

## **The Effect of a Group Support Enhancing Self-Management Program on Lifestyle Modification Behaviors among Indonesian Older Adults with Knee Osteoarthritis**

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### **Abstract**

Osteoarthritis, as a common type of degenerative joint disease, puts older adults at high risk. It could impact the wellbeing of older adults, including physical, psychological, social, and economic factors. The aim of this study was to examine the effect of group support enhancing a self-management program on lifestyle modification behaviors among Indonesian older adults with knee osteoarthritis. Seventy-nine participants who met the inclusion criteria were recruited and assigned into the experimental group and the control group. Lifestyle modification behavior was measured during the first week, and after 6 weeks, of the program by using a Lifestyle Modification Behaviors Questionnaire (LMBQ). The internal consistency reliability coefficient of the LMBQ was 0.84. An independent *t*-test was conducted to examine the between group effect of the program. There was a statistically significant difference in lifestyle modification behaviors between the experimental group and the control group after receiving the program ( $t = 18.19, p = < 0.05$ ). The group support enhancing self-management program effectively improved lifestyle modification behaviors among Indonesian older adults with knee osteoarthritis.

**Keywords:** Group support, self-management, older adults, lifestyle modification behaviours, knee osteoarthritis

### **Introduction**

Older adults are at high risk of having osteoarthritis (OA) because it is one of the most common degenerative joint diseases [1]. The prevalence of OA in Indonesia is higher among people of 55 - 60 years of age, and knee OA is the most frequent type of OA, with 89.1 % of cases [2]. Furthermore, a study that was conducted to examine the characteristics of patients with knee OA who came to OPD found that 45.58 % of patients were aged 60 - 65 years old, and 53.26 % were more than 65 years old [3].

The main impact of knee OA is joint pain. However, the majority of older adults view this as a normal condition of the aging process [4]. In fact, joint pain might have various impacts on the wellbeing of older adults with knee OA, including limitations in movement, disability, or loss of mobility [5], anxiety, depression [6], social activity limitation [7], and dependency on family and health care providers.

In practice, there is a range of pharmacological managements for pain in knee OA [8]. Acetaminophen, or a combination of acetaminophen with NSAIDs, is a commonly used and recommended primary analgesic by general practitioners to relieve pain symptoms [9]. However, giving analgesic medication to older adults can induce hepatotoxicity, due to a decrease in hepatic metabolism, as well as NSAID potentially inducing gastrointestinal toxicity and renal insufficiency [10].

Because of this undesirable effect, it is important to consider using non-pharmacological intervention to treat knee OA [11]. European League Against Rheumatism (EULAR) suggests lifestyle modification behaviors as non-pharmacological management for knee OA, including exercise, weight control, and posture practice to prevent joint injury [12]. A study about the effects of lifestyle behavior modification, including weight management and exercise in patients with knee OA, found significant differences in pain [13]. Furthermore, a study that reviewed strengthening exercises in patients with knee OA showed that both specific quadriceps strengthening exercises and strength training for the lower limbs were effective in reducing pain [14].

However, one previous study found lack of motivation, lack of knowledge, and feeling tired as factors related to older adults' participation in performing exercise behaviors [15]. Self-management skills, which consisted of 3 components: self-monitoring, self-evaluation, and self-reinforcement, can be one of the ways to overcome the factors related to behavior changes including exercise [16]. This emphasizes the ability of patients with chronic illness to be responsible for their behaviors in managing the consequences of their diseases [17]. Numerous studies have been conducted to examine the effectiveness of self-management for patients with knee OA [13,18,19]. An example of this was a 6-week nurse-led tailored self-management program implemented in Chinese older adults with knee OA, which confirmed that the self-management program was effective in reducing pain, including pain intensity and pain interference [18].

Self-management can be provided by the individual or in a group. One study revealed that adding group support to a self-management program was found to be beneficial in improving confidence to maintain new behavior [20]. Several previous studies were conducted in the general population, whereas few studies were performed in older adults [13,18,19] or on the pain sensitivity of older adults with knee OA increasing due to the aging process [21]. Therefore, to apply a self-management program to this aged population, as well as to consider the local cultural context of the setting, was important.

In Indonesian tradition, the older adults usually live with their children, and they are dependent on the family to deal with their problems, including physical, psychological and social problems [22]. Furthermore, most Indonesian people prefer to create close relationships with their neighbours and solve problems together. Therefore, it is important to conduct a group support enhancing self-management program, and involve family members in lifestyle modification behaviors, including exercise and posture practice among Indonesian older adults with knee OA. This program will use group activity in discussions and education sessions to enhance each activity in the self-management program. In this study, group support activity is expected to facilitate all participants to motivate and support each other to implement their self-management program in modifying their lifestyle.

## **Materials and methods**

A quasi-experimental study was used to examine the effect of the group support enhancing self-management program on lifestyle modification behaviors among older adults with knee osteoarthritis. Lifestyle modification behavior was identified before and after conducting the group support enhancing self-management program, and the resulting scores were compared between the 2 groups. This study was conducted at 4 primary health care units that have integrated health services for the elderly, in Bandung, West Java Province, Indonesia, from December 2016 to March 2017.

The sample in this study was taken from primary health care units by using purposive sampling technique. The sample size calculation was based on power analysis from a previous study [18]. The effect size calculation of that study was 0.70. According to Polit and Beck [23], with a significance level of 0.05, power of 0.80, and effect size of 0.70, at least 40 subjects were required per group, where one group received the group support enhancing self-management program and usual care, and the other group received only the usual care. The sample of this study was taken from 4 primary health care units that had integrated health services for the elderly. Then, the researchers randomly selected 2 primary health care units and assigned them to either the experimental group or the control group by using a lottery technique. Participants were recruited based on the inclusion criteria; then, the participants were randomly assigned to either the experimental group or control group by using matching technique based

on age, gender, body mass Index, and level of severity of knee OA by using the Lequesne index based on subjective symptoms [24]. This process was run until 80 older adults with knee OA (40 each group) were obtained. The inclusion criteria were people who were 60 years and above; without cognitive impairment by a score over 24 in Mini Mental State Examination (MMSE) [25]; without depression by a score < 3 by using the patient health questionnaire-2 (PHQ-2) [26]; were not undergoing joint surgery treatment, were able to communicate in Indonesian language, both verbally and written; had a family member who stayed with the older adults with knee OA; and were able to be contacted by telephone and home visit. The experiment group received the group support enhancing self-management program and usual care, while the control group received usual care only. Finally, 79 participants completed the study. Thirty-nine participants were in the experimental group, and 40 participants were in the control group.

#### **Data collection**

Data collection was conducted after receiving approval from the Faculty of Nursing, Prince of Songkla University, Thailand, and the Head of Public Health Care in Bandung. Eligible participants were identified from medical records. Then, the older adults with knee OA completed the pre-test questionnaires, consisting of a demographic data questionnaire and a lifestyle modification behaviours questionnaire (LMBQ). The LMBQ was developed by the researchers based on a literature review on exercise and posture practice to prevent joint injury. The LMBQ consisted of 17 items: exercise (8 items), and posture practice to prevent joint injury (9 items). Each item was measured by using a 4-point (1 - 4) Likert scale. The total score of the LMBQ ranged from 1 - 68. Higher scores indicated the frequency of performing lifestyle modification behaviors. An English version of the LMBQ was tested for content validity by 3 experts, and the content validity score was 0.87. The internal consistency reliability of the LMBQ in the Indonesian version yielded a Cronbach Alpha coefficient of 0.84. Next, the older adults with knee OA in the experimental group received the group support enhancing self-management program for 6 weeks.

#### **Procedure of the group support enhancing self-management program**

The program was conducted for a duration of 6 weeks. Participants in the experimental group received the group support enhancing self-management program, which consisted of reflection from older adults and their family members on their previous behaviors in managing joint pain, providing specific information lifestyle modification behaviors in a group education session, discussion in a group activity to compare their current behaviors with the expected behaviors, assisting older adults and their family to set goal(s) and action plan(s), assisting participants and their family to develop personal reinforcement strategies, and weekly follow-ups by face-to-face and telephone. The details of program were as follows: in the first week, intervention was conducted in the primary health care unit. The activity in this week was reflected on in the self-monitoring process to observe and monitor their previous behaviors. The second week, the researchers facilitated the group support activity for older adults with knee OA in a community setting. The researchers provided health education for 1 h duration in a group session; then, the researchers helped the older adults with knee OA and their families to decide on behaviors that they wanted to develop, modify, change, or maintain. Following this, the researchers assisted the older adults with knee OA to set specific, measurable, rational goal(s), develop an action plan(s) and generate their personal goal achievements. In the third week of intervention, the researchers facilitated a group activity for older adults with knee OA and their families. In this group activity, they also helped each other by supporting and motivating each other in maintaining good behaviors. In the fourth week intervention, the researchers made follow-up home visits to the older adults with knee OA to evaluate the implementation based on the action plan and goals. In the fifth week of intervention, the researchers conducted follow-ups by phone to support the older adults with knee OA in performing their action plans, and evaluated the implementation of the action plan based on the goal. In the sixth week intervention, the researchers facilitated the group activity for older adults with knee OA in a community setting. The researchers facilitated the group members to meet again to discuss and identify together the barriers to implementing their action plans, and helped them to find solutions to the barriers.

### Data analysis

Descriptive statistics were used to analyze and describe the demographic data and health information of the participants. The comparison of the proportion of demographic and health information between the 2 groups was tested using the Pearson Chi-Square test, Likelihood Ratio test, and Independent *t*-test. Before determining statistical analysis, the assumptions of normality and homogeneity of variance for inferential statistic variables were checked, before determining the appropriate statistical analysis. The assumptions were met, and the researchers used Independent *t*-test for testing the mean differences score of lifestyle modification behaviors between groups who received the group support enhancing self-management program. Then, dependent *t*-test was used to test the mean score differences in those who received group support enhancing self-management program, before and after the program.

### Results and discussion

#### Demographic Data and Health related Information

There was no significant difference between the experiment group and the control group at the baseline of the lifestyle modification behaviors in older adults with knee osteoarthritis.

**Table 1** Demographic data and health related information.

Characteristic	Experimental group (n = 39)		Control group (n = 40)		Statistic values	p
	n	%	n	%		
Age (years)	(M = 70.46, SD = 4.806)		(M = 70.90, SD = 4.717)		-.40 <sup>a</sup>	.68
Gender						
Male	19	48.7	20	50	.13 <sup>b</sup>	.90
Female	20	51.3	20	20		
Religion						
Islam	39	100	40	100	-	-
Marital Status						
Married	29	74.4	30	75	.004 <sup>b</sup>	.94
Widowed	10	25.6	10	25		
Education Level						
Primary School	18	46.2	18	45	.74 <sup>c</sup>	.86
Secondary School	12	30.8	12	30		
High School	7	17.9	6	15		
College or higher	2	5.1	4	10		
Occupation						
Housewife	18	46.2	5	12.5	7.75 <sup>c</sup>	.10
Farmer	10	25.6	18	45.0		
Retired	6	15.4	14	35.0		
Others	3	7.7	3	7.5		
Private employee	2	5.1	0	0		
Medication						
No Use	8	20.5	4	10	2.35 <sup>c</sup>	.50
Paracetamol	10	25.6	15	37.5		
NSAID	20	51.3	20	50		
Glucosamine	1	2.6	1	2.5		
Frequency use medication						
One time a day	3	7.7	8	20	4.12 <sup>c</sup>	.30
Two times a day	20	51.3	20	50		
Three times a day	2	5.1	1	2.5		

Characteristic	Experimental group (n = 39)		Control group (n = 40)		Statistic values	p
	n	%	n	%		
If pain	6	15.4	7	17.5		
No use	8	20.5	4	10		
Comorbid disease						
Diabetes	5	12.8	8	20	6.13 <sup>c</sup>	.18
Hypertension	20	51.3	21	52.5		
Heart Disease	3	7.7	0	0		
Asthma	3	7.7	1	2.5		
No comorbid disease	8	20.5	10	25		
Alternative Therapy						
Yes	5	12.8	3	7.5	.48 <sup>d</sup>	.34
No	34	87.2	37	92.5		
Level of knee OA severity					1.90 <sup>c</sup>	.38
Mild	8	20.8	9	22.5		
Moderate	21	52.7	21	52.5		
Severe	10	25.2	10	25.0		
BMI (Min–Max = 20–35)	<i>(M = 26.95, SD = 4.06)</i>		<i>(M = 27.36, SD = 3.60)</i>		.48 <sup>a</sup>	.63
Duration of illness	<i>(M = 12.92, SD = 4.06)</i>		<i>(M = 11.60, SD = 7.28)</i>		.77 <sup>a</sup>	.44

Note: *M* = Mean, *SD* = Standard Deviation

<sup>a</sup> = Independent *t*-test, <sup>b</sup> = Chi Square, <sup>c</sup> = Likelihood Ratio, <sup>d</sup> = Fisher's Exact Test

#### Effects of group support enhancing self-management program on lifestyle modification behaviors

Table 2 shows that the mean score of lifestyle modification behaviors in the experimental group (*M* = 62.97, *SD* = 3.41) was significantly higher than in the control group (*M* = 47.15, *SD* = 4.25). There was a significant difference in lifestyle modification behaviors after receiving the group support enhancing self-management program between the participants in the experimental and the control group (*t* = 18.19, *p* < 0.05).

Table 2 Pre-test and post-test mean scores of lifestyle modification behaviours.

Variables	Experimental Group (n = 39)			Control Group (n = 40)			<i>t</i>	<i>p</i>
	Min-Max	<i>M</i>	<i>SD</i>	Min-Max	<i>M</i>	<i>SD</i>		
Pre-Test								
Lifestyle modification behaviors	25-47	34.51	5.63	17-51	32.58	6.37	1.43	0.15
Exercise	8-22	15.10	4.08	8-26	13.80	4.47	1.35	0.18
Posture Practice	15-27	19.41	2.78	6-29	18.78	7.71	0.85	0.39
Post-Test								
Lifestyle modification behaviors	55-68	62.97	3.41	39-60	47.15	4.25	18.19	0.00
Exercise	24-32	29.36	2.45	18-27	21.70	2.33	14.21	0.00
Posture Practice	27-36	33.62	1.99	26-33	25.45	2.96	14.33	0.00

Note: *M* = Mean, *SD* = Standard Deviation

## **Discussion**

### **The effect of group support enhancing self-management program on lifestyle modification behaviors**

The following reasons helped to explain the effectiveness of the group support enhancing self-management program that was implemented in this study on lifestyle modification behaviors. Firstly, the group support enhancing self-management program was applied. Self-management is the capability of a person to be responsible for their behavior in managing the symptoms, treatment, and changes in lifestyle. This consists of 3 components: self-monitoring, self-evaluation and self-reinforcement [16]. All the components of self-management were applied in this study. Furthermore, the researchers included a group support activity to enhance the self-management process. In the group activity, the participants shared their experiences regarding their behaviors in managing joint pain. In this study, all the participants were Muslim, so they enthusiastically shared their experiences of modifying their posture to reduce joint pain when they were praying. By sharing their activity experiences, the group members could learn how to modify their lifestyles to manage joint pain. Moreover, they were also facilitated to motivate and support each other. A systematic review about the factors that contributed to participation in physical activity in adults with knee and hip OA found that social support was a possible factor that could influence the physical activity of adults with knee and hip OA [27]. In addition, the researchers also involved family members in all components of self-management. The family supported the older adults with knee OA to do activities based on the lists on their action plans. Furthermore, the family was also responsible for reminding the older adults whenever they forgot what kinds of activity they needed to do and to avoid. A meta-analysis was conducted regarding intervention in the treatment of patients with chronic physical diseases; it found that intervention by involving family members was more effective in improving physical health outcomes and decreasing mental health problems [28].

Secondly, the researchers used a combination of strategies in the process of self-management, including individual reflection and counselling, group education, goal setting, and weekly follow-ups by face-to-face and telephone. Individual reflection and counselling in this study could increase the awareness and intention of the participants regarding their behaviors to reduce joint pain of knee OA. By reflecting, participants knew what activities they should do and why they needed to conduct those activities. Furthermore, group education sessions in this study were group activities that could help participants to learn together regarding lifestyle modification behaviors aiming to control or reduce joint pain. After the sixth week of intervention, the lifestyle modification behaviors of the participants in the experimental group increased. This result was consistent with a previous study that conducted a group rehabilitation program that included education and exercise for 41 patients with moderate to severe knee OA for 8 weeks, and which saw significant improvement in behaviours and pain ( $p < 0.05$ ) [19].

In addition, in the self-evaluation process, the researchers asked the participants to set their goals and action plans. This could help them to take an active role in managing their lifestyle modification behaviors, based on their achievable goals and action plans. Furthermore, the action plan(s) were made by the participants, which gave them the chance to take an active role in modifying their lifestyle. The goals that were arranged clearly inspired the participants to determine any possible strategies to achieve the goals, and helped them to identify possible barriers in achieving the goals [16]. In this present study, the researchers also provided weekly follow-ups by face-to-face and telephone. In this weekly follow-up method, the researchers provided brief counselling to empower and support older adults with knee OA to perform their action plans. The participants were also able to share their barriers to implementing their action plans with the researchers, and revise their goals and action plans after discussing them.

## **Conclusions and recommendations**

In this study, the researchers applied group support to enhance a self-management program. The experimental group received the usual care as well as the group support enhancing self-management program for 6 weeks. Meanwhile, the control group received the usual care at primary health care units. The findings of this study showed that the group support enhancing self-management program effectively improved lifestyle modification behaviors among Indonesian older adults with knee osteoarthritis. Nurses

in the community can use the protocol of this study, encouraging group support and 6-week self-management activities, including weekly home visits or telephone follow-ups, to improve the lifestyle behaviors of older people with knee OA. In addition, as this study only measured the results after 6 weeks of the program, further study that continually follows-up at 3-6-12 months is recommended to determine whether or not the older people with knee OA are able to maintain their lifestyle behaviors. Also, as this study was conducted in primary health care units that had integrated comprehensive health services for the older population, including health promotion, prevention, and rehabilitation, and the group support activities were conducted in community settings where small groups of older people decided the place for this activity, this may limit its application in other settings.

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