

ORIGINAL ARTICLE

Factors influencing health status in older people with knee osteoarthritis

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Abstract

Aim: To examine a causal model of health status among older people with knee osteoarthritis.

Methods: A cross-sectional, correlational design was used with a convenience sample of 220 older Thai people with knee osteoarthritis (mean age 68.96 years; SD = 6.22). Participants were asked to complete a demographic questionnaire, the Pain Catastrophizing Scale, the Tampa Scale of Kinesiophobia, The Medical Outcomes Study Social Support Survey, and the Arthritis Impact Measurement Scales 2-Short Form. Structural Equation Model was used to examine a hypothesized model.

Results: Using Chi-square, hypothesized model was statistically nonsignificant. A model of health status fitted with the empirical data and explained 19.2% of variance. Pain catastrophizing had negative direct effect on self-efficacy and health status. Pain catastrophizing also had negative indirect effect on health status through self-efficacy. Self-efficacy and social support had positive direct effects on health status. However, pain-related fear had no direct or indirect effect on health status.

Conclusion: Lower level of pain catastrophizing can improve self-efficacy. Increasing of self-efficacy and social support can then lead to improvement on health status. This study highlighted the effect of psychosocial factors on health status. It is necessary to develop a program to minimize pain catastrophizing, improve social support, and promote self-efficacy to improve the health status of older people with knee osteoarthritis.

KEYWORDS

health status, knee osteoarthritis, older people, pain catastrophizing, self-efficacy, social support

1 | INTRODUCTION

Osteoarthritis (OA), the most prevalent form of arthritis, has a profound impact on older people's mobility and quality of life (Murphy & Helmick, 2012). Approximately 37% of American people over 60 years of age have been diagnosed with knee OA (Zhang & Jordan, 2010). In 2009, 620,192 knee replacements were performed in the United States at a cost of \$28.5 billion in hospital expenditure (Murphy &

Helmick, 2012). The prevalence of knee OA in Thai older people was between 34.5 and 45.6% (Kuptniratsaikul, Tosayanonda, Nilganuwong, & Thamalikitkul, 2002). Pain is a significant symptom of knee OA and the consequences of this pain include fatigue, disability, limited functional activities, and self-perceptions of poor health (Zhang & Jordan, 2010). Pain resulting from knee OA is also related to psychological problems such as stress, anxiety, and depression (Hawker, 2009). Pain, physical disability, and psychological

disabilities are concerns for older people with knee OA because they represent older people's health status. Investigators have found that pain catastrophizing, pain-related fear, perceptions of social support, and perceived self-efficacy are associated with pain, physical and psychological disabilities in older people with knee OA (Ferreira & Sherman, 2007; Marks, 2007; Rayahin et al., 2014; Scopaz, Piva, Wisniewski, & Fitzgerald, 2009; Sinikallio, Helminen, Valjakka, Vaisanen-Rouvali, & Arokoski, 2014; Somers et al., 2009).

Pain catastrophizing is defined as an individuals' exaggeration of pain perceptions which results in negatively evaluating their ability to deal with pain (Sullivan et al., 2001). The psychological stimulation provided by catastrophizing induces strong perceptions of painful experiences and emotional distress (Sullivan et al., 2001). A high level of pain catastrophizing was associated with high pain scores and poorer functional activity in patients with knee OA (Sinikallio et al., 2014). Pain catastrophizing was also a significant predictor of: pain severity; physical and psychological disability; and walking at normal, intermediate, and fast speeds for patients with knee OA (Helminen, Sinikallio, Valjakka, Vaisanen-Rouvali, & Arokoski, 2016; Somers et al., 2009); as well as postoperative pain after knee arthroplasty (Burns et al., 2015). Moreover, good pain experience outcomes (i.e. persistence in or movement to no pain or predictable pain in response to a known trigger) at 2 years were significantly related with low self-perceptions of pain catastrophizing (Rayahin et al., 2014).

Pain-related fear is defined as people's perceived fear of movement that may or will result in pain (Somers et al., 2009). When people fear pain, they are likely to avoid activities that may cause them pain or enhance their pain intensity. Regarding patients with knee OA, investigators found that pain-related fear was a significant predictor of psychological disability and walking speed (Somers et al., 2009). In addition, fear of movement was associated with greater pain and poorer functional ability and self-efficacy for pain management, physical function, and coping with symptoms (Helminen et al., 2016; Perry & Francis, 2013; Scopaz et al., 2009; Sinikallio et al., 2014).

Social support refers to individual perceptions of emotional and tangible assistance from others as well as perceptions of the availability of resources from others in a social network (Cohen, 2004). In knee OA patients, greater social support was significantly associated with good physical outcomes such as less pain (Ferreira & Sherman, 2007) and with lower perceptions of disability and better physical functions and health (Sherman et al., 2006). Moreover, high perceptions of social support were also found to be related to psychological factors, including lower depressive symptoms (Ferreira & Sherman, 2007) and higher self-efficacy (Pattayakorn et al., 2010), as well as improvement of well-

being variables such as life satisfaction (Ferreira & Sherman, 2007; Luger, Cotter, & Sherman, 2009; Pattayakorn et al., 2010; Sherman et al., 2006). However, one study reported that social support had no direct effect on health status (Aree-Ue, Roopsawang, & Belza, 2016).

Self-efficacy is defined as an individuals' perceptions of their ability and confidence to perform a behavior in order to reach a goal (Bandura, 1977). Self-efficacy for arthritis management refers to self-efficacy for pain management, physical activity, and managing other symptoms related to arthritis (e.g. fatigue and depression) (Lorig, Chastain, Ung, Shoor, & Holman, 1989). Previous studies of patients with knee OA showed that when patients perceived high self-efficacy for pain management and physical function, they had good functional ability/physical performance and low levels of pain intensity, perceived exertion during a walking task, and depression (Helminen et al., 2016; Marks, 2007; Sinikallio et al., 2014). Patients with high self-efficacy for pain management could manage other arthritis symptoms more quickly and showed higher walking speeds than those who had low self-efficacy for pain management (Marks, 2007). Moreover, self-efficacy for pain management, physical function, and management of other arthritis symptoms was found to be a significant predictor of pain intensity level, physical disability, and psychological disability, respectively (Pells et al., 2008). High self-efficacy for physical function was associated with good pain experience outcomes (Rayahin et al., 2014). Self-efficacy for pain management, physical function, and managing other symptoms related to arthritis were also found to mediate the relationships between pain catastrophizing and pain, physical disability, and psychological disability respectively, in overweight and obese knee OA patients (Shelby et al., 2008).

Previous researchers have not examined the potential relationships among pain catastrophizing, pain-related fear, perceptions of social support, perceived self-efficacy, and health status in older people with knee OA, or whether perceived self-efficacy acts as a mediator in these relationships. Exploration of the relevant relationships will support development of interventions to reduce pain intensity and disability and minimize the progression of knee OA, perhaps reducing the need for surgery. The aim of this study was to explain the pattern of causal relationships among pain catastrophizing, pain-related fear, social support, and self-efficacy to influence health status of older people with knee OA.

1.1 | Conceptual framework

Braden's self-help theory was chosen for this study to comprehensively understand factors associated with health status of older people with knee OA. Braden's self-help theory (1990) consists of three major constructs: antecedents

(perceived severity of illness, limitation, and uncertainty), mediators (enabling skills), and outcomes (self-help and life quality). Perceived severity of illness can affect learning processes by increasing people's perceptions of their limitations and uncertainty. Enabling skills, mediators, are defined as people's perceptions of their abilities to manage themselves when faced with adversities of illness. People with high perceptions of limitations and uncertainty can experience reduced perceptions of their enabling skills, which can influence their quality of life. In this study, we conceptualized antecedents as perceptions regarding their pain catastrophizing, pain-related fear, and social support. The mediator was self-efficacy to manage pain and other arthritis symptoms. The outcome variable was health status, which includes pain, physical and psychological disabilities among Thai older people with knee OA.

2 | METHODS

2.1 | Design, settings, and sample

A cross-sectional correlational design was used in this study. A convenience sample of Thai older people with knee OA was recruited from five districts of one province in the north-eastern part of Thailand. Eligible participants were: (a) Thai older people (60 years or older); (b) diagnosed with OA in at least one knee by an orthopedist or had knee OA symptoms, which included knee pain and had at least three additional symptom (stiffness <30 min, crepitus, bony tenderness, bony enlargement, and no palpable warmth), as determined by the American College of Rheumatology classification criteria for clinical knee OA; and (c) no cognitive impairment (as determined by the mini-cog score ≥ 3) (Trongsakul, Lambert, Clark, Wongpakaran, & Cross, 2015). People diagnosed with mental health problems, dementia, history of knee arthroplasty surgery or knee injury, history of knee joint injections within 3 months before enrollment or who were in bedridden condition were excluded.

The sample size for this study was determined using the number of estimated parameters to be included in the path analyses. Typically, use of 10 to 20 cases per parameter is more appropriate for path analysis (Kline, 2011). Because this study involved 22 estimated parameters, a minimum sample size of 220 was needed in this study.

2.2 | Ethical considerations

The study was approved by the university's institutional review board (ID 03-59-77). Researchers distributed an information sheet explaining the study purpose, potential risks, and benefits of participating. When participants agree

to participate in the study, they were asked to sign a consent form.

2.3 | Measures

Demographic questionnaire. A demographic questionnaire was developed by the investigators and was used to measure participant age, gender, marital status, educational level, occupation, job characteristic, knee pain duration, side of knee pain, history of knee pain treatment, knee pain management, chronic illnesses, frequency of exercise, and type of exercise. Knee pain intensity was measured by a numeric rating scale. Researchers also measured patients' weight and height to calculate body mass index.

The Pain Catastrophizing Scale (PCS). The PCS measures pain catastrophizing in three dimensions: rumination, magnification, and helplessness (Sullivan, Bishop, & Pivik, 1995). The PCS was translated into Thai (PCS-Thai) to examine level of pain catastrophizing in older people with knee OA (Youngcharoen, Aree-Ue, & Saraboon, 2018). The PCS consists of 13 items rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (all the time). The total score ranges from 0 to 52. Higher scores represent a higher level of catastrophizing. The Cronbach's alpha coefficients for the total PCS was .87. The test-retest reliability was .75. The construct validity of the PCS was established through exploratory factor analysis. Rumination, magnification, and helplessness subscales accounted for 41, 10, and 8% of the total variance, respectively (Sullivan et al., 1995). Construct validity of the PCS-Thai was confirmed through factor analysis. Exploratory factor analysis indicated three factors, rumination, magnification, and helplessness, accounted for 65.97% of variance. Helplessness, rumination, and magnification subscales explained 25.98, 22.72, and 17.27% of the total variance. The Cronbach's alpha coefficients of the PCS-Thai were .91 (Youngcharoen et al., 2018) and .92 in this study.

The Tampa Scale of Kinesiophobia (TSK11). The TSK11 measures fear of movement in patients with chronic pain. The Thai version of the TSK11 (TSK11-Thai) was translated and used in this study. The TSK-11 includes 11 items, which are rated on a 4-point Likert scale ranging from 1 = strongly disagree to 4 = strongly agree. The total score of the TSK-11 ranges from 11 to 44. Higher scores reflect greater fear of injury. The Cronbach's alpha coefficient for the TSK-11 was .79. Criterion validity was supported by concurrent and predictive validity with the Roland disability questionnaire (Woby, Roach, Urmston, & Watson, 2005). In this study, Cronbach's alpha coefficient was .96.

The Medical Outcomes Study Social Support Survey (MOS-SSS) measures patients' perception of availability of

support. Rungruangsiripan, Sitthimongkol, Maneesriwongul, Talley, and Vorapongsathorn (2011) translated the MOS-SSS into Thai (MOS-SSS-Thai) to assess social support in people with schizophrenia. The MOS-SSS includes 19 items related to tangible, affectionate, positive social interaction, and emotional or informational support and are rated on a 5-point Likert scale ranging from 1 (none of the time) to 5 (all of the time). The total score ranges from 19 to 95, and higher scores represent a greater perceived availability of support. The Cronbach's alpha coefficient of the MOS-SSS was .96 and the test-retest reliability was .78. The construct validity was supported by convergent and discriminant validities (Sherbourne & Stewart, 1991). Because four culturally irrelevant items were deleted from the original MOS-SSS, the final MOS-SSS-Thai includes 15 items. Possible score ranges from 15 to 75. The Cronbach's alpha coefficients of the MOS-SSS-Thai were .87 (Rungruangsiripan et al., 2011) and .96 in this study.

The short version of the Arthritis Self-Efficacy Scale (ASES-8). The ASES-8 measures an arthritis patient's ability to control pain and other symptoms. The ASES-8 was translated into Thai (ASES-8-Thai) by Pattayakorn et al. (2010) to examine self-efficacy for arthritis management in the health status of older people with knee OA. Each item is rated on a 1 (very uncertain) to 10 (very certain) visual analog scale. The total score ranges from 8 to 80, and higher scores reflect greater perception of self-efficacy. The Cronbach's alpha coefficients of the ASES-8, ASES-8-Thai, and in this study were .94 (Lorig et al., 1989), .91 (Pattayakorn et al., 2010), and .94, respectively.

The Arthritis Impact Measurement Scales 2-Short Form (AIMS2-SF). The AIMS2-SF measures health status (pain, physical disability, and psychological disability in people with arthritis). The AIMS2-SF was translated into Thai (the AIMS2-SF-Thai) and was used to examine the health status of older people living in urban areas (Aree-Ue et al., 2016). The AIMS2-SF consists of 26 items measuring five domains for both lower and upper body limitations: physical function, role function, social function, symptoms, and affect. Each item is rated on a 5-point Likert scale ranging from 0 (all days or always) to 4 (no days or never). For each domain and component, item values are summed, and the scores are normalized so as to range from 0 (worst health) to 10 (perfect health). The Cronbach's alpha coefficients for the modified AIMS2-SF subscales ranged from .67 to .86. Construct validity was supported by factor analysis (Ren, Kazis, & Meenan, 1999). Only 18 items measuring lower body limitations were used to assess health status of Thai older people with knee OA. The Cronbach's alpha coefficient for the AIMS2-SF-Thai in their study was .69 (Aree-Ue et al., 2016) and was .81 in this study.

2.4 | Procedure

Potential participants were recruited through individual/group meetings at the Tambon Health Promoting Hospitals or in their homes. Potential participants with knee pain were screened by the investigators to examine whether they meet the inclusion criteria. After participants signed a consent form, they were asked to complete the study questionnaires. Investigators read each questionnaire item and response option. When participants selected a response, the investigator recorded them in the questionnaire.

2.5 | Data analysis

Descriptive statistics (mean, standard deviation, frequency, and percentage) were used to describe pain catastrophizing, pain-related fear, social support, self-efficacy, and health status of older people with knee OA using Stata version 13 (StataCorp, College Station, TX, USA). Pearson's correlation coefficient was used to examine relationships among study variables. Path analyses were conducted using structural equation model (SEM) through Lisrel 9.30 (student) to identify relationships among pain catastrophizing, pain-related fear, social support, self-efficacy, and health status. The significance of indirect effects were examined in order to determine whether self-efficacy mediates the relationships between pain catastrophizing, pain-related fear, social support and health status of older people with knee OA. The goodness of fit index, including the comparative fit index (CFI), the non-normed fit index (NNFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA), were examined using SEM to estimate model fit to the data and to modify the model as necessary.

3 | RESULTS

3.1 | Characteristics of participants

As shown in Table 1, the mean age of participants was 68.96 years ($SD = 6.22$) and approximately 74% of the 220 participants were female. About 57% were married and 94% had an elementary level of education. Regarding knee pain, the mean knee pain duration was 3.99 years ($SD = 4.56$) and 104 participants (47.27%) had bilateral knee pain. With respect to knee pain severity, the mean pain score was 6.32 ($SD = 2.30$). About 75% of participants used medication for pain reduction. For underlying disease, about 27% had metabolic syndromes, such as hypertension. Approximately 10% of participants did not go to exercise and about 38% had obesity.

TABLE 1 Participants' characteristics

Characteristic	N (%)	Mean (SD)	Range
Age (years)		68.96 (6.22)	60.00–87.00
Gender			
Female	162 (73.64)		
Male	58 (26.36)		
Marital status			
Married	125 (56.82)		
Single (never married)	14 (6.36)		
Separated	3 (1.36)		
Divorced	4 (1.82)		
Widowed	74 (33.64)		
Level of education			
No school	1 (0.45)		
Lower than elementary school	7 (3.18)		
Elementary school	206 (93.64)		
High school	6 (2.73)		
Income			
Lower than 5,000 baht	169 (76.82)		
5,001 to 10,000 baht	43 (19.55)		
10,001 to 15,000 baht	6 (2.73)		
15,001 to 20,000 baht	2 (0.91)		
Knee pain duration (years)		3.99 (4.56)	.02–32.49
Knee pain side			
One side	116 (52.73)		
Both sides	104 (47.27)		
Pain intensity level		6.32 (2.30)	1–10
Pain reduction			
Pain medication	164 (74.55)		
Quadiceps muscle exercise	70 (31.82)		
Decreasing use of joint	38 (17.27)		
Co-morbidities			
Hypertension	60 (27.27)		
Diabetes	34 (15.45)		
Cardiovascular disease	4 (1.82)		
Chronic kidney disease	6 (2.73)		
Exercise behavior			
Never	21 (9.55)		
Once a month	24 (10.91)		
1 to 2 times a week	50 (22.73)		
2 to 3 times a week	19 (8.64)		
3 to 5 times a week	43 (19.55)		
	63 (28.64)		

TABLE 1 (Continued)

Characteristic	N (%)	Mean (SD)	Range
More than 5 times a week			
Body mass index (kg m ⁻²)		23.93 (4.17)	12.89–37.78
Underweight (<18.5)	16 (7.27)		
Normal (18.5–22.9)	80 (36.36)		
Overweight (23–24.9)	41 (18.64)		
Obesity (>25)	83 (37.73)		

Note: Participants could have one or more co-morbidities and pain reduction method.

3.2 | Characteristics of study variables and correlations

As Table 2 shows, the participants had moderate scores on pain catastrophizing, pain-related fear, self-efficacy, and health status. However, they had high scores on social support. Regarding correlations (Table 3), social support and self-efficacy showed significant positive correlations with health status. As expected, negative correlations existed between pain catastrophizing and health status. However, no significant correlations were found for pain-related fear and health status.

Previous studies indicated the relationships between: (a) social-demographic characteristics and self-efficacy for arthritis management (Pattayakorn et al., 2010; Rayahin et al., 2014; Shelby et al., 2008); and (b) social-demographic characteristics and health status (Marks, 2007; Shelby et al., 2008; Somers et al., 2009). Thus, we analyzed the correlations among age, body mass index, education level, self-efficacy for arthritis management, and health status to identify the potential effect of them on the model. There were no correlations between health status and (a) age ($r = -.06$, $p = .40$), (b) body mass index ($r = -.09$, $p = .20$), and (c) education level ($r = .12$, $p = .08$). Age ($r = .08$, $p = .23$), body mass index ($r = -.09$, $p = .19$), and education level ($r = .02$, $p = .73$) were not associated with self-efficacy for arthritis management. Similarly, although knee pain duration

TABLE 2 Descriptive statistics of pain catastrophizing, pain-related fear, social support, self-efficacy, and health status

Variable	Possible range	Actual range	Mean	SD
Pain catastrophizing	0–52	2–48	24.65	10.35
Pain-related fear	11–44	20–39	29.97	3.86
Social support	15–75	38–75	61.96	9.37
Self-efficacy	8–80	19–80	50.32	13.22
Health status	0–10	2.76–9.11	6.25	1.31

TABLE 3 Correlations among study variables

Variable	1	2	3	4	5
1. Pain catastrophizing	1				
2. Pain-related fear	.34**	1			
3. Social support	.07	.17*	1		
4. Self-efficacy	-.48**	-.15*	.07	1	
5. Health status	-.35**	.02	.16*	.34**	1

* $p < .05$; ** $p < .01$.

was so long (ranging from 0.02 to 32.49 years), the relationships between knee pain duration and (a) self-efficacy ($r = -.09$, $p = .19$); and (b) health status ($r = -.11$, $p = .09$) did not exist. Thus, we did not include these social-demographic characteristics in the model.

3.3 | Path model of health status of older people with knee OA

A hypothesized model (Figure 1) was tested using Chi-square analysis. The results indicated that it was statistically nonsignificant ($\chi^2 = .16$; $df = 4$; $p = .99$; CFI = 1.00, NNFI = 1.08, SRMR = .01, and RMSEA = .00). The model explained 19.20% of variance in health status and 23.60% in self-efficacy. The direct effect, indirect effect, and total effect among study variables are shown in Table 4.

4 | DISCUSSION

The aim of this study was to examine a causal model of health status among Thai older people with knee OA. The results indicated that the proposed model showed an acceptable fit with the data. Pain catastrophizing had negative direct and indirect effects on the health status of older people with knee OA. Social support had no direct effect on self-efficacy, but had a positive direct effect on health status. In addition, social support had no indirect effect on health

status through self-efficacy. Pain-related fear had no direct or indirect effect on health status.

Our model explained only 19.2% of variance on health status of older people with knee OA. This modest result may perhaps be because of the homogeneity of participants' socioeconomic status. Less variability may have reduced their ability to explain health status. Our findings were not congruent with the results of a previous study using Braden's self-help theory as a conceptual framework (Pattayakorn et al., 2010), in which the causal relationships among disease severity, social support, socioeconomic status, and self-efficacy explained 44% of variance in life satisfaction among older people with knee OA. In this study, pain catastrophizing, pain-related fear, and social support were antecedents. Self-efficacy was tested as a mediator. We also conceptualized health status as an outcome variable. Although it showed a similar pattern of relationship, different variables of interest and measures might introduce inconsistent results.

As expected, the higher level of pain catastrophizing that older people with knee OA reported, the lower their score on health status. This finding was congruent with the results of previous studies in which older people with knee OA with higher pain catastrophizing, had poorer health status in terms of increased pain intensity level and limitations in performing physical functions (Burns et al., 2015; Helminen et al., 2016; Rayahin et al., 2014; Sinikallio et al., 2014; Somers et al., 2009). It is theorized that when older people score highly on pain catastrophizing, their perception of symptoms is more severe and thus this may limit their physical function (Sinikallio et al., 2014). Pain catastrophizing also had a negative relationship on self-efficacy. In addition, the relationship between pain catastrophizing and health status was mediated by self-efficacy, which was consistent with the findings reported by Shelby et al. (2008). The relationship among these variables could be explained by the Braden's self-help theory, in which people who had high perceptions on their negative ability to deal with pain can experience reduced perceptions of enabling skills, such as self-efficacy, which in turn influences their health status, an

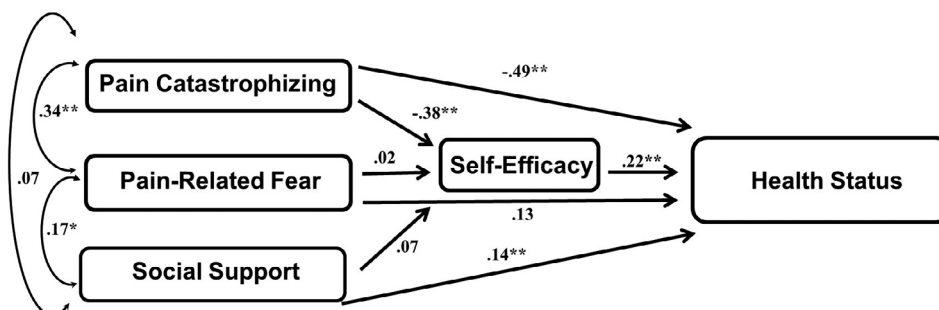


FIGURE 1 A model of health status in Thai older adults with knee osteoarthritis. **Path coefficients significant at .01; *Path coefficients significant at .05; model fit statistics: $\chi^2 = .16$; $df = 4$; $p = .99$, comparative fit index (CFI) = 1.00, non-normed fit index (NNFI) = 1.08, standardized root mean square residual (SRMR) = .01, and root mean square error of approximation (RMSEA) = .00

TABLE 4 Direct, indirect, and total effects of the model

Variable	Self-efficacy			Health status		
	Direct	Indirect	Total	Direct	Indirect	Total
Pain catastrophizing	-.49**	—	-.49**	-.38**	-.11**	-.49**
Pain-related fear	.02	—	.02	.13	.00	.13
Social support	.07	—	.07	.14**	.02	.16**
Self-efficacy	—	—	—	.22**	—	.22**

Note: R^2 of self-efficacy = 23.60%; R^2 of health status = 19.20%; R^2 = squared multiple correlations for structural equations.

** $p < .01$.

indicator of quality of life (Braden, 1990). Although there was a correlation between pain catastrophizing and health status, the degree of correlation was moderate. Possibly this is because participants with only mild knee OA may have been included in this study, resulting in less heterogeneity.

Our results also indicated that self-efficacy had a direct positive effect on health status. The findings were consistent with those of a previous study, in which older people with high perceptions of self-efficacy for arthritis management had a good health status in terms of less pain intensity level, less physical and psychological disability, and improved physical functions (Helminen et al., 2016; Pells et al., 2008; Rayahin et al., 2014). However, self-efficacy had a moderate positive correlation with health status. These results were consistent with the results of Pells et al. (2008). Although participants had moderate scores on self-efficacy for arthritis management, self-efficacy may not be the only factor people need to have in order to improve their health status. Other factors, such as self-management may possibly share an explanation in factors associating with health status because self-management aims to minimize the impact of chronic disease on physical health and function (Rijken, Jones, Heijmans, & Dixon, 2008).

There was low positive correlation between social support and health status, which contrasts with Sherman et al.'s (2006) results which showed a moderate positive correlation between social support and health status. The low correlations may be because social support is more likely to be associated with psychosocial outcomes, such as depressive symptoms, than health status (Sherman et al., 2006). Social support had positive direct effect with health status, which is congruent with the results of previous studies, in which social support tended to positively contribute to health status (Sherman et al., 2006), as well as life satisfaction and positive well-being (Pattayakorn et al., 2010). Conversely, our results were not consistent with those of a previous study (Aree-Ue et al., 2016), which indicated that social support had no direct effect on the health status of older people with knee OA. The contrasting findings might be due to different settings and participant characteristics. Most participants in our study lived with their family members or relatives and

this may have led to high scores on perceptions of tangible and affectionate support and moderate scores on social interaction and emotional support. This may positively influence their perception of health status. Moreover, participants included a higher number of older people with obesity and this frequently leads to greater knee OA symptom severity in terms of pain (Sowers & Karvonen-Gutierrez, 2010). Similar to people with severe chronic conditions, such as rheumatic disease, higher perception on social support was directly perceived to facilitate them to minimize symptom severity, which could then lead to a better health status (Brooks, Andrade, Middleton, & Wallen, 2014).

Our results indicated there was no association between social support and self-efficacy for arthritis management. Our results contrasted with those of a previous study, in which the greater social support, the higher the self-efficacy of older people with knee OA (Pattayakorn et al., 2010). The contrasting finding might be due to Thai culture related to caring. Due to unstable gait resulting from knee OA symptoms, family members usually take care of older people with all activities and may not allow older people to walk in order to minimize falls, which might cause death and disability. Thai people tend to be very protective about older people and this may not improve perceived self-efficacy for those with arthritis.

There was no association between pain-related fear of movement and health status, which were not consistent with the results of Perry and Francis (2013) and Scopaz et al. (2009). These results may be because other factors, such as pain catastrophizing, may better explain the health status of older people with knee OA than pain-related fear of movement (Somers et al., 2009). Pain-related fear of movement had neither a significant direct effect nor indirect effect on health status through self-efficacy. In addition, pain-related fear of movement had no relationship with self-efficacy. Our findings were not congruent with previous studies (Helminen et al., 2016; Perry & Francis, 2013; Scopaz et al., 2009; Sinikallio et al., 2014; Somers et al., 2009), in which pain-related fear of movement was associated with physical performance and disability; and self-efficacy. According to the fear-avoidance model, people will perform activity or movement based on their fear of pain (Lethem, Slade,

Troup, & Bentley, 1983). Although older people with knee OA participating in this study had a low to moderate score on pain-related fear of movement and had moderate pain intensity levels, they were able to regularly perform exercise. It is possible that they might have less symptom severity and less limitation in movement resulting from the disease. They might overcome their fear to perform regular exercise using confrontation since it is considered as one of the responses to the fear (Lethem et al., 1983). Thus, pain-related fear of movement was not related to their self-efficacy and health status.

4.1 | Limitations of the study

This study had limitations. Although the study was guided by the Braden self-help theory, only selected variables were included in the model, which may affect the power of model explanation. In future studies, the model needs more specification by adding other antecedents, such as disease severity or mediating, such as self-management variables to improve variance explanation. In addition, a cross-sectional design was used and all variables were simultaneously assessed. Only associations among study variables can be discussed; however, it could limit the explanation on inferences of causality. To confirm a causal effect of the study variables, future longitudinal study designs are indicated to further explore the model. All measures used in this study were self-reported, which may limit understanding on physical performance, an indicator of health status. Thus, future research should include actual physical performance variables, such as a timed get-up-and-go test. Although the sample size in this study was large enough to detect levels of significance, using convenience sampling can bias sample selection, and thus limit generalizability of the findings.

5 | CONCLUSION

The results in this study provided a better understanding of health status of older people with knee OA. Lower levels of pain catastrophizing could improve self-efficacy, which could lead to improvement in health status. Higher levels of social support could also increase the health status of older people with knee OA. Our results highlight the need to provide healthcare professionals with education that addresses the influence of pain catastrophizing and social support on self-efficacy and health status. The intervention should target minimizing pain catastrophizing, and encourage family members to provide proper support as well as promoting self-efficacy in OA management, which could ultimately result in a better quality of life.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

P.Y., Y.S., and S.A. contributed to conception and study design. P.Y. and Y.S. performed data collection. P.Y. analyzed the data and prepared the draft of the manuscript. P.Y., Y.S., and S.A. critically reviewed, revised, and approved content of the final manuscript.

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REFERENCES

- Aree-Ue, S., Roopsawang, I. & Belza, B. (2016). Self-regulation in older Thai women with self-reported knee osteoarthritis: A path analysis. *Journal of Women & Aging*, 28(3), 247–258.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215.
- Braden, C. J. (1990). A test of the self-help model: Learned response to chronic illness experience. *Nursing Research*, 39(1), 42–47.
- Brooks, A. T., Andrade, R. E., Middleton, K. R. & Wallen, G. R. (2014). Social support: A key variable for health promotion and chronic disease management in Hispanic patients with rheumatic diseases. *Clinical Medicine Insights: Arthritis and Musculoskeletal Disorders*, 7, 21–26. <https://doi.org/10.4137/CMAMD.S13849>.
- Burns, L. C., Ritvo, S. E., Ferguson, M. K., Clarke, H., Seltzer, Z. E. & Katz, J. (2015). Pain catastrophizing as a risk factor for chronic pain after total knee arthroplasty: A systematic review. *Journal of Pain Research*, 8, 21–32. <https://doi.org/10.2147/JPR.S64730>.
- Cohen, S. (2004). Social relationships and health. *American Psychologist*, 59(8), 676–684. <https://doi.org/10.1037/0003-066X.59.8.676>.
- Ferreira, V. M. & Sherman, A. M. (2007). The relationship of optimism, pain and social support to well-being in older adults with osteoarthritis. *Aging & Mental Health*, 11(1), 89–98. <https://doi.org/10.1080/13607860600736166>.
- Hawker, G. A. (2009). Experiencing painful osteoarthritis: What have we learned from listening? *Current Opinion in Rheumatology*, 21(5), 507–512. <https://doi.org/10.1097/BOR.0b013e32832e99d7>.
- Helminen, E. E., Sinikallio, S. H., Valjakka, A. L., Vaisanen-Rouvali, R. H. & Arokoski, J. P. (2016). Determinants of pain and functioning in knee osteoarthritis: A one-year prospective study. *Clinical Rehabilitation*, 30(9), 890–900. <https://doi.org/10.1177/0269215515619660>.
- Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd edn). New York, NY: Guilford Press.

- Kuptniratsaikul, V., Tosayanonda, O., Nilganuwong, S. & Thamalikitkul, V. (2002). The epidemiology of osteoarthritis of the knee in elderly patients living an urban area of Bangkok. *Journal of the Medical Association of Thailand*, 85(2), 154–161.
- Lethem, J., Slade, P. D., Troup, J. D. G. & Bentley, G. (1983). Outline of a fear-avoidance model of exaggerated pain perception—I. *Behaviour Research and Therapy*, 21(4), 401–408.
- Lorig, K., Chastain, R. L., Ung, E., Shoor, S. & Holman, H. R. (1989). Development and evaluation of a scale to measure perceived self-efficacy in people with arthritis. *Arthritis and Rheumatism*, 32(1), 37–44.
- Luger, T., Cotter, K. A. & Sherman, A. M. (2009). It's all in how you view it: Pessimism, social relations, and life satisfaction in older adults with osteoarthritis. *Aging & Mental Health*, 13(5), 635–647. <https://doi.org/10.1080/13607860802534633>.
- Marks, R. (2007). Physical and psychological correlates of disability among a cohort of individuals with knee osteoarthritis. *Canadian Journal on Aging*, 26(04), 367–377. <https://doi.org/10.3138/cja.26.4.367>.
- Murphy, L. & Helmick, C. G. (2012). The impact of osteoarthritis in the United States: A population-health perspective. *The American Journal of Nursing*, 112(3), S13–S19. <https://doi.org/10.1097/01.NAJ.0000412646.80054.21>.
- Pattayakorn, P., Hanucharunkul, S., Goeppinger, J., Vorapongsathorn, T., Malathum, P. & Chotaphuthi, T. (2010). Factors influencing life satisfaction among older Thai women with knee osteoarthritis. *Pacific Rim International Journal of Nursing Research*, 14(1), 3–16.
- Pells, J. J., Shelby, R. A., Keefe, F. J., Dixon, K. E., Blumenthal, J. A., LaCaille, L. *et al.* (2008). Arthritis self-efficacy and self-efficacy for resisting eating: Relationships to pain, disability, and eating behavior in overweight and obese individuals with osteoarthritic knee pain. *Pain*, 136(3), 340–347. <https://doi.org/10.1016/j.pain.2007.07.012>.
- Perry, E. V. & Francis, A. J. P. (2013). Self-efficacy, pain related fear, and disability in a heterogeneous pain sample. *Pain Management Nursing*, 14(4), e124–e134. <https://doi.org/10.1016/j.pmn.2011.09.001>.
- Rayahin, J. E., Chmiel, J. S., Hayes, K. W., Almagor, O., Belisle, L., Chang, A. H. *et al.* (2014). Factors associated with pain experience outcome in knee osteoarthritis. *Arthritis Care & Research*, 66(12), 1828–1835. <https://doi.org/10.1002/acr.22402>.
- Ren, X. S., Kazis, L. & Meenan, R. F. (1999). Short-form arthritis impact measurement scales 2: Tests of reliability and validity among patients with osteoarthritis. *Arthritis Care & Research*, 12(3), 163–171. [https://doi.org/10.1002/1529-0131\(199906\)12:3<163::AID-ART3>3.0.CO;2-Z](https://doi.org/10.1002/1529-0131(199906)12:3<163::AID-ART3>3.0.CO;2-Z).
- Rijken, M., Jones, M., Heijmans, M. & Dixon, A. (2008). Supporting self-management. In: E. Nolte & M. McKee (Eds), *Caring for people with chronic condition* (1st. edn, pp. 116–142). Maidenhead, England: McGraw-Hill.
- Rungruangsiripan, M., Sitthimongkol, Y., Maneesriwongul, W., Talley, S. & Vorapongsathorn, T. (2011). Mediating role of illness representation among social support, therapeutic alliance, experience of medication side effects, and medication adherence in persons with schizophrenia. *Archives of Psychiatric Nursing*, 25(4), 269–283. <https://doi.org/10.1016/j.apnu.2010.09.002>.
- Scopaz, K. A., Piva, S. R., Wisniewski, S. & Fitzgerald, K. (2009). Relationships of fear, anxiety, and depression with physical function in patients with knee osteoarthritis. *Archives of Physical Medicine and Rehabilitation*, 90, 1866–1873.
- Shelby, R. A., Somers, T. J., Keefe, F. J., Pells, J. J., Dixon, K. E. & Blumenthal, J. A. (2008). Domain specific self-efficacy mediates the impact of pain catastrophizing on pain and disability in overweight and obese osteoarthritis patients. *The Journal of Pain*, 9(10), 912–919. <https://doi.org/10.1016/j.jpain.2008.05.008>.
- Sherbourne, C. D. & Stewart, A. L. (1991). The MOS social support survey. *Social Science & Medicine*, 32(6), 705–714. [https://doi.org/10.1016/0277-9536\(91\)90150-B](https://doi.org/10.1016/0277-9536(91)90150-B).
- Sherman, A. M., Shumaker, S. A., Rejeski, J. W., Morgan, T., Applegate, W. B. & Ettinger, W. (2006). Social support, social integration, and health-related quality of life over time: Results from the fitness and arthritis in seniors trial (FAST). *Psychology & Health*, 21(4), 463–480. <https://doi.org/10.1080/14768320500380881>.
- Sinikallio, S. H., Helminen, E. E., Valjakka, A. L., Vaisanen-Rouvali, R. H. & Arokoski, J. P. (2014). Multiple psychological factors are associated with poorer functioning in a sample of community-dwelling knee osteoarthritis patients. *Journal of Clinical Rheumatology: Practical Reports on Rheumatic & Musculoskeletal Diseases*, 20(5), 261–267. <https://doi.org/10.1097/RHU.000000000000123>.
- Somers, T. J., Keefe, F. J., Pells, J. J., Dixon, K. E., Waters, S. J., Riordan, P. A. *et al.* (2009). Pain catastrophizing and pain-related fear in osteoarthritis patients: Relationships to pain and disability. *Journal of Pain and Symptom Management*, 37(5), 863–872. <https://doi.org/10.1016/j.jpainsymman.2008.05.009>.
- Sowers, M. R. & Karvonen-Gutierrez, C. A. (2010). The evolving role of obesity in knee osteoarthritis. *Current Opinion in Rheumatology*, 22(5), 533–537. <https://doi.org/10.1097/BOR.0b013e32833b4682>.
- Sullivan, M. J., Bishop, S. R. & Pivik, J. (1995). The pain catastrophizing scale: Development and validation. *Psychological Assessment*, 7(4), 524–532. <https://doi.org/10.1037/1040-3590.7.4.524>.
- Sullivan, M. J., Thorn, B., Haythornthwaite, J. A., Keefe, F., Martin, M., Bradley, L. A. *et al.* (2001). Theoretical perspectives on the relation between catastrophizing and pain. *The Clinical Journal of Pain*, 17(1), 52–64.
- Trongsakul, S., Lambert, R., Clark, A., Wongpakaran, N. & Cross, J. (2015). Development of the Thai version of mini-cog, a brief cognitive screening test. *Geriatrics and Gerontology International*, 5, 594–600. <https://doi.org/10.1111/ggi.12318>.
- Woby, S. R., Roach, N. K., Urmston, M. & Watson, P. J. (2005). Psychometric properties of the TSK-11: A shortened version of the Tampa scale for kinesophobia. *Pain*, 117(1–2), 137–144. <https://doi.org/10.1016/j.pain.2005.05.029>.
- Youngcharoen, P., Aree-Ue, S. & Saraboon, Y. (2018). Validation of pain catastrophizing scale Thai version in older adults with knee osteoarthritis. *Pacific Rim International Journal of Nursing Research*, 22(3), 237–248.
- Zhang, Y. & Jordan, J. M. (2010). Epidemiology of osteoarthritis. *Clinics in Geriatric Medicine*, 26(3), 355–369. <https://doi.org/10.1016/j.cger.2010.03.001>.

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