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Self-Help Education as Outreach Program for Osteoarthritis Patients in Rural Korea

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Abstract

Purpose: This study was done to determine if osteoarthritis (OA) patients living in rural Korea would have a benefit from a structured group program focused on self-help strategies. **Methods**: A hundred and twenty-six patients with OA were recruited from nine Primary Health Care Posts. The experimental group received a 6-week self-help education program while the control group received usual care. T-tests and c2-tests were used to determine the homogeneity between the experimental and control groups. Independent sample t-tests were performed to determine the effect of the treatment program. To guard against such likelihood, the level of significance of t-test was determined by Bonferroni correction within the study constructs. When significant group differences were found in study variables at baseline, analysis of covariances (ANCOVAs) were used for group comparisons of outcome variables. **Results**: The experimental group reported more significant improvement in fatigue, difficulty with physical activity, depression, quality of life, self-efficacy, and health behaviors than did the control group. The experimental group also showed improvements in range of motion and muscle strength as compared to the control group. **Conclusion**: A self-help group education program was an effective and powerful strategy to promote physical and psychosocial health in OA patients

Key words : self-help groups, osteoarthritis, rural communities

Introduction

Osteoarthritis (OA) is the most common form of arthritis and can cause severe pain and disability. In

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2002, the management of arthritis was identified as one of the top priorities for the Korean National Health Promotion Planning (Choi, 2003). In Korea, the arthritis prevalence rate is 1.7-2.2 times higher in rural areas as compared to urban areas (Yoon & Kim, 2006), 4.2 times higher in females as compared to males. At this time, 96% of the physicians and 92% of hospital beds are concentrated in the cities in Korea (Oh, 2003) while patients living in rural communities can find it difficult to access health care services due to distance and poor transportation. Rural arthritis patients not only experience more severe pain and fatigue (Lee et al., 2001) but are also less confident in their ability to manage their arthritis pain as well as less likely to exercise than their urban counterparts (Barlow, Williams, & Wright, 2001). Thus, geographically isolated, rural patients with arthritis may be at higher risk for poor health status due to disparities in health care access. Especially, regional health inequalities in women are significant. For example, health care accessibility in rural areas was lower and medical indirect costs were higher in these areas than those in urban regions (Yoon & Kim, 2006). Therefore, to reduce these health inequalities, it is important to develop and test strategies to enhance self-care management for this population.

Self-help education program is the most widely used intervention for patients with arthritis. The effectiveness of this program has been tested (Barlow et al., 2001; Cho et al., 2007; Choi, So, Lee, & Lee, 2008; Goeppinger, Arthur, Baglioni, Brunk, & Brunner, 1989; Newman, 2001). Riemsma, Taal, Kirwan, & Rasker (2004) analyzed the significant effects of the self-help program for the rheumatoid arthritis (RA) patients on disability, joint counts, patient global assessment, psychological status, and depression using data from thirty-one studies. Korean Society of Muscle and Joint Health (KSMJH) published self-help guidelines for patients with arthritis and their care providers since 1994. To date, studies (Cho et al., 2007; Kim et al., 2003; Lee et al., 2002) on the effects of this arthritis self-help program have been performed with patients residing in urban Korean areas. Scant attention has been paid to rural arthritis patients, particularly in Korea. Moreover the almost research tested the effects in only self-help group but compared with control group in Korea.

In Britain, Barlow, et al. (2001) in a rural sample of 102 patients with OA and other types of arthritis showed that a self-help program was effective in enhancing self-efficacy, and reducing fatigue, anxiety, and cognitive symptoms relative to baseline. Goeppinger, et al. (1989) found improvements in arthritis knowledge, self-care behavior, perceived helplessness, pain, and depression in rural American patients (n=100) with OA and other types of arthritis as compared to 153 control participants. Such findings provide a basis for examining self-help program of OA in rural Korean patients. The purpose of this study was to determine if OA patients living in rural Korea, health disparity population, would benefit from a structured program focused on self-help strategies delivered in their rural environments.

Methods

Design and Sampling

A two-group quasi-experimental design was used to compare outcomes of a usual care group with those of a self-help education program. Patients diagnosed with OA were recruited from nine Primary Health Care Posts (PHCPs) in the South Korean province of Gangwon. These PHCPs are located in rural areas where there is extremely limited access to other clinic or medical facilities. All participants were informed of the purpose and procedures of the study. Each subject signed an informed consent. They were assured that their responses would remain anonymous and confidential, and they could refuse to participate or withdraw at any time without penalty or loss of benefits which they would be otherwise entitled.

Based on convenient sampling, the PHCPs were assigned to either experimental or control facilities. Because most of the subjects were farmers, the study was conducted from late November to early February to insure participation. Because of limited access to three PHCPSs during the winter months, these PHCPSs were assigned to the control condition. Inclusion criteria for the subjects included (a) an interest for participation in a self-help program, (b) an actual experience of some degree of joint pain, (c) a non-participation in any regular exercise program during the previous 12 months, (d) age 40 or older, and (e) the capacity to communicate verbally in Korean.

By reviewing medical records of primary care in PHCPs, it was determined that a total of 420 subjects were eligible to participate in the study. Of these, 180 were randomly selected (20 per 9 PHCPs), 135 agreed to participate in the study, and 126 (85 in the experimental group and 41 in the control group; Fig 1) provided baseline data. Consistent with Cohen's power analysis (Cohen, 1988), at an alpha level of 0.05 and a power of 0.80, at least 78 subjects (39 in each group) were needed to achieve an effect size of 0. 57. The effect size was calculated based on the study of Lorig, Chastain, Ung, Shoor, & Holman (1989). The mean and SD on arthritis self-efficacy of two groups were 61.47 (±19.21) / 52.02 (±13.19).

Data Collection Procedures

After obtaining approval from the office of the PHCPs in Korea, community health nurse practitioners (CHPs) at each of the nine PHCPs received training in the self-help education program. They each attended a three-day workshop that provided standardized content developed by the KSMJH.

At the first meeting for self-help education, all subjects (N=126) completed the baseline assessment which included demographic characteristics, self-report measures including pain, fatigue, disability, depression, quality of life, self-efficacy, health behavior, and physiologic measures including range of motion (ROM) and muscle strength. After the first week, subjects at the experimental posts started the self-help education program that was taught over a 6-week period by 6 researchers certified as self-help leaders and 6 community health practitioners. Each session lasted 2 hours, and self-help education was used, which was standardized by the KSMJH. It consisted of a weekly health contract, exercise (ROM exercise, muscle strengthening exercise, and dance "Arirang"), health education, group discussion, group counseling, and

Table 1. Program and Courses of Arthritis Self-Help Education Program

Week	Arthritis Self-help Education Program (minutes)
1	Pretest (40), Intermission (10), Introduction of myself (10), Program orientation (10), Understanding of arthritis (30), Making appointment (20)
2	Identification of appointments (10), Muscle strength exercise - standing position (45), Intermission(10), Techniques to deal with problems such as pain (15), Fatigue (20), Making appointment (20)
3	Identification of appointments (10), Joint flexibility exercise (40), Intermission (10), Coping with daily activity limitations(30), Introduction of Aquatic exercise (10), Making appointment (20)
4	Identification of appointments (10), Muscle strength exercise - sitting position (40), Intermission (10), Stress management (20), Ariang (20), Making appointment (20)
5	Identification of appointments (10), Muscle strength exercise - lying position (50), Intermission (10), Nutrition and Diet (20), Medication (10), Making appointment (20)
6	Identification of appointments (10), Review exercises (40), Intermission (10), Making informed Treatment (10), Post-test (40) Completion program ceremony (10)

recreation (Table 1). Magnified drawings and pictures were used to illustrate key points and exercises. A researcher and a community health nurse practitioner, working in tandem, delivered the program. At the 7th week meeting, subjects completed the post-testevaluation. The control group was not given any treatment and did not meet again until week 7 when post-test measures were taken. The control group was offered the opportunity to take the course after the study period. Data collectors were trained and blinded to group assignment.

Measurements

Self-Report Measures

Pain. Two measures were used to determine pain. First, a numerical rating scale was used to assess pain intensity. Subjects rated present pain intensity on a 15cm scale from 0 'no pain' to 100 'extreme'. Second, a graphic scale of 44 joints was used to assess pain sites. Subjects checked all sites where they felt pain. This numerical rating scale has been used by Lee et al. (2002) to assess arthritis pain.

Fatigue. Two measures were used to determine fatigue. First, a numerical rating scale was used to assess fatigue intensity. Subjects rated present fatigue intensity on a 15cm scale from 0 'no fatigue' to 100 'extreme'. Second, the Multidimensional Assessment of Fatigue-Korean (MAF-K) (Lee & Lee, 1998) was used to assess global fatigue is a Korean version of MAF. MAF-K contains sixteen items and measures fatigue patterns for the previous week. Fourteen items contain numerical rating scales and two items have multiple-choice responses. It was translated into Korean by six translators and translated back into English by two different translators. Criterion validity (correlation coefficient with Piper Fatigue Scale was 0.76, p=.0000), construct validity (corrected item-total correlation coefficients were 0.63---0.88 and factor analysis) and reliability (Cronbach's alpha was 0.96) were tested in 137 RA patients. Cronbach's alpha in this study was 0.96.

Disability. Disability was measured with the Korean Health Assessment Questionnaire (KHAQ). The KHAQ (Bae, Cook, & Kim, 1998) is the Korean version of HAQ. It has twenty items which are rated on a 4-point Likert scale ranging from 0 'can do without any difficulty' to 3 'cannot do at all'. It assesses difficulties in activities of daily living such as dressing and grooming, arising, eating, gripping, personal hygiene, reaching, walking, and other activities. It was translated into Korean by 3 translators and translated back into English by 3 different translators. Comprehensibility (76%---98%), criterion validity (correlation coefficient with disease severity were 0.24---0.67) and reliability (test-retest reliability was 0.99, Cronbach's alpha was 0.95) were tested in 116 RA patients (Bae et al., 1998). KHAQ has been used in patients with OA (Song, Lee, Lam, & Bae, 2003). Cronbach's alpha was 0.92 in this study.

Depression. The Center for Epidemiologic Studies-Depression-Korean (CES-D-K) was used to assess depression. The CES-D-K, which is a Korean version of CES-D, was standardized by Chon and Rhee (1992). It is a 20-item questionnaire that uses a 4-point Likert scale ranging from 0 'rarely or none of the time' to 3 'most or all the time'. Subjects rated their feeling during this previous week. It was translated into Korean by 3 translators and translated back into English by 5 different translators. Criterion validity (Pearson correlation with depression subscale of Symptom Checklist-90 was 0.69) and reliability (Cronbach's alpha was 0.89) were tested in 220 Korean adults in diverse areas (Chon & Rhee, 1992). The Cronbach's alpha was 0.84 in this study.

Quality of Life. The Quality of Life Scale (QOLS) was used to assess quality of life. The QOLS (Ro, 1988) is a 47-item questionnaire that uses a 5-point Likert scale ranging from 1 'quite dissatisfied' to 5

'quite satisfied'. It is consisted of six subdimensions: (a) emotional status, (b) economic status, (c) physical status, (d) self-esteem, (e) family relation, and (f) relation with neighbor. Cronbach's alpha was 0.94 in both 2,179 Korean adults (Ro, 1988) and this study.

Self-Efficacy. The Arthritis Self-Efficacy-Korean (ASE-K, Kim, 1994) is the Korean version of ASE. It was used to assess self-efficacy. It was translated into Korean by three translators, and translated back into English by two translators. The items were reviewed by four specialists and selected for their appropriateness for Korean arthritis patients. The ASES-K contains 14 items that range from 10 'not confident at all' to 100 'fully confident'. The Cronbach's alpha was 0.92 with 35 arthritis patients (Kim, 1994) and 0.88 in this study.

Health Behavior. The Arthritis Health Behavior Assessment (AHBA), which was developed for Korean arthritis patients by Jo, Oh, and Choe (2000), was used to assess health behavior. The AHBA is a 24-item questionnaire that uses a 4-point Likert scale ranging from 0 'not do at all' to 3 'frequently do'. The conceptual framework was organized in eight subdimensions: (a) pain management, (b) exercise, (c) rest, (d) diet, (e) active commitment, (f) self-management, (g) positive thinking, and (h) interpersonal relationship. The Cronbach's alpha was 0.90 in 174 RA patients (Jo, et al., 2000) and 0.86 in this study.

Physiological Measures

In all physiologic measures, two measures in the right side separated by two-minute rest intervals were taken and averaged.

Range of Motion (ROM). Flexion, hyperextension, abduction, and adduction of shoulder joint, flexion and extension of knee joint, dorsiflexion, and plantar flexion of ankle joint were measured with an Alimed personal goniometer (#YN5051). Measurement range of this goniometer is 0---180°, increments are 5°, and the length is 63/4inches. The goniometer is one of the most widely used assessment procedures to measure of joint ROM, and goniometric measure ments are generally considered to provide valid and reliable measures of joint ROM(Brosseau et al., 2001). The correlation between the ROM by goniometric measures and radiographic scores for flexion and extension of knee was statistically significant in knee OA patients (Ersoz & Ergun, 2003). Measurements of ROMs of the shoulder joint were obtained with subjects in the standing position, those of the knee and ankle joint in a lying supine position on the floor. The fully flexed and abducted shoulder and fully extended knee were considered the 180-degree position. All ROM measures followed the guidelines (Park, 1991), were performed twice, and then averaged.

Arm reach, grasp both hands at back, and sit and reach were measured in centimeters with a ruler. Arm reach is the distance (cm) from floor to fingertip of the reached hand when the patient maximally reached one hand on the wall without raising the feet. 'Grasp both hands at back' is the distance (cm) between the downward and upward hands when the patient attempts to grasp both hands downward from shoulder and the other upward from waist at back. 'Sit and reach' is the distance (cm) between the fingertip and toe when the patient bends at the waist and stretch both hands towards the feet without bending the knee. The overlapping distance between both hands in grasp both hands at back and between fingertip and toe in sit and reach is represented as a minus value.

Muscle strength. Grip force (kg) was measured by Dynanometer (TANITA Hand Grip Meter, Model #6103) to assess the muscle strength. Two measures separated by two-minute rest intervals were taken and averaged. The testing position was standardized. It was standing, shoulder placed at 0° of flexion, and elbow at 0° with the wrist in neutral position. Measurement range of the dynanometer is 0---75kg, increments are 0.5kg, and accuracy is within ±2kg (0---40kg) and ±4kg (41---75kg).

Table 2. Comparisons of Demographic Characteristics and Pre-test Measures between Experimental and Control Groups

Variables		Experimental group (n=65)	Control group (n=36)	χ^2 or t
Demographic Characteristics	Female n (%)	54 (83.0)	36 (100.0)	6.84**
	Married n (%)	54 (83.0)	22 (61.0)	6.88*
		Mean (SD)		
	Mean Age (YR) (SD)	64.2 (8.5)	63. 8 (7.6)	0.26
	Mean Illness Duration (YR) (SD)	11.8 (9.0)	12. 1 (10.8)	-0.28
Self-Report Measures	Pain Intensity (NRS) (0-100)	67.98 (25.04)	72.22 (17.42)	-0.90
	Pain Sites (GS) (0-44)	7.88 (8.86)	8.19 (8.79)	-0.17
	Fatigue Intensity (NRS) (0-100)	60.17 (27.32)	66.11 (21.82)	-1.12
	Global Fatigue Index (MAF-K) (0-50)	29.66 (11.91)	31.43 (10.60)	-0.74
	Disability (KHAQ) (0-3)	0.62 (0.44)	0.68 (0.51)	-0.64
	Depression CES-D-K) (0-60)	18.40 (9.81)	21.82 (9.20)	-1.66
	Quality of Life (QOLS) (1-5)	3.17 (0.57)	2.94 (0.41)	2.18*
	Self-Efficacy (ASE-K) (10-100)	73.00 (14.96)	68.84 (18.03)	1.24
	Health Behavior (AHBA) (0-3)	1.39 (0.46)	1.26 (0.45)	1.04
Physiologic Measures	Flexion of Shoulder (°)	155.51 (25.01)	160.69 (11.10)	-1.15
	Hyperextension of Shoulder (°)	49.91 (9.33)	47.74 (16.36)	1.06
	Abduction of Shoulder (°)	152.89 (25.58)	152.66 (16.67)	0.05
	Adduction of Shoulder (°)	0.56 (2.86)	2.11 (6.20)	-1.70
	Arm Reach (cm)	179.53 (38.05)	150.96 (47.06)	3.27**
	Grasp Both Hands at Back (cm)	14.83 (10.25)	19.09 (12.54)	-1.83
	Sit and Reach (cm)	0.67 (8.81)	-0.59 (6.29)	0.74
	Flexion of Knee (°)	134.22 (9.64)	135.81 (6.50)	-0.87
	Extension of Knee (°)	171.25 (7.01)	173.20 (6.23)	-1.38
	Dorsiflexion (°)	9.81 (5.93)	9.74 (6.69)	0.05
	Plantar Flexion (°)	47.51 (12.71)	47.75 (11.85)	-0.09
	Grip Force (kg)	21.96 (7.70)	15.79 (6.33)	4.06***

Note. NRS= Numerical Rating Scale; GS= Graphic Scale; MAF-K= Multidimensional Assessment of Fatigue-Korean; KHAQ= Korean Health Assessment Questionnaire; CES-D-K= Center for Epidemiologic Studies-Depression-Korean; QOLS= Quality of Life Scale; ASE-K= Arthritis Self-Efficacy-Korean; AHBA= Arthritis Health Behavior Assessment; Minus value represents the overlapping distance between fingertip and toe.
*p<.05, **p<.01, ***p<.001

Statistical Analysis

All statistical analyses were performed using the SPSS 17.0 for Windows. Descriptive statistics were used to summarize the demographic characteristics of the sample. T-tests and c2-tests were used to determine the homogeneity between the experimental and control groups. To determine the effect of the treatment program, independent sample t-tests were performed. Because the same data were used for the multiple tests of significance, the likelihood existed that some significant results would be due simply to chance. To guard against such likelihood, the level of significance of t-test was determined by Bonferroni correction within the study constructs. When there were significant differences between the two groups at baseline, analysis of covariances (ANCOVAs) was used for group comparisons of outcome variables.

Results

Demographic Characteristics and Comparisons between Two Groups Sixty-five out of eighty-five subjects in the experimental group (dropout rate, 17.6%) and thirty-six out of forty-one subjects in the control group (dropout rate, 12.2%) completed both the pretest and post-test data collection. For those who dropped from the experimental group, the reasons were as follows: out of town travel (n=8), increased pain (n=2), weather (n=4), and time commitment (n=6). For those who dropped out from the control group, the reasons were as follows: out of town travel (n=1), increased pain (n=2), and weather (n=2). The subjects who did not complete at least three of the six sessions were not included in the analyses. There were no statistically significant differences on baseline scores between the participants and those who dropped out.

At baseline, there were significant differences ($p<.05$) in gender and marital status between the groups. Women formed 83% of the experimental group as compared to 100% of the control group; 83% of the experimental group participants were married (widows, 17%) as compared to 61% in the control group (widows, 39%) (Table 2). Mean age of the experimental group was 64.2 (SD=8.5) and control group 63.8 (SD=7.6) years, and mean illness duration of the experimental group was 11.8 (SD=9.0) and control group 12.1 (SD=10.8) years. As shown in Table 2, there were significant statistical differences in self-report QOL, arm reach, and grip force between the two groups at baseline. In general, the experimental group had higher values in the domains relative to the control group.

Treatment Effects

Self-report measures. At the completion of the 6 weeks of self-help education, the experimental group reported significantly less fatigue intensity ($t=-3.40$, $p<.001$), decreased global fatigue index ($t=-3.98$, $p<.0001$), less difficulty in physical activity ($t=-3.03$, $p<.006$), and reduced depression ($t=-4.57$, $p<.0001$) as compared to the control group (Table 3). In addition, the experimental group also reported improved QOL ($t=4.37$, $p<.0001$), self-efficacy in managing arthritis ($t=4.20$, $p<.0001$), and health behaviors related to OA ($t=6.07$, $p<.0001$) as compared to the control group.

Because baseline QOL values and gender were different between the two groups, ANCOVA was performed using the baseline QOL value and gender as covariates. The results indicated that QOL in the experimental group remained significantly higher ($F=11.77$, $p<.01$) than in the control group at the completion of the 6-week education.

Physiologic measures. At the post-test, the ROM of experimental group was significantly improved in flexion ($t=3.07$, $p<.0046$), hyperextension ($t=5.29$, $p<.00009$), and abduction of the shoulder joint ($t=3.30$, $p<.0046$), grasp both hands at back ($t=-3.25$, $p<.0046$), extension of knee joint ($t=3.19$, $p<.0046$), dorsiflexion ($t=4.22$, $p<.00009$), and plantar flexion of ankle joint ($t=2.71$, $p<.0046$) than was that of the control group (Table 4).

Additionally, muscle strength ($t=5.88$, $p<.00009$), as determined by grip force, had significantly improved in the experimental group as compared to that of the control group (Table 4). Because baseline values were different between the two groups on grip force, ANCOVA was performed. The results indicated that grip force of the experimental group remained significantly ($F=15.75$, $p<.001$) higher than that of the control group at the completion of the 6-week education.

Discussion

The results of this study are consistent with those of others (Barlow et al., 2001; Goeppinger et al., 1989), which can be extended to patients living in rural South Korea. In this region of Korea, there is very limited

Table 3. Comparisons of Post-test Physiologic Measures between Experimental and Control Groups

Variables	Mean (SD)		t
	Experimental group (n=65)	Control group (n=36)	
Pain Intensity (NRS) (0-100)	52.62 (24.56)	65.14 (22.01)	-2.50
Pain Sites (GS) (0-44)	5.56 (6.37)	7.45 (6.77)	-1.29
Fatigue Intensity (NRS) (0-100)	45.90 (25.78)	64.29 (25.00)	-3.40**
Global Fatigue Index (MAF-K) (0-50)	20.91 (10.41)	30.27 (12.28)	-3.98***
Disability (KHAQ) (0-3)	0.38 (0.39)	0.66 (0.50)	-3.03*
Depression (CES-D-K) (0-60)	15.12 (8.81)	24.33 (10.31)	-4.57***
Quality of Life# (QOLS) (1-5)	3.38 (0.45)	2.96 (0.48)	4.37***
Self-Efficacy (ASE-K) (10-100)	79.43 (15.84)	65.13 (16.66)	4.20***
Health Behavior (AHBA) (0-3)	1.95 (0.50)	1.25 (0.47)	6.07***

Note. NRS= Numerical Rating Scale; GS= Graphic Scale; MAF-K= Multidimensional Assessment of Fatigue-Korean; KHAQ= Korean Health Assessment Questionnaire; CES-D-K= Center for Epidemiologic Studies-Depression-Korean; QOLS= Quality of Life Scale; ASE-K= Arthritis Self-Efficacy-Korean; AHBA= Arthritis Health Behavior Assessment.
* $p<.006$ ** $p<.001$ *** $p<.0001$ (Bonferroni Correction)
# ANCOVA was performed using the baseline QOL value and gender as covariates ($F=11.77$, $p<.01$).

Table 4. Comparisons of Post-test Self-Physical Measures between Experimental and Control Groups

Variables		Mean (SD)		t
		Experimental group (n=65)	Control group (n=36)	
Range of Motion	Flexion of Shoulder (°)	169.10 (9.79)	158.74 (16.11)	3.07*
	Hyperextension of Shoulder (°)	59.73 (7.42)	51.65 (7.19)	5.29***
	Abduction of Shoulder (°)	164.96 (18.80)	152.56 (21.33)	3.03*
	Adduction of Shoulder (°)	0.00 (0.00)	0.97 (4.11)	-1.92
	Arm Reach (cm)	186.66 (29.62)	173.20 (37.25)	1.98
	Grasp Both Hands at Back (cm)	9.08 (9.64)	15.81 (10.30)	-3.25*
	Sit and Reach (cm)	-7.68 (7.95)	-3.30 (7.48)	-2.76
	Flexion of Knee (°)	137.56 (9.40)	133.56 (10.65)	1.96
	Extension of Knee (°)	175.09 (5.37)	171.00 (7.38)	3.19*
	Dorsiflexion (°)	12.75 (5.44)	9.44 (6.31)	4.22***
	Plantar Flexion (°)	53.46 (11.59)	47.19 (10.23)	2.71*
Muscle Strength	Grip Force # (Kg)	24.36 (7.15)	16.28 (5.24)	5.88***

Note. Minus values represent the overlapping distance between fingertip and toe.
* $p<.0046$, ** $p<.0009$, *** $p<.00009$ (Bonferroni Correction)
# ANCOVA was performed using the baseline grip force value and gender as covariates ($F=15.75$, $p<.001$).

access to other clinical or medical facilities except for a PHCP. Although participants in the self-help program improved on most outcome measures, there was no statistically significant difference in the self-reported pain levels. The experimental group reported decreased pain, but this report did not achieve statistical significance. These findings are consistent with the studies conducted by Barlow et al. (2001) and Song, Eom, Lee, Lam, & Bae (2009) who also based their programs on the AASHC as did this study. In a rural British sample of 132 patients with OA and other types of arthritis, Barlow et al. found significant effects on

self-efficacy, fatigue, and anxiety but did not find a significant effect on pain. The actual diminution of the pain resulting from the enhanced general health status may have been offset by the additional pain triggered by the physical activity resulting from the increased functional status (Belza, Topolski, Kinne, Patrick, & Ramsey, 2002).

In contrast, Goeppinger et al. (1989) did find a significant effect on pain. However, there are important differences between this study and the study of Goeppinger et al. In this study, only OA patients participated whereas in the study of Goeppinger et al., OA, RA, and other chronic musculoskeletal diseases patients participated. Riemsma et al. (2004), in a meta-analysis of 31 studies, found that the overall effect of education program on pain was 4% (not statistically significant). Thus, the effect of the self-help program on pain is inconsistent. It should be pointed out that most Korean studies did not show a significant decrease on pain reports (Lee et al., 2002; Song et al., 2009).

In the current study, the mean baseline score for depression was 19.6 on the CES-D-K, which was markedly higher than the score of 13.9 noted in American rural arthritis patients (Goeppinger et al., 1989). A score of 16 on the CES-D is the recommended cut-off value for detecting a clinical mood disorder. In the current study, 60% of the subjects scored ³16.0. This was also higher than the 31% of the British rural arthritis patients who scored ³8.0, which is cut-off value for the Hospital Anxiety and Depression Scale (Barlow et al., 2001). A study of 2000 Korean adults found that subjects were likely to score the four positive items on the CES-D-K negatively and recommended that a score of 24 be used as the indicator for depression (Moon, et al., 1991). In the current study, 35% of the subjects scored greater than 23 on CES-D-K. Interestingly, the mean scores for pain and fatigue at baseline were similar to that of American and British rural arthritis patients while self-efficacy and functional status scores were higher than that of American or British rural patients.

ROM of shoulder, knee, and ankle joints were improved by the self-help education program. In addition to significant changes in ROM and flexibility, anecdotal evidence supports the positive benefits of this self-management program. For example, one patient could not wash or comb her hair due to limited arm ROM at baseline, but after the first session, she was Table 4. Comparisons of Post-test Physical Measures between Experimental and Control Groupo it. In another case, an 80-year old male patient could grasp both hands at back on completion of the course. It has been shown by others that the most upsetting symptom for OA patients is the limitation of activity (Tallon, Chard, & Dieppe, 2000). The American College of Sports Medicine has recommended that flexibility and muscle strength be used as indicators for performing daily activities and avoiding disability, especially for older adults. ROM and grip force measures are recommended as easily adoptable physiologic measures that can be used in any setting. Moreover, the use of these measures with each an education session may provide motivation as well as a sense of accomplishment.

Limitations

This study has limitations. Recruitment bias was likely to be present. Random assignment of PHCPs could not be done due to limited access to some PHCPs during the winter season. Gender distribution was different between two groups. As a result of this gender distribution, post-hoc analyses were performed. When only women patients were included in the analyses, the experimental (n=54) and control group (n=36) had results that were similar to the total sample. In addition, comparison of men (n=11) and women (n=54) in the experimental group using Mann-Whitney U test at pre-test and post-test revealed that women had a longer history of OA than men while arm reach and grip force in men were higher than in women. However, several

physiologic measures including pre-test and post-test flexion of shoulder joint, pre-test shoulder abduction, pre-test and post-test sit and reach, and post-test knee flexion were less in men as compared to women. Based on ANCOVAs and these additional analyses, it is unlikely that gender contributed significantly to the study findings.

Figure 1. Flow of the participants

Conclusion

This study was designed to determine if OA patients living in rural Korea would benefit from a structured program focused on self-help strategies delivered in their rural environment. Interestingly, the subjects in the experimental group were motivated to continue meeting after the end of the course. The only element that subjects disliked about the self-help education was that it was too short. To reach isolated rural areas, additional strategies are needed. One approach may be for PHCP nurses to be trained to deliver the program. Another approach includes using appropriate written materials that are consistent with the literacy level of the population. Recruitment of couples may enhance the enrollment and the retention of men in these programs.

Based upon the results of the study, a self-help education program was an effective strategy to enhance self-care in such population. This study demonstrates that self-help education promotes physical and psychosocial health, revealing that the interventions such as health education are an effective method to increase the use of self-management techniques that impact on mobility, a crucial factor for rural residents. These findings can be utilized to help health care professionals to promote

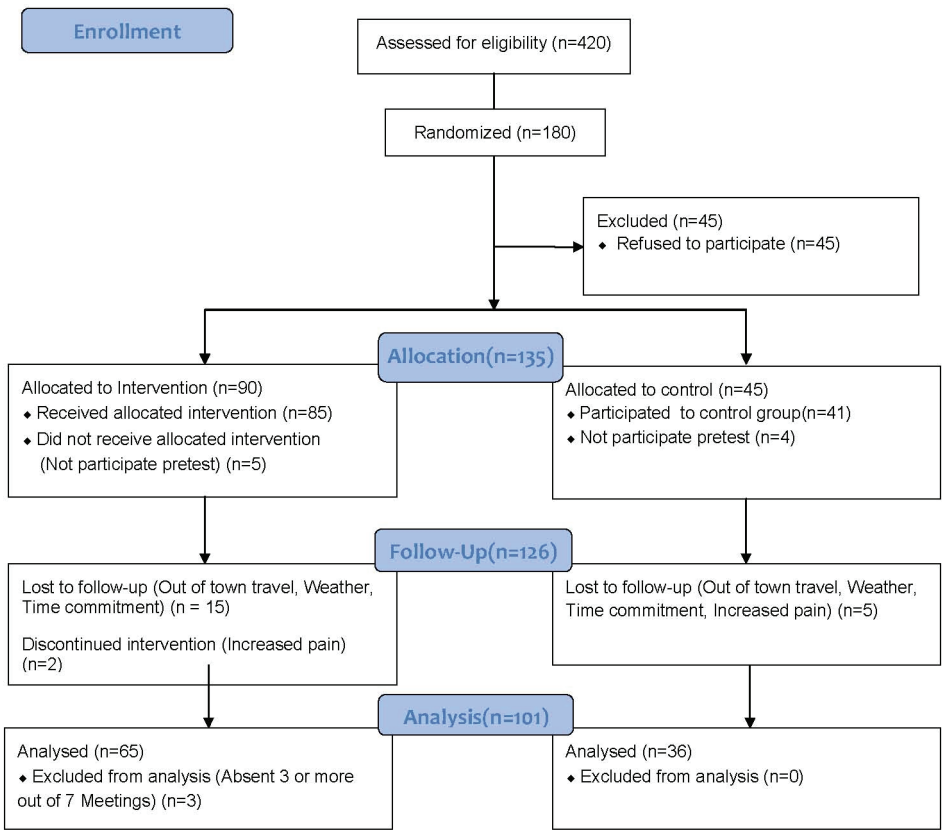

Figure 1. Flow of the participants

self-efficacy, quality of life, and physical function among OA patients living in isolated rural areas and having limited access to health care services compared to those in urban environments. While minimizing risks for vulnerable populations, the expansion of a self-help education program can be a vital strategy to maximize rural health services. Therefore, its continuing development, implementation, and evaluation should be considered. Further study on this topic and population may yield a better understanding of the self-education program applicability with OA in rural areas.

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