

# Knee Osteoarthritis in Adult and Older Thais Living in Rural and Urban Areas: A Comparative Study

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**Abstract:** Knee osteoarthritis is the most common cause of disability in adult and older adults, and it increases as people age. Illness representations and coping behaviors may have decisive impacts on management of this chronic disease. The aims of this study were to describe the differences in illness representations and coping behaviors among adult and older Thais living in rural and urban areas and to examine the relationship between illness representations and coping behaviors among those individuals in rural and urban areas. One hundred and sixteen participants with knee osteoarthritis living in rural areas and 112 individuals living in urban areas responded to the Brief Illness Perception Questionnaire and the Knee Osteoarthritis Coping Behavior Questionnaire. Descriptive statistics, t-test, and Pearson's product moment correlation coefficient were used to analyze data.

There was no significant difference in illness representations between two groups, but the participants living in rural areas had a significantly lower mean score of treatment control and emotional representation subscales than those living in urban areas. The participants from urban areas had a significantly higher mean score of total coping, cognitive-focused coping subscale, and emotional adjustment than those living in rural areas. A negative correlation between illness representations and coping behaviors was found in the rural group, but no significant correlation was observed in the urban group. Our findings suggest that a further intervention which emphasizes the need for raising awareness of knee osteoarthritis and promoting appropriate coping behaviors would be beneficial.

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**Keywords:** Adults; Coping behaviors; Illness representations; Knee osteoarthritis; Older persons; Rural areas; Thailand Urban areas

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## Introduction

Knee osteoarthritis (OA) is a common problem worldwide. The prevalence of knee OA is increasing rapidly with advanced age, particularly in older adults.<sup>1,2</sup> A part of the Community Oriented Program for the Control of Rheumatic Diseases (COPCORD)

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studies and another study conducted in the Asian region revealed a high prevalence of either knee pain or knee OA; which prevalence ranged from 38.1% to 50.0% in the elderly.<sup>1,3</sup> Similar findings reported high prevalence of knee OA in the older Thai population. A survey study among Thais elderly in the community, aged >50 years, with a history of knee pain, and using conventional radiography found that the prevalence of knee OA ranged from 34.5% to 45.6%.<sup>4</sup> The prevalence of OA varies not only according to advanced age, but also according to the exposures to religious activities (praying and other sitting religious worships); squatting; duration of heavy physical activity; sitting on the floor, obesity, and sedentary behavior.<sup>1,5</sup> Thai people seem to be prone to these associated risk factors.

As known, knee OA generally causes significant chronic pain and increasing difficulty performing the usual daily activities necessary to maintain independence leading to disability. According to the World health report 2002<sup>6</sup>, OA is the fourth leading cause of the Years Lost due to Disability (YLDs) at global level. In addition, it is costly in the form of direct and indirect costs including increased utilization of hospital and medical services, and lost productivity of individuals and their work.<sup>2,7</sup> With regard to an aging population, a vital musculoskeletal disability will lead to a diminished capacity to successfully extend retirement age and a reduction in health-related quality of life. However, some patients perceive symptoms of knee OA interfere with their capacities to perform activities, while others can perform normal activities with little or no pain despite having severity of knee OA.<sup>8</sup> These indicate varying perceptions of patients regarding complaint and knee OA symptoms; and these perceptions may be an important issue as a part of reducing the impact of disease and encouraging appropriate management.<sup>9</sup> The common-sense model (CSM) of self-regulation is one particular approach to describe a way to understand this linkage, because the CSM proposes that patients create simultaneously cognitive representations and

emotional representations of their illness, which direct coping strategies and illness specific behavior for the patients to reduce the symptoms of illness and to reduce the emotional response to the health threat.<sup>10</sup> Information from the COPCORD studies showed that physical and socioeconomic environment affected the prevalence of symptomatic knee OA as a higher prevalence was found in rural than in urban areas.<sup>1</sup> Consequently, persons with knee OA may have different perceptions of their illness (illness representations) and these perceptions can guide their behavior in which they engage over time, but the published study in this area is limited. Additionally, environment and cultural beliefs were significant factors related to health-related behaviors,<sup>11,12</sup> resulting from the understanding of illness representations and coping behaviors among adult and older Thais living in rural and urban areas, so it would be beneficial to establish an appropriate management in line with each group of population affected knee OA.

## **Review of Literature**

According to the common-sense model (CSM) of self-regulation, when persons face with situational stimuli (such as disease symptoms), they will create illness representations, which are active parallel cognitive processing to regulate their responses to illness or health threat and to regulate emotional control through three stages.<sup>10</sup> These stages start with the individual forming a representation of the illness or health threat, then they adopt behaviors to cope with their illness, and, finally they appraise the efficacy of these behaviors. These illness representations are based on their knowledge and experience as well as that of significant others, such as family members with similar symptoms or diagnoses, health professionals, and media sources.<sup>13,14</sup> The cognitive illness representation consists of five components<sup>10,15</sup>, namely identity (the label or name given to the conditions as well as the symptoms),

cause (the perceived cause of the conditions), timeline (the predictive belief about the condition being acute or chronic), consequences (the individual beliefs about the consequences these conditions have on their work, family, lifestyle, physical health, and finances), and curability/controllability (the beliefs about whether the condition can be cured or kept under control). The CSM has been employed widely in recent years following the development of a questionnaire to investigate the five dimensions detailed above and has expanded to assess emotional representations including concern and emotions and to assesses illness comprehensibility (the coherent understanding of illness condition).<sup>16</sup> A number of researchers have been tested the influence of illness representations on coping and outcomes in a diverse range of chronic diseases. For example, in women with rheumatoid arthritis, avoidant and resigned coping behaviors were found to partially mediate the association between symptoms identities and illness outcomes including disability and psychiatric morbidity.<sup>17</sup> In addition, most illness representations showed a weak correlation with coping strategies, and coping strategies were not strongly associated with illness outcomes. In patients with cancer, a more chronic timeline used by patients with breast cancer was strongly related to avoidant coping, but the perception of major consequences was related to lower use of problem-focused coping. Moreover, the emotional representation was positively related to venting emotion and not to other emotional focused-coping. However, illness representations both cognitive and emotional representations showed a strong correlation to physical and mental health.<sup>18</sup> These findings were consistent with a study conducted in survivors of esophageal cancer demonstrating that illness perceptions were stronger correlations with outcomes than coping strategies.<sup>19</sup> An association between illness perceptions and outcomes was also found in patients with chronic kidney disease (CKD). The perceptions about early symptoms of CKD, the causes of having CKD, CKD as a long-term disease, CKD could be controlled by

following doctors' orders, and the consequences of having CKD stimulate the patients to adopt coping strategies to delay the progress of CKD.<sup>20</sup>

Within the area of osteoarthritis, including knee OA, there were some studies which investigated the components of the CSM both together and only one or two components of the model. The correlation between illness representations and outcome was found in a previous study conducted on patients with hip and knee OA. Patients who perceived high scores on the identity, consequences, and chronic timeline subscales were more likely to increase risk of reporting more activity limitation of the lower extremities than expected based on disease characteristics. Contrastingly, low scores of identity, consequences, and emotional representation were associated with reporting less limitation in activities than the expected range.<sup>21</sup> Similar findings were found in older adults with musculoskeletal hand problems.<sup>9</sup> Although there was little difference between the illness representations of the older people reporting musculoskeletal hand problems and those who self-reported a diagnosis of hand OA, older adults who perceived their musculoskeletal hand problem to have negative effects on their life (more symptoms on identity and severe consequences) were more likely to encounter difficulties to consult, take medication or both. In addition, illness representations and beliefs about medical and surgical control of pain in patients living with knee OA was also reported in a qualitative study.<sup>22</sup> The patients reported their understanding of OA focusing on loss of cartilage, bones rubbing against each other or abnormally bones growth. These were associated with pain, which they were always aware of and felt like it was something, which never went away. Also, they had experiences of limited pain relief and concerns about the use of drugs and surgery.

However, these studies were cross-sectional studies that precluded extrapolation of causes and effects. A 6-year longitudinal study was carried out to investigate changes in illness representations in

people with OA.<sup>23</sup> Participants with progressive disability, a decrease in functional status assessing activities of daily life and mobility, showed increases in OA symptoms, perceived consequences, perceived disease chronicity, a decrease in perceived control and understanding of OA, and negative emotions compared with patients without progression of disability. Moreover, the predictors of high disability after 6 year follow-up included a higher number of OA symptoms, less perceived control, and more perceived consequences of OA than at baseline. In a later longitudinal study with the same cohort of these participants with OA, similar findings were also revealed that negative changes in illness representations (timeline, personal control, and illness coherence dimensions) were associated with worse functional status, pain and disability.<sup>24</sup>

The aforementioned studies demonstrated that patients with chronic conditions, including osteoarthritis perceived their illness representations as associated with activity limitations (eg. activity of daily life and mobility) as well as quality of life including physical and mental health problems through coping behaviors. However, the relationship between coping behaviors and illness representations was not clearly presented, but some studies investigated coping behaviors associated with outcomes in patients with OA. For example, a longitudinal study, of patients with knee OA, revealed that patients, who used the passive coping style of resting, were associated with a higher level of disability.<sup>25</sup> Consistent with adults with knee and hip osteoarthritis, the use of guarding coping behavior was significantly related to lower activity levels, whereas asking for assistance was significantly related to higher activity levels. Additional findings reported that only resting moderated the association between pain and activity.<sup>26</sup> A pattern emerged across these various studies concerning illness representations and coping behaviors which varied by disease symptoms. As stated earlier, CSM posited that illness representations (health threats) are purported to be disease specific,

and a health threat guides the need in generating action plans to manage or cope with the problem and the emotions.<sup>10</sup> Considering the limited research on beliefs about knee OA, coping behaviors, assessing patients' perceptions of knee OA and use of coping strategies are all important for understanding their beliefs and their attempts to manage their OA symptoms. Regardless of results from many studies on Western and European people, they may not apply to Asian people whose have differences in cultures, beliefs, and life styles. In addition, as previously mentioned<sup>1</sup>, people living in rural and urban areas showed a different prevalence of knee OA, they may have a difference in perceptions of illness and coping behaviors to manage their symptoms. Therefore, using the CSM as a framework, the aims of this descriptive study were to describe the differences in illness representations and coping behaviors among adult and older Thais with self-reported knee OA living in rural and urban areas and to examine the relationship between illness representations and coping behaviors among those adult and older adults in rural and urban areas.

## **Methods**

**Design:** A cross-sectional survey design was employed.

**Sample and Setting:** Participants were selected by a convenient sampling method based on the participants' living area in six communities in Bangkok and its vicinity, three rural and three urban areas. The participants were recruited if they were: having symptoms of primary osteoarthritis of the knee at one side or both sides based on the diagnosis of classification criteria for knee osteoarthritis from clinical symptoms of the American College of Rheumatology<sup>27</sup>, which included knee pain related to 1) age 50 years or above 2) joint stiffness less than 30 minutes, and 3) crepitation; and being able to understand Thai. Exclusion criteria were potential

participants with 1) cognitive impairment as suggested by a health center leader or community leader at each center; 2) had a history of knee arthroplasty; and 3) had serious illness or bedridden.

**Sample Size Calculation:** Sample size was calculated by using G\*Power software version 3.1.9.2. Using effect size of .38 based on a previous study<sup>28</sup>, and an alpha of .05 with a power of .80, a t-test calculation gave that a sample of at least 110 participants per group were needed to examine a difference between the two groups. A total of 247 prospective participants was screened. Of these, 228 individuals met the inclusion criteria and showed their willingness to participate in the study. There were 116 participants living in rural areas and 112 individuals living in urban areas.

**Ethical Considerations:** This study received ethical approval from the institutional review board of the Faculty of Medicine Ramathibodi Hospital, Mahidol University (ID 10-54-45). Each potential participant was informed about study procedures in accordance with the Helsinki Declaration of 1964, as revised in 2000. Either written or verbal informed consent was obtained from all participants prior to initiating the start of the recruitment procedures and selection process. All data collection forms used codes or number in the place of individual names. Importantly, participants confidentiality were retained as data collection forms together with consent forms were kept in the safe place where only the research team has access to information. After the study ended, all study forms were destroyed.

**Instruments:** Three questionnaires were employed for data collection. They included 1) the Demographic and Health Information Questionnaire; 2) the Brief Illness Perception Questionnaire (Brief-IPQ); and 3) the Knee Osteoarthritis Coping Behavior Questionnaire.

The Demographic and Health Information Questionnaire was used to gain demographic information including age, gender (male/female), and education level. In addition, the participants were asked to

provide details of the number of self-reported comorbidities, currently affected knee pain (one side/both sides), their self-reported height and weight, and body mass index (BMI) was calculated ( $\text{kg}/\text{m}^2$ ). This questionnaire consists of 8 items. Age, weight, and height are provided with open-ended responses, while other items are categorized questions.

The Brief Illness Perception Questionnaire (Brief-IPQ)<sup>16</sup> was used to measure participants' cognitive and emotional representations of their illness. It comprised nine items including illness consequences (item 1), timeline (item 2), personal and treatment control (items 3 and 4), identity (item 5), concerns (item 6), coherence (item 7), emotions (item 8), and illness cause (item 9). The illness concern measured by item 6 reflects a combination of emotional and cognitive representations. For the illness cause, it requires participants to list what they believe to be the most three important causal factors of their illness. Since the cause of the disease was not the objective of this study, the illness cause was not applied in this study. To make the questionnaire appropriate for patients with knee OA, we replaced the word 'illness' used in the Brief-IPQ with 'knee OA'. For example, "How much does your knee OA affect your life?" (illness consequences subscale) and "How long do you think your knee OA will continue?" (timeline subscale). The eight items were measured on a scale of 0 to 10 with endpoint descriptors. An overall score was computed which indicated the perception of illness as threatening or benign. To compute the score, the score of three negative items were reversed before adding to the score of other items. Higher total scores indicate a more threatening perception of the illness (health threat). For each subscale (item), higher scores indicate a strong belief that the knee OA symptoms are suffering (identity), chronicity (timeline), serious negative consequence (consequence), amenable to control (personal control), curable (treatment control), understanding of conditions (coherence), concern, and strong negative emotional response (emotional representation).

The Brief IPQ is a useful tool for assessing illness perceptions. Due to the advantages of being brief and easy to understand, the Brief IPQ is particularly useful in the very ill or elderly who have limited time available for assessment<sup>16</sup> as well as it has been widely used in a variety of patients (eg, palliative care, brain injury, diabetes, arthritis, bipolar disorder, and low back pain).<sup>29</sup> The reliability of this measure was acceptable as reported in the intraclass correlation coefficient test-retest reliability of .72 and .86 and for the individual items ranging from .64 to .88.<sup>30</sup> The Cronbach's alpha for internal consistency was .73 and the intraclass correlation coefficient measuring concurrent validity when compared with the mental health component scale of the SF-36 was .65 (95% CI, 0.46 – 0.80).<sup>30</sup> Since the original version of the Brief-IPQ is in English, it was translated into Thai by the research team. Back translation technique was performed by two bilingual experts in English and Thai. The first expert confirmed the accurate translations, then back translation was performed by the other. The Brief-IPQ Thai version was employed in 10 patients with knee OA before administering in this study. Test-retest reliability over one week showed a correlation of .82.

The Knee Osteoarthritis Coping Behavior Questionnaire was developed by the research team to assess coping behavior in participants. This 30 item questionnaire consisted of cognitive-focused coping and emotion-focused coping aspects. The cognitive-focused coping includes information seeking and self-care subscales (eg. "Try to seek information on knee OA" "Try to keep walking as possible as to be active"), while the emotional-focused coping comprises of spiritual support, distraction, and emotional adjustment subscales (eg. "Pray for good health" "Try to ignore knee pain"). A 5-point Likert scale was used to rate items from never use (0) to always use (4) in each subscale. Higher scores represent participants favor the use of particular coping behavior. Because each subscale contained unequal numbers of items, the percentage of subscale scores was calculated to determine coping strategy use.

The initial development of this questionnaire included the interviews of 10 community-dwelling older adults with self-reported knee OA classified by the American College of Rheumatology<sup>27</sup> and specific information delivered to patients with knee OA by health care personnel. The developed questionnaire then was validated by three experts including an orthopaedist, advanced practice nurse in orthopedics, and academic educator in orthogeriatric nursing. The content validity index was .89. Subscales of this questionnaire were determined by factor analytic methods; item loading >.3 on each component was acceptable. The internal consistency coefficient of Cronbach alpha for each component ranged from .68-.83 when administered in 327 community-dwelling older adults with self-reported knee OA. In this study, the internal consistency coefficient of Cronbach alpha for total scale, cognitive-focused coping subscale, and emotional-focused coping subscale was .89, .86, and .78, respectively.

**Data Collection:** Data were collected from three communities in Bangkok and the other three communities in its vicinity. Initially, the research team met with a health center leader and a community leader at each site to discuss the purpose and procedures of the study and to receive advice on older adults who would be eligible to participate in the study. The potential participants were approached for their convenience at each health center or community. An agreed time and convenient place to undertake the data collection were set up with eligible participants. In order to prevent data invalidity due to patient's vision or illiteracy problems, interviews were employed for data collection. The researcher read each item and its response scale to the participant which allowed the respondent to develop her/his answer. Verbal response obtained from each respondent was written down by the researcher on the questionnaire. The research was careful to avoid leading questions and body language that might suggest prejudiced answers.

**Data Analysis:** Data were analyzed using a statistical package software program, SPSS version

18.0 for windows (SPSS Co., Ltd. Bangkok, Thailand). Descriptive statistics were employed for demographic and health information data. Tests of assumptions for independent t-test were conducted on the data including Kolmogorov-Smirnov test which assessed normal distribution and Levene's test which detected homogeneity of variance. When these assumptions were acceptable, independent t-tests and  $\chi^2$  tests were used to analyze study variable differences in continuous and categorical data, respectively. Pearson's product moment correlation coefficient was also used to examine the relationship between variables. A p-value of <.05 was considered statistically significant.

### Results

**Sample:** Participants were 116 rural adult and older adults with the mean age of 65.78 years (SD =

9.82 years) and 112 urban individuals with the mean age of 60.63 years (SD = 9.18 years). There was significant difference in the age of participants between the two groups. The proportion of females in the group of rural participants was not significantly different compared with the group of urban participants. However, compared with the urban group, those in the rural group were more likely to receive low level of education (p = .001). In relation to health information, the rural group had less comorbidities than the urban group (p = .011), and they were more likely to have normal BMI (p = .01). In addition, there were not any differences in affected knee pain of participants in the rural group compared with the urban group, nor in the duration of knee OA. The participants in both groups reported moderate pain. Demographics and health information differences between the two groups have been summarized in Table 1.

**Table 1.** Demographic and Health Information of Study Participants

Variables	Gr.I (n = 116)		Gr.II (n = 112)		t	X <sup>2</sup>	p-value
	n (%)	M±SD	n (%)	M±SD			
Gender						.088	.895
Female	99 (85.3)		94 (83.9)				
Male	17 (14.7)		18 (16.1)				
Age (years)		65.7 ± 9.8		60.6 ± 9.1	4.078		.005
Education Level						34.97	.001
Informal education & Illiterate	40 (34.5)		17 (15.2)				
Primary school	70 (60.3)		56 (50.0)				
≥ High school	6 (5.2)		39 (34.8)				
Career Status						82.16	.000
Retired	17 (14.7)		42 (37.5)				
Employees	20 (17.2)		22 (19.6)				
Famers	41 (35.3)		0				
Small shopkeepers	6 (5.2)		36 (32.2)				
Without any jobs	32 (27.6)		12 (10.7)				
Comorbidities <sup>a</sup>						6.47	.011
None	52 (44.8)		32 (28.6)				
Only one disease	23 (19.9)		27 (24.1)				

**Table 1.** Demographic and Health Information of Study Participants (cont.)

Variables	Gr.I (n = 116)		Gr.II (n = 112)		t	X <sup>2</sup>	p-value
	n (%)	M±SD	n (%)	M±SD			
≥ 2 diseases	41 (35.3)		53 (47.3)				
BMI (kg/m <sup>2</sup> )						9.82	.04
Normal	41 (35.3)		21 (18.8)				
Overweight	24 (20.7)		33 (29.5)				
Obesity level I	43 (37.1)		44 (39.2)				
Obesity level II	8 ( 6.9)		14 (12.5)				
Affected Knee Pain						3.30	.192
Only one side	52 (44.8)		62 (55.4)				
Both sides	64 (55.2)		50 (44.6)				
Duration of Knee OA (month)		48.9 ± 4.9		40.7 ± 3.3	.226		.176
Knee Pain		5.3 ± 2.4		4.9 ± 1.9	.226		.243
Managements of Knee OA Symptoms						27.40	.000
Taken pain killer occasionally	87 (75.0)		56 (50.0)				
Quadriceps exercise	14 (12.1)		38 (33.9)				
Rest affected joint	7 ( 6.0)		17 (15.2)				
Any others	8 ( 6.9)		1 ( 0.9)				

Note: <sup>a</sup> Using Fisher's Exact Test; BMI = Body Mass Index; Gr.I = Rural Participants; Gr.II = Urban Participants

Importantly participants in the both groups perceived moderate health threat, and they reported timeline with the highest score. Participants in the rural group perceived treatment control with the lowest score, while those in the urban group reported the lowest score on personal control component. When independent t-tests were employed to determine the differences between the two groups, participants in the rural group had significantly lower perceptions on treatment control and emotional representation compared with those in the urban group (p = .002 and p = .007, respectively). However, participants in the rural group expressed non-significant differences in the other components of illness representations and

health threats compared to those in the urban group. Details of illness representations differences between the two groups have been presented in Table 2. With regard to coping behaviors, spiritual support was most commonly used following self-care behavior in the rural participants. Contrastingly, the most frequently use of coping behaviors in the urban group was self-care behavior following information seeking. Participants in the urban group were more likely to use cognitive-focused coping as well as emotional adjustment subscale compared to those in the rural group (p = .000 and p = .017, respectively). Interestingly, emotion-focused coping including spiritual support and distraction was similarly used in the both groups although participants in the

urban group were more frequently use coping than those in the rural group. Details of coping behaviors among the two groups have been demonstrated in Table 3.

Table 4 displays an association between illness representations and coping behaviors among participants. A negative correlation between illness representations (health threat) and coping behaviors was found in a rural group ( $r = -.21$ ;  $p < .05$ ), but no significant correlation was observed in the urban group. Understanding

showed a moderate association with coping behaviors and coping subscales including cognitive-focused coping and emotion -focused coping in rural older adults ( $r = .39$ ,  $p < .01$ ;  $r = .32$ ,  $p < .01$ ;  $r = -.42$ ,  $p < .01$ , respectively). These relationships were also observed in all participants. In addition, personal control was significantly negative in relation to emotion-focused coping ( $r = -.27$ ,  $p < .01$ ) and to coping behaviors ( $r = -.21$ ,  $p < .05$ ) in the rural group.

**Table 2.** Illness Representations among Rural and Urban Study Participants

Illness Representations	Group I (n =116)	Group II (n = 112)	t	p-value
	M ± SD	M ± SD		
Cognitive Representation	25.91 ± 6.88	26.16 ± 5.73	-.29	.769
Consequences	5.59 ± 2.26	5.19 ± 2.29	1.32	.188
Timeline	6.47 ± 2.99	6.55 ± 2.48	-.21	.828
Personal control	4.75 ± 2.30	4.30 ± 2.17	1.53	.126
Treatment control	3.92 ± 2.22	4.87 ± 2.35	-3.13	.002
Identity	5.16 ± 2.12	5.23 ± 2.19	-.23	.811
Emotional Representation	4.17 ± 2.85	5.11 ± 2.33	-2.72	.007
Concern	5.37 ± 2.58	5.41 ± 2.36	-.12	.902
Understanding	4.95 ± 2.36	4.44 ± 2.30	1.65	.100
Total (Health Threat)	40.42 ± 9.96	41.14 ± 7.83	-.60	.225

Note: Group I = Rural Participants; Group II = Urban Participants

**Table 3.** Coping Behaviors among Rural and Urban Study Participants

Coping Behaviors	Group I (n = 116)	Group II (n = 112)	t	p-value
	M ± SD	M ± SD		
Cognitive-Focused Coping	49.25 ± 15.76	59.87 ± 18.25	-4.71	.000
Information seeking	43.97 ± 21.22	54.74 ± 22.32	-3.74	.000
Self-care	51.89 ± 16.32	62.44 ± 18.05	-4.63	.000
Emotion-Focused Coping	42.77 ± 13.57	44.21 ± 14.00	-0.78	.431
Spiritual support	58.41 ± 22.04	52.06 ± 21.28	1.75	.081
Distraction	41.19 ± 16.95	43.64 ± 15.75	-1.12	.262
Emotional adjustment	36.13 ± 14.84	40.71 ± 13.82	-2.41	.017
Total	45.36 ± 12.86	50.47 ± 14.63	-2.80	.005

Note: Group I = Rural Participants; Group II = Urban Participants

**Table 4.** Correlations between Illness Representations and Coping Behaviors among Study Participants

Variables	Rural Participants (n = 116)			Urban Participants (n = 112)			Total ( n = 228)		
	1	2	3	1	2	3	1	2	3
Consequences	-.03	.08	-.05	.14	.06	.10	.03	-.01	.15
Timeline	.05	-.06	.01	.05	.05	.05	.02	.05	.29
Personal control	-.13	-.27**	-.21*	.02	.18	.10	-.08	-.04	-.06
Treatment control	-.15	.12	-.18	.10	-.09	-.01	.05	-.12	-.05
Identity	.08	.02	.07	.15	.08	.12	.12	.06	.10
Concern	.05	-.03	.04	-.09	-.04	-.05	-.01	-.08	-.07
Understanding	.32**	-.42**	.39**	-.14	-.16	-.20	.25**	-.27**	.29**
Emotional representation	-.01	.08	-.20	.05	-.05	-.01	.07	-.20	.25
Total (Illness Threat)	-.13	-.20*	-.21*	.08	.01	.04	-.02	-.09	-.06

Note: 1 = Cognitive-Focused Coping; 2 = Emotion-Focused Coping; 3 = Coping Behaviors;

\* p< .05; \*\* p<.01

### Discussion

This study was conducted on adult and older adults with self-reported knee osteoarthritis to examine illness representations, coping behaviors, and an association between illness representations and coping behaviors. Moreover, the differences in these variables were also investigated between adult and older adults living in rural and urban areas. As expected, adult and older adults in the rural group and those in the urban group were shown to perceive similar health threat. This may be related to the fact that the study was carried out as a community-based survey and has, therefore, included a broad range of adult and older adults who were self-reported knee OA. These participants may suffer less from knee OA symptoms as our findings showed that the both groups perceived moderate health threat and did not reveal any significant differences in knee pain nor duration of having knee OA symptoms. However, the urban group perceived significantly greater treatment control and emotional representation than those in the rural group. This finding may be because the urban group has easier access to trustworthy information

regarding knee OA treatment regimen published worldwide as well as available on internet including pain killer medication, rest of the affected knee joint, and knee muscle exercise.<sup>31</sup> Our findings indicated that the urban group was more likely to use these treatment regimens compared with the rural group. In addition, the urban group had higher educational levels than those in the rural group. Notably, some previous studies reported that participants with lower education levels seemed to have weaker illness control.<sup>32,33</sup> As for the emotional representation, the urban group perceived more emotional impact of knee OA compared with those in the rural group. One explanation may be the fact that participants in the rural area more frequently do religious activities than those in the urban group. As such, the rural group perceived less emotional impact of the disease as our findings showed that the rural group used more spiritual support coping than those in the urban group.

Surprisingly, participants in the urban group were more likely to use coping behaviors than those in the rural group, but a significant difference was observed only in cognitive-focused coping including information seeking and self-care, emotional adjustment,

and overall coping behaviors. One may speculate that the difference of cognitive-focused coping is that as the aforementioned, the urban group may have easier access to health care information and had higher educational level than those in the rural group. Moreover, there are a number of factors influencing coping behaviors including individual abilities and resources, personality traits, living situation, the relationship to others, and suggestions and education provided to patients by health care providers.<sup>34</sup> Unfortunately, these factors were not explored in this study providing strong evidence to support the notation is problematic. Focusing on emotional adjustment, notably, in one previous study, the duration from diagnosis not only affected changes in coping styles over time, but also influenced psychological adaptation.<sup>35</sup> Our findings did not support this previous study's results since the participants in both group did not show a significant difference of duration of knee OA, but their emotional adjustment coping was significantly different. One explanation may be that the urban group perceived more negative emotional response (emotional representation) of knee OA than those in the rural group. As such, they were likely to use emotional adjustment to deal with their conditions. This finding is partly supported by a previous study<sup>36</sup> indicating that most of the patients (83%) suffered from high knee pain variability and used some emotion-focused coping.

It is important to note that participants in both groups adopted a wide range of coping behaviors to manage their knee OA symptoms which was similar to a previous study.<sup>37</sup> However, cognitive-focused coping seemed to be more frequently used than emotion-focused coping strategies contrasting with a previous study in hip and knee osteoarthritis patients which indicated that the patients with osteoarthritis demonstrated lower active pain coping strategies and much higher passive pain coping scores than patients with rheumatoid arthritis and those with chronic pain.<sup>38</sup> A different finding may be partly due to a

measure used to assess coping behavior in this study which is newer and different from others, and it is difficult to make exact comparisons between studies.

With respect to the association between illness representations and coping behaviors, illness representations (health threat) and its dimensions including timeline and understanding were moderate association with coping behaviors only in the rural group. As in a previous study, results from a meta-analysis revealed that some illness representations was related to certain categories of coping strategies.<sup>15</sup> Likewise, our findings partly agreed with a study about patients treated for breast cancer which found that the illness representation dimension was weakly associated with coping behaviors.<sup>18</sup> Importantly, a correlation between illness representations (health threat) and coping behaviors is implied by the self-regulation model, which proposes that an individual's perception of threat of illness (illness representations) influence ability to select appropriate coping strategies managing their illness.<sup>10,39</sup> The failure of this study to find a strong association between health threat and coping behaviors in rural participants and a correlation between health threat and coping behaviors in urban participants may be due in part to a limitation of the instrument used to assess coping behaviors. Although the Knee Osteoarthritis Coping Behavior Questionnaire was developed for use with knee osteoarthritis population, it contains various types of coping behaviors. The participants in this study experienced with chronic knee OA which varied in its symptoms. In addition, the difference in disease severity may lead participants to cope appropriately with their conditions as mentioned in a previous study<sup>34</sup> indicated that people used different daily coping strategies over time. However, the severity or stage of the disease was not focused on in this study. In the aforementioned, the relationship between health threat and coping behaviors may have been misled.

An interesting finding from this study is that, understanding (illness coherence) showed a positive relation to coping behaviors and to cognitive-focused

coping, and a negative correlation to emotion-focused coping in rural participants. One explanation may be related to the fact that a person who understands the nature of knee OA will seek information from friends, medias, or health personnel to manage their conditions for reduction the progression of the disease instead of ignoring or using emotion -focused coping. Consistent with the CSM, a person will perform coping behaviors consistent with that the meaning individuals assign to their symptoms.<sup>10,39</sup> This is particularly important as personal control and health threat were found to have an independently negative relationship to coping behaviors and to emotion-focused coping. It is possible that the rural participants living with knee OA over the long term may consider the illness as part of their lives that they have found a better way to cope with the impact of knee OA symptoms. Although, our finding showed more than half of the rural group still worked as employees and farmers their functional ability to do so was outside the scope of this study.

### **Limitations**

A few potential limitations should be acknowledged for this study. As the participants in this study were self-reported knee OA and predominantly female, our findings might not be generalized to older adults who were either diagnosed knee OA with radiograph or male population. Another potential limitation due to its cross-sectional design is limited to exact illness representations and coping behaviors since the field of knee OA is known as a chronic condition, with a variability of symptoms over the trajectory of the disease.

### **Conclusions and Implications for Nursing**

#### **Practice**

Despite the shortcomings, the study indicates the significance of understanding the illness representations and coping behaviors among adult and older adults

with knee osteoarthritis. Although participants in the both groups were likely to perceive similar illness representations, the two dimensions of treatment control and emotional representation were different. The urban participants used more cognitive-focused coping than those in the rural area. The illness representation subscales, and understanding of illness had a correlation with coping behaviors only in the rural participants. The results of this study are beneficial to design interventions to raise awareness of health threat with respect to understanding (illness coherence) and to promote appropriate coping behaviors concerning living areas which may be important. Further study is required to conduct prospective longitudinal designs investigating the subscales of illness representations and coping behaviors across more points in time. Additionally, the association among illness representations, coping behaviors, and health outcomes seems to very much need further study in order to determine which self-regulating process, illness representations and coping behaviors, are associated with the best illness outcomes and to evaluate the effectiveness of behaviors adopted to cope with illness after coping behaviors have been used.

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## ข้อเข่าเสื่อมในผู้ใหญ่และผู้สูงอายุไทยที่อาศัยในชนบทและเขตเมือง: การศึกษาเปรียบเทียบ

อินทิรา รูปสว่าง สุภาพ อารีเอื้อ

**บทคัดย่อ:** ข้อเข่าเสื่อมเป็นสาเหตุสำคัญที่ทำให้เกิดความพิการในผู้ใหญ่และผู้สูงอายุและอุบัติการณ์ของโรคพบมากขึ้นตามอายุที่เพิ่มขึ้น การรับรู้ถึงภาพความเจ็บป่วยและพฤติกรรมการเผชิญปัญหาอาจช่วยในการวางแผนจัดการกับโรคเรื้อรังนี้ วัตถุประสงค์ของการศึกษาคั้งนี้ เพื่อศึกษาความแตกต่างการรับรู้ถึงภาพความเจ็บป่วยและพฤติกรรมการเผชิญปัญหาในผู้ใหญ่และผู้สูงอายุไทยที่อาศัยในชนบทและเขตเมือง และศึกษาความสัมพันธ์ระหว่างการรับรู้ถึงภาพความเจ็บป่วยและพฤติกรรมการเผชิญปัญหาในผู้ใหญ่และผู้สูงอายุในชนบทและเขตเมือง กลุ่มตัวอย่างผู้ใหญ่และผู้สูงอายุที่มีอาการข้อเข่าเสื่อมซึ่งอาศัยอยู่ในชนบทจำนวน 116 ราย และ อาศัยอยู่ในเขตเมืองจำนวน 112 ราย เก็บข้อมูลโดยการตอบแบบสอบถาม การรับรู้ความเจ็บป่วยฉบับย่อ และแบบสอบถามพฤติกรรมการเผชิญปัญหาของผู้ป่วยข้อเข่าเสื่อม วิเคราะห์ข้อมูลด้วย สถิติเชิงพรรณนาการทดสอบค่าที และค่าสัมประสิทธิ์สหสัมพันธ์เพียร์สัน

ผลการศึกษาพบว่า การรับรู้ถึงภาพความเจ็บป่วยระหว่างสองกลุ่มไม่มีความแตกต่างกัน แต่กลุ่มตัวอย่างที่อาศัยอยู่ในชนบทมีคะแนนด้านประสิทธิภาพการดูแลสุขภาพในการควบคุมโรคและมโนภาพความเจ็บป่วยด้านอารมณ์ต่ำกว่าผู้ที่อาศัยอยู่ในเขตเมือง ผู้ที่อาศัยอยู่ในเขตเมืองมีคะแนนเฉลี่ยพฤติกรรมการเผชิญปัญหาโดยรวมด้านการมุ่งแก้ปัญหา และด้านการปรับอารมณ์สูงกว่าผู้ที่อาศัยอยู่ในชนบท การรับรู้ถึงภาพความเจ็บป่วยมีความสัมพันธ์ทางลบกับพฤติกรรมการเผชิญปัญหาในกลุ่มตัวอย่างที่อาศัยในชนบท แต่ไม่พบความสัมพันธ์ดังกล่าวในกลุ่มที่อาศัยในเขตเมือง ผลการวิจัยครั้งนี้ชี้ให้เห็นถึงการจัดกิจกรรมพยาบาลที่จะเป็นประโยชน์ในอนาคต ควรส่งเสริมการตระหนักรู้เกี่ยวกับข้อเข่าเสื่อมและพฤติกรรมการเผชิญปัญหาอย่างเหมาะสม โดยคำนึงถึงความแตกต่างของบริบทและสิ่งแวดล้อมของกลุ่มตัวอย่างในแต่ละพื้นที่

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**คำสำคัญ :** ผู้ใหญ่และผู้สูงอายุไทย พฤติกรรมการเผชิญปัญหา การรับรู้ถึงภาพความเจ็บป่วย ข้อเข่าเสื่อม ชนบท เขตเมือง

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