

# Designed Educational Interventional Program and Knee Pain Prevention behaviors in women with knee osteoarthritis in Yasouj, Iran

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## ABSTRACT

**Aims:** This study will be done to evaluate the effectiveness of a designed educational intervention program in adopting knee prevention behaviors in women with knee osteoarthritis in Yasouj, Iran.

**Method and Materials:** This research is a mix method study that has 3 phases. The 1<sup>st</sup> stage is an observational checklist regarding risky behaviors of common daily activities will be provided based on literature review and interview with related specialists. In 2<sup>nd</sup> stages of doing risky behaviors will be determined through interviews with women suffering from knee osteoarthritis. The third stage of this study will be a semi experimental study in which the designed educational intervention program will be tested. This study will be conducted on eligible 100 women with knee osteoarthritis referred to the orthopedic clinic of Yasouj city in south of Iran. These women will be randomly divided into intervention and control groups, each one with 50 participants. Just intervention group will be educated with intervention program The data collection instruments will be demographic profile questionnaire, Visual Analog Scale (VAS), self-efficacy questionnaire, Western Ontario and McMaster Universities osteoarthritis Index (WOMAC) questionnaire, muscle strength test and a checklist of protective behaviors. Data will be collected before and six months after the intervention of both groups and analyzed by software version 24 SPSS.

**Conclusion:** This study will determine that the designed educational program could be effective in improving the knee protective behaviors and consequently may be resulted in increased knee muscle strength, decreased knee pain and manage the problems caused by knee osteoarthritis.

**Keywords:** Knee Osteoarthritis, Preventive Behaviors, Knee pain, Menopausal women.

## Introduction

knee arthritis is the most common cause of knee pain. This pain may get worse or come and go over time which is accompanied by other symptoms like knee stiffness [1]. There are many symptoms for knee osteoarthritis such as pain, swelling, knee stiffness, motion defects, joint instability or abnormal movements of due to laxity of the ligaments, sensitivity and numbness and increased local temperature [1]. In spite of causing individual problems, knee osteoarthritis causes significant health care costs in health system of countries [2]. Physiological differences between men and women may play a role in the osteoarthritis

development in female rather than male. In postmenopausal women, decreased estrogen is responsible for higher prevalence of this disease [3]. Furthermore, other causes like socioeconomic level, genetics, ethnicity, smoking, and fertility history contribute to the problem to be severe [4]. In some countries, including Iran, due to doing more risky behaviors, knee osteoarthritis is more prevalent and appears at a younger age [5]. The previous study conducted in Kermanshah, a city in west of Iran, showed that the prevalence of knee stiffness rate after sitting, lying down, or resting during the day among women and men were 40.7% and 20.5%,

respectively [6]. Previous evidence shows that the most important cause of arthritis in Iran is unhealthy lifestyle and wrong movement behaviors. Some behaviors such as improperly sitting, long period standing, improper shoes, repeated knee bending, and lifting heavy objects cause more prevalent knee arthritis in Iran [7]. Existed document shows that training and therapeutic interventions are effective in reducing the symptoms of osteoarthritis and its clinical results, but their effectiveness is not long-term. This is because such interventions do not have long-term effectiveness and the most important reason for ineffectiveness is lack of adherence to behavior change [8]. Since osteoarthritis is a chronic and long-term disease and its prevalence and frequency increases with age, modifying behaviors to maintain knee health is essential for long-term improvement of pain and disability and performance in affected patients. In this regard, Previous research revealed that behavioral change techniques could be effective on promoting physical activity and lowering knee arthritis [8]. Education plays a vital role in improving people's health and is one of the basic pillars of changing inappropriate behaviors. In this regard, a previous study showed interventions and policies to change behavior can be usefully characterized by means of behavior change wheel that is a new method for characterizing and designing behavior change interventions [9]. Correct training and regular training programs, behavior change techniques such as self-regulation, self-efficacy in interventions encourage patients to participate in the management of disease symptoms, which are more effective than passive techniques such as (providing information and counseling) to maintain protective behavior in patients [10]. Regular physical activity among women leads to balance and muscle strength,

physical fitness, , and performing knee protection behaviors has a positive effect on bone density [11]. Many women in different countries, including Iran, do not perform knee protection behaviors. Considering the increasing prevalence of osteoarthritis in women and their susceptibility to many diseases and other problems caused by not performing knee protection behaviors in women with osteoarthritis, designing and implementing educational programs is one of the most effective solutions [11].

Therefore, the purpose of this study was to design and evaluate an educational intervention based on the health belief model in adopting knee pain prevention behaviors in women with knee osteoarthritis in Yasouj city.

### Method and Materials

The present study will be a quasi - experimental randomized clinical trial is adopted from the declaration of Helsinki and has been received ethical approval from the Human Ethics Committee at University, Tarbiat Modares Tehran, Iran (IR.MODARES.REC.1398.101). The present study has been recorded in Iranian Registry of Clinical Trials (IRCT20220105053636N1). This research aims to design and evaluate an educational intervention to prevent risky behaviors for knee pain in pri-postmenopausal women with knee osteoarthritis who will refer to Yasouj Orthopedic Clinics. It is predicted that this interventional program could determine the effect the educational intervention on knee protective behaviors, muscle strength and finally knee pain reduction of women with knee osteoarthritis. It is estimated that a sample size equal to 50 eligible women in each group is calculated with considering drop out during 60 month follow up. Therefore, using inclusion/exclusion criteria, 100 eligible patients will be selected from the referred individuals to the clinics of Yasooj and then will be divided into two

intervention and control groups by simple random sampling.

Inclusion criteria include aging around menopause (40 to 55 years old), women with moderate degree of knee pain, having knee pain for three months or more (chronic pain), knee stiffness when sitting and standing up, not having a history of trauma, injury or surgery and broken limbs in the last 6 months, not have been previously trained in protective behaviors and having at least primary education. Exclusion criteria include having history of joint surgery, joint replacement, intra-articular injection in the past 6 months, knee joint infections, using oral corticosteroid within 6 weeks (present or past), suffering from any other disease that affects the function of the lower limb, women with skeletal muscle disabilities due to limitations in therapeutic exercise movements and taking part in behavioral educational program. The selected participants will be divided into two groups of intervention and control group each one with 50 participants. The care providers and those who evaluated the results will be blinded to the group division. All participants will be explained regarding studying method and will be asked to sign informed consent.

The present study is performed in three stages. The first stage will be designed to make a checklist of knee-protecting behaviors. To make this tool, first a research based on reviewing studies, reading books, resources, available tools and interviewing with physiotherapist and rehabilitation experts will be performed to find the factors affecting knee pain in premenopausal women suffering from knee osteoarthritis. Furthermore, through observation of women's' lifestyle and their usual activities in open data collection methods the most common body postures during their daily activities (including sitting, standing,

walking, sleeping and exercising) will be determined. The prepared initial checklist of knee protective behaviors, it will be sent to 10 experts in the fields of health education and health promotion, ergonomics, and physiotherapy to check the validity and reliability of the content, and the checklist is examined in terms of the relevance of the main concepts to the purpose of the study, the way of writing, and the generality. To calculate the reliability, the reliability assessment method is used with internal consistency method (Cronbach's alpha).

The second stage of the research is a qualitative study. At this stage, using a qualitative approach and conducting interviews with a range of people (experts, non-experts and suffered women), the reason for not performing knee-protective behaviors will be identified and explained. The main participants of this study will be the women with knee osteoarthritis with a history of knee pain for at least 6 months. In this study, a semi-structured interview will be conducted with women with knee osteoarthritis. The selection of participants started with the purposeful sampling method and then the sampling process will be completed with the snowball sampling method in order to increase access to the key participants. A combination of purposeful and snowball sampling methods will be chosen based on the opinion of the research team because the combination of these two methods is the most practical and effective way to select the most diverse and informed participant. In this study, the researcher will gather the information from the participants and analyze the data manually. From the analysis of the data collected the codes, classes and subclasses will be obtained. Based on the reasons given by the participants for not performing knee-protective behaviors, the structures of a proper model will be determined.

The third stage of this study include the design, implementation and evaluation of an educational intervention based on a proper model which will be selected based on results of qualitative study. Before the start of the intervention, a needs assessment that include interviews and data collection by the questionnaire will be carried out from all 100 participants in the research. The questionnaires used in this stage include demographic questionnaire (personal information), Visual Analog Scale (VAS) [12], Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) [13], self-efficacy questionnaire and muscle [14] strength test and researcher-made checklist of knee

protective behaviors. After conducting the pre-test in the studied samples and analyzing the results, an educational intervention program will be edited completely. Then the intervention group will take part in the designed intervention program. The educational intervention program will be lasted for one month and the purpose of its implementation is to manage the pain related to the knee in the participants by adjusting to knee protective behaviors, strengthening muscle strength and self-efficacy. The designed educational program will be held during 4 weeks in the form of a combination of holding face-to-face training sessions and providing training on social

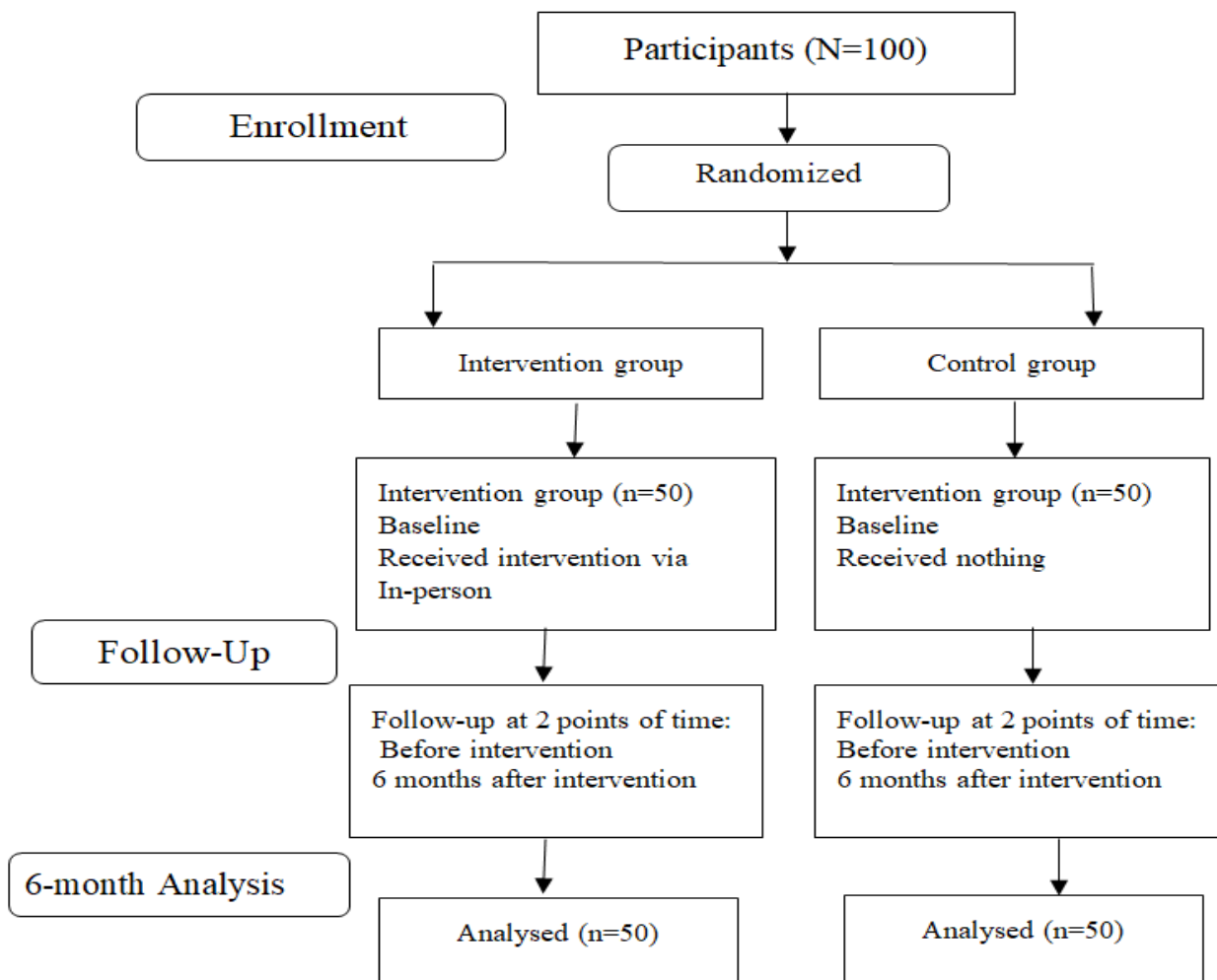


Figure 1) Flowchart and overview of the trial

networks. The duration of each session will be 90 to 120 minutes. The educational content is provided under the supervision of health education and health promotion specialists and rehabilitation specialists of the clinic. The educational content of the sessions includes variables based on the obtained model. Educational contents will be presented to the participants of the intervention group in the form of face-to-face meetings and also through social networks in the form of group discussions, lectures, training, question and answer sessions, educational videos, posters, pamphlets, podcasts, info graphics and animations. During this period, the control group will not receive any training. After one month of training with the intervention group, they will receive reminder training once a week for six months. Immediately after ending the educational intervention program on the intervention group, all the questionnaires will be given to both groups and the data will be collected and analyzed. (Figure 1)

The collected data will be analyzed using SPSS 24 software. Shapiro-Wilk and Skewness tests will be used to evaluate the normality of the data. One-way repeatable ANOVA test with Bonferroni will be used to compare the changes in each group (in two time periods). Independent t-test will be used to compare the mean of quantitative data between the intervention and control groups. Chi-square test and Pearson correlation will be used to compare the frequency of qualitative data between the intervention and control groups (before, and 6 months after the intervention).

### Conclusion

This study will determine that the designed educational program could be effective in improving the knee protective behaviors and consequently may be resulted in increased knee muscle strength, decreased

knee pain and manage the problems caused by knee osteoarthritis. It is proposed that this program could be based on the behavioral needs of Iranian women and would be effective on their knee pain control.

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**Authors' contribution:** MD will conduct all stages of study. SST will supervise the study. KKSh will advise about the different stages of the study. PY will help in representing the eligible patients.

**Conflict of Interest:** There is no conflict of Interest for this study.

**Ethical Permission:** This study has been verified in Ethics Committee of Tarbiat Modares University (IR.MODARES.REC.1398.101).

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