perception between patients and their physicians in primary care. J Natl Med Assoc 2007;99(5):532–8.
28. Byrne A, Morton J, Salmon P. Defending against patients' pain: a qualitative analysis of nurses' responses to children's postoperative pain. J Psychosom Res 2001;50(2):69–76.
29. Harrison A. Comparing nurses' and patients' pain evaluations: a study of hospitalized patients in Kuwait. Soc Sci Med 1993;36(5):683–92.
30. Miaskowski C, Zimmer EF, Barrett KM, Dibble SL, Wallhagen M. Differences in patients' and family caregivers' perceptions of the pain experience influence patient and caregiver outcomes. Pain 1997;72(1-2):217–26.
31. Kappesser J, Williams AC. Pain and negative emotions in the face: judgements by health care professionals. Pain 2002;99(1-2):197–206.