

Effectiveness of Instruction Program on Osteoporosis Old Age Performance about Prevention of Fall

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Abstract

Objectives: The aim of this study is to assess the effectiveness of instruction program on osteoporosis old age performance about prevention of fall

Methods: A quantitative approach using a quasi-experimental design was used in the present study with the application of a pre-tests/ post-tests approach for the study group and control group. Non-probability (purposive) sample of (100) osteoporotic patients were selected from senior homes. The study sample in this research was divided into two groups; (50) osteoporotic patients for the study, which were exposed to the health instructional program, and (50) osteoporotic patients for the control group.

Results: This study reveals that the level of total performance among participants towards the prevention of falls reveals that most osteoporotic patients had a low performance level in preventing falls (96%) at pre-test results. The post-test results indicate that all osteoporotic patients in the study group had a high level of performance in preventing falls (100%), while the osteoporotic patients in the control group had a low level of performance in preventing falls for the pretest and post-test. According to the levels of balance and risk for falls among participants which reveals that most of osteoporotic patients had moderate risk of falls (88%) at pre-test results, while the post-test results indicates that all osteoporotic patients in the study group were having low risk of fall (100%), while the most of osteoporotic patients in control group were holding moderate risk for falling (78%) at pretest and (94%) of them had moderate fall risk at posttest. The effectiveness of instructional program on fall prevention performance, the results refer to highly significant difference among osteoporotic patients' performance in the study group at p -value= 0.00 respectively, and there is no significant difference among osteoporotic patients' performance in the control group at p -value= 0.05 respectively, Also the effectiveness of instructional program on fall prevention performance, the results refer to highly significant difference among osteoporotic patients' balance level between pretest and posttest in the study group at p -value= 0.00 respectively, and there is high significant difference among osteoporotic patients' balance level between pretest and posttest in the control group at p -value= 0.05 respectively.

Conclusion: The instructional program is effective in improving performance levels. This study suggests further research on a larger sample should be carried out to estimate the incidence of osteoporosis and osteoporotic fractures related to falls in Iraq and induce the practical application of the instructions, precautions, management methods, preventive measurements, and monitoring its impact on the long-term lifestyle of the seniors with osteoporosis.

Keywords: Effectiveness, Instructional Program, Old Age Performance, Osteoporosis.

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Introduction

A skeletal illness known as osteoporosis is defined by the loss of bone mass and microstructural degradation of bone tissue. Osteoporosis, which means "porous bone," makes bones more brittle and fracture-prone. It is no longer seen as an unavoidable side effect of aging, also, as a result of the development in the pharmacological treatment of osteoporosis during the last 50 years the number of effective drug use to prevent and treatment osteoporosis and osteoporotic fracture. With a recent emphasis on bone mineral density (BMD), risk calculators like the web-based Fracture Risk Assessment Tool (FRAX) algorithm have made it easy to calculate a person's osteoporosis-related fracture risks through indicators of some clinical risk factors like age and alcohol-drinking¹.

The most common metabolic bone disorder is osteoporosis. Due to its lack of symptoms, it could not be recognized until a clinical occurrence, such a fracture, has taken place. Osteoporosis itself does not have a significant clinical or financial effect; rather, osteoporotic fractures do. According to the World Health Organization (WHO), industrialized nations have a lifetime risk of 30 to 40% for hip, vertebral, or wrist osteoporotic fractures. In the 27 member states of the European Union, osteoporosis affects 15% of people over the age of 50 (22% of women and 6.6% of men); according to the European Prospective Osteoporosis Study (EPOS), the disease affects 15% of women between the ages of 50 and 60 and 45% of women over the age of 70. The estimated prevalence of EPOS in males was 2.4% between the ages of 50 and 60 and 17% over the age of 70².

Age: has a significant role in the onset of osteoporosis. Your skeleton starts to lose more bone as you age than it gains. Additionally, the solid outer covering of bones becomes thinner while the microscopic holes within them begin to become larger. Your bones are less thick as a result. Hard bones become pliable, while pliable bones become even pliable. Osteoporosis develops when bone density loss reaches a particular threshold. Insufficient bone density makes bones more brittle and less able to withstand falls. The majority of specialists advise beginning osteoporosis screening around age 65, particularly for women. However, those who are at high risk for fractures and are younger than 65 should begin screening sooner³.

Low bone mass and microstructural bone tissue degeneration are symptoms of osteoporosis, a metabolic bone disease that increases the risk of brittle fractures with high rates of mortality and disability and adversely affects a patient's quality of life. One of the most frequent direct causes of fractures is falls. An osteoporosis patient is susceptible to the risk of falling due to several external and internal variables, including slick footwear, a risky living environment, and intensive activity, as well as internal ones including age, balance issues, and underlying disorders brought on by osteoporosis. Older individuals' falls may be decreased by multifaceted podiatric therapies, which may involve the right footwear and, most significantly, patient education. The elderly believed that falls could be prevented, but they lacked the knowledge to do so. It is crucial to implement an intervention that emphasizes changing the surroundings, balancing enchantment, and providing fall prevention information. This demonstrates why individuals with osteoporosis should also get medication and instruction on fall prevention. Anti-osteoporosis medications get clinical attention, but fall prevention education is often neglected⁴.

For older people at risk for fragility fractures, falls represent a separate risk factor. Studies have shown that 87% of senior fractures are connected to falls, and that 40% to 50% of older persons who are over 80 and live in the community fall at least once a year on average. The FRAX tool does not account for falls when calculating risk assessment, which may understate the likelihood of fracture in the older population and prevent prompt intervention. For those over 80 years old, the FRAX tool's prediction of the

probability of fragility fractures in the next 10 years has very limited practical importance⁵.

The emphasis on fall prevention has become more important as the focus of fragility fracture prevention has switched from anti-OP medication alone to a multimodal treatment approach. Elderly persons may have concurrent concerns such as sarcopenia, weakness, and an increased risk of falling in addition to vitamin D-related problems such as dietary inadequacies and decreased generation of active vitamin D⁶.

Fall is defined as an unintentional fall to the ground, with or without harm. When seniors are admitted to the hospital due to an infection, falling is the second most frequent adverse occurrence. Falls are the most common incidents that are documented in hospitalized older persons, with the incidence rate being greatest for the elderly in rehabilitative settings. Although falls may be avoided, they sadly become more common among seniors beyond the age of 60, with potentially fatal results such as fractures, decreased mobility, elevated levels of worry, and self-confidence loss. In addition to potentially fatal illnesses and long-term effects, falls among the elderly raise the price of the health care system. In order to account for avoidable diseases that have an impact on payment in both acute and long-term care settings, Medicare included falls. Among the problems that might cause falls in the elderly in diverse situations include changes in mental state, pain, surgery, decreased mobility, and drugs. Patients who have a fall in an acute care environment often remain longer as inpatients and are more likely to experience frequent readmissions and unsuccessful outcomes⁷.

Materials and Methods

A quantitative approach (quasi-experimental design) in order to apply this design, we use pre-test and post-test for the present study. The pre-test and post-test approaches were applied to both groups. The study group face pre-test and applied instructional program and finally done posttest. Non-probability known as purposive sample of (100) patients with osteoporosis were selected from senior homes. The study sample in this research was divided into two groups; (50) osteoporotic patients for the study, which were exposed to the health instructional program, and (50) osteoporotic patients for the control group.

The preliminary considerations before starting the study aim to assess seniors' performance toward fall prevention. Assessment need was applied before the beginning of the study on (10) seniors with osteoporosis. The observational checklist which was related to the senior's needs assessment composed of (20) items scored on (do it) and (not do it). Result of assessment needs demonstrated (9%) of participants were (do it). According to the results of the preliminary assessment, the researcher constructed the program in order to apply it.

The instructional program, which was developed in accordance with the results of the assessment of patients' needs and from a review of relevant scientific literature and earlier research, aims to accomplish the following objectives: Patients with osteoporosis need to be aware of the following information to improve their performance in fall prevention:

General Osteoporosis Knowledge Domain:

- a. Bone health.
- b. How does osteoporosis occur.
- c. Osteoporosis.
- d. Pathophysiology.
- e. Types and risk factors.
- f. Signs and symptoms.

g. Diagnosis.

Falls Domain:

- a. Introduction to Falling
- b. Physiological changes in the elderly, which can lead to falls
- c. Fear from falling
- d. Causes and risk factors for falls
- e. Symptoms
- f. Diagnosis
- g. Prevention
- h. Treatment
- i. Correct steps to prevent falls
- j. Appropriate measures in the event of a fall
- k. A list of things to check to prevent falls at home

Fractures Domain

- a. Osteoporotic fractures.
- b. Incidence of fractures
- c. Fractures effect on life quality.
- d. Signs and symptoms of osteoporotic fractures.
- e. Fractures risk factors.
- f. Osteoporotic fractures risk assessment.

Treatments and Prevention Domain:

- a. Prevention of fall and its fractures.
- b. Pharmacological treatment of fall and osteoporosis.
- c. Non-pharmacological treatment of fall.
- d. Instructions for prevention falls related fractures.

A pre- and post-test observational checklist was created and utilized to track seniors' performance in regard to fall prevention prior to the start of the health education program. The observational checklist is created as a means of data collecting after an assessment of the relevant literature and research. It was divided into four main sections, the first of which dealt with the sociodemographic details of the patient. Clinical characteristics are covered in the second section. The final section is a performance level checklist for fall prevention that consists of 18 elements. The balancing scale, which has 14 components, is discussed in the fourth section.

The capacity of an instrument to collect the necessary data is what determines the validity of its contents. A panel of experts evaluates the questionnaire's clarity, relevance, and suitability for measuring the idea of interest in order to establish the content validity of the early-developed instrument.

Data are examined for this research utilizing statistical techniques and (SPSS) version 23, which may help to identify the study's findings.

Results

The descriptive analysis of the sample for both groups reveal that more than half of the sample was female (56%) in the study group and (62%) in the control group, while (52%) of the patients were in the age range of (70-80), followed by those in the range of (60-70) with 30%, while (42%) of the control group were in the (70-80) age range, followed by (40%) for those in the range of (60-70). In terms of educational attainment, (32%) of the patients in both groups could only read and write, whereas (22%) of the control group's patients had completed high school.

Fifty four percent of individuals in the study group and 46 percent of the control group are widows, respectively. In both the research group (74%) and the control group (80%), the majority of individuals are unemployed.

According to body mass index markers, this table shows that 34% of research group participants and 36% of control group members are overweight. More than half of those in the study group (56%) and the control group (60%) do not follow a diet.

Additionally, more than 50% of the study group participants claimed not to have taken calcium and vitamin D supplements (52%). According to the report, 66% of those in the control group didn't take calcium and vitamin D supplements. For a duration of (3-6) years, exactly (42%) of the study group and a higher proportion of the control group participants (46%) have osteoporosis.

In the end, (36%) of participants in the study group and (24%) in the control group admitted to smoking. Less than a quarter of the sample's participants in both categories were drinking.

The overall performance levels among participants with regard to avoiding falls show that the majority of osteoporotic patients (96%) had subpar performance levels in this area at pre-test results. The results of the post-test indicate that all osteoporotic patients in the study group had high levels of performance regarding fall prevention (100%) whereas the osteoporotic patients in the control group had low levels of performance regarding fall prevention for both the pretest and the post-test.

The participants' levels of balance and fall risk show that the majority of osteoporotic patients (88%) had a moderate risk of falls at the pre-test results. According to the post-test results, 100% of the osteoporotic patients in the study group had low fall risk, in contrast to the majority of the osteoporotic patients in the control group, who had intermediate fall risk both at pretest and posttest (94%) respectively.

According to the results of the instructional program's effectiveness in improving fall prevention performance, there is no significant difference in the performance of osteoporotic patients in the control group at p -value=0.05 and a highly significant difference between osteoporotic patients in the study group at p -value=0.00, respectively.

the impact of a lesson plan's efficacy on balance, the findings show that there is a highly significant difference in the balance level of osteoporotic patients between the pretest and posttest in the study group at a p -value of 0.00 and a highly significant difference in the balance level of osteoporotic patients between the pretest and posttest in the control group at a p -value of 0.05, respectively.

The results of the post-test show a significant difference between the study and control groups, with a p -value of 0.00.

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Discussion

According to the study's findings, there is no significant difference between osteoporotic patients' performance in the control group and osteoporotic patients' performance in the study group at p-values of 0.05 and 0.00, respectively, indicating that instructional programs are effective in improving fall prevention performance. These findings are in line with those of Ahn et al. (2021), who discovered that the health belief model (HBM)-based osteoporosis- and fall-prevention program was helpful in encouraging participants to avoid osteoporosis and falls. The intervention increased understanding of fall prevention techniques, exercise-related fall prevention, and osteoporosis. An osteoporosis and fall prevention program based on HBM was evaluated using a pretest-posttest research design with an untreated control group ⁸.

The highly significant difference in balance level between the pretest and posttest among patients with osteoporosis in the study group. According to the control group, there are highly significant differences in participants balance level between the pretest and posttest, demonstrate an instructional program's effectiveness on balance level. This is in line with the findings of Smulders et al. (2010), who conducted research to assess the effectiveness of the Nijmegen Falls Prevention Program (NFPP) for people with osteoporosis and a history of falls. Because their bones are not as strong, people with osteoporosis are more likely to fracture from falls. Therefore, it is anticipated that fewer falls will be especially advantageous for these people. The NFPP for those with osteoporosis proved successful in reducing falls and raising balance level ⁹.

According to the results, there are no statistically significant correlations between the study group's sociodemographic data and performance level.

These findings are in line with the research of Abdul-Hameed and Mohammed (2012). They discovered that the program's success is unaffected by demographic factors or daily habits, indicating that all female students may participate in it and the program's goals can be met ¹⁰.

According to our knowledge, this was the first research to evaluate the balance and performance of elderly people with osteoporosis in Babylon City, Iraq. The older population is the primary focus of this project, which aims to make them more independent and active.

Limitations

There are no previous national studies or references about fall prevention performance. The sample size was very small; which limits the generalization of the findings to other settings. Also, Longitudinal studies are therefore recommended.

Recommendations

In order to estimate the prevalence of osteoporosis and osteoporotic fractures associated with falls in Iraq, further research on a larger sample is recommended. This research also encourages the practical implementation of instructions, precautions, management techniques, preventive measures, and monitoring its impact on the long-term lifestyle of the elderly with osteoporosis.

Conclusion

In order to build instructional programs that will assist seniors improve their performance and balance, it is crucial to assess their fall prevention performance and balance levels.

The educational program aids in their improvement of fall prevention performance, making it appropriate for both performance improvement and fall risk reduction. The training successfully raises the elderly's degree of balance. All seniors could understand the material since it was provided in an easy-to-understand manner.

Such programs are useful for recognizing dangers and hazards that may result in osteoporosis fractures brought on by falls as well as for improving performance and balance.

Ethical Consideration

Before conducting the study, the researcher obtaining the approval for the ethical committee in collage of nursing agreement to conduct the present study. Permission was obtained from the Ministry of Labour and Social Affairs / Directorate of Labour and Social Affairs when the research protocol was approved and granted from the Seniors Homes in Babylon. The last permission was obtained from participants in verbal and written.

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Conflicts of Interest Disclosures

There is no conflict of interest.

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