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Rheumatology nurses' knowledge and practices on pain management

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ABSTRACT

Objectives: Nurses have important responsibilities in providing effective pain management. This study was conducted to determine the level of knowledge and practices of rheumatology nurses regarding pain management.

Methods: A descriptive study sample was 64 nurses in the rheumatology clinic. Data were collected using the Nurse Introduction Form and Questionnaire on Knowledge and Practices Regarding Pain Management. The data were evaluated in the SPSS.

Results: It was determined that 73.4% of the rheumatology nurses did not receive training on pain management. The pain management knowledge score was moderate, and the knowledge of non-pharmacological pain management was insufficient. The mean pain management self-confidence score was 6.03±2.01 (0-10), and a positive correlation was found between the graduation year, working years in rheumatology, and pain management knowledge score ($P<0.05$). Findings showed that the rheumatology nurses wanted to receive training on non-pharmacological interventions in pain management, pain-related psychosocial issues, and pain diagnosis.

Conclusion: Most of the participating rheumatology nurses did not receive training on pain management; their knowledge was only moderate, and they wanted to receive more training. As nurses' working years increased, the pain management self-confidence score increased. It is important to ensure orientation in the clinic by providing training to nurses who start to work in the rheumatology clinic regarding management and non-pharmacological interventions.

Keywords: Nursing, pain management, rheumatology

Pain is a universal human experience: it appears in many different dimensions, including the physical, mental, emotional, spiritual, existential, and interpersonal [1, 2]. The definition of pain The International Association for the Study of Pain (IASP) states, "Pain is a specific, unpleasant emotional experience with or without an organic cause, originating from any part of the body and including all past experiences of a person." [3]. Pain is classified as acute, chronic, and recurrent based on its duration. Chronic pain is defined as pain that continues longer than three months, longer than expected, or persists after recovery [4]. While chronic musculoskeletal pain is seen in 26-50% of adults, chronic low back pain may occur in 50-80% of the population at some time in their lives [5, 6]. However, pain is the predominant

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symptom in most rheumatological diseases and is the primary reason for hospital admission for patients with inflammatory arthritis [7]. 68-88% of rheumatoid arthritis (RA) patients consider pain one of their top three priorities [8]. Chronic pain is very common in rheumatological diseases, where it starts for an etiological reason; it becomes the primary problem when recovery fails, resulting in immitigable pain associated with poor quality of life and an increased socioeconomic burden [4, 9].

Pain is the most common symptom in rheumatology patients: it negatively affects patients' daily activities and reduces their quality of life. Therefore, pain management of rheumatology patients is very important. Nurses should play an active role in the pain management of individuals with arthritis and regularly renew their knowledge of pain management methods [10]. Nurses must successfully manage pain to provide safe, quality, and recovery-supporting care. The nurse should provide the most appropriate individualized pain management by addressing the patient who is experiencing pain with a holistic approach. Sufficient pain management is already considered an international human right [1]. Therefore, all health professionals should have the necessary knowledge and skills to help rheumatology patients manage their pain better [7]. The American Pain Association defined pain as the "fifth vital sign" in 2010 [11]. Pain management in rheumatology patients includes assessment of pain (severity, type, duration), definition of the causes of pain (inflammatory, degenerative, widespread body pain), determination of the aims/expectations of treatment, development and implementation of the treatment plan, pharmacological treatments (treatment of disease and pain treatment), non-pharmacological treatments, assessment of the efficiency of treatment, physical activities and exercise, and patient education (joint protection, weight control, non-pharmacological practices) [7, 11]. Uncontrolled pain in rheumatology patients causes negative outcomes that include limitations in activities of daily life, limited resting activities, decreased socialization, anxiety, depression, sleep disorders, loss of appetite, and increased health service use and costs, thereby negatively affecting the quality of life [10]. When effective pain management is achieved in rheumatology patients, pain can be reduced, functionality and well-being can be increased, and individual and social costs (such as disability, increase in the number of days absent from work, recurrent hospital admissions, and hospitalizations) can be reduced [7]. Therefore, nurses in rheumatology cases should take responsibility regarding pain management to increase patients' quality of life.

Nurse-led pain management is a way to improve the provision of health service: nurses have key roles in pain management [4]. The global role of nurses in pain management is to provide pain management in accordance with the individual and cultural characteristics of the patient [1]. Nurses should have the necessary knowledge and skills for effective pain management; however, there are only a limited number of studies that evaluate the knowledge and practices of rheumatology nurses on pain management. In the study, found that rheumatology nurses defined pain as one of the distressful symptoms, and that they did not feel competent in pain management due to lack of information [12]. Some studies have been conducted with nurses in Turkey [13, 14, 15]; however, no study was found on pain management by rheumatology nurses. Studies conducted found that nurses have insufficient knowledge about pain management, pain diagnosis, and recommendations for reducing pain, and pharmacological treatment [13, 14]. However, determining the fields where nurses' lack of knowledge and practices in pain management are inadequate and the obstacles encountered is important in terms of planning the solution to the problems. Accordingly, the aim of our study was to determine the knowledge and practices of rheumatology nurses on pain management.

METHODS

In the present research, 64 nurses (28 via e-mail and 36 via face-to-face interviews) who were members of the Turkish Rheumatology Nurses Society, were employed in a rheumatology clinic, and volunteered to participate were included. Nurses who were employed in other clinics despite being a member of the society, who could not be reached at the time (October 2015-December 2016) of the study, and who did not complete the questionnaire were excluded from the study.

National Rheumatology Nurses Association of our

country was established in 2006 under the leadership of rheumatology nurses. The association, which had 87 registered members at the time of the research, continues its activities with 99 active members today. In the sample calculation of the study, the sample size was found to be 61 with α=0.05 and 0.95 confidence level (1-β). In post hoc power analysis; it was concluded that according to this effect size value, it reached 90% (0.8955774) power at the 95% confidence level and the sample size was sufficient.

Data Collection

The research data were collected using the Nurse Introduction Form and Questionnaire on Knowledge and Practices Regarding Pain Management. The questionnaire forms were sent to the e-mails (n=87) of the members of the national Rheumatology Nurses Society. After the rheumatology nurses filled out the questionnaire, it was sent to the researcher via e-mail (n=26). The security of the returned e-mails was checked. Since there was not enough feedback by mail, questionnaires were applied face-to-face by going to the clinics in the cities where the researchers lived. A total of 38 rheumatology nurses who were members of the association from 8 clinics were reached.

Nurse Introduction Form

The form consists of six questions regarding age, gender, educational status, marital status, graduation year, and years working as a rheumatology nurse.

Questionnaire on Knowledge and Practices Regarding Pain Management

The researchers created the questionnaire by reviewing the literature to determine nurses' knowledge and practices concerning patients having pain and the management of pain [15, 16]. The questionnaire form consists of 5 parts, having a total of 22 questions.

1. Causes of Pain

The most common causes of pain in rheumatological diseases were listed, and nurses were asked to indicate how often they encountered these conditions in clinical practice. The causes of pain in patients were grouped as “inflammatory joint pain (RA, PsA, etc.)”, “non-inflammatory joint pain (Osteoarthritis, trauma, etc.)”, “inflammatory back pain (SpA, AS, etc.)”, “non-inflammatory back pain (mechanical pain, etc.)” and “widespread body pain (Fibromyalgia, etc.)”. Nurses were asked to describe their encounter frequency as "rarely, “middle,” or often.”

2. The Status of Knowledge Regarding Pain Management

This part assessed the level of knowledge regarding pain management. Nurses were asked whether they had received pain management education. Eleven items about pain management were listed to determine nurses' knowledge of pain management. Nurses were asked to mark the given information as “true” or “false”. The score on knowledge regarding pain management was determined by awarding each correct item 1 score point (0-11).

3. The Practices Regarding Pain Management

In this section, there are questions to determine the practices used by nurses in pain management. It included questions about diagnosing pain, using a scale to assess pain, and pain-related record keeping. In addition, nurses were asked to evaluate their self-confidence in pain management with a 10-cm visual analogue scale (VAS). The self-confidence score was scored from 0=never to 10=always.

4. The Problems Related to Pain Management

This section has questions to determine the problems experienced (barriers, ethical dilemmas, subjects with educational needs) in pain management.

5. The Non-pharmacological Practices

In this section, the non-pharmacological methods used by nurses in pain management were asked. Nurses were asked about their knowledge and opinions about non-pharmacological practices (exercise, hot application, cold application, massage, aromatherapy, acupressure, acupuncture, yoga, meditation, reiki, music, other). For each non-pharmacological method, they were asked to mark the appropriate options among the options “I consider it beneficial”, “I recommend it to my patients”, and “I have no idea”.
The nurses completed the questionnaires in approximately 15-20 minutes.

Ethical Consideration

Ethical approval was obtained from the Scientific

Ethical Committee of Ege University Faculty of Nursing (Date: 30.09.2015, numbered 2015-113). Moreover, informed consent was requested from the Chairman of the Turkish Rheumatology Nurses Society and the participants who involved in this study. For all research, this must include a final section including details of ethical approval, informed consent, and, where relevant, registration.

Statistical Analysis

The data were evaluated using the Statistical Package for the Social Sciences (SPSS) and percentage, mean±standard deviation, and Pearson correlation analyses. A P-value of <0.05 was considered significant.

RESULTS

Sociodemographic Characteristics of Rheumatology Nurses

Considering the distribution of sociodemographic characteristics of rheumatology nurses, the mean age of the nurses was 34.68±7.05 years, and most of them had a bachelor's degree and were married. The mean time since graduation was 13.43±7.87 years, and the mean of working years in the rheumatology clinic was 6.42±5.91 years (Table 1).

Knowledge and Practices Regarding Pain Management

1. Causes of Pain

Table 2 shows data by frequency of encountering painful patients according to the reasons described by rheumatology nurses. Rheumatology nurses reported that the most common causes of pain were inflammatory joint pain (87.5%) and inflammatory back pain (51.5%). Non-inflammatory back pain and non-inflammatory joint pain were encountered less frequently than the other pain types.

2. The Status of Knowledge Regarding Pain Management

The majority of rheumatology nurses reported that they did not receive training in pain management (Table 1). The answers given by the nurses to the 11 items prepared to determine the pain management information are shown in Table 3. Each correct answer was scored 1 point, and the mean pain management knowledge score was 7.67±2.74 (0-11). The three statements that the nurses answered incorrectly were as follows: "Rheumatology patients' pain cannot be treated with non-pharmacological methods" "Pain should be treated when it reaches the level that the patient cannot tolerate any longer", and "Nurses can apply non-pharmacological methods independently in pain management". No correlation was found between the knowledge score and graduation time (r=0.061, P=0.631) and working years in rheumatology (r=0.061, P=0.633).

3. The Pain Management Practices

Table 4 shows the distribution of rheumatology nurses' pain management practices. The majority of the rheumatology nurses' did pain assessment regularly and used a scale for pain assessment. The majority of the nurses stated that they asked the patient how much pain he/she had while making a pain assessment. Again, the majority of the nurses stated that they administered painkillers (analgesic drugs) as ordered by a physician and contacting the patient's physician about pain. The topics included reporting changes in pain (35), discussing increases in drug amount(s) (11), discussing drug/administration route changes (7), and

Table 1. Descriptive characteristics of nurses

Characteristics	n (%) or (mean±SD)
Age (years)	34.68±7.05
Educational status	
Associate's degree	4 (6.3)
Bachelor's degree	56 (87.4)
Master's degree	4 (6.3)
Marital status	
Married	36 (56.2)
Single	28 (43.8)
Graduation time, *years*	13.43±7.87
Duration of working in rheumatology, *years*	6.42±5.91
Education of pain management	
Yes	17 (26.6)
No	47 (73.4)

Table 2. Frequency of nurses encountering painful patients by reasons

Causes of pain	Encounter Frequency					
	Rarely		Middle		Often	
	n	%	n	%	n	%
Inflammatory joint pain (RA, PsA, etc)	2	3.1	6	9.4	56	87.5
Non-inflammatory joint pain (Osteoarthritis, trauma, etc)	13	20.3	24	37.5	27	42.2
Inflammatory back pain (SpA, AS, etc)	4	6.3	27	42.2	33	51.5
Non-inflammatory back pain (Mechanical pain, etc)	18	28.1	31	48.4	15	23.5
Widespread body pain (Fibromyaljia, etc)	10	15.6	32	50.0	22	34.4

RA=rheumatoid arthritis, PsA=psoriatic arthritis, SpA=spondylarthritis, As=ankylosing spondylitis

reporting drug side effects (1). The majority of nurses reported that they kept records about pain and entered the records on the nurse observation form. Nurses reported that they most frequently needed to decide on "the identification of pain and its severity," and "the drugs and administration time". The mean pain management self-confidence score of the rheumatology nurses was 6.03±2.01 (0–10). A positive correlation was found between the self-confidence score and the graduation year (r=0.268, P=0.038), working years in rheumatology (r=0.296, P=0.018), and pain management knowledge score (r=0.334, P=0.007).

4. The Problems Related to Pain Management

Twenty-eight (43.8%) rheumatology nurses answered "yes" to the question of whether they encountered any barriers in relieving the pain. These barriers included insufficient drug ordering (10), lack of patient cooperation (9), lack of patient/family knowledge (7), insufficient time (4), and insufficient physician cooperation (3). The three most important issues with professional ethical dilemmas in pain management were problems or anxiety about administering too many drugs (50.0%), feeling that the pain could not be relieved sufficiently (46.8%), and conflict with the physician (35.9%). Considering the distribution of the subjects that required training on pain management, it was found that the top three subjects were non-pharmacological interventions, psychosocial issues related to pain, and pain diagnosis (Table 5).

Table 3. Knowledge of pain and pain management

Pain and pain management related items	Knowing		Unknowing	
	n	%	n	%
Pain is a multidimensional experience and the one who best experienced it can describe it. (T)	56	87.5	8	12.5
Pain can cause many problems such as loss of appetite and insomnia. (T)	58	90.6	6	9.4
When the pain reaches the level that the patient cannot bear, it should be treated. (F)	25	39.1	39	60.9
Pain treatment should always be individualized. (T)	53	82.8	11	17.2
Patients can live painlessly with appropriate treatment. (T)	54	84.4	10	15.6
It is natural for the patient to wait for the pain to pass completely after the treatment. (T)	48	75.0	16	25.0
There are non-pharmacological pain treatment methods that can be recommended to rheumatology patients. (T)	45	70.3	19	29.7
The pain of rheumatology patients cannot be treated with non-pharmacological methods. (F)	14	21.8	50	78.2
Nurses can independently apply non-pharmacological methods in pain management. (T)	38	59.4	26	40.6
Nurses can recommend non-pharmacological pain treatment methods to their patients. (T)	41	64.1	23	35.9
Nurses have an important place in the multidisciplinary pain management team. (T)	52	81.3	12	18.7

T=True, F=False

Table 4. Nurses' practices on pain management

Practices	n	%
Regular pain assessment		
No	54	84.4
Yes	10	15.6
Using a scale in pain assessment		
Yes	54	84.4
No	10	15.6
When assessing pain		
I observe the patient's behavior.	15	23.4
I ask the patient how much pain he has.	41	64.1
I review the physician notes	0	0
I evaluate the verbal information given by my nurse colleagues.	1	1.6
All	7	10.9
When administering analgesic drugs		
I give it less often than ordered.	5	7.8
I give it more often than is ordered.	0	0
I give drugs other than analgesic drugs (antiemetic, sedative, etc.)	2	3.1
I give it as ordered.	57	89.1
Non-pharmacological method application in the clinic		
Yes	25	39.1
No	39	60.9
Contacting the doctor about pain		
Yes	54	84.4
No	10	15.6
Pain related record keeping		
Yes	57	89.1
No	7	10.9
Decision-making issue regarding pain		
Identifying the pain	10	15.6
Defining the severity of pain	34	53.2
Medicines	13	20.3
Time of drugs	7	10.9
Self-confidence in pain management (0-10) (mean±SD)	6.03±2.01	

5. The Non-pharmacological Practices

Twenty-five (39.1%) rheumatology nurses stated that non-pharmacological practices were performed in the clinic: cold application (14), physiotherapy (10), hot application (5), and exercise (1) (Multiple practices reported). Non-pharmacological methods that the nurses considered beneficial were exercise (73.4%), physiotherapy (64.1%), and massage (59.4%). The non-pharmacological methods they recommended were cold application (17.2%), massage (17.2%,) and

Table 5. The problems experienced by nurses in pain management

Problems	n	%
Barriers in relieving the pain		
Yes	28	43.8
No	36	56.3
The most important professional ethical dilemmas in pain management*		
Worry about giving too much medication	32	50.0
Concern about giving small amounts of medication	16	25.0
Feeling that the patient cannot adequately relieve pain	30	46.8
Worry about addiction	18	28.1
Concern about respiratory depression	21	32.8
Knowing that the patient has pain and not accepting it	8	12.5
Don't doubt that the pain is real	16	25.0
Conflict with the doctor	23	35.9
Conflict with patient and family	21	32.8
The subjects that required training on pain management		
Pain diagnosis	34	53.1
Pharmacological management of pain	33	51.5
Analgesia pumps	23	35.9
Nonpharmacological interventions	40	62.5
Psychosocial issues related to pain	38	59.3
Pain management in special populations	18	28.1

*More than one option is marked.

Table 6. The non-pharmacological practices

Nonpharmacological Practices	Beneficial		Recommend		No idea	
	n	%	n	%	n	%
Exercise	47	73.4	7	10.9	3	4.7
Hot application	28	43.8	10	15.6	13	20.3
Cold application	31	48.4	11	17.2	18	28.1
Massage	38	59.4	11	17.2	11	17.2
Physiotherapy	41	64.1	8	12.5	13	20.3
Herbal tharapy	12	18.8	4	6.3	40	62.5
Aromatherapy	14	21.9	2	3.1	45	70.3
Acupressure	11	17.2	2	3.1	50	78.1
Acupuncture	21	32.8	1	1.6	41	64.1
Yoga	22	34.4	5	7.8	36	56.3
Meditation	23	35.9	4	6.3	36	56.3
Reiki	14	21.9	2	3.1	47	73.4
Music	28	43.8	9	14.1	27	42.2

hot application (15.6%). The non-pharmacological methods that the nurses had no idea about were acupressure (78.1%), reiki (73.4%), and aromatherapy (70.3%) (Table 6).

DISCUSSION

The majority of the rheumatology nurses did not receive training on pain management: their knowledge was only at a moderate level, and they wanted to receive more training. As nurses' working years increased, the pain management self-confidence score increased. Pain is among patients' most frequently reported symptoms: approximately 79% of hospitalized patients experience pain [17]. Looking at the history of nursing; it seems to be a longstanding tradition of comforting the sufferers [18]. Nurses are the health service providers who are not only responsible for relieving patients' pain but also play an important role in managing patients' pain. However, many international organizations dealing with the improvement of the safety and quality of health of patients have addressed this problem and reported that nurses provide insufficient pain management in all countries. Furthermore, it has been emphasized that neglecting patients' pain is ethically and morally unacceptable [17]. The European League Against Rheumatism (EULAR) defined rheumatology nurses as the part of the health care team who make decisions along with patients and provide evidence-based care. Rheumatology nurses have several roles, including self-management support, patient education, person-to-person counselling, and even telephone counselling. The EULAR, on the other hand, emphasized that each patient needs to reach out to a nurse from whom they can receive education that will improve their disease management [19]. Patient education on pain management should include the causes of pain, pharmacological treatments and their side effects, non-pharmacological practices, self-help, physical activity, joint protection exercises, behavioral changes, and weight control [10, 20]. Parlar *et al*. [10], in a study of arthritis patients, found that those who received education on pain management experienced decreased pain severity, increased use of non-pharmacological interventions, and achieved positive impacts related to coping with pain and daily activities.

Causes of Pain

In the management of pain in rheumatological diseases, first of all, the etiology of pain should be determined. In rheumatological diseases, sources of pain can be divided into inflammatory, degenerative, and widespread body pain [7]. Rheumatology nurses reported that the causes of pain they encountered in patients were often inflammatory joint pain and inflammatory back pain, less frequently non-inflammatory back pain, and non-inflammatory joint pain. These results show that nurses encounter diseases such as RA and ankylosing spondylitis (AS) more frequently in clinics. To know if the pain is inflammatory is important in terms of determining the right applications (Hot application or thermal water should not be recommended for inflammatory pain).

The Status of Knowledge Regarding Pain Management

It is of vital importance to manage chronic musculoskeletal pain with effective, safe, and low-cost approaches [21]. Pain management is a primary issue in rheumatic diseases, and pain management should be at the center of training and research studies in rheumatology [11]. A study was conducted to identify the basic education issues and problems, and then to suggest solutions for rheumatology clinicians (nurses, physiotherapists, occupational therapists) and educators in undergraduate education for rheumatology practice. That study determined that the roles of nurses on pain management, administration and monitoring of analgesics; training and self-management of the patient should be included in the educational content of nurses [22]. Another study emphasized that nursing students' pain knowledge and attitude scores were low and that the nursing educators should make more efforts to improve pain education in the current curriculum and ensure nursing students develop pain management attitudes [23]. Demir Dikmen *et al*. [13] determined that nurses' knowledge and behavior scores about patients in pain and their pain management were at a moderate level; the authors concluded that most of the nurses did not have sufficient knowledge about pain diagnosis and management. In our study, most of the nurses reported that they did not receive training on pain management and that their pain management knowledge score was only at a moderate level. These findings are consistent with the literature.

For this reason, it is suggested that pain management should be included more often, both in the content of undergraduate education and in-service training programs after graduation.

Pharmacological treatment of pain may remain insufficient in terms of effectiveness, and it has been also reported to be associated with various toxicities [11]. Therefore, the authors emphasized that non-pharmacological pain treatment is an inseparable part of pain management [24]. This conclusion is supported by evidence from another study showing that the use of analgesics can be reduced without increasing pain by benefitting from non-pharmacological interventions more in pain management guided by nurses [4]. It should be also noted that patients are more willing to use these methods. Notably, several studies emphasized that nurses should provide training and counseling to their patients on non-pharmacological methods as well as pharmacological methods in pain management [24, 25]. Other studies determined that nurses initially treated patients in pain with analgesics [4, 14, 26, 27]. One study found that the reason why nurses used non-pharmacological interventions on a limited level in pain management was related to their inadequate education on pain management [28]. The results of recent systematic review and meta-analysis studies showed that non-pharmacological practices were effective in reducing the pain of rheumatology patients. Some of these practices were even included in the American College of Rheumatology (ACR) guidelines because of their high efficiency [11].

The level of pain experienced by the patients and patient care outcomes are affected by the knowledge, attitudes, and behaviors of the nurses providing their care. It was observed that the insufficiency of nurses' knowledge and experience is a cause of ineffective pain management [29]. In our study, a positive correlation was found between the pain management self-confidence score and the knowledge score, supporting that information. A previous study determined that rheumatology nurses mainly rely on informal sources of information (interactions with physicians and patients) and their professional experiences gained in the clinic over the years [30]. In our study, the pain management self-confidence score increased as the working years in the rheumatology clinic increased. This finding can be explained by the above-mentioned information. However, this learning method is time-consuming; therefore, formal evidence-based learning needs to be facilitated and expanded on pain management as an important issue. Accordingly, institutions and managers of rheumatology clinics also have major responsibilities. Pain management protocols should be developed by following the current evidence-based literature, and nurses should be encouraged to implement these protocols.

The Practices and Problems Related to Pain Management

Pain management practices are hindered by three main obstacles: patients' obstacles, organizational obstacles, and health service providers' obstacles. Nurses' knowledge of pain management is reported to be the strongest independent determinant of patients' pain management practices. Therefore, nurses are recommended to focus on their knowledge and attitudes on pain management to improve their practice in pain management [17]. Demir Dikmen *et al*. [13] found that 36.8% of the nurses encountered barriers to acquiring that knowledge. Ryan *et al*. [12] conducted a study with rheumatology nurses and determined that the most important barriers encountered in pain management were lack of time and lack of knowledge. In our study, approximately half of the nurses reported that they encountered obstacles in pain management, and that the barriers they encountered were mostly caused by external reasons (insufficient drug ordering, lack of patient cooperation, lack of patient/family knowledge, and insufficient physician cooperation). Moreover, the three most important issues with professional ethical dilemmas in pain management were found to be problems/anxiety about administering too many drugs (50.0%), feeling that the pain could not be relieved sufficiently (46.8%), and conflict with the physician (35.9%). The subjects requiring training on pain management were found as non-pharmacological interventions, psychosocial issues related to pain, and pain diagnosis. Demir Dikmen *et al*. [13] determined that the issues in which nurses had ethical dilemmas were fear of "administering overdoses" (36.5%) and "addiction" (30.6%), and that the subjects that required information were pain diagnosis (41.9%), pharmacological management of pain (27.6%), non-pharmacological interventions in pain manage-

ment (15.9%). These findings show that the ethical problems and training requirements of nurses on pain management are similar in all working environments.

The Non-pharmacological Practices

Non-pharmacological management of pain in rheumatology patients includes patient education, physical and occupational therapy, diet and weight control, physical activity, massage, yoga, meditation, aromatherapy, behavior therapies that include cognitive-behavioral therapy, and development of self-management strategies [11]. Rheumatology nurses can determine pain management-related non-pharmacological interventions appropriate for their patients, implement these interventions independently, and even teach them to their patients, implement the methods concurrently with them, and assess the results together [31, 32]. Nursing studies conducted with rheumatology patients showed that methods such as pain management training, exercise, massage, aromatherapy, reflexology, music, and yoga are some of the non-pharmacological methods that are effective in reducing pain [10, 33-38]. These results show that non-pharmacological interventions applied by nurses in pain management are simple, independently applicable, safe, and most importantly, effective [37]. In both previous studies and our study, nurses were determined to have insufficient knowledge about using non-pharmacological interventions and how to recommend them to the patients and that they want to receive training on this subject [13, 14, 26, 27]. The main reason of the lack of knowledge on non-pharmacological interventions may be because evidence-based practices are not included in nursing education and nurses are not informed about the study results. A study reported that the sources of information of rheumatology nurses included primarily colleagues and medical doctors and that research-based nursing knowledge and studies played a limited role [30]. To eliminate these deficiencies in rheumatology nurses' training on non-pharmacological methods, it is necessary to ensure nurses keep up with relevant studies, to inform nurses who have difficulties in keeping up about the study results, and to share information in appropriate learning environments. Additionally, nurses can be informed about the courses and certificate programs regarding non-pharmacological methods including aromatherapy, acupressure, and reiki which require special education, and their participation can be encouraged accordingly.

Limitations

Due to the low number of nurses who are members of the rheumatology nursing association and the low rate of answering the questionnaires, a limited number of nurses participated in the study, although the working period was extended. Giving together data obtained by different methods (e-mail and face-to-face) may be another limitation of the study

CONCLUSION

In our study, we found that most of the rheumatology nurses performed pain assessment; however, their pain management knowledge and self-confidence were only at moderate levels. It was seen that the most important deficiency in nurses' knowledge was about non-pharmacological interventions, and that they wanted to get information on this issue. Furthermore, it was important that the self-confidence in pain management increased as the working years in the clinic increased, indicating that pain management education should be more often included during undergraduate nursing education. The literature emphasizes the preparation of nursing students to analytically implement their pain knowledge and their acquiring positive pain attitudes is necessary for their future nursing roles [23]. Nursing education programs should also include evidence-based interventions regarding pain management. Despite all that, managers should consider that newly graduated nurses may have deficiencies on pain management. For this reason, comprehensive in-service training on pain management and evidence-based non-pharmacological interventions should be provided to nurses who will work in clinics such as rheumatology and the results of that training should be evaluated. Nurses should be encouraged to participate in activities such as conferences, symposiums, and courses to develop competencies on non-pharmacological practices (aromatherapy, massage, reiki, yoga, etc.). In addition, institutions and clinics can develop pain management protocols, and nurses can follow and implement these protocols.

Authors' Contribution

Study Conception: SP; Study Design: SP, SÖ; Supervision: SP, SÖ; Funding: N/A; Materials: N/A; Data Collection and/or Processing: SP; Statistical Analysis and/or Data Interpretation: SP; Literature Review: SP, SÖ; Manuscript Preparation: SP and Critical Review: SP, SÖ.

Conflict of interest

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REFERENCES

1. Rosa WE. Transcultural Pain Management: Theory, Practice, and Nurse-Client Partnerships. Pain Manag Nurs. 2018;19(1):23-33. doi: 10.1016/j.pmn.2017.10.007.
2. Özveren H, Faydalı S, Gülnar E, Dokuz HF. [Attitude and applications of nurses to evaluate pain]. J Contemp Med. 2018;8(1):60-66. doi: 10.16899/gopctd.388195. [Article in Turkish].
3. International Association for the Study of Pain (IASP) Terminology. (Last Updated: December 14, 2017). https://www.iasp-pain.org/terminology?navItemNumber=576#Pain. Accessed June 17, 2020.
4. Courtenay M, Carey N. The impact and effectiveness of nurse-led care in the management of acute and chronic pain: a review of the literature. J Clin Nurs. 2008;17(15):2001-2013. doi: 10.1111/j.1365-2702.2008.02361.x.
5. Köken İŞ, Eyigör C. [Interventional pain treatment modalities in palliation of rheumatic pains]. Ege Tıp Dergisi. 2019;58(Supp):22-26. doi: 10.19161/etd.648690. [Article in Turkish]
6. Rubin DI. Epidemiology and risk factors for spine pain. Neurol Clin. 2007;25(2):353-371. doi: 10.1016/j.ncl.2007.01.004.
7. Geenen R, Overman CL, Christensen R, et al. EULAR recommendations for the health professional's approach to pain management in inflammatory arthritis and osteoarthritis. Ann Rheum Dis. 2018;77(6):797-807. doi: 10.1136/annrheumdis-2017-212662.
8. Lee YC. Effect and treatment of chronic pain in inflammatory arthritis. Curr Rheumatol Rep. 2013;15(1):300. doi: 10.1007/s11926-012-0300-4.
9. Akdemir N, Akyar İ, Görgülü Ü. [Nurses' approaches towards the pain problem of patients admitted to physical therapy and rehabilitation inpatient and outpatient clinics]. Turk J Phys Med Rehab. 2008;54(4):157-163. [Article in Turkish]
10. Parlar S, Fadiloglu C, Argon G, Tokem Y, Keser G. The effects of self-pain management on the intensity of pain and pain management methods in arthritic patients. Pain Manag Nurs. 2013;14(3):133-142. doi: 10.1016/j.pmn.2010.08.002.
11. Borenstein DG, Hassett AL, Pisetsky D. Pain management in rheumatology research, training, and practice. Clin Exp Rheumatol. 2017;35 Suppl 107(5):2-7.
12. Ryan S, McCabe CS, Adams J. The current knowledge and confidence of rheumatology nurses in providing advice on pain management. Musculoskeletal Care. 2016;14(1):62-66. doi: 10.1002/msc.1113.
13. Demir Dikmen Y, Usta Yıldırım Y, İnce Y, Türken Gel K, Akı Kaya M. [Determining of nurses' knowledge, behavior and clinical decision making regarding pain management]. Çağdaş Tıp Dergisi. 2012;2(3):162-172. [Article in Turkish]
14. Yılmaz M, Gürler H. [Nursing approaches toward postoperative pain in patients: patients' opinions]. Agri. 2011;23(2):71-79. doi: 10.5505/agri.2011.36349. [Article in Turkish]
15. Ozer S, Akyürek B, Başbakkal Z. [Investigation of nurses' pain related knowledge, attitude and clinical decision making skills]. Agri. 2006;18(4):36-43. [Article in Turkish]
16. Ferrell BR, Eberts MT, McCaffery M, Grant M. The Clinical Decision Making Survey (CDMS) Measurement Instrument Database for the Social Science. 2012. https://www.midss.org/sites/default/files/clinical_decision_making.pdf. Accessed December 19, 2019.
17. Alzghoul BI, Abdullah NA. Pain management practices by nurses: an application of the Knowledge, Attitude and Practices (KAP) Model. Glob J Health Sci. 2015;8(6):154-160. doi: 10.5539/gjhs.v8n6p154.
18. Wells-Federman C, Arnstein P, Caudill M. Nurse-led pain management program: effect on self-efficacy, pain intensity, pain-related disability, and depressive symptoms in chronic pain patients. Pain Manag Nurs. 2002;3(4):131-140. doi: 10.1053/jpmn.2002.127178.
19. Bech B, Primdahl J, van Tubergen A, et al. 2018 update of the EULAR recommendations for the role of the nurse in the management of chronic inflammatory arthritis. Ann Rheum Dis. 2020;79(1):61-68. doi: 10.1136/annrheumdis-2019-215458.
20. Zangi HA, Ndosi M, Adams J, et al; European League Against Rheumatism (EULAR). EULAR recommendations for patient education for people with inflammatory arthritis. Ann Rheum Dis. 2015;74(6):954-962. doi: 10.1136/annrheumdis-2014-206807.
21. Du S, Yuan C, Xiao X, Chu J, Qiu Y, Qian H. Self-management programs for chronic musculoskeletal pain conditions: a systematic review and meta-analysis. Patient Educ Couns. 2011;85(3):e299-310. doi: 10.1016/j.pec.2011.02.021.
22. Hewlett S, Clarke B, O'Brien A, et al. Rheumatology education for undergraduate nursing, physiotherapy and occupational therapy students in the UK: standards, challenges and solutions. Rheumatology (Oxford). 2008;47(7):1025-1030. doi: 10.1093/rheumatology/ken139.

23. Chan JC, Hamamura T. Emotional intelligence, pain knowledge, and attitudes of nursing students in Hong Kong. Pain Manag Nurs. 2016;17(2):159-168. doi: 10.1016/j.pmn.2016.02.001.
24. Kalinowski S, Budnick A, Kuhnert R, et al. Nonpharmacologic Pain Management Interventions in German Nursing Homes: A Cluster Randomized Trial. Pain Manag Nurs. 2015;16(4):464-474. doi: 10.1016/j.pmn.2014.09.002.
25. Menefee LA, Monti DA. Nonpharmacologic and complementary approaches to cancer pain management. J Am Osteopath Assoc. 2005;105(11 Suppl 5):S15-20.
26. Göl İ, Onarıcı M. [Nurses' knowledge and practices about pain and pain control in children]. Hacettepe Üniversitesi Hemşirelik Fakültesi Dergisi.2015;2(3):20-29. [Article in Turkish]
27. Yılmaz F, Atay S. [Clinical pain management of nursing students]. Hacettepe Üniversitesi Hemşirelik Fakültesi Dergisi. 2014;1(2):32-41. [Article in Turkish]
28. Lewis MJM, Kohtz C, Emmerling S, Fisher M, Mcgarvey J. Pain control and nonpharmacologic interventions. Nursing. 2018;48(9):65-68. doi: 10.1097/01.NURSE.0000544231.59222.ab.
29. Akbaş M, Tosunöz İK. [Knowledge and approaches of nurses about pain related interventions]. Cukurova Med J 2019;44(1):136-143. doi: 10.17826/cumj.431892. [Article in Turkish]
30. Neher M, Ståhl C, Ellström PE, Nilsen P. Knowledge sources for evidence-based practice in rheumatology nursing. Clin Nurs Res. 2015;24(6):661-679. doi: 10.1177/1054773814543355.
31. Sağkal Midilli T, Eşer İ, Yücel Ş. [The use of nonpharmacological methods in pain management of nurses working in surgical clinics and factors affecting their use]. ACU Sağlık Bil Derg. 2019;10(1):60-66. doi: 10.31067/0.2018.72. [Article in Turkish]
32. Van Niekerk LM, Martin F. Tasmanian nurses' knowledge of pain management. Int J Nurs Stud. 2001;38(2):141-52. doi: 10.1016/s0020-7489(00)00053-5.
33. Lauche R, Hunter DJ, Adams J, Cramer H. Yoga for Osteoarthritis: a Systematic Review and Meta-analysis. Curr Rheumatol Rep. 2019;21(9):47. doi: 10.1007/s11926-019-0846-5.
34. Pehlivan S, Karadakovan A. Effects of aromatherapy massage on pain, functional state, and quality of life in an elderly individual with knee osteoarthritis. Jpn J Nurs Sci. 2019;16(4):450-458. doi: 10.1111/jjns.12254.
35. Bakir E, Baglama SS, Gursoy S. The effects of reflexology on pain and sleep deprivation in patients with rheumatoid arthritis: A randomized controlled trial. Complement Ther Clin Pract. 2018;31:315-319. doi: 10.1016/j.ctcp.2018.02.017.
36. Alparslan GB, Babadağ B, Özkaraman A, Yıldız P, Musmul A, Korkmaz C. Effects of music on pain in patients with fibromyalgia. Clin Rheumatol. 2016;35(5):1317-1321. doi: 10.1007/s10067-015-3046-3.
37. Gok Metin Z, Ozdemir L. The Effects of Aromatherapy Massage and Reflexology on Pain and Fatigue in Patients with Rheumatoid Arthritis: A Randomized Controlled Trial. Pain Manag Nurs. 2016;17(2):140-149. doi: 10.1016/j.pmn.2016.01.004.
38. Larsson A, Palstam A, Löfgren M, et al. Resistance exercise improves muscle strength, health status and pain intensity in fibromyalgia--a randomized controlled trial. Arthritis Res Ther. 2015;17(1):161. doi: 10.1186/s13075-015-0679-1.