Factors Influencing Physical Activity among Women with Osteoarthritis of the Knee

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Abstract: This cross-sectional study examined the factors influencing physical activity among women with osteoarthritis of the knee. The Interaction Model of Client Health Behaviors was used as a theoretical framework to guide the study. The sample consisted of 242 female participants with osteoarthritis of the knee attending the outpatient department of a university hospital in Bangkok, Thailand. Data were collected using Personal Data Questionnaire, Modified Thai version of Western Ontario and McMaster Universities' Osteoarthritis Index, Thai version of Catastrophizing Subscale of the Coping Strategies Questionnaire, Thai version of Fear-Avoidance Beliefs Questionnaire about Physical Activity modified for osteoarthritis of the knee, Revised Thai Multi-dimensional Scale of Perceived Social Support, and the Short Form of International Physical Activity Questionnaire. Data were analyzed using descriptive statistics and logistical regression.

The findings revealed that the mean age of the participants was 65.1 years and 60% had low physical activity. Body mass index and pain-related fear significantly influenced physical activity. However, age, knee pain, functional limitation, pain catastrophizing, and social support did not significantly influence physical activity. The implication for nursing practice from this finding is that nurses need to assess body mass index and identify barriers to performing physical activity among women with osteoarthritis. Any intervention program should include the benefit of weight reduction as well as strategies to reduce pain-related fear to increase their physical activity level.

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Introduction

Knee osteoarthritis (KOA) is the most common musculoskeletal disease among older adults, especially women ≥ 50 years. It is a slow, progressive deterioration of synovial membrane of articular cartilage in the knee, causing the people to have knee pain and physical disability.[1] Physical activity is the first choice of non-pharmacological management, and is beneficial to reduce knee pain and prevent functional limitation.[2] Physical activity is usually denoted by any bodily

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movement produced by skeletal muscles that requires energy expenditure. It has various forms, including occupational, sports, exercise conditioning, household, and other activities.[3] To attain health benefit, people should perform physical activity to expend energy to a minimum 500 metabolic equivalent of task in a minute (MET-minute) by performing moderate to high physical activity, which means a minimum of 3 or more days of vigorous-intensity activity of at least 20 minutes per day; or 5 or more days of moderate-intensity and/or walking at least 30 minutes per day.[4]

Although physical activity gives plentiful advantages, around 41% of people with KOA had sufficient physical activity.[5] Insufficient physical activity in women with KOA is a substantive issue challenging to health professionals. The proportion of insufficient physical activity in women with KOA is more than men.[6-8] Understanding the factors influencing physical activity is essential, and it is the first step of program development for KOA. Such understanding helps healthcare providers to know clients' needs and the intervention strategies accommodating to their needs. Previous studies of possible factors influencing physical activity are demographic characteristics such as age,[7, 9, 10] body mass index (BMI),[7, 9, 10] and previous health experience, such as knee pain and functional limitation of the knees.[9,10] However, these studies do not contribute to nurses' understanding of the influence of cognitive and social factors on clients' decision to adhere to health recommendations. In addition, the previous studies were performed in Western countries which might limit the application of their findings in Eastern countries.

Conceptual Framework and Review of Literature

The Interaction Model of Client Health Behaviors (IMCHB), developed by Cox,[11] was used as a theoretical framework to guide the study. This Model assumes that the clients have responsibility to make choices about health care behavior by themselves, within their limitations. Adherence to a recommended care regimen is affected by a client's singularity (including background variables, intrinsic motivation, cognitive appraisal, and affective response), and client-professional interaction. The variables of client singularity independently and simultaneously influence a client's decision to adhere to a care regimen. In this study, the selected factors associated with clients' singularity included demographic factors, previous healthcare experience, environmental resources, and cognitive appraisal.[12,13] Knowledge related to the clients' singularity was assumed to be helpful to explain the complexity of factors influencing physical activity among women with KOA.

For demographic factors, previous studies have found that age and BMI were associated with physical activity,[7-9] whereas ethnicity, education, income, and marital and employment status were not.[8, 14, 15] Therefore, age and BMI were selected in this study. Age can imply a reduction in social and family roles, financial resources, health, and capacity to perform activity. Previous studies also found that age negatively influences physical activity among people with KOA.[7, 9, 10] Body mass index is a demographic characteristic which can exacerbate knee pain when excess weight overloads and then deteriorates function of the knees.[2] However, other studies have revealed that physical activity among people with KOA was decreased with BMI.[9, 10, 16] Therefore, it is possible that patients with obesity might not undertake physical activity because of intense pain and functional limitation.

Knee pain, knee stiffness, and functional limitation are common experiences of people with KOA, who generally have difficulty to ascend and descend the stairs, rise from a chair and bed, and walk long distances. Knee pain is often triggered by those activities, and knee stiffness often occurs in the morning, thus making their activities even more

limited. In addition, they lose quadriceps strength, thus causing functional limitation or difficulty to perform physical activity.[1] Previous research has provided evidence of the influence of knee pain and functional limitation on physical activity.[8, 9]

Cognitive factors are important as the clients will be able to make appropriate choices for themselves. Several studies have found that the cognitive appraisals of pain, both negative and positive, affect perceived knee pain and functional limitation, in particular the influence of positive appraisal, such as self-efficacy, on osteoarthritis status among Thai women with KOA.[17] On the other hand, some international studies support the effects of negative appraisals, including pain catastrophizing (negative self-statements, catastrophizing thoughts and ideation about pain[18]), and pain-related fear (personal belief assuming pain and injury induced by doing physical activity[19]) on osteoarthritis status.[20, 21] To date, little is known about the roles of negative appraisal among Thai women with KOA, thus, to extend nursing and health knowledge, the influence of pain catastrophizing and pain-related fear on physical activity was explored in this study.

Social support from family, friends, and professionals help people cope with stress. Social support can prevent distress and reduce the effect of distress.[22] A previous study discovered that social support had benefits to perceive pain and physical disability among the people with chronic musculoskeletal pain.[23] However, the influence of social support on physical activity is somewhat limited.

Study Aim

The purpose of this study was to examine the factors influencing physical activity among women with KOA, including age, BMI, knee pain, functional limitation, social support, pain catastrophizing, and pain-related fear.

Methods

Design:

This study was a cross-sectional research.

Ethical Considerations:

This study was approved by the Institutional Review Board of the Faculty of Medicine, Mahidol University, Bangkok (Protocol #109/2558 (EC3). Potential participants received information regarding the study purposes and processes, and the advantages and risks of the study. In addition, they were informed about the right to withdraw from the study at any time, before they signed a consent form.

Sample and Setting:

The sample size was estimated by G* Power 3.1.9 program which was set as one tail probability (Y=1|X=1) 0.2, type I error 0.05. The odds ratio and power of test (1-β) was set as 1.5, and 0.80, respectively, according to the criteria of small effect size logistic regression proposed by Maher et al.[24] The final sample was determined to be 242. Convenience sampling was used based on the following inclusion criteria: 1) Women with KOA aged ≥ 50 years who visited the outpatients departments of a university hospital in Bangkok; 2) diagnosed with KOA by orthopedists using the standard clinical criteria of the American College of Rheumatology;[25] 3) being able to communicate in Thai language, and (4) not being wheelchair-bound or bedridden. Potential participants were excluded if they had the following: 1) being diagnosed with major depression, psychosis, Parkinsonism, another condition such as a history of acute myocardial infarction, or another form of arthritis that prohibited or limited them from engaging in moderate to high physical activity; 2) aged ≥ 60 years having cognitive impairment as assessed by not passing the Mini-Mental State Examination version Thai 2002 (MMSE-Thai 2002), at cut-point scores ≤ 14 for older adults who was not able to read and write Thai language, ≤ 17 for older adults who graduated from elementary school, ≤ 22 for older

adult who graduated from high school and above;[26] and, 3) having a history of knee replacement surgery. The latter was to help ensure safety, and mitigate the need to have intensive supervision from orthopedists.

Instruments:

Six questionnaires, described below, were used to collect the data:

A *Personal Data Questionnaire*, developed by PI, was used to obtain demographic information. This included marital and occupational status, education, personal monthly income, living status, BMI and data from medical records, birthdate, onset of diagnosis of osteoarthritis, which knee(s) were affected, osteoarthritis management, and comorbidity.

The *Modified Thai version of Western Ontario and McMaster Universities Osteoarthritis Index* (Thai-WOMAC) was used to assess knee pain and functional limitation in the previous 7 days. The original WOMAC was developed in English, and items comprise pain (5 items), stiffness (2 items), and function subscales (17 items).[27] To be compatible with Thai culture, the translated Thai-WOMAC has 22 items (5 for pain, 2 for stiffness, and 15 for function).[28] In this study, pain and function subscales were used. An example of a pain subscale is: "In the past 7 days, how much pain is experienced in your knees during walking?" Knee pain is rated in daily life activities on a 11-point numeric scale ranging from 0 (no pain) to 10 (extremely pain). Possible scores are 0 to 50, and higher scores refer to higher pain intensity. An example of an item for the function subscale is: "In the past 7 days, how much difficulty have you had to descend the stairs?" Difficulty in performing physical activities is rated on 11-point numeric scales ranging from 0 (excellent ability) to 10 (most difficultly). Possible scores range from 0 to 150, and higher scores indicate greater functional limitation. Pain and function subscales measure different aspects of OA, and each subscale is analyzed separately.[27]

The *Revised Thai Multi-dimensional Scale of Perceived Social Support* (rMSPSS) was used to assess one's perceived adequacy supports provided by family, friends, and significant others. The original MSPSS was developed in English,[29] and translated, back-translated, and modified to enhance reliability for Thai people.[30] An item example is: "My friend has really tried to help me". The rMSPSS has 12 items with 7-point Likert scale. Possible scores are 1 to 7, and higher scores indicate higher social support.

The *Thai version of Catastrophizing Subscale of the Coping Strategies Questionnaire* (CSCSQ) was used to assess negative self-statement, catastrophizing thought, and negative idea about pain. The original Coping Strategies Questionnaire (CSQ) comprised 48 items with 6 coping response subscales. The CSCSQ of 6 items had been used for OA, has acceptable internal consistency,[31] and was translated from English into Thai.[32] An example of a negative self-statement is: "I feel like I can't go on when I feel pain". Statements are rated on a 7-point Likert scale ranging from 0 (never) to 6 (always). Possible scores are 0 to 36, and higher scores means higher pain catastrophizing.[32]

The *Thai version of Fear-avoidance Beliefs Questionnaire about Physical Activity*, modified for KOA (FABQ-PA for KOA) was used to assess pain-related fear. FABQ-PA was developed to assess clients' belief about how physical activity affects their current back pain.[19] This instrument was translated from English into Thai with permission of the author, using the forward-backward translation technique.[33] To be compatible with KOA, the term 'back pain' and 'bending, lifting, walking, or driving' were replaced by 'knee pain' and 'running, walking, kneeling, and driving', respectively.[20] The modified FABQ-PA comprises 4 items with a 7-point Likert scale. An item example is: "How much physical activities, such as bending, lifting, walking or driving, might harm your knee?" The scales range from completely

disagree (0) to completely agree (6). Possible scores of FABQ-PA are 0 to 24. Higher scores mean greater pain-related fear.

The *Short Form International Physical Activity* (IPAQ-SF) includes 6 items to inquire about the amount of time spent performing vigorous and moderate physical activity, and walking in the previous 7 days, and an additional item to inquire about the amount of time per day spent sitting on weekdays.[4] This instrument was translated from English into Thai, and item examples are: "During the last 7 days, how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?"; "How much time did you usually spend doing vigorous physical activities on one of those days?" There are three levels of physical activity, low, moderate, and high. Based on the criteria of health-enhancing physical activity (500 METs), physical activity in this study was categorized into low and moderate to high physical activities. Moderate to high physical activity means a minimum of 3 or more days of vigorous-intensity activity of 20 minutes per day; or 5 or more days of moderate-intensity and/or walking 30 minutes per day. Low physical activity means 2 days or below of vigorous-intensity activity of 20 minutes per day; or 4 days or below of moderate-intensity and/or walking 30 minutes per day.

The content validity of all instruments was examined by a panel of 5 specialists of osteoarthritis management and physical activity. A pilot study was conducted to test reliability of the instruments among 30 women with KOA using face-to face interview because of the potential problem of visual acuity in this age-group. All instruments had an acceptable reliability with Cronbach's alpha coefficient of: 1) 0.93 for WOMAC pain; 2) 0.95 for WOMAC function; 3) 0.85 for rMSPSS; 4) 0.85 for CSCSQ; and 4) 0.75 for FABQ-PA. The IPAQ-SF had an acceptable test-retest reliability (time interval 7 – 11 days), with a kappa coefficient of 0.74.

Data Collection:

Potential participants were invited by registered nurses based on the inclusion and exclusion criteria, and the PI contacted them, informed them about the study and gained consent from interested participants. Interviews were performed by the PI in a separate area while the participants were waiting for orthopedists.

Data Analysis:

Data were analyzed using descriptive statistics and logistic regression (SPSS version 17.0). Descriptive statistics were used to describe the demographic and clinical characteristics of the participants, as well as the study variables. Binary logistic regression was used to estimate the probability of achieving to the criteria of moderate to high physical activity. Dummy codes were used in logistic regression analysis. Based on the criteria of health-enhancing physical activity (500 METs),[4] the physical activity was coded as 0 for low physical activity and 1 for moderate to high physical activity. According to the age classification by Thai government,[34] age was coded as 0 for late adults (< 60 years), and 1 for older adults (≥ 60 years). Based on the criteria of obesity for Asian populations proposed by World Health Organization,[35] non-obesity (BMI < 25 kg/m^2) was coded as 0, and obesity (BMI ≥ 25 kg/m^2) was coded as 1.

Before performing logistic regression, a correlation matrix was established using Pearson correlation product to check the problem of multicollinearity among independent variables. The multicollinearity was not found in this study, with statistically significant correlation coefficients among the independent variables <0.85.[36]

Results

Participant characteristics:

There were 242 participants in this study, and 72% were older adults. Approximately 58% were

married, and only 5% live alone and were uneducated. Half (50.4%) of the participants did not work. However, 84% of them had a monthly income above the poverty line (≥ 72 USD/person/month).[37] Most participants (55.0%) had bilateral KOA, and 74% had KOA for <5 years. Most (78.9%) used only pharmacological management to relieve knee pain, such as analgesic and/ or non-steroidal anti-inflammatory drugs, and muscle relaxants. However, 13% used both pharmacological and non-pharmacological management. One quarter (25.3%) had hypertension and dyslipidemia, accompanied by diabetes, and the majority (63.2%) were obese (**Table 1**). The majority also had mild knee pain, functional limitation, catastrophizing thoughts, and moderate pain-related fear. They perceived a great support from family, friends, and significant others (**Table 2**).

Table 1 Characteristics of the Participants

Characteristics	**n**	**%**
Age		
Late adults (< 60 years)	69	28.5
Older adults (≥ 60 years)	173	71.5
Body Mass Index		
Underweight (< 18.5 kg/m^2)	2	0.8
Normal (18.5 – 22.9 kg/m^2)	42	17.4
Overweight (23.0 – 24.9 kg/m^2)	45	18.6
Obesity (≥ 25 kg/m^2)	153	63.2
Marital status		
Single	26	10.7
Married	140	57.9
Widowed/ Divorced/ Separated	76	31.4
Education		
Uneducated	12	5.0
Elementary school	127	52.5
High school, vocational certificate, and diploma	63	26.0
Bachelor degree and above	40	16.5
Occupational status		
Being unemployed	122	50.4
Employed	120	49.6
Monthly income		
< 72 USD/month	33	13.6
≥ 72 USD/month	209	86.4
Living status		
Living alone	12	5.0
Living with others	230	95.0
Site of osteoarthritis (OA) of the knee		
Unilateral	109	45.0
Bilateral	133	55.0

Table 1 Characteristics of the Participants (Cont.)

Characteristics	n	%
Duration of knee OA		
< 5 years	180	74.4
≥ 5 years	62	25.6
OA management		
Pharmacology only	191	78.9
Non-pharmacology only	19	7.9
Pharmacology and non-pharmacology	32	13.2
Comorbidity		
Without comorbidity	52	21.5
With comorbidity	190	78.5
- Hypertension (HT) only	29	15.3
- Dyslipidemia (DLP) only	19	10.0
- Diabetes (DM) only	3	1.6
- HT and DLP	20	10.5
- DM and DLP	2	1.0
- HT, DLP, and DM	48	25.3
- Others (e.g. asthma, heart disease, stroke, cancer, thyroid diseases)	69	36.3

Table 2 Characteristics of Study Variables

Variables	Possible range	Actual range	M	SD	Interpretation
Age	-	50 - 83	65.10	8.10	-
Body Mass Index	-	17.35 - 42.98	26.64	4.12	-
Knee pain	0 - 50	0 - 46	13.00	10.43	Mild
Functional limitation	0 - 150	0 - 119	45.58	28.93	Mild
Social support	1 - 7	1.25 - 7.00	5.17	1.12	Great
Pain catastrophizing	0 - 36	0 - 35	8.37	8.25	Mild
Pain-related fear	0 - 24	0 - 24	12.21	6.36	Moderate

Levels of physical activity and factors influencing physical activity:

Only 39.7% of the participants had moderate to high physical activity and 60.3% had low physical activity. Univariate logistic regression demonstrated that the significant factors influencing physical activity were BMI, functional limitation, and pain-related fear, as shown in **Table 3.** In multivariate logistic regression, however, the remains of the influencing factors of physical activity were BMI and pain-related fear. Interestingly, moderate to high physical activity decreased by half when the participants were obese, and the odds decreased by one time when the score of pain-related fear was increased one unit, as shown in **Table 4.** The overall rate of correct classification of the model was 61.6%, with 63.7% of low physical activity (sensitivity), and 53.1% of moderate to high physical activity (specificity) being correctly classified.

Table 3 Univariate Logistic Regression of Each Variable between Two Categories of Levels of Physical Activity

Predictors	b	S.E.	Odds ratio	95%CI	Wald	p-value
Age (years)						
< 60			Ref.*			
≥ 60	- 0.14	0.29	0.87	0.49 - 1.54	0.22	> 0.05
Body mass index (kg/m^2)						
< 25.00			Ref.*			
≥ 25.00	- 0.63	0.27	0.53	0.31 - 0.90	5.46	< 0.01
Knee pain	- 0.004	0.01	0.99	0.97 - 1.02	0.10	> 0.05
Functional limitation	- 0.01	0.01	0.99	0.98 - 0.99	4.43	< 0.05
Social support	0.09	0.12	1.09	0.87 - 1.37	0.53	> 0.05
Pain catastrophizing	0.01	0.20	1.01	0.98 - 1.04	0.20	> 0.05
Pain-related fear	- 0.07	0.02	0.94	0.90 - 0.98	9.77	< 0.01

* Reference

Table 4 Multivariate Logistic Regression Models on Physical Activity

Predictors	b	S.E.	Odds ratio	95%CI	Wald	p-value
Body Mass Index	- 0.61	0.28	0.54	0.32 - 0.93	4.92	< 0.05
Pain-related fear	- 0.07	0.02	0.94	0.90 - 0.98	9.27	< 0.01

Model (likelihood ratio) chi-square = 15.10, df = 2, p < 0.01

Negelkerke R^2 = 8.2%

Percent correctly classified = 61.6%

Discussion

This study examined the influence of age, BMI, knee pain, functional limitation, social support, pain catastrophizing, and pain-related fear on physical activity among women with KOA. Being an older adult is often associated with loss of social and family roles and financial resources, and deterioration of health. However, age did not influence physical activity in the current study. This finding was not aligned with the previous studies.[10, 16, 38] Firstly, it is possible that late and older adults in the current study had similarity in the number of comorbidity and social support. Secondly, being female, the participants had an opportunity to maintain physical activity by engaging in household activities.[39] In general, older Thai women maintain the role of family caregiver. Finally, the previous study of Rosemann et al.[10] found that age was a weak predictor of physical activity among the people with KOA, comparing with BMI. It was because of the effect of BMI on knee pain and knee function.

Regarding the influence of BMI, 63.2% of the participants in current study were obese, which was higher than 38.5% of the participant in the research by Lee et al.[9] In this study, BMI was negatively influenced by physical activity which was consistent with previous studies.[9, 10, 16] Lee et al.[9] revealed that persons who had obesity and KOA did not engage in moderate to high physical activity because of intense knee pain and functional limitation. In the current study, BMI was not related to knee pain. However, participants with obesity tended to have more functional limitation, compared with participants with non-obesity. Moreover, participants with obesity did not perform moderate to high physical activity because of functional limitation.

Previous studies have demonstrated the influence of knee pain and functional limitation on physical activity;[9,10] however, functional limitation only influenced physical activity in the current study. It was possible that our participants had only mild knee pain, compared with the previous studies. Mild knee pain might be easy to control using pain killers or stopping a physical activity for a short period. Lee et al.[9] discovered that severe knee pain could prevent people with KOA from engaging in moderate to high physical activity whilst mild and moderate knee pain could not. In addition, the research by Rosemann et al.[10] confirmed that physical activity among the patients with KOA was dominated by functional limitation, compared with knee pain, as was found in the current study.

There was no effect of social support on physical activity in the current study; however there were negative associations among social support, knee pain, and functional limitation. This finding is not in line with that of Martire et al.[40] One possible explanation for the unexpected result is the difference in research instruments between the studies. The current study focused on measuring perceived general support (non-specific to physical activity), whilst the other[40] focused on measuring received specific support for physical activity. Perceived support is the personal perception toward the support that individual has. Received support is personal perception toward actual support that individual receives when distressed during performing physical activity. Perceived support cannot imply actual support, as people intend to help one another, but this does not always achieve desired outcomes.[22]

Although a previous study confirmed the association among pain catastrophizing, knee pain, and functional limitation,[21] the influence of pain catastrophizing on physical activity was not found in the current study. It was possible that our participants had only low catastrophic ideas about pain. In addition, they might have taken benefit from performing physical activity to distract themselves from negative ideas and emotions.[41] Regarding the influence of pain-related fear, as expected this had an influence on physical activity. This is in line with research findings about the context of non-specified chronic musculoskeletal pain.[42] It might be claimed that people with chronic musculoskeletal pain do not perform moderate to high physical activity because they believe physical activity will expose them to pain.

Cox[11] stated that each variable of client singularity can simultaneously influence the adherence to recommendations. Multivariate logistic regression in the current study confirmed the collaborative influence of BMI and pain-related fear on physical activity. This could imply that our participants had fearful memories about knee pain, and this fear made them avoid doing moderate to high physical activity, and thus leading to weight gain.[43] The experience about knee pain among participants with obesity was induced easily during performing activity because of weight overloading on the knee joints. They had to stop performing physical activities in short term and long term periods to relieve pain. Therefore, the participants with obese and elevated pain-related fear among women with KOA declined from engaging moderate to high physical activity.

Limitations and Implications for Further Research

This study has some limitations. Firstly, it used a cross-sectional study. The results should be interpreted with caution with respect to causality. Secondly, we used convenience sampling which causes the generalizability of the findings to be limited. Finally, physical activity was measured by a questionnaire that might not represent actual activity. Therefore, further research which examines physical activity using both subjective and objective measurements is required to enhance the reliability of the findings. This study was also limited in the exploration of the

interaction between the clients and health professionals which might influence physical activity. Information from health professionals can be either promote or prevent factors about such activity, and the further research should explore this.

Conclusion and Implications for Nursing Practice

This study revealed that only 39.7% of the female participants with KOA achieved a criteria of moderate to high physical activity. Being obese and having elevated pain-related fear were important obstacles to doing moderate to high physical activity. Although a previous study demonstrated the effect of self-efficacy on coping behaviors among women with KOA,[17] we argue that negative cognition might play an important role in performing physical activity. The implication of this study's results is that a weight control program, including diet control and exercise, needs to be provided with women with obesity. However, pain-related fear was found as a negative belief, reinforcing the participants not to undertake moderate to high physical activity. Therefore, nurses should provide education to women with KOA, aiming to help them understand the pathology of knee pain to correct their beliefs.

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ปัจจัยที่มีอิทธิพลต่อกิจกรรมทางกายในหญิงข้อเข่าเสื่อม

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บทคัดย่อ: งานวิจัยครั้งนี้เป็นการศึกษาภาคตัดขวาง มีวัตถุประสงค์เพื่อศึกษาปัจจัยที่มีอิทธิพลต่อกิจกรรมทางกายในหญิงข้อเข่าเสื่อม โดยใช้โมเดลปฏิสัมพันธ์ของพฤติกรรมสุขภาพผู้รับบริการมาเป็นกรอบแนวคิดในการศึกษา กลุ่มตัวอย่างประกอบด้วยหญิงข้อเข่าเสื่อมที่มารับบริการที่แผนกผู้ป่วยนอกโรงพยาบาลมหาวิทยาลัยแห่งหนึ่งในกรุงเทพมหานคร ประเทศไทย จำนวน 242 ราย เก็บรวบรวมข้อมูล โดยใช้แบบสอบถาม ได้แก่ แบบสอบถามข้อมูลส่วนบุคคล แบบสอบถามอาการข้อเข่าเสื่อม แบบสอบถามยุทธวิธีในการแก้ปัญหาฉบับย่อ ในส่วนการประเมินความคิดเมื่อเผชิญกับอาการปวด แบบสอบถาม ความเชื่อเกี่ยวกับความกลัวและการถอยหนีจากอาการปวด แบบสอบถามความรู้สึกหลากหลายมิติเกี่ยวกับความช่วยเหลือทางสังคม ฉบับปรับปรุงภาษาไทย และแบบสอบถามกิจกรรมทางกายนานาชาติฉบับย่อ วิเคราะห์ข้อมูลด้วยสถิติเชิงพรรณนาและสถิติถดถอยโลจิสติก

ผลการวิจัย พบว่า กลุ่มตัวอย่างมีอายุเฉลี่ย 65.1 ปี ร้อยละ 60.3 ของกลุ่มตัวอย่างมีกิจกรรมทางกายในระดับต่ำ ปัจจัยที่มีอิทธิพลต่อกิจกรรมทางกาย ได้แก่ ดัชนีมวลกายและความกลัวที่เกี่ยวข้องกับอาการปวด อย่างไรก็ตาม อายุ อาการปวดเข่า ข้อจำกัดในการทำหน้าที่ของข้อเข่า ความคิดด้านลบเมื่อเผชิญกับอาการปวด และแหล่งสนับสนุนทางสังคม ไม่มีอิทธิพลต่อการทำกิจกรรมทางกาย

จากผลการวิจัย พยาบาลควรประเมินดัชนีมวลกายและอุปสรรคต่อการทำกิจกรรมทางกายของผู้หญิงที่มีปัญหาข้อเข่าเสื่อม ทั้งนี้ โปรแกรมส่งเสริมกิจกรรมทางกายควรเน้นประโยชน์ของการลดน้ำหนักและกลวิธีในการลดความกลัวที่เกี่ยวข้องกับอาการปวดเพื่อช่วยให้มีกิจกรรมทางกายเพิ่มมากขึ้น

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