**ORIGINAL ARTICLE**

# Effect of Education on Perceived Self-Efficacy for Individuals with Arthritis

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**ABSTRACT**
**Background:** Arthritis self-efficacy characterizes individuals' confidence in managing their arthritis. Patient education in arthritis aims to improve health outcomes by prompting people to adopt self-management behaviours. Therefore, perceived self-efficacy and patient education in arthritis is of great importance.
**Aims:** This study was performed to determine the effects of education on self-efficacy perception in arthritis individuals.
**Methodology:** This study was a semi-experimental of pre-test and post test design in an equivalent control group. The research was conducted in a physiotherapy and immunology clinics in Erzurum, Turkey. The data were obtained from 80 individuals with arthritis. These eighty arthritis individuals were composed 40 of whom were in the experimental and 40 of whom were in control group. As the data gathering tools, a questionnaire form and arthritis self-efficacy scale (ASES) were used. ASES developed by Lorig et al. and adjusted from English to Turkish by Ünsal&Kaşıkçı was used to measure individuals' self-efficacy. Questionnaire form and scale were completed by the individuals in both groups. Patients in the experimental group were educated with the booklet. The education program was applied 4 times, once in 3 weeks. The time required for each stage was 45~60 minutes. In the control group, care was provided according to the usual routine.
**Results:** There was no statistically significant difference between the pre-test ASES scores of the individuals in both groups. Self-efficacy levels after education were significantly improved in the experimental group compared to the control group.
**Conclusions:** The results of this study showed that the planned education can be considered an effective intervention for increasing self-efficacy perception in arthritis individuals.

**Key Words:** Arthritis, Self-efficacy, Patient Education, Nursing

## INTRODUCTION

Arthritis is a chronic condition which affects 10 % of world population, is the reason in the second row after the cardiovascular diseases for people over 50 years old to give up their jobs (CDC 2008, CRA 2008). The most common forms of arthritis are osteoarthritis (OA), rheumatoid arthritis (RA), fibromyalgia (FM), and gout (Gulanick et al. 1998, Smeltzer & Bare 2005, CRA 2008, AF 2008).

Perceived self-efficacy (SE), as postulated by American psychologist Albert Bandura, is one's belief that one can perform a specific behaviour or task in the future.

Perceived SE is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy theory states that 1) perceived SE for behaviours that affect health status will predict future health status, given that subjects believe that the outcome of the behaviour will be improved health status and that they value improved health status, 2) SE is not a static trait; it can be altered, and 3) enhanced SE will be associated with improved health status in the areas affected by those specific behaviours (Bandura 1994).

Patient education is to nursing care as flour is to cake. Each, teaching and flour, is so essential in their respective processes that without them the outcome is unsatisfactory. Flour cannot stand alone; it requires the blending of other ingredients to create a cake. So it is with patient education. It must be done along with the other aspects of holistic nursing care, such as emotional support of the patient and family, physical care and performing the delegated medical tasks, to achieve the desired outcome of patient change in behaviour and attitude. In summary, patient education is necessary for good nursing care. World Health Organization also emphasises consistently on the importance of the education to be given to patients about the management of the chronic diseases (Gessner 1989, Gulanick et al. 1998, CRA 2008).

Arthritis education increases knowledge (Potts & Brandt 1983, Branch et al. 1999, Riemsma et al. 2003, Mäkeläinen et al. 2008), and sometimes influences health behaviours, such as compliance with treatment regimens, the practice of joint protection, or exercise (Gross & Brandt 1981, Knudson et al. 1981, Hopman-Rock et al. 2000, Maurer et al. 2000, Giraudet-Le et al. 2007, Masiero et al. 2007, Lundon et al. 2008). To our knowledge, the current study is the first survey that was to determined effect of education on self-efficacy perception in arthritis individuals to be conducted in Turkey.

## AIM

This study was carried out to determine the effects of planned education given to arthritis patients on self-efficacy perception.

## HYPOTHESES OF THE STUDY

**Hypothesis 1.** There will be a difference between self-efficacy in pain before and after arthritis self-efficacy education.

**Hypothesis 2.** There will be a difference between self-efficacy in leg-foot function before and after arthritis self-efficacy education.

**Hypothesis 3.** There will be a difference between self-efficacy in arm-hand function before and after arthritis self-efficacy education.

**Hypothesis 4.** There will be a difference between self-efficacy in other symptoms before and after arthritis self-efficacy education.

## METHODOLOGY

### Design

This research was a semi-experimental study. This design was used to identify the effect of an education program intervention 4 times, once in 3 weeks on the self-efficacy of individual's arthritis in Erzurum, Turkey.

### Sample

Subjects included 80 individuals with arthritis existent in the clinics of physiotherapy and immunology at a university hospital. These eighty arthritis patients were composed 40 of whom were in the experimental and 40 were in control group. Dependent variables of the study were arthritis self-efficacy scale (ASES) scores, independent variable was patient education and control variables were gender, age, education, economical status, disease duration and mean scores of the pre-test of the scale. Experiment and control group were matched for control variables (Table 1). It was found that no statistically significant differences were detected between the patients in both groups for control variables.

### Data Collection

Data was collected from 18 May to 25 November 2005. As the data gathering tools, a questionnaire form and ASES were used. A questionnaire was composed of 15 close-ended questions, based on previously published literature (Hewlett et al 2001, Lorig et al $1989_a$, Lorig et al $1989_b$, Lorig et al 1985), and designed to determine socio-demographic characteristics and disease features of the individuals. ASES developed by Kate Lorig and her colleagues in 1989 in the USA. It was found as the result of the studies in Arthritis Self-Management Course (ASMC) that a measurement tool like this was needed. In this ten-numbered visual scale, in which three self-efficacy sub-scales were present in pain, functions and other symptoms, there were 20 statements.

The twenty statements constituting the scale were scored between 1 (I am not sure at all) and 10 (I am completely sure) points. Lorig and colleagues stated that the range of total point correlation of the scale was between 0.71 and 0.85. It was stated again that Cronbach α values of the subscale were 0.87, 0.85 and 0.90 in pain self-efficacy, function self-efficacy, and other symptoms, respectively (Lorig et al. $1989_a$).

ASES was translated into Turkish with a few modifications but the original form was kept. It was found as the result of statistical analyses that when the original 3 subscales were applied as 4 in Turkish form, the scale would be more sensitive. In the modified version of ASES, there were 4 subscales as self-efficacy in pain, leg-foot and arm-hand function and other symptoms. It was found that test–repetition test reliability was r=.94, internal consistency Cronbach α value was 0.96, total element reliability point was correlation between .59 and .96 (Ünsal & Kaşıkçı 2008).

The questionnaire and ASES were administered during a face to face interview with participants. Interviewing time for each participant was between 15 and 20 minutes.

**Education Program**

A booklet with the headline "You can learn how to live with Arthritis" was prepared by the researchers to increase the self-efficacy perceptions of the participants. At the preparation stage of the education booklet, opinions of the individuals' with arthritis and health staffs were taken, literatures related to topic were reviewed (Lorig & Holman 1993, Smarr et al. 1997, Lorig 1998, Gulanick et al. 1998). Booklet was divided into three chapters, which were "Introduction", "Arthritis and daily life" and "Arthritis and Surgical treatment". Under the title of "Introduction", information about the disease in the subtitles of "What is arthritis?", "Who is under the arthritis risk?", "What are the symptoms of arthritis?, "How can arthritis be diagnosed?", "Can arthritis be treated ?". In the following parts in the booklet, under the title of "Arthritis and daily life", statements about providing and sustaining the secure environment, communication and respiration and daily activities such as eating- drinking, excretion, personal hygiene and clothing, controlling the body temperature, activity, working, and having fun, sexual life, and sleeping took place. As the last topic in the booklet, surgical treatment approach was taken. The booklet, of 45 pages, was revised according to the expert considerations and published.

Individuals in the experimental group were educated in a room in the clinic of physiotherapy. Individuals were classified before the education according to gender, age, education status, and arthritis types. Education was given to the groups of 2 or 4 patients between 10 and 12 in the morning and 13 and 16 in the afternoon. Each subject in the experimental group was received a 3-month education with a prepared education booklet and exercise catalogues prepared by medical firms. During the education period, each subject was interviewed 4 times, once in 3 weeks (twelve interventions in total). Each interview took approximately 45 or 60 minutes. In the education, oral presentation about arthritis, questioning-answering about symptoms of arthritis, treatment, care protocols, preventing methods, act technique for exercises were used. Questions about their experiences with their disease were directed to the participants and by doing this they participated in the education more actively. At the first education, greeting was performed and general information about arthritis was given. At the second and third educations all the information in the booklet was transferred to the participants. At the last education, a general review was performed. It was pointed out that subjects must receive help mainly from their families, friends or close relatives and they must contact with the researchers or the related health staffs when an undesired condition happens. Throughout the education period, subjects were told that they could be efficient to struggle and live with the disease. Three subjects included in the study could not attend the education because they were too old to travel, arthritis was affecting their walking ability and they did not have a car to come to the education room. For this, their education was performed at their home. During and after the education, some positive feedbacks from the subjects such as "This education made me feel that I am an important man/woman", "I think people think I am an important person", "I have never been interested in me and my illness", "I am practising what I have learnt and I feel good" were taken. However, some of them explained their negative thoughts such as "It is very time consuming to come here leaving my work", "I know most of what you explained but I have difficulties applying them", "If you are a woman living in the east of Turkey, you have to work", "As a woman living in a large family, it is

very difficult to leave time and do something for myself".

Post test was performed, applying ASES to experimental and control groups immediately after the education and post test of the control group, respectively. The interview with the individuals, the researchers made for the post test, lasted approximately 10 minutes.

**Ethical Issues**

Directors, nurses and clinicians of the units where the study was conducted were informed about the aim, plan and applications of the study and cooperation with them was supplied. Ethical permissions were received from participating institutions prior to the study being conducted. Participants in the study were voluntary. The security of the data and the anonymity of participants were maintained. Additionally, informed written consent was obtained from all participants after explanation of the purpose of the study. After the post test control group received the same education with experimental group with the booklet.

**Data Analysis**

Data collected was analyzed using SPSS for Windows 11.0 software. Percentage, arithmetical means, chi-square and t test were used. Percentage analysis was undertaken for the whole group to show the socio-demographic characteristics. The groups were compared for significant differences between pre-test and post test ASES by arithmetical mean, chi-square and t test.

## RESULTS

**Socio-demographic characteristics of the subjects**

There was no significant difference in the socio-demographic characteristics and pre-test of the ASES of the two groups as shown Table 1. In the experimental and control groups, there were mainly female subjects with the age between 40 and 59. In addition, most of the subjects in both groups had at a primary school education or a high school/university. The economic status of participants was predominantly "income = expenditure" according to self-report of participants. In both groups, the range of disease duration for study subjects was 1-5 years.

**Table 1. Socio-demographic characteristics and homogeneity of subjects**

| Socio-demographic characteristics | Control (n=40) Counts (%) | Experimental (n=40) Counts (%) | $X^2$ or t | p |
|---|---|---|---|---|
| **Gender** | | | | .799 |
| -Female | 29 (72.5) | 30 (75.0) | .065 | |
| -Male | 11 (27.5) | 10 (25.0) | | |
| **Age** | | | | |
| -20-39 | 9 (22.5) | 6 (15.0) | 5.353 | .069 |
| -40-59 | 18 (45.0) | 28 (70.0) | | |
| -60-79 | 13 (32.5) | 6 (15.0) | | |
| **Education level** | | | | |
| -Literate | 11 (27.5) | 9 (22.5) | .617 | .893 |
| -Primary school | 11 (27.5) | 12 (30.0) | | |
| -Secondary school | 5 (12.5) | 7 (17.5) | | |
| -High school/University | 13 (32.5) | 12 (30.0) | | |
| **Economic status** | | | | |
| -Income > expenditure | 5 (12.5) | 5 (12.5) | 1.061 | .588 |
| -Income = expenditure | 26 (65.0) | 22 (55.0) | | |
| -Income < expenditure | 9 (22.5) | 13 (32.5) | | |
| **Disease Duration** | | | | |
| -6 months to 1 year | 5 (12.5) | 5 (12.5) | 2.248 | .523 |
| -1 to 5 years | 19 (47.5) | 24 (60.0) | | |
| -6 to10 years | 10 (25.0) | 5 (12.5) | | |
| -11 years and above | 6 (15.0) | 6 (15.0) | | |
| **Pre-test of the ASES** | | | | |
| -Self-efficacy in pain | 18.32±10.65 | 20.62±10.69 | .964 | .980 |
| -Self-efficacy in foot-leg function | 19.80±13.02 | 18.77±11.88 | .368 | .763 |
| -Self-efficacy in hand- arm function | 35.05±15.12 | 36.30±14.48 | .378 | .789 |
| -Self-efficacy in other symptoms | 30.25±15.49 | 31.10±14.86 | .250 | .645 |
| -Total ASES | 103.42±47.49 | 106.80±44.51 | .328 | .708 |

**Table 2. Disease characteristics of the subjects**

| Disease characteristics | Control (n=40) Counts (%) | Experimental (n=40) Counts (%) |
|---|---|---|
| **Arthritis Type** | | |
| -Osteoarthritis | 16 (40.0) | 24 (60.0) |
| -Rheumatoid arthritis | 7 (17.5) | 9 (22.5) |
| -Other (ancyloseon spondylitis, fibromyalgia and gut etc.) | 17 (42.5) | 7 (17.5) |
| **Complaints with the disease*** | 39 (97.5) | 39 (97.5) |
| -Pains in joints | 21 (52.5) | 29 (72.5) |
| -Tiredness | 17 (42.5) | 17 (42.5) |
| -Swellings in joints | 9 (22.5) | 16 (40.0) |
| -Sleeplessness | 8 (20.0) | 10 (25.0) |
| -Numbs in joints | 8 (20.0) | 9 (22.5) |
| -Stiffness in joints | 2 (5.0) | 6 (15.0) |
| -Combustion in joints | 6 (15.0) | 6 (15.0) |
| -Redness in joints | | |
| **Joints affected by the disease*** | 26 (65.0) | 33 (82.5) |
| -Knee | 29 (72.5) | 31 (77.5) |
| -Foot | 16 (40.0) | 18 (45.0) |
| -Hand | 15 (37.5) | 13 (32.5) |
| -Waist | 14 (35.0) | 11 (27.5) |
| -Hip | 11 (27.5) | 8 (20.0) |
| -Neck | 7 (17.5) | 11 (27.5) |
| -Back | 10 (25.0) | 10 (25.0) |
| -Bend | 6 (15.0) | 3 (7.5) |
| -Shoulder | | |
| **Presence of deformity in joints** | 4 (10.0) | 6 (15.0) |
| -Present | 36 (90.0) | 34 (85.0) |
| -Absent | | |
| **Presence of a special diet for the disease** | 9 (22.5) | 4 (10.0) |
| -Following | 5 (12.5) | 2 (5.0) |
| -Following sometimes | 26 (65.0) | 34 (85.0) |
| -Not following | | |
| **Presence of a special exercise program for the disease** | 3 (7.5) | 1 (2.5) |
| -Following | 7 (17.5) | 7 (17.5) |
| -Following sometimes | 30 (75.0) | 32 (80. 0) |
| -Not following | | |

*More than one answer. Percentage was taken accepting n as 40.

**Table 3. Effect of self-efficacy education program on ASES scores**

| SUB-SCALES | Control Group (n=40) | Experimental Group (n=40) | t | p *p<0.05 |
|---|---|---|---|---|
| Self-efficacy in pain | 18.32±10.65 | 20.62±10.69 | .964 | .980 |
| Pretest | 16.75±9.54 | 26.97±10.50 | 4.556 | *.000 |
| Post test | | | | |
| Self-efficacy in foot-leg function | 19.80±13.02 | 18.77±11.88 | .368 | .763 |
| Pretest | 18.20±12.28 | 21.45±10.96 | 1.248 | .094 |
| Post test | | | | |
| Self-efficacy in hand-arm function | 35.05±15.12 | 36.30±14.48 | .378 | .789 |
| Pretest | 32.80±15.22 | 38.57±12.52 | 1.853 | .081 |
| Post test | | | | |
| Self-efficacy in other symptoms | 30.25±15.49 | 31.10±14.86 | .250 | .645 |
| Pretest | 27.75±14.05 | 38.27±13.41 | 3.427 | *.004 |
| Post test | | | | |
| Total ASES | 103.42±47.49 | 106.80±44.51 | .328 | .708 |
| Pretest | 95.50±44.48 | 125.27±39.82 | 3.154 | *.006 |
| Post test | | | | |

**Disease characteristics of the subjects**

Subjects in the experimental group were diagnosed mostly with osteoarthritis (% 60.0) while those in control group were mostly with the types such as ancyloseon spondylitis, fibromyalgia and gut (% 40.0). Musculoskeletal pain, tiredness, swelling in joints was the most common complaints for which subjects in the both groups were referred. Most participants reported difficulties with their knee and foot joints. Total ten participants in the both groups

reported joint deformity. The majority reported that they were not practicing any special diet or exercise program related to their arthritis (Table 2).

**Changes in variables before and after the self-efficacy education program**

Mean pre-test and post test self-efficacy scores in the both groups presented in Table 3. After the self-efficacy education program, self-efficacy in pain appeared to be significantly increased (26.97±10.50) in the experimental group compared to the control group (16.75±9.54) (p=.000). Self-efficacy in other symptoms and total ASES was significantly increased in the experimental group (p=.004, p=.006) however there was no significant differences self-efficacy in foot-leg (p=.094) and hand-arm (p=.081) functions.

**DISCUSSION**

This study reported similar results to previously published studies in that the majority of arthritis individuals were female, middle-aged, most common arthritis related complaint was musculoskeletal pain, tiredness, swelling in joints and joints affected by the disease were knee, foot, hand, etc. (Lorig et al. 1985, Lorig et al. 1989 $_{b}$, Schouten et al. 1992, Smarr et al. 1997, Felson & Chaisson 1997, Glazier et al. 1998, ACRSRAG 2002, Hosie et al. 2002, Groessl et al. 2003, JHAC 2006).

No special diet was detected to be followed by the subjects in both groups in the study. In many of the studies related to the topic, the importance of the diet in the arthritis individuals was pointed out. It was well-known that Mediterranean diet, including food such as fresh vegetables and fruits, olive oil, fish oil, white meat and especially fish, is good for arthritis.

For the overweighed patients, low-calorie food had to be prescribed and salt had to be limited in the diet. It was important that arthritis individuals followed a diet holding low-calorie food rich in protein and vitamins for the prognosis of the disease (Panush et al. 1983, Kjeldsen-Kragh 2003, Sköldstam et al. 2003, Pedersen et al. 2005).

No special exercise was detected to be followed by the participants in each group. For the arthritis individuals exercise was of great importance. However, these exercises had to be done under the controls of an expert, regularly and without tiring the joints excessively. Many of the patients avoided exercises because of the pain, swelling and deformities in the joints (Smeltzer & Bare 2005). It might be thought that the patients in the present study hesitate to do exercises because of the complaints they experience as in the literature.

Although no statistically significant differences were present between the mean pre-test scores in both groups, a statistically significant difference was found between the mean post test scores of self-efficacy sub-scales in pain and other symptoms and total ASES. A significantly higher rate of the individuals were found to pain (p=0.000) and other symptoms (p=0.004) after arthritis self-efficacy education, which confirmed the hypothesis 1 and 4. In the study of Kılıç and Erci on the women with osteoporosis, no statistically significant differences between the mean osteoporosis self-efficacy pre-test scores were detected; however, it was found that between the post test score means, a statistically significant difference was present (Kılıç & Erci 2003). In addition, the fact that no statistically significant differences were found between the mean pre-test scores of the patients in the experimental and control groups was resulted from that these two groups were matched for the scale score means. This matching is important the determination of the effectiveness of the education.

While in the post test score means, there were statistically significant differences between pain, other symptoms and total ASES, no statistically significant differences between post test score means in foot-leg and hand-arm functions were found. In this case, the hypothesis 2 and 3 was'nt confirmed.

The fact that self-efficacy post test score means of the patients in foot-leg and hand-arm functions in both groups were not significantly different shows that education is not so effective on this subject. Arthritis is a chronic condition that can hold all the joints mainly knee, hand, backbone and hip. This disease causes pains, swelling, stiffness, crepitating and deformity in the joints of the patients (Lorig et al. 1989$_{a}$, Smeltzer & Bare 2005).

The reason that education was not effective on the functions foot-leg and hand-arm is that the patients in the study had pains, swelling, stiffness redness and combustions in their foot- leg and hand-arm joints. On these functions, longer and applied education was required. For this, a three-month period was not enough for a psycho-motor levelled education. Among the experimental group, mean foot-leg

and hand-arm function efficacy post test scores were higher than that in the pre-test.

Although there were not statistically significant differences between them, an increase in the mean scores was detected. In also the studies of Piaseu et al. (2001), Berarducci et al. (2002), and Kılıç and Erci (2003) on osteoporosis patients in experimental and control groups, post test score means were higher in the experimental group than that in the control group. These results are consistent with the present study.

The fact that there was a significant increase in ASES and sub-scale scores of the patients in the experimental group compared to that of those in control group shows that the planned education is effective. In the study of Taal et al. (1993) it was stated that the education of arthritis patients helped them improve their health status and increase their life qualities. In the same study, it was also found that education attempts in RA patients strengthened their self-efficacy perceptions; enabled them to control their own pains and helped them cope with the disease.

Most of the studies on rheumatologic diseases have focused on the patient education. In these educational programs, especially the information about the disease, pain management, following a regular exercise and diet program are included.

Prepared educational programs, aims of which are disease management, help patients get accustomed to living with the disease (Lorig et al. $1989_a$, Downe-Wamboldt 1991, Taal et al. 1996, Burna et al. 1996, Downe-Wamboldt & Melanson 1998).

## CONCLUSION

This study found that the self-efficacy education program could increase self-efficacy perception in arthritis individuals. Self-efficacy education program supports recognition of the importance of developing individualised nursing intervention which considers personal characteristics based on humanistic existentialism.

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