

Sleep Disturbances in Patients with Knee Osteoarthritis

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Received:13-2-2024

Accepted:9-4-2024

Abstract

Backgrounds: Osteoarthritis (OA) is a prevalent disorder characterized by focal loss of articular cartilage in weight-bearing synovial joints and associated with significant pain and functional impairment. Sleep disturbances are common symptoms in adults and are related to numerous chronic conditions like osteoarthritis.

Aim of the study: To discover the relationship between knee osteoarthritis with sleep disturbances

Materials and methods: Cross-sectional study, including 102 with knee osteoarthritis consulted outpatient clinic in Al-Sader Teaching Hospital / in Al-Basrah during the period from September 2023 to December 2023 assessed for the presence of sleep disturbance. Knee osteoarthritis pain was assessed by the VAS scale and the radiological grade of OA was recorded. A sleep scale from the Medical Outcome Study (MOS) was used to assess sleep disturbances in patients with knee osteoarthritis over the past 4 weeks.

Results: Out of the 102 patients with knee osteoarthritis, 73.5 % were female and 72.5% of them were married. The mean age was (53.9 ± 11.4) years and the majority 73.5% of the participants were homemakers. Most of the participants had high BMI values (31.05 ± 5.7) kg/m² with increased waist circumference (103.4 ± 14.9) cm. About 75% of participants were in grade 2 and 3 osteoarthritis and about 94% of the patients complained of moderate to severe pain when assessed using Visual Analog Score Analysis (VAS). There is a significant association between knee osteoarthritis grades and the MOS sleep scale on one hand and pain score assessed by the visual analogue scale on the other hand. Conclusion Sleep disturbances become more prevalent with an increase in the grades of knee osteoarthritis and are associated with worse pain scores.

Key Words: Osteoarthritis, Sleep Disturbances, MOS sleep scale, Visual Analog Score (VAS)

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Introduction

Osteoarthritis is a disorder characterized by focal loss of articular cartilage mostly in weight-bearing synovial joints accompanied by osteophytosis and subchondral bone sclerosis with capsular thickening. (1)

Osteoarthritis important progressive condition, not only causing chronic pain and functional impairment but also may influence several aspects of the population's well-being including psychosocial health, employment, and most importantly sleep. (2) It is the most common form of degenerative joint disease and is roughly estimated to affect 15% of the general population. OA is the major cause of debility in elderly patients and knee osteoarthritis accounted for 40% in males and 47% in females during their lifetimes. (3) Osteoarthritis is a well-known cause of disability around the globe. (4) Osteoarthritis risk factors are categorized into: Individual-based factors, including inheritance, age, sex, obesity,

and nutrition habits, as well as Joint based factors that comprise sports injuries and joint overuse and overloading injuries. (5) Etiologically, Osteoarthritis is characterized into two sets: Primary (Idiopathic or Non-traumatic) and Secondary (trauma or mechanical misalignment). (6) The chondrocytes play pivotal roles in cartilage and Juxta-articular tissue damage hastening by producing inflammatory mediators (7) The net results of joint architectural alterations will be focal erosions of cartilages, inflammation of synovial membranes, osteophytosis, and sclerosis of the subchondral area of the joints. (8) The key manifestations of osteoarthritis are pain, stiffness, and joint range of motion limitation. Additionally, crepitus, joint malalignment, and fixed joint enlargement (which results from bone remodeling, severe osteophytosis, or joint subluxation) elicited on physical examination of the affected joints. These features characteristically start in just one or a few joints in a person above the age of fifties unless Osteoarthritis is secondary to injuries or mechanical disfigurements. It is well known that Osteoarthritic pain typically becomes worse with activities and is relieved by rest. (9). People 50 years old and over are frequently diagnosed with knee osteoarthritis worldwide. Its progression is insidious, and irreversible and often leads to severe incapacity and daily living difficulties. The American College of Rheumatology (ACR) anticipated diagnostic standards for the diagnosis of knee Osteoarthritis in 1986. The prevalence of knee Osteoarthritis in different studies depends on diagnostic criteria (clinical or radiological) and the characteristics of the studied populations. (10) As the general population grows in age, definitely there is an anticipated increase in the sum of knee osteoarthritis cases and the total number of patients requiring Knee surgery is predicted to upsurge by several folds by 2030. (11)

Up-to-date, the diagnosis of knee osteoarthritis depends on patient-reported outcome measures (PROMS) and knee X-ray features. Another

approach to diagnosing knee osteoarthritis comprises clinical examination, arthroscopic assessment, Knee synovial fluid aspiration, and unconventional diagnostic imaging techniques. Knee osteoarthritis diagnosis typically happens during a moderate-to-late stage of the disease, at a point where irreversible joint damage is in evidence.

Nevertheless, even by experts, the diagnosis of early knee osteoarthritis may be overlooked because the complaints of those patients are trivial and most of them are asymptomatic. So, the patient loses the opportunity for the best treatment time and then develops everlasting debility. To avoid this obstacle, sufficient early detection approaches are intensely desired. (12)

Kellgren and Lawrence classification system:

Below is the original description of the Kallgren and Lawrence Osteoarthritis classification system, despite that there were several versions presented and denoted as follows: Grade 0 (None): Absolute nonappearance of x-ray changes of osteoarthritis, Grade 1 (Doubtful): Uncertain joint space narrowing and Probable osteophytic lipping, Grade 2 (Minimal): Absolute osteophytes and Probable joint space narrowing, Grade 3 (Moderate): Moderate multiple osteophytes, Absolute narrowing of joint space and some sclerosis and possible deformity of bone ends, Grade 4 (Severe): Large osteophytes, Marked narrowing of joint space, Severe sclerosis and Absolute Deformity of bone ends. (13) Treating patients with osteoarthritis, (especially those with knee osteoarthritis) is challenging. It includes several diverse health aspects :patient education programs, Physical exercises, analgesics, and Nonsteroidal anti-inflammatory drugs (NSAIDs). (14) Intra-articular corticosteroid injections are still a relatively safe and acceptable technique for symptomatic approaches. (15) Sleep is a multifaceted process that is ingrained in the

central nervous system and its impact is dispersed to various other systems. It is a dynamic process originated and controlled by sophisticated, merged, and highly linked neurologic networks located mainly in the hypothalamus, brainstem, and thalamus. Disturbed sleep usually represents dissimilar aspects to the various population groups. The main problem reported by adult people is sleep starting and preservation difficulties. (16) Sleep disturbances are usually linked to different issues, including coffee, cigarette, and alcohol consumption, bad sleep hygiene, and diverse comorbid disorders. (17) Suicidal ideations and actions are strongly linked to sleep disturbances. Overall, sleep disturbances are common in patients suffering from diverse psychological and medical illnesses. (18) Moreover, sleep disturbances are widespread in the elderly because of the high prevalence of medical comorbidities such as obstructive sleep apnea (OSA) and because of environmental factors for example but not limited to poor sleep environment. (19) Linking to the general population, people suffering from osteoarthritis record more sleep disturbance such as difficulty in falling and/or remaining asleep. (20) Categorically, individuals with knee or lower back pain frequently complain of difficulties in sleep commencement and sleep preservation. (21) Sleep disturbances have an obvious association with knee pain and deteriorating self-perceived health, function, and physical performance. (22)

Aim of the study

To determine the relationship between Knee osteoarthritis and sleep disturbances

Patients and Methods

One hundred-two Patients with knee osteoarthritis consulted the outpatient clinic in Al-Sader Teaching Hospital / in Al-Basrah during the period from September 2023 to December 2023 and

[10.33762/mjbu.2024.146812.1195](https://doi.org/10.33762/mjbu.2024.146812.1195)

assessed for the presence of sleep disturbance. After taking a full medical history and doing the proper clinical examination then appropriate investigations are done if needed. Patients with any known other overlapping diseases like diabetes mellitus, hypertension, bronchial asthma, malignancy, rheumatoid arthritis, or infectious diseases that affected the quality of sleep of patients with OA were excluded. A questionnaire sheets were used to collect the patients' data; the questionnaire included the social and demographic information for example patient names, age, gender, address, occupation, marital status, educational level, and disease duration. Knee osteoarthritis pain was assessed by the VAS scale and the radiological grade of OA was recorded. Measurement of height in meters (m) without shoes using a stadiometer, and weight was measured in kilogram (Kg.), patients weighed on a scale, wearing light clothes and without shoes, and the waist circumference was measured in (cm.).

- Body mass index (BMI) was measured according to the equation (weight in kilogram divided by the square of height in meters) and is classified into five subgroups:
- Underweight if $BMI < 18 \text{ kg/m}^2$
- Normal ($18.5\text{-}24.9 \text{ kg/m}^2$)
- overweight ($25\text{-}29.9 \text{ kg/m}^2$)
- Obesity $\geq 30 \text{ kg/m}^2$
- Obesity class I – BMI 30 to 34.9 kg/m^2
- Obesity class II – BMI 35 to 39.9 kg/m^2

According to the classification system of the World Health Organization (WHO). (23) Sleep scale from Medical Outcome Study used to assess sleep disturbances in patients with knee

osteoarthritis over the past 4 weeks. It consists of 12 items, 6-point scales, assessing different aspects of sleep disturbances in the past 4 weeks ranging from 1 (all of the time) to 6 (none of the time). The total score is the mean of the 12 items with high scores indicating no sleep disturbances. The scale uses predominantly Likert-type questions to evaluate sleep that is interpreted in a unidirectional flow way, so higher scores specify better sleep for all subscales and both global indices. (24) Statistical analysis was performed using SPSS software version 24.0. The descriptive statistical analysis was performed using mean and standard deviation for numerical variables and frequency and percentage for categorical variables.

Ethical Issues

The study protocol was approved by the University of Basrah /Al-Zahraa College of Medicine/ Department of Medicine, Rheumatology and Medicine Rehabilitation Unit (IRB number 0035). All Patients wrote consents before participating in the study. The data and information of the participants are kept confidential and any personal or private information that identifies the participant is kept secret.

RESULTS

The study included 102 patients with knee osteoarthritis consulting the outpatient clinic, of whom 73.5 % were female and 72.5% of them were married. The mean age was (53.9 ± 11.4) years and the majority 73.5% of the participants were housewives. The sociodemographic characteristics of the studied sample are shown in Table(1).

Table: the sociodemographic features of the participants

Variables		No.	%
Age	Mean ± SD Range	53.9 ± 11.430-85	
Gender	Male	27	26.5
	Female	75	73.5
Residency	Rural	38	37.3
	Urban	64	62.7
Marital status	Single	9	8.8
	Married	74	72.5
	Divorced	4	3.9
	Widow	15	14.7
Education	Illiterate	21	20.6
	Reads and writes	52	51.0
	High School	13	12.7
	College Graduate	14	13.7
	Higher education	2	2.0
Occupation	Housewife	75	73.5
	Employee	20	19.6
	Self-employee	7	6.9
Total		102	100.0

The majority of the participants had high BMI values (31.05 ± 5.7) kg/m² with increased waist circumference (103.4 ± 14.9) cm. The detailed anthropometric features of the studied patients are shown in Table 2

Table 2: The anthropometric measurement of the participants.

Variables		No.	%
Weight	Mean ± SD	81.3 ± 17.1	
	Range	42 – 113	
Height	Mean ± SD	161.5 ± 9.2	
	Range	137 -185	
Waist circumference	Mean ± SD	103.4 ±14.9	
	Range	65-133	
BMI	Mean ± SD	31.05 ± 5.7	
	Normal weight	15	14.7
	Overweight	28	27.5
	Obese I	30	29.4
	Obese II	29	28.4

About 75% of participants were in grade 2 and 3 osteoarthritis as presented in Figure 1, and about 94% of the patients suffered from moderate to severe pain when assessed using Visual Analog Score Analysis (VAS) as demonstrated in Table 3.

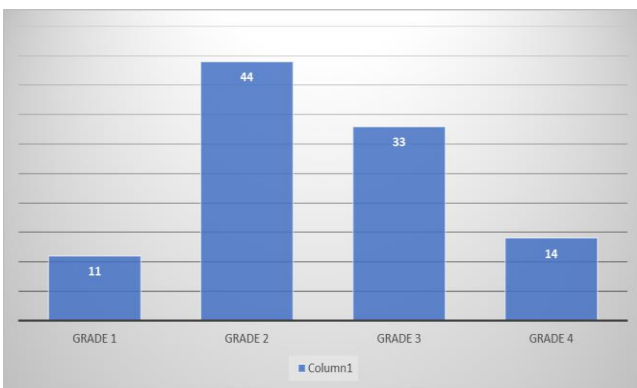


Figure 1 The grade of OA among the participants.

Table 3: The VAS score among the participants

Variables		No.	%
VAS score	Mean ± SD	6.84 ±1.86	
	Range	2-10	
No pain		0	0.0
Mild pain (1-3)		6	5.9
Moderate pain (4-6)		33	32.4
Severe pain (7-10)		63	61.8

Among study participants, there was an intensification of pain score as the grade of osteoarthritis advanced as expected (p-Value 0.001) which is demonstrated in Table 4

Table 4: the association between the VAS score and the OA grade

OA Grade	VAS Mean ± SD	p-value
Grade 1	5.7 ±2.2	0.001
Grade 2	6.3 ±1.6	
Grade 3	7.3 ± 1.5	
Grade 4	8.4± 1.7	

In general, the Sleep measure used during the study derived from the Medical Outcomes Study, score value of (41.33 ±7.81) ranging from 21 – 58 and a median of 41.0 as shown in Table 5

Table 5: The MOS sleep scale among patients

Sleep Scale from the Medical Outcomes Study	Mean ± SD	41.33 ± 7.81
	Range	21 – 58
	Median	41.0

The males show better sleep patterns than females and this difference is significant statistically, but on the other hand, although statically not significant, it was noticed that as the population sample increases in age, the Sleep

Scale reduced so there is an adverse correlation between the age and the sleep, this is shown in Table 6

Table 6: the association between the sleep scale with the demographic characteristics

Gender	MOS sleep scale Mean ± SD	p-value
Male	44.5 ± 7.9	0.013
Female	40.2 ± 7.4	
Age	R-value	p-value
	- 0.102	0.310

By using ANOVA, the association between the grades of knee osteoarthritis and MOS sleep scale on one hand and the pain score assessed by the visual analogue scale, on the other hand, were verified, the results were consistent and statically significant. As the grade of osteoarthritis deteriorates, the sleep becomes worse and the pain becomes more severe. This understandable observation is shown in Table 7

Table 7: the association between the sleep scale with the OA grade and VAS.

OA Grade	MOS sleep scale Mean ± SD	p-value
Grade 1	43.0 ± 6.5	0.05
Grade 2	41.9 ± 8.1	
Grade 3	39.8 ± 8.3	
Grade 4	36.7 ± 6.5	
VAS score	MOS sleep scale Mean ± SD	p-value
Mild pain (1-3)	52.16 ± 3.06	0.001
Moderate pain (4-6)	42.1 ± 6.62	
Severe pain (7-10)	39.8 ± 7.8	

Discussion

As well established, sleep has had an important influence on health and well-being, and impaired

sleep nowadays is recognized as a common and important worldwide health-related problem (25).

This study attempts to determine the expected relationship between osteoarthritis specifically knee osteoarthritis" which is a chronic degenerative joint disease associated with the presence of multidimensional pain profiles and substantial functional impairments" with sleep disturbances. (26)

The study found that in general, with knee osteoarthritis accompanying sleep disturbances, this correlation ultimately becomes more robust with the progression of joint damage, as patients with advanced osteoarthritis grades suffered from worse sleep patterns than earlier grades. Despite the limited research in this field that verifying sleep disturbance in patients with knee osteoarthritis, it is well known that the pain associated with advanced-stage osteoarthritis may provoke recurrent sleep troubles events (27)

In harmony with the results of our study, Zullig., et al. Established that patients with knee and hip osteoarthritis not only have had worse pain score values but more depressive symptoms, tiredness, and sleep problems with more functional limitations and activity restrictions. (28)

Once more, Şah V., et al found that in patients with knee osteoarthritis, as the disease severity progresses, the sleep quality and the quality of life decline. (29)

This observation could encompass a spectrum beyond what is assumed to be the grounds related to the mechanical aspect of osteoarthritis.

Quartana PJ., et al. conclude that patients with knee osteoarthritis suffering from nocturnal pain that cause sleep disturbances have had a significant increase in IL-6 and a decrease in IL-10; which could be one of the probable bases for insomnia as osteoarthritis considered by some scientists as low-grade inflammatory arthritis. (30)

Conclusion

Sleep disturbances become more widespread with an increase in the grades of knee osteoarthritis and are associated with worse pain scores.

Limitations of the study

1. The study did not figure out the psychosocial aspects of sleep problems in patients with osteoarthritis and their effects on life quality
2. The assessment scales (MOS –sleep Scale and VAS) are based on self-reported data used to evaluate pain severity and sleep.
3. A small sample size and a large number of studies are needed for the exploration of the role of knee osteoarthritis in a range of different aspects of sleep disorder.

Recommendations

1. Encourage all physicians especially junior rheumatologists to assess the quality of sleep in patients with knee osteoarthritis who consult outpatient clinics for various reasons.
2. Educate all clinicians dealing with sleep disorders to consider this important relation
3. Conduct a larger study including additional aspects like mental, social, and occupational, among others related to knee osteoarthritis

Reference:

1. Pereira D., Peleteiro B., Araújo J., Branco J., Santos R.A, Ramos E. The effect of osteoarthritis definition on prevalence and incidence estimates: a systematic review. *Osteoarthritis and Cartilage*. November 2011; 1270-85.
2. Allen KD, Thoma LM, Golightly YM. Epidemiology of osteoarthritis. *Osteoarthritis Cartilage*. 2022 Feb; 30(2):184-195.
3. Victoria L. David J. The epidemiology of osteoarthritis. *Best Practice & Research Clinical Rheumatology*. February 2014; 28(1):5-15.
4. Vina ER, Kwok CK. Epidemiology of osteoarthritis: a literature update. *Curr Opin Rheumatol*. 2018 Mar; 30(2):160-167.
5. Palazzo C, Nguyen C, Lefevre-Colau MM, Rannou F, Poiraudou S. Risk factors and burden of osteoarthritis. *Annals of Physical and Rehabilitation Medicine*. June 2016; 59(3): 134-8.
6. Juan C Mora, Rene Przkora & Yenisel Cruz-Almeida. Knee osteoarthritis: pathophysiology and current treatment modalities. *Journal of Pain Research*. 2018:2189-2196.
7. Jang, S.; Lee, K.; Ju, J.H. Recent Updates of Diagnosis, Pathophysiology, and Treatment on Osteoarthritis of the Knee. *International Journal of Molecular Sciences*. 2021, 22:2619.
8. Yunus MHM, Nordin A, Kamal H. Pathophysiological Perspective of Osteoarthritis. *Medicina (Kaunas)*. 2020 Nov 16; 56(11):614
9. Abhishek A., Michael Doherty, MD, FRCP. *Diagnosis and Clinical. Presentation of Osteoarthritis* 2013; 45–66.
10. Lukusa A, Malemba JJ, Lebughe P, Akilimali P, Mbuyi-Muamba JM. Clinical and radiological features of knee osteoarthritis in patients attending the University Hospital of Kinshasa, Democratic Republic of Congo. *Pan Afr Med J*. 2019 Sep 13; 34:29
11. Kwon SB, Ro DH, Song MK, Han HS, Lee MC, Kim HC. Identifying key gait features associated with the radiological grade of knee osteoarthritis. *Osteoarthritis Cartilage*. 2019 Dec; 27(12):1755-1760.
12. Teoh YX, Lai KW, Usman J, Goh SL, Mohafez H, Hasikin K, Qian P, Jiang Y, Zhang Y, Dhanalakshmi S. Discovering Knee Osteoarthritis Imaging Features for Diagnosis and Prognosis: Review of Manual Imaging Grading and Machine Learning Approaches. *J Healthc Eng*. 2022 Feb 18; 2022:4138666.

13. Knipe H. Kellgren and Lawrence system for classification of osteoarthritis. *Radiopaedia*. 15 Sep 2021.
14. Abdurakhmanovich K .O. Servetovna A. Javlanovich Y. D. Narbay Ugli N.Z. Diagnosis and Structural Modification Treatment of Osteoarthritis of the Knee. *Central Asian journal of medical and natural*. Sep-Oct 2022; 2660-4159.
15. Wang F., HE X. Intra-articular hyaluronic acid and corticosteroids in the treatment of knee osteoarthritis. *Experimental and Therapeutic Medicine*. 2015; 493-500.
16. Cipriani G, Lucetti C, Danti S, Nuti A. Sleep disturbances and dementia. *Psychogeriatric*. 2015 Mar; 15(1):65-74.
17. Suzuki K, Miyamoto M, Hirata K. Sleep disorders in the elderly: Diagnosis and management. *J Gen Fam Med*. 2017 Mar 30; 18(2):61-71
18. Pigeon WR, Pinquart M, Conner K. Meta-analysis of sleep disturbance and suicidal thoughts and behaviors. *J Clin Psychiatry*. 2012 Sep; 73(9):e1160-723.
19. Reynolds, A. C., & Adams, R. J. (2019). Treatment of sleep disturbance in older adults. *Journal of Pharmacy Practice and Research*, 49(3), 296-304.
20. Lapane KL, Shridharmurthy D, Harkey MS, Driban JB, Dubé CE, Liu SH. The relationship between restless sleep and symptoms of the knee: data from the Osteoarthritis Initiative. *Clin Rheumatol*. 2021 Jun;40(6):2167-2175.
21. Cho Y, Jung B, Lee YJ, Kim MR, Kim EJ, Sung WS, Ha IH. Association between sleep duration, osteoarthritis, and their prevalence in Koreans: A cross-sectional study. *PLoS One*. 2020 Apr 27; 15(4):e0230481.
22. 31.Silva A, Mello MT, Serrão PR, Luz RP, Ruiz F, Bittencourt LR, Tufik S, Mattiello SM. Influence of obstructive sleep apnea in the functional aspects of patients with osteoarthritis. *J Clin Sleep Med*. 2018; 14(2):265–270.
23. Body mass index (BMI) [Internet]. Available from: <https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/body-mass-index>
24. Yarlal, A., White, M. K., St Pierre, D. G., & Bjorner, J. B. (2021). The development and validation of a revised version of the Medical Outcomes Study Sleep Scale (MOS Sleep-R). *Journal of patient-reported outcomes*, 5(1), 40. <https://doi.org/10.1186/s41687-021-00311-3>
25. Ogilvie RP and Patel SR. “The epidemiology of sleep and obesity”. *Sleep Health* 3.5 (2017): 383-388.
26. Mills K, Hübscher M, O'Leary H, Moloney N. Current concepts in joint pain in knee osteoarthritis. *Schmerz*. 2019 Feb;33(1):22-29.
27. Sasaki E., et al. “Nocturnal knee pain increases with the severity of knee osteoarthritis, disturbing patient sleep quality”. *Arthritis Care and Research* 66.7 (2014): 1027-1032.
28. Zullig LL., et al. “The association of comorbid conditions with patient-reported outcomes in Veterans with hip and knee osteoarthritis”. *Clinical Rheumatology* 34.8 (2015): 1435-1441.
29. Şah, V., "Relation of disease activity with quality of life and sleep quality in knee osteoarthritis." *Environment* 51.16.23 (2021): 13-0.
30. Quartana PJ., et al. “Effects of insomnia disorder and knee osteoarthritis on resting and pain-evoked inflammatory markers”. *Brain Behavior and Immunology* 47 (2015): 228-237.

اضطرابات النوم لدى المرضى المصابين بخشونة مفصل الركبة

المخلص

الخلفية: خشونة المفاصل هو اضطراب منتشر يتميز بفقدان موضعي لغضروف المفصل في المفاصل الزليقية التي تتحمل الوزن ويرتبط بألم كبير واختلال وظيفي. تعد اضطرابات النوم من الأعراض الشائعة لدى البالغين وترتبط بالعديد من الحالات المزمنة مثل خشونة المفاصل.

هدف الدراسة: اكتشاف العلاقة بين خشونة الركبة واضطرابات النوم.

الأسلوب: دراسة مقطعية تشمل ١٠٢ مريضًا يعانون من خشونة الركبة راجعوا العيادة الخارجية في مستشفى الصدر التعليمي / بالبصرة خلال الفترة من سبتمبر ٢٠٢٣ إلى ديسمبر ٢٠٢٣ لتقييم وجود اضطرابات النوم. تم تقييم آلام خشونة الركبة باستخدام مقياس VAS وتم تسجيل الدرجة الشعاعية لخشونة المفاصل. تم استخدام مقياس النوم من دراسة النتائج الطبية (MOS) لتقييم اضطرابات النوم لدى مرضى خشونة الركبة خلال الأسابيع الأربعة الماضية.

النتائج: من بين ١٠٢ مريضًا مصابًا بخشونة الركبة، كانت ٧٣,٥٪ من الإناث و ٧٢,٥٪ منهم متزوجات. وكان متوسط العمر (٥٣,٩ ± ١١,٤) سنة وكان معظم المشاركين (٧٣,٥٪) من ربات البيوت. كان لدى معظم المشاركين قيم مؤشر كتلة الجسم عالية (٣١,٠٥ ± ٥,٧) كجم / م^٢ مع زيادة محيط الخصر (١٤,٩ ± ١٠٣,٤) سم. يعاني حوالي ٧٥٪ من المشاركين من خشونة المفاصل من الدرجة الثانية والثالثة، واشتكى حوالي ٩٤٪ من المرضى من آلام متوسطة إلى شديدة عند تقييمها باستخدام تحليل مقياس التقييم البصري (VAS). يوجد ارتباط مهم بين درجات خشونة الركبة ومقياس نوم MOS من ناحية ودرجة الألم التي تم تقييمها باستخدام المقياس التناظري البصري من ناحية أخرى.

الخاتمة: تصبح اضطرابات النوم أكثر شيوعًا مع زيادة درجات خشونة الركبة وترتبط بدرجات ألم أسوأ.

الكلمات المفتاحية: خشونة المفاصل, اضطرابات النوم, مقياس MOS للنوم, الدرجة التناظرية البصرية