ORIGINAL ARTICLE

Arch AHS

Archives of Allied Health Sciences 2022; 34(1): 37-47.

Perception and impairments of female community dwellers with knee osteoarthritis who have not sought treatment or lost follow-ups

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KEYWORDS
Knee osteoarthritis;
Perception;
Rehabilitation;
Knee pain;
Physical Therapy.

ABSTRACT

Knee osteoarthritis (OA) is expected to increase in the future because of increasing life expectancy. However, the perception of the condition and clinical characteristics of symptomatic knee OA among Thai female community dwellers is not known. The primary objective of this study was to explore the perception of knee OA among participants who lost their follow-ups or had not sought health professional consultation regarding their condition. The secondary objective was to compare knee OA-related problems between those with and without the perceived need for physical therapy (PT). Ninety-four female community dwellers with symptomatic knee OA were enrolled in this study. They were divided into two groups based on their perceived need for PT management. The Knee Injury and Osteoarthritis Outcome Score (KOOS) subscales, knee range of motion (ROM), and knee muscle strength were compared. Their perception of OA was determined using a structured questionnaire. The results showed that around half of the participants perceived that knee OA was associated with aging or degenerative change. Approximately 80% of the participants lost their follow-ups due to perceived ineffective medical care, preference for self-care management, and barriers associated with transportation services. The most important factor for the perceived need for PT management was pain severity. Pain improvement was the expected outcome if they had a chance to receive PT management. KOOS-Pain, KOOS-Symptoms, KOOS-Function in Daily Living, KOOS-Sport and Recreation, and knee flexion ROM were significantly different between groups with and without the perceived need for PT (p-value < 0.05). Patient perception was an important factor for knee OA management. Those who needed rehabilitation had more debilitating problems than those who did not need rehabilitation, confirming that patients tend to consult health professionals when symptoms are severe.

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Received: 12 October 2021/ Revised: 25 November 2021/ Accepted: 11 December 2021

Introduction

Knee osteoarthritis (OA) is perceptibly heterogeneous with a variety of clinical features, biochemical and genetic characteristics, as well as responses to treatment[1,2]. The prevalence of knee OA increases with age and more frequently affects women than men, considering the estrogen deficiency in postmenopausal women[3]. Moreover, the differences in cartilage thickness and lower extremity alignment between genders are related with the higher prevalence, worse symptoms, and greater disability in women than men[3]. Joint structural change in knee OA is associated with pain, which worsens during motion and relieves at rest[4]. Aside from pain, reduced range of motion (ROM) and muscle weakness are also present. Limitation in knee flexion ROM was found to be associated with osteophytes, joint space narrowing, bony enlargement, and pain or crepitus during knee flexion[5]. The degree of impaired ROM was also associated with activity limitation[6]. Decreased strength of both the quadriceps and hamstrings muscles was observed in patients with knee OA[7] and correlated with impaired physical function, specifically ambulation including walking, squatting, and stair climbing[8].

Although knee OA is apparently a debilitating condition, research has shown that many individuals with symptomatic knee OA have not sought medical treatment[9]. Community studies have shown that only 15-50% of older adults with knee pain have sought medical attention[9]. Several reasons were mentioned; for instance, ineffective medical care, use of self-coping strategies, and lack of information about the disease[10]. The decision to seek medical consultation was linked to the chronicity of the knee problem, experiences with health care services, as well as perceptions of the aging and degenerative process, beliefs about treatments and their effectiveness, and perceived seriousness of the condition[11]. A study in Australia has found that individuals with hip or knee OA had encountered significant challenges in treatment accessibility, and the challenges were largely associated with health care professionals, health systems, and financial factors[12].

Osteoarthritis is expected to increase in the future because of increasing life expectancy. Nonsurgical procedures, including physical therapy consultation, are currently the standard practice. However, the escalating cost of health care and the burden for health-care providers for pain and disability management have become important issues[13]. With the reported large prevalence of knee OA in Thailand (34.5-45.6%)[14], the physical therapy caseload for this condition is increasing. Self-care with professional guidance in the community, especially among individuals with early-stage knee OA management, is recommended. Physical therapists could play an important role in screening and providing reassurance and clear advice about movement and behavioral adjustments as well as the value of exercise in controlling symptoms. Still, the personal beliefs of the patients would shape the patients' attitudes and behaviors about how to manage their pain[15].

The perception of the condition and clinical features of symptomatic knee OA among female Thai community dwellers is not known. Therefore, this study aimed to explore the perception regarding knee OA in participants who had not consulted health professionals regarding their condition or missed their follow-ups. The reasons and factors influencing the decisions to seek treatment and rehabilitation were the issues of interest. Their perceived need for rehabilitation and the expected outcome improvements if they had a chance to undergo a rehabilitation program were also determined. The comparisons of disability and impairment variables related to knee OA between those with and without the perceived need for rehabilitation were then undertaken.

Materials and methods

Study design

This study was a cross-sectional survey, carried out in Thai communities. The protocol of this study was approved by the Walailak University Human Research Ethics Committee (WUEC-19-010-01).

Participants

Two hundred sixty-two female community dwellers with knee OA were interested in

participating in the study. They were included in this study if their symptoms met the American College of Rheumatology (ACR) clinical criteria for knee OA[16], having knee pain for at least 12 months, having pain intensity of at least two in a 10-point scale within 48 hours, and having never received physical therapy (PT) management and rehabilitation program. Participants were excluded if they had pain intensity of more than two in a 10-point scale in other joints of the lower limbs, had severe lower back pain, used pain medication within 48 hours, received lower extremity joint replacement, had surgery in the back and lower extremities, or underwent treatments for knee OA by health professionals within a year. The exclusion criteria considered the conditions that might influence the rating of the difficulty levels of activity performance. All participants provided written informed consent prior to data collection. Finally, 94 participants were enrolled in this study. They were also divided into two subgroups for the secondary analysis based on their answer to a yes/no question asking about the need for rehabilitation for their knee OA condition (Figure 1).

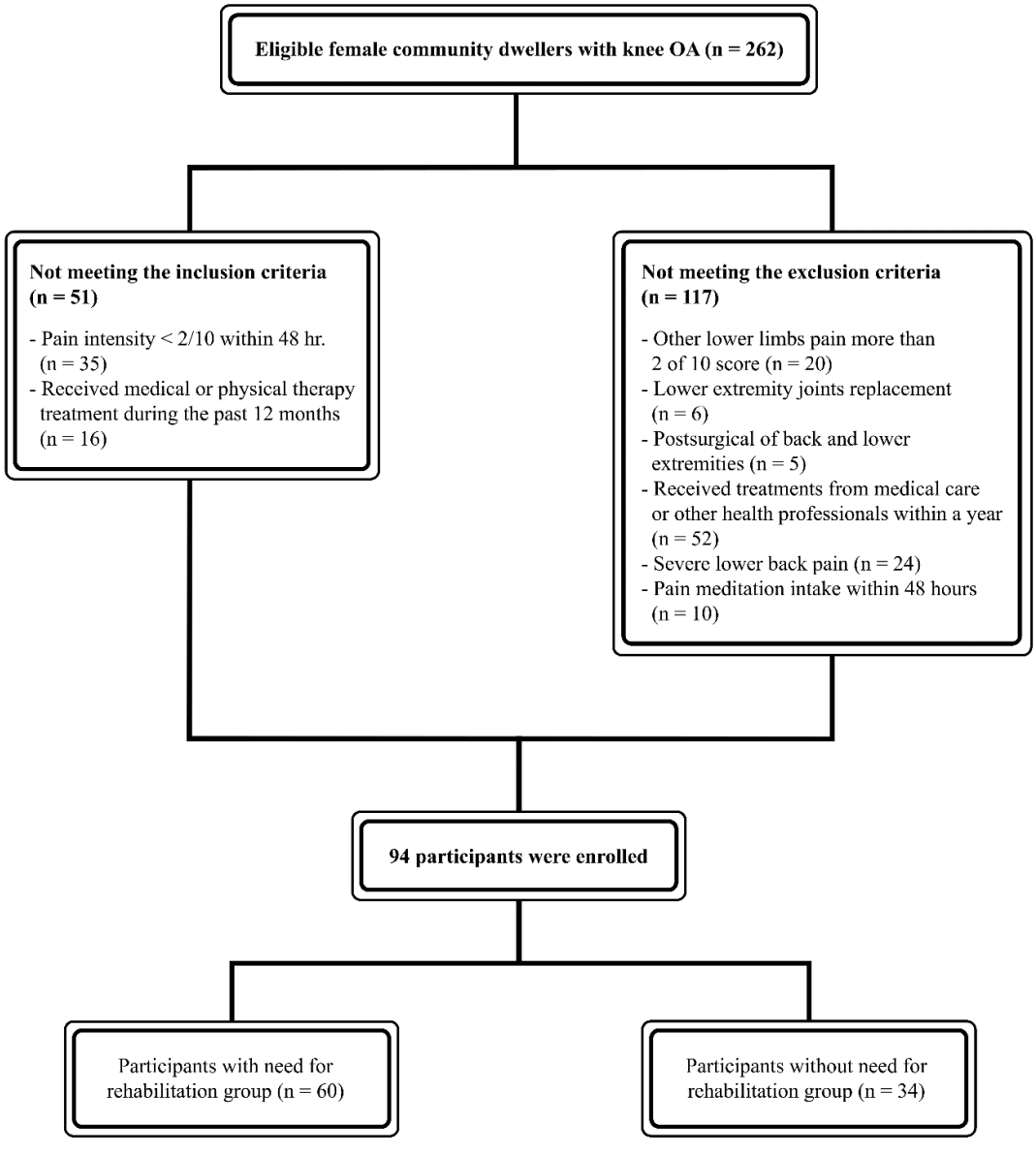

Figure 1 Participant recruitment

Procedures

The participants were interviewed regarding their demographic information (age, height, and weight), duration of knee pain, current pain intensity, and worst pain during the last 48 hours. Knee OA perception was determined through an interview using a structured questionnaire. The issues explored that contributed to the reason(s) towards a delay in seeking medical care or missing follow-ups included the following: need for rehabilitation, perceived cause(s) of knee pain, factors influencing the decision to seek physical therapists, and expected outcome if they had a chance to undergo a rehabilitation program. The disability and impairments including the Knee Injury and Osteoarthritis Outcome Score (KOOS), knee muscle strength, and knee ROM were also assessed.

KOOS (Thai version; www.koos.nu) was used to determine the multidimensional disability in five domains: pain, other symptoms, function in daily living (ADL), function in sport and recreation (Sport/Rec), and knee-related quality of life (QOL). A five-point Likert scale was used for standardized answer options, with 100 as the highest total score for each section (0 = extreme problem; 100 = no problem). Thai KOOS illustrated an acceptable reliability and validity among Thai people with knee OA[17].

A physical therapist with 10 years of experience in treating patients with musculoskeletal conditions, especially knee disorders, performed the objective examination for both muscle strength and knee ROM. The test-retest reliability of ICC > 0.85 for each measurement was confirmed. The maximum isometric strengths of both the knee flexor and extensor muscles were measured by a hand-held dynamometer (JT-AA104, PowerTrack MMT; JTECH Medical Industries, Midvale, UT, USA). The testing procedures and positions were performed according to standardized protocols[18]. The starting position of the strength test was in a sitting position with the knee flexed 90 degrees. Participants were asked to perform isometric contraction against the dynamometer. The average value of three trials was used for data analysis.

Passive knee flexion and extension ROMs were assessed using a goniometer. Participants were tested in a supine position. The fulcrum of the goniometer was centered over the lateral epicondyle of the femur. The stationary arm of the goniometer was placed along the lateral femur, with the greater trochanter as the reference point; and the moving arm was aligned with the lateral aspect of the leg, with the head of the fibula and the lateral malleolus as the reference points[19].

Statistical analysis

Statistical analysis was performed using SPSS version 18 for Windows (IBM Corp., Armonk, NY, USA). The Kolmogorov-Smirnov goodness-of-fit test was used to test the distribution of data. Continuous data are presented as mean ± standard deviation. Nonparametric data are presented as median (interquartile range, 25th-75th percentile). Nominal and categorical data are presented as percentages.

The groups were determined by the participants' answer about the perceived need for rehabilitation for their current knee OA condition. To compare the demographic data, the KOOS subscales, knee muscle strength and knee ROM between groups, independent t-test, or Mann-Whitney U-test was used depending on the characteristic of the variables and the distribution of data.

The sample size in this study was calculated based on the formula from the study of Pourhoseingholi, et al [20]. The expected pain solving of 6% was used in this formula based on the study by Bedson, et al [21]. The 5% substitution was also considered in case of missing data. Finally, 94 subjects were needed for this study.

Results

There was a total of 94 participants enrolled in this study. Their characteristics including age, BMI, duration of knee pain, current pain intensity, worst pain during the last 48 hours for both groups, and need for rehabilitation are presented in Table 1. BMI and duration of knee pain were significantly different between the groups.

Table 1 Participants' characteristics

Variable	Need rehabilitation (n = 60)			Not-need rehabilitation (n = 34)			95% CI	*p-value*
	Mean ± SD	Median	IQR	Mean ± SD	Median	IQR		
Age (years)	64.7 ± 9.1			66.6 ± 8.7			-1.89,5.72	0.319[a]
BMI (kg/m^2)	26.5 ± 4.0			24.9 ± 3.0			-3.14,-0.03	0.046[a*]
Duration of knee pain (years)		4	2-6		3	1-5		0.044[b*]
Current pain intensity (NRS)		1	0-3		0	0-2		0.254[b]
The worst pain intensity during the last 48 hr. (NRS)		7	4-8		5.5	4-7.3		0.106[b]

Note: [a] Independent t-test, [b] Mann-Whitney U-test, [*] *p*-value < 0.05. BMI, Body Mass Index; SD, standard deviation; IQR, interquartile range; CI, Confidence Interval; NRS, numeric rating scale

There were less participants who had never sought medical care for knee osteoarthritis (OA) or knee pain (18.09%) compared with those who used to receive treatments from health professionals but lost follow-ups (81.91%). The participants who never received professional care reported that the reasons included inconvenient transportation (9.58%) and preference for self-care management (8.51%). Those who did not go back for medical follow-ups gave the reasons of preference for self-care management (38.29%), perceived ineffective medical treatment (32.98%), and transportation inconvenience (10.64%). There were 60 participants (63.83%) who responded that they needed a rehabilitation program for their knee OA, while 34 participants (36.17%) reported that they did not need rehabilitation.

The participants' perception of the causes of knee OA and the factors influencing decision making for knee OA management are reported in Table 2. Most of the participants perceived that their knee OA was due to aging or degenerative change, whereas approximately one in 10 perceived that knee OA was related to previous knee injury (secondary OA). Moreover, pain severity was the most common influencing factor for deciding to undergo a rehabilitation program. If given the chance to receive rehabilitation, most of the participants expected pain reduction after treatment.

Table 2 Knee osteoarthritis perception

Perception	Overall (n = 94)		Need for rehabilitation (n = 60)		No need for rehabilitation (n = 34)	
	n	%	n	%	n	%
Causes of knee pain						
- Aging/ degenerative change	50	53.2	34	56.7	16	47.1
- Previous prolonged vigorous activity/ excessive loading of the knee	35	37.2	22	36.7	13	38.2
- Previous knee injury	9	9.6	4	6.6	5	14.7
Factors influencing the decision to seek treatment and rehabilitation for knee OA						
- Severity of knee pain	41	43.6	28	46.7	13	38.2
- Activity limitation	20	21.3	11	18.3	9	26.5
- Both severity of knee pain together with activity limitation	15	16.0	14	23.3	1	2.9
- Transportation service barriers	18	19.1	7	11.7	11	32.4
Expected outcome improvements if they had a chance to undergo a rehabilitation program for their current knee pain						
- Pain relief	88	93.6	58	96.7	30	88.2
- Improved ability to perform activities	16	17.0	14	23.3	2	5.9
- No expectation	4	4.3	1	1.7	3	8.8

For the secondary analysis, the disability and impairments related to knee OA were compared between participants who needed and did not need rehabilitation. Five variables including KOOS-Pain, KOOS-Symptoms, KOOS-ADL, KOOS-Sport/Rec, and passive knee flexion ROM were significantly different between groups (p-value < 0.05), but the KOOS-QOL, passive knee extension ROM, knee extensor muscle strength, and knee flexor muscle strength were not significantly different. For all domains of KOOS, the scores of the group that needed rehabilitation were lower than the scores of the group that did not need rehabilitation. The results are presented in Table 3.

Table 3 Comparisons of knee OA-related problems between participants who needed and did not need rehabilitation

Variables	Need for rehabilitation (n = 60)			No need for rehabilitation (n = 34)			95% CI	*p*-value
	Mean ± SD	Median	IQR	Mean ± SD	Median	IQR		
KOOS-Pain		56.0	47.0-68.5		69.0	56.0-81.5		0.001[a*]
KOOS-Symptoms		62.5	50-71		77.0	67.0-86.0		0.001 [a *]
KOOS-Function in Daily Living		77.0	68.0-88.0		87.5	74.5-94.8		0.015 [a *]
KOOS-Sports/Rec		22.5	15.0-45.0		35.0	25.0-65.0		0.012 [a *]
KOOS-QOL		50.0	38.0-56.0		50.0	42.5-72.0		0.084 [a]
Knee flexion PROM (degree)		133.0	124.0-138.0		137.5	131.8-142.5		0.019 [a *]
Knee flexor strength (lb)		20.0	18.0-23.3		20.5	17.5-25.1		0.705 [a]
Knee extension PROM (degree)	9.0 ± 5.3			9.1 ± 5.4			-2.16, 2.37	0.927[b]
Knee extensor strength (lb)	32.9 ± 8.8			33.4 ± 10.0			-3.38, 4.48	0.783 [b]

Notes: [a] Mann-Whitney U-test, [b] Independent t-test, [*] *p*-value < 0.05. KOOS, Knee Injury and Osteoarthritis Outcome Score; SD, standard deviation; PROM, passive range of motion; IQR, interquartile range

Discussion

This study explored the perception of knee OA among participants who had not consulted health professionals regarding their condition or lost their follow-ups. Their perceived need for rehabilitation was also determined. The results revealed that approximately four in five participants in this study had once sought medical treatment but their follow-ups for more than a year. The reasons included preference for self-care management, perception that medical treatment was ineffective, and barriers associated with transportation service. To support this group, effective self-coping strategies according to the evidence of home- and community-based exercises under professional supervision might be encouraged[22]. Further research is needed for investigating the effectiveness of self-care management and professional management approaches in this population. The issue of transportation service barriers should also be addressed.

Although having knee symptoms, some participants in this study had never sought medical treatment. A study on the prevalence of knee OA in the southern part of Sweden showed that one in three participants consulted physicians for knee OA or knee pain, and the influencing factors were inefficient OA care and self-coping[9]. Similar to our participants, previous studies have reported that aging patients perceived chronic joint pain and other symptoms of OA as a part of normal aging[23]. These patients were more likely to seek medical consultation when symptoms were acute and severe along with the problems of sleep disturbance and mobility[23].

The key finding of this study was that participants, who had not consulted health professionals regarding their condition lost their follow-ups, perceived that knee OA was associated with aging. The severity of pain was the most important concern for their decision to seek treatment and rehabilitation. Also, pain reduction was the key expected outcome if treatment was received. Two-thirds of them would want to receive rehabilitation for their present condition. The group that needed rehabilitation also had significantly greater pain level and symptoms, and greater limitations in daily and sport/recreation activities reflected by the KOOS subscales. These results implied that those with greater pain and perceived disability were more likely to consider seeking medical assistance. This group also had a significantly longer duration of knee pain compared with those who did not need rehabilitation. The duration and progression of knee OA were known to increase the severity of symptoms[24], which resulted in the need for a rehabilitation program. Knee pain was the key feature of knee OA, which is used by the ACR clinical criteria as the first criterion for diagnosing knee OA[16]. However, health-seeking behavior was also highly affected by the perception of the problem, concern, and expectation from treatment[25].

Another impairment found to be different between groups was knee flexion limitation. As reduced ROM is a sign of OA, people with knee OA demonstrated less knee flexion ROM than healthy controls[4]. Limitation in knee flexion ROM could result in the decline of functional performance[26]. Therefore, progressive knee OA might reduce both knee flexion ROM and physical function. Impaired joint motion might influence the functions causing these participants to consider the need for rehabilitation. Previous studies have demonstrated the deficits in both knee extensor and knee flexor strength in patients with knee OA[27]. In contrast, there was no significant difference in the strength of both muscles between groups in this study. However, the strength of the knee flexor and extensor muscles of the participants in both groups was less than the normative data from a previous study[28]. Remarkably, the participants in this study also did not perceive strength to be an important outcome in the decision to undergo a rehabilitation program. This might be because muscle weakness was not directly felt, i.e. individuals with knee OA might simply perceive this problem during some demanding activities such as walking.

Interestingly, the participants who reported not needing rehabilitation in this study had disability and impairments related to knee OA, although the severity was less than that of those

who needed rehabilitation. This might be due to the heterogenous characteristics of knee OA regarding different phenotypes[29]. The pathology of knee OA could result in different impairments and the difficulty to perform activities. Moreover, the participants who reported not needing rehabilitation had a KOOS-ADL score of 87.5 out of 100. This lower score also did not reach the minimal detectable change of KOOS-ADL (15.4) in knee OA[30]. For this group, screening programs can help identify those with risk factors and progressive signs of knee OA, and initial preventive strategies can be applied. The comorbidities which would occur later should also be addressed.

Physical therapists and health professionals in the primary care settings should play a role, especially in knee OA patients in the community who do not have the opportunity to consult with health professionals. However, therapies should be considered according to individualized patient needs and preferences. Professional advice with reassurance and clear instructions about the appropriate methods and value of exercises in controlling knee OA symptoms is recommended as an appropriate strategy for knee OA management[15].

This study had some limitations. The level of education of the participants was not investigated in this study, which might have been a factor that would have a large influence on knee OA perception and health service accessibility. Moreover, the perception of other environmental factors included in the ICF core set for OA (i.e. products or substances for personal consumption, immediate family, and individual attitude of health professionals) should be further investigated. According to the quantitative design, we could not explain the participants' perspective in further detail. Hence, a mixed method of qualitative and quantitative study should be performed. In addition, to emphasize our expectation about the importance of patient perception on knee OA, future research should evaluate the effectiveness of educational intervention on patient perception and self-coping strategies.

Conclusion

In conclusion, the results of this study revealed the important perception of patients who had missed follow-ups or never received any treatment from health professionals. The influencing factors for decision making in seeking rehabilitation and the expected outcome of treatment were also made known. Moreover, participants who needed rehabilitation demonstrated high levels of pain and other symptoms, greater activity limitation, and more limitation of passive knee flexion ROM than those who did not need rehabilitation. This implied that the high severity of symptoms seemed to prompt the patients to seek treatment. The results of this study can be used as preliminary data for the management of knee OA in communities. The education of symptoms and problems related to knee functions should be self-monitored, and appropriate self-coping management should be encouraged.

Take home messages

Patient perception was an important factor for knee OA management. Participants who needed rehabilitation had more severe problems than those who did not need rehabilitation, confirming that patients tend to consult health professionals when symptoms are severe. The results can be used as preliminary data for the management of knee OA.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgement

We want to thank all participants and the medical staff in the communities.

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