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A HEALTH INTERVENTION PROGRAM TO IMPROVE BALANCE DISORDERS AND PREVENT FALLS FOR THE ELDERLY

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Abstract

Background: Aging is associated with a reduction in both physical and cognitive functions of the human body, which also involves the likeliness in the occurrence of age related diseases. **Aim**: The study aims to evaluate the effect of health intervention program to improve balance disorders and prevent falls for elderly **Study Design:** A quasi experimental design was used in this study. **Setting:** This study conducted in two outpatient clinics(Ear, nose, throat and Internal medicine) at Elsalam hospital, Port Said City. **Sample:** A purposive sample was used in this study. **Tools:** three tools were used: interviewing questionnaire include: demographic characteristic, elderlys' knowledge regarding balance disorders and falls prevention. Berg Balance Scale. Hendrich II Fall Risk Model. **Results:** 23.4% of elderly had unsatisfactory total knowledge post intervention program while 76.6 of them had satisfactory total knowledge post intervention program. Related to elderly reported practices about Berg balance scale, about 58.4 % of elderly post intervetion program had acceptable balance performance, 32.5% of elderly had no risk of fall post intervention program and 67.5% had high risk of fall post intervention program. **Conclusion**: There was a marked improvement in elderly's total knowledge about balance disorders and fall prevention post intervention program than pre intervention program. Additionally, there was statistically significant improvement in elderly's total reported practices as standing unsupported post intervention program in berg balance scale and minority of elderly had no risk for fall post intervention program in hendrich II fall risk model. **Recommendations:** Continuous health educational program for elderly about fall prevention measures and perform balance exercise regularly.

Keywords: Balance Disorders, Berg Balance Scale, Elderly, Hendrich II Fall Risk Model

1. INTRODUCTION

The age distribution of the global population is subject to consistent fluctuations. A global trend seen is the rise in the old population with a concomitant decrease in the younger population. Given that the natural phenomenon of aging is characterized by a continuous and irreversible progression, it is important to acknowledge that a long life expectancy has not only benefits but also potential drawbacks. The process of aging is characterized by a decline in both physical and cognitive capabilities of the human body, as well as an increased susceptibility to age-related disorders [1]. The process of aging is often linked to a gradual deterioration in equilibrium. In particular, when the task difficulty is heightened by reducing sensory input, it becomes possible to identify balance abnormalities at earlier stages of development. The reduction in postural stability often becomes more evident over an extended period of time, particularly when faced with prolonged obstacles related to balance. This decline in stability tends to remain and worsen with each successive decade of an individual's lifespan [2].

Balance refers to the capacity to gather sensory and proprioceptive data pertaining to an individual's spatial orientation and then generate the necessary motor responses for regulating bodily motion [3]. The capacity to regulate balance relies on the amalgamation of sensory input from the somatosensory, vestibular, and visual systems, which collaborate with the neuromuscular system to govern the alignment of the body in relation to the surroundings and maintain the stability of the body's center [4]. Balance is a complex skill that encompasses various bodily systems, including the musculoskeletal, cognitive, and somatosensory systems. Consequently, it can be influenced by a range of conditions, such as neurological diseases. The ability to maintain balance enables individuals to engage in physical movement and effectively perform their daily activities [5].

Balance can be classified into two categories: static and dynamic. In static stability, the center of gravity of the frame remains within the base of support. In dynamic stability, the center of gravity is maintained within the base of support while in motion. Impaired balance can be influenced by various factors, depending on the individual's condition. These factors include reduced muscle strength, impaired motor coordination, cognitive deficits, and compromised sensory organization. Neurological conditions can potentially affect all of these factors [6].

Falls were the primary cause of injury among those aged 65 years or older. According to a study conducted in 2018, a notable proportion of older individuals, namely 27.5%, had at least one instance of falling during the previous year. This led to a substantial number of fall-related injuries, estimated to be over 8.4 million, and unfortunately, resulted in around 32,000 fatalities [6]. The occurrence of frequent falls in the older population may result in significant health implications, such as pain, bruises, lacerations, and fractures, including upper extremity and hip fractures. In extreme situations, falls can even lead to cerebral hemorrhage. Therefore, it is imperative to implement measures aimed at reducing the frequency of falls in this demographic. Approximately 28-35% of the senior population has falls annually, with this proportion rising to 32-42% for those aged 70 years and above. Additionally, it has been shown that a significant proportion of the older population, ranging from 20% to 39%, develop a fear of falling subsequent to experiencing a fall incident. This fear, in turn, results in a further reduction in their level of physical activity and independence, regardless of whether they sustain any actual injuries [7]. Falls have both immediate and long-term consequences, impacting the quality of life for those who experience falls as well as their families, and also imposing economic burdens on the healthcare system. Falls often result in diminished mobility, reduced self-assurance, and compromised functional autonomy, even in the absence of any physical injuries [8]. Falls may result in significant social ramifications, including the need for hospitalization and heightened need for social care [9].

The implementation of health intervention programs has significant importance for the older population in terms of fall prevention and balance improvement. This is primarily due to their limited awareness of personal fall risks and potential lack of understanding about preventive measures. Moreover, their knowledge, attitudes, and behaviors pertaining to fall prevention may be insufficient [10]. Exercise therapies that are specifically tailored to enhance lower limb muscular strength and postural balance have been shown to be helpful in improving balance and reducing the risk of falls among senior individuals [11]. Engaging in balance exercises may enhance an older adult's capacity to effectively manage and sustain their bodily orientation, hence

reducing the risk of falls. This improvement in balance control encompasses both dynamic and static scenarios. The intervention has been determined to be both safe and effective for older persons, and it has also been deemed acceptable by healthcare providers. Furthermore, the use of balancing exercises has been shown to enhance muscular strength, cardiovascular capacity, flexibility, and balance, while also mitigating the likelihood of falls and therefore enhancing overall quality of life [12].

The involvement of gerontological nurses is crucial in the efficient treatment of balance disorders and fall difficulties. This often involves collaborating with a multidisciplinary team, as well as actively involving the older individuals and their carers. However, the nurse plays a crucial role in initiating and coordinating activities aimed at promoting balance. In the context of geriatric nursing, it is important for healthcare professionals to possess knowledge about the clinical symptoms, kinds, and problems associated with balance disorders. Additionally, they should prioritize the implementation of safety measures and the promotion of independence among their patients [13].

1.1 Significance of the Study

A balance disturbance is a prevalent issue that affects a significant proportion of the elderly population, particularly those aged 75 years and older [14]. Balance problems are significant contributing factors to falls, which in turn elevate the risk of mortality and disability. Additionally, they may result in a loss of autonomy. Hence, the presence of balance abnormalities in the aged population might be regarded as a sign that contributes to functional insufficiency [3]. The occurrence of falls among the elderly is a significant global health issue, mostly attributed to age-related physiological changes. Falls are the predominant cause of injury within this demographic, necessitating medical intervention in over 37 million cases annually. Furthermore, falls contribute to the loss of more than 17 million disability-adjusted life-years per year [15].

Annually, a projected 646,000 older individuals succumb to fatal injuries resulting from falls on a worldwide scale, with more than 80% of these incidents occurring in low-income and middle-income nations. The incidence rates recorded in this group exhibit significant range, ranging from a minimum of 29% to a maximum of 40%. The prevalence of recurring falls, defined as experiencing more than two incidents within a single calendar year, was found to range from 11% to 21% according to a previous study [16]. The estimated prevalence of falls among the older population in Egypt is reported to be 33.3% [17]. The Egyptian census is conducted on a decennial basis, with the most recent one taking place in 2016. The proportion of individuals classified as old was recorded as 4.4% in the year 1976. This figure had a gradual increase over the subsequent years, reaching 5.75% in 1996. Further analysis reveals a continued upward trend, with the percentage of senior individuals growing to 6.27% in 2006 and then reaching 6.9% in 2016. According to projections, the anticipated proportion is 9.2% in the year 2021, with an estimated increase to 20.8% by the year 2050 [18].

The term "balance" is often used to denote the state of stability and steadiness experienced by individuals when standing or sitting. It is observed that senior individuals, owing to the progression of age, often encounter balance disorders. Maintaining equilibrium is crucial during daily actions that need intricate regulation and synchronization of both the sensory and neuromuscular systems. Balance issues may result in a decrease in functional independence, leading to hospitalization and admission to long-term care facilities among the senior population. It is essential to

implement a health intervention program aimed at enhancing balance issues and mitigating the risk of falls among the senior population.

1.2 Aim of the study

This study aim to evaluate the effect of health intervention program to improve balance disorders and prevent falls for elderly through:

1) Assessing elderly knowledge and reported practices about balance disorders and falls according to elderly needs.
2) Developing health intervention program about balance disorders and falls according to elderly needs.
3) Implementing health intervention program about balance disorders and falls according to elderly needs.
4) Evaluating the effect of health intervention program on balanced disorders and prevention of falls for elderly.

1.3 Research Hypothesis

Health intervention program will improve elderly knowledge and reported practices about balance disorders and fall prevention.

2. SUBJECTS AND METHODS

2.1 Research design

A quasi-expremintal study was applied to achieve the aim of the current study.

2.2 Research setting

The study was conducted in Ear, Nose & Throat (ENT) and Internal medicine (recently named as Cardiothoracic) outpatient clinics at Elsalam hospital-Port Said City, which affiliated to Comprehensive Health Insurance, Ministry of Health, Egypt.

2.3 Sample: Purposive sample was used in this study

2.4 Tools for data collection

The data of this study were collected by using three tools

1st tool: An interviewing questionnaire; it was developed after reviewing related litrature and it included 3 parts::

Part 1: Elderly demographic characteristics: It includes 9 questions such as: Gender, age, marital status, educational level, current work, source of income, ……etc.

Part 2: Elderly medical history (Past and present): - Past history includes 10 questions such as: Suffer from any family history for certain disease?, If yes, what type of disease?, enter hospital the last year, reason of entering hospital, face any fall at the last 12 months,…..etc.

- Present history includes 11 questions such as: Suffer from certain diseases, If yes, what type of disease, Taking any medications now, If yes, what medications, taking medications regularly, smoking, practicing sports regularly,…..etc.

Part 3: Assess elderly knowledge with pre and post test about:

A) Balance disorders it includes 9 questions such as: Meaning, causes, symptoms, signs and risk that need physician counseling, predisposing factors to keep elderly balance,……etc.

B) Fall prevention it includes 9 questions such as: Meaning, causes, symptoms and signs, complications of fall,…..etc.

Scoring system for knowledge:

The scale contains 18 questions, each item was assigned as the following:

2 = Complete correct

1 = Incomplete correct

0 = Don't known.

The total score for the elderly knowledge was calculated by the addition of the total score. Elderly's total knowledge score was classified as the following:

Total scores of knowledge =18 questions =36 grades = 100%

- Satisfactory knowledge when total score was ≥ 50% (≥ 18 grades).

- Unsatisfactory knowledge when the total score was< 50% (< 18 grades).

2nd tool: Berg Balance Scale developed by (Berg et al., 1992): with pre and post test, This scale measures reported practices about balance in elderly, it was observed and scored pre and post program by the researcher**.** The scale contains 14 items as: Sitting to standing, standing unsupported, sitting unsupported, standing to sitting, transfers, standing unsupported with eyes closed, standing unsupported with feet together,….etc.

Scoring system for Berg Balance Scale:

The scale contains 14 items, each item was assigned as the following:

0 = Unable to do the task

1= Maximum assist need

2= Moderate assist need

3= Minimum assist need

4= Independent (ability to finish the task without assistance).

The maximal global score of the scale was 56 points.

The total score of elderly calculated as follows:

0 to 20 means an impairment of balance and had a high risk of fall.

21 to 40 means acceptable balance performance.

41 to 56 means good balance performance.

3rd tool: **Hendrich II Fall Risk Model:** with pre and post test, this model measures reported practices about falls, it was adapted and modified from the original by **(Hendrich et al., 2007**) and was observed and scored pre and post program by the researcher. It consists of the following eight items:

Scoring system for Hendrich II Fall Risk Model:

Confusion /disorientation / impulsivity (0 mean unconfused to 4 mean confused), symptomatic depression (0 mean un depressed to 2 mean depressed), altered elimination (0 mean normal elimination to 1 mean urinary incontinence), dizziness or vertigo (0 mean no history of dizziness or vertigo to 1 mean have history of dizziness or vertigo), male gender (0 mean women gender to 1 mean male gender), any administrated of antiepileptic (0 mean no history of taking antiepileptic to 2 mean had history of taking antiepileptic), any administrated of benzodiazepines (0 mean no history of taking benzodiazepines to 1 mean had history of taking benzodiazepines), and The get-up-and-go test assessing four items as: ability to rise in single movement-no loss of balance with steps (receives score of 0), pushes up , successful in one attempt (receives score of 1), multiple attempts, but successful (receives score of 3) and unable to rise without assistance during rest, (receives score of 4).

The elderly total reported practices about fall-risk score for the Hendrich II Fall Risk Model (HIIFRM) ranged from 0 to 20 as the following:

- The elderly who took ≥ 5 considered high risk of fall.
- The elderly who took < 5 considered no risk for fall.

2.5 Validity

The tools validity was done by five of Faculty's staff Nursing experts in the field of Community Health Nursing, Faculty of Nursing, Helwan University and Specialties who reviewed the tools for clarity, relevance, comprehensiveness, applicability, and reliability.

2.6 Reliability

To assess reliability, the study tools were tested by the pilot subjects at first session and retested after 2weeks as test-retest reliability for calculating Cronbach's Alpha coefficient test, which revealed that each of the three tools consisted of relatively homogenous items as indicated high reliability of each tool. Cronbach's Alpha of knowledge was 0.91, Berg balance scale was 0.984 and 0.894 for the Hendrich II Fall Risk model.

2.7 Pilot study

The pilot study was carried out on 10% (7) of the sample to examine the clarity of questions and time needed to complete the study tools consumed about 15-20 minutes. Based on the results of pilot study no modifications were done. So subjects of the pilot study were included in the main study sample.

2.8 Fieldwork

- An approval letters was obtained from the Dean of Faculty of Nursing, Helwan University for director of outpatient clinics at Elsalam hospital, Port Said City, which affiliated to Comprehensive Health Insurance, Ministry of Health, Egypt.
- Data was collected by the researcher in a period of 6 months (from beginning of December 2021 to end of May 2022). The data collection tools were conducted in Ear, Nose & Throat (ENT) and Internal medicine outpatient clinics. Elderly's informed consent were obtained, assured that the obtained

information was kept confidentiality and used only for the purpose of the study. The researcher was conducted the study by distribution of the tool for them as pretest.

- Health intervention program to improve balance disorders and prevent falls for elderly was developed based on the results obtained from the pretest questionnaire.
- The effect of the intervention program was assessed after the end of the program by using the same tool one time only. The researcher interview the elderly 2 days per week (Sunday and Wednesday) during the morning shift; 10 am - 1 pm, the researcher was taken 30-45 minutes with each elderly to fill the study tool.

Health intervention program to improve balance disorders and prevent falls for elderly was conducted in four phases:

1st preparatory phase: Tools for data collection development based on review of the past & current related literature covering various aspects of the study by using available books, periodical articles and magazines. The aim is to get acquainted with the research problem to develop the study tools.

2nd assessment phase: By using pre-test questionnaire to assess elderly knowledge about meaning balance disorders and falls, causes balance disorders and falls, symptoms, signs balance disorders and falls, risk that need physician counseling about balance disorders, complications of fall, extrinsic factors that increase fall exposure, risk of fall cause by and ways to make home safety…etc, and reported practices about berg balance scale and hendrich fall risk model.

3rd planning and implementation phase: By developing the health intervention program contents. In this phase the researcher implemented the intervention program sessions, with the clearance of general objectives as follow:

-By the end of the intervention program, the elderly was able to improve their knowledge meaning balance disorders and falls, causes balance disorders and falls, symptoms, signs balance disorders and falls, risk that need physician counseling about balance disorders, complications of fall, extrinsic factors that increase fall exposure, risk of fall cause by and ways to make home safety…etc, and reported practices about berg balance scale and hendrich fall risk model.

-The program was done through four theoretical and practical sessions each session lasted 30-40 minutes and immediately did the post test.

Elderly were divided into 15 groups, each group consists of 5-6 elderly, and each group took 1-2 week (2 elderly per day). The program was implemented within six months. By the end of each session, the elderly were informed about the content of the next session, its time and a brief summary was given emphasizing the most important points.

Health Education Program Booklet:

A booklet including all content of the program it was design and given to elderly as an educational reference during and after the program implementation. Contents of booklet including theoretical part as (meaning of balance, balance benefits, factors that affect elderly's ability to maintain balance, meaning of balance disorders, types of

balance disorders, common symptoms of balance disorders, causes of elderly's balance disorders, effect of some drugs on elderly's balance, signs and risks that you should consult a doctor when they appear, scales to determine the health of body balance, strategies to help the elderly maintain balance, meaning of fall, risk factors that lead to falls, causes of fall, complications of fall, the importance of keeping the elderly from falling, fall prevention methods. And Practical part include: Otago exercise and Epley maneuver.

Teaching methods:

- Lecture/ group discussion
- Demonstration/ re-demonstration
- Brain storming

Media:

- Pictures and data show.
- Handout prepared by the researcher.
- Colored posters and videos

Four sessions (2 theoretical sessions and 2 practical sessions)

The pretest knowledge questionnaire, Berg balance scale and Hendrich II Fall Risk model was collected from elderly (pre-program assessment).

Inform the elderly that each session started by summary about the previous session and objectives of new topics.

First session: At the beginning of the first session, the researcher welcomes and introduce self to elderly, an orientation to the program was given, and take informed consent of elderly, set an agreement on the time and duration of sessions. The researcher provide a trust, warm and secure atmosphere between elderly group to relieve anxiety, tension, and increase the motivation to participate in all sessions of the intervention program. Begin with the content of the booklet, provide introduction about meaning balance disorders, symptoms, causes, complications taking into consideration the use of clear and simple language. Discussion, motivation and reinforcement during session were used to enhance learning.

Second session: Meaning of falls, causes and risk factors by Arabic booklet developed by researcher

Third session: Performing Otago strength and balance training exercise program based on the result of the pre-test the researcher was do.

-Meeting the elderly was done in waiting area of outpatient clinic.

Fourth session: Performing the EPLY maneuver to enhance balance.

4th evaluation phase: This phase aimed to evaluate the effect of health intervention program on elderly's knowledge and reported practices about berg balance scale and hendrich fall risk model. Post-test was done immediately after implementation of the health intervention program.

2.9 Ethical considerations

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee, Faculty of Nursing, Helwan University. Participation in the study was voluntary and subject was given complete full information about the study and their role before signing the informed consent. The ethical considerations were included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs were respected.

Statistical analysis:

The collected data were organized, tabulated and analyzed using appropriate statistical test. The data were analyzed by using the Statistical Package for Social Science (SPSS) version 24, which was applied to calculate frequencies, percentages, mean and standard deviation, as well as test statistical significance, associations by using Chi-square test (x2), is a test used to study association between two qualitative variables, and matrix correlation to detect the relation between the variables for (p value). It considered as follows: Highly statistically significant at $p < 0.001$, statistically significant when $p < 0.05$ and not significant when $p > 0.05$.

RESULTS

Table (1): Indicates that, 63.6 % of studied elderly were males, 53.2 % of them their ages were more than 65 years, the mean age of elderly were 68.5 ±6.7 year. Related to marital status, 46.8 % of the elderly were married. According to elderly's education, 46.8% of them were had basic education and 55.8 % of them weren't worked. In addition, 44.2 % of the elderly their source of income were pensions and 58.4 % of them their income not enough. According to living with 46.8 % of them were lived with their husbands/wife.

Figure (1): Illustrates that, 56% of elderly were visited the cardiothoracic clinic. And 44% of them visited the ear-nose &throat clinic.

Table (2): Shows that, 35.1 % of the elderly had suffered from certain disease in family history. 63% of the elderly had suffered from tumors and 85.2 of them had diabetes. According to enter the hospital during last year, 58.4% of them didn't enter hospital and 50.0% of them had entered the hospital for medication. 59.7% of them falled during the last 12 months, 52.2 of them falled once, 76.1% of elderly who falling had ability to standup alone. 80.4% of them injured due to falling.

Table (3): Indicates that, 57.1% of the elderly suffer from certain diseases. 88.6% of them suffered from hypertension, 97.4% of them take medications now. 34.7% of them take heart medications and 61.3% of them take anticoagulants medication. 64.9% of the elderly take their medications regularly. 54.5% of them currently non-smokers. 100% of the elderly currently didn`t practice any sports regularly, 66.2% of the elderly lose their balances even if they didn`t fall and 70.6% of them stopped current activities due to loss of balance. 57.1 % of them had the ability to care of themselves.

Table (4): Reveals that, there was a marked improvement in elderly's knowledge post intervention program with highly statistically significant difference at (P= 0.001), As evidenced, 22.1% of elderly didn't know about causes of balance disorder pre intervention program, While this decreased to 10.4% post intervention program. And

statistically significant difference at (P= 0.005). As evidenced, 18.2% of elderly didn't know symptoms and signs of fall pre intervention program. While this decreased to 7.8% post intervention program.

Figure (2): Illustrates that, 59.8% of elderly had unsatisfactory total knowledge pre intervention program. While improved to 23.4% of them had unsatisfactory total knowledge post intervention program. And 40.2 of them had satisfactory total knowledge pre intervention program. While this improved to 76.6 of them had satisfactory total knowledge post intervention program.

Table (5): Indicate that, there was highly statistically significant improvement in all items of elderly reported practices about berg balance scale post intervention program, as evidenced by 44.2% of the elderly **unable to do** response of setting to standing pre intervention program, which decreased to 13.0% post intervention program. Also 62.3% **maximum assist needed** response of pick up object from the floor from a standing position, which decreased to 36.4% post intervention program. And 61.0% **unable to do** response of Turn 360 degrees, which decreased to 26.0% post intervention program.

Figure (3): Reveals that, 84.4 % of elderly had impairment of balance pre intervention program, which decreased to 36.4 % post intervention program, while 15.6 % of them had acceptable balance performance, which improved to 58.4 % post intervention program. In pre intervention no one elderly had good balance performance, which improved to 5.2 % post intervention.

Table (6): Indicates that, there was slightly improvement in elderly reported practices about hendrich II fall risk model post intervention program, as evidenced by, 49.4% of elderly had confused pre intervention program, which decreased to 37.7%. Also no one of them had ability to rise in a single movement - no loss of balance with step pre intervention, which improved to 49.4 %. And 26.0% of them had multiple attempts but successful, which become 5.2% post intervention program.

Figure (4): Shows that, 10.4% of elderly had no risk pre intervention program to become 32.5% post intervention program, 89.6% had high risk pre intervention program to become 67.5% post intervention program.

Table (1): Frequency Distribution of Elderly regarding Demographic Characteristics (n=77)

Demographic characteristics	No	%
Gender		
Male	49	**63.6**
Female	28	36.4
Age (Years)		
60 – 65	36	46.8
> 65	41	**53.2**
Mean ±SD	68.5 ±6.7	
*** Marital Status**		
Married	36	**46.8**
Widowed	24	31.2
Divorced	17	22.1
Educational level		
No read and write	4	5.2
Basic education	36	**46.8**
Secondary education	24	31.2
University education or higher	13	16.9

Do you work currently?		
Yes	34	44.2
No	43	**55.8**
Source of Income		
Pension	34	**44.2**
Children assistance	8	10.4
Current work	31	40.3
Relative's assistance	4	5.2
**** Income level**		
Not enough	45	**58.4**
Enough	32	41.6
Whom are you living with?		
Husband / Wife	36	**46.8**
With children	18	23.4
Alone	23	29.9

* None of elderly were single

** None of elderly had enough and save income

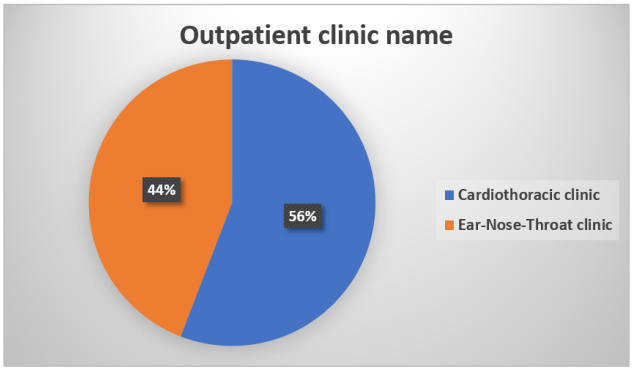

Figure (1): Percentage Distribution of the Elderly according to Outpatient Clinic attendance (n=77)

Table (2): Frequency Distribution of Past History for the Elderly (n=77)

Past history items	No	%
History for certain disease in the family history		
Yes	27	**35.1**
No	50	64.9
***If yes, do you suffer from: (n=27)**		
Tumor	17	**63.0**
Hypertension	15	55.6
Diabetes	23	**85.2**
Enter the hospital during last year		
Didn't enter	45	**58.4**
Once	6	7.8
Twice	9	11.7
Three times	17	22.1
Reason of entering hospital (n=32)		
Diagnosis	14	43.8
Medication	16	**50.0**
Surgery	2	6.2
Fall during the last 12 months		
Yes	46	**59.7**
No	31	40.3
If yes, Number of falls (n=46)		
Once	24	**52.2**
Twice	17	37.0
Three times	3	6.5

Four times	2	4.3
Ability to standup alone		
Yes	35	**76.1**
No	11	23.9
Injury from fall		
Yes	37	**80.4**
No	9	19.6
Fear of fall again		
Yes	41	89.1
No	5	10.9
The surrounding environment cause falling		
Yes	43	93.5
No	3	6.5

* The elderly have more than one family history of disease

Table (3): Frequency Distribution of Present History for the Elderly (n=77)

Present history items	No	%
Suffer from certain diseases		
Yes	44	**57.1**
No	33	42.9
***If yes, what kind of disease? (n=44)**		
Hypertension	39	**88.6**
Diabetes	36	81.8
Heart diseases	25	56.8
Arthritis	24	54.5
Renal failure	11	25
Take medications		
Yes	75	**97.4**
No	2	2.6
***If yes, what medications do you take? (n=75)**		
Heart medications	26	**34.7**
Hypertension medications	39	52
Diabetics	35	46.7
Anticoagulants	46	**61.3**
Pain killers	6	8
Bronchodilators	26	34.7
Take medications regularly		
Yes	50	**64.9**
No	27	35.1
Specific habits		
Smoking		
Yes	35	45.5
No	42	**54.5**
Practice sports regularly		
Yes	0	0
No	77	**100**
Loss balance even if you didn't fall		
Yes	51	**66.2**
No	26	33.8
If yes, stop current activity due to loss of balance (n=51)		
Yes	36	**70.6**
No	15	29.4
Do you have the ability to take care of yourself?		
Yes	44	**57.1**
No	33	42.9
If not, who cares about you? (n=33)		
Husband / Wife	17	51.5
Children	9	27.3
Relatives	7	21.2

* The elderly have more than one response

Table (4): Statistical Difference of the Elderly Knowledge regarding Balance Disorder and Falling Pre and Post Intervention Program (n=77)

Balance Disorder Knowledge Items	Pre – Intervention						Post – Intervention						Chi – Square	
	Complete Correct		Incomplete Correct		Don't know		Complete Correct		Incomplete Correct		Don't know			
	No	%	No	%	No	%	No	%	No	%	No	%	X^2	P-Value
Meaning of balance disorder	38	49.4	24	31.2	15	19.5	60	77.9	9	11.7	8	10.4	13.887	<0.001**
Causes of balance disorder	34	44.2	26	33.8	**17**	**22.1**	67	87	12	15.6	**8**	**10.4**	18.639	<0.001**
Symptoms of balance disorder	24	31.2	26	33.8	26	33.8	58	75.3	10	13	9	11.7	29.46	<0.001**
Signs and risk that need physician counseling	55	71.4	11	14.3	11	14.3	67	87	6	7.8	4	5.2	5.917	0.051
Factors affect on elderly body balance	23	29.9	29	37.7	25	32.5	64	83.1	8	10.4	5	6.5	44.574	<0.001**
Effect of medications on balance disorder	58	75.3	11	14.3	8	10.4	69	89.6	6	7.8	2	2.6	6.023	0.049*
Negative effects for balance disorder	25	32.5	34	44.2	18	23.4	61	79.2	11	14.3	5	6.5	34.173	<0.001**
Nutritional supplements help[balance	26	33.8	34	44.2	17	22.1	60	77.9	11	14.3	6	7.8	30.458	<0.001**
Exercises to strengthening lower limbs	15	19.5	41	53.2	21	27.3	62	80.5	10	13	5	6.5	57.377	<0.001**
Falling Knowledge Items														
Meaning of fall	13	16.9	24	31.2	30	39	66	85.7	6	7.8	5	6.5	63.827	<0.001**
Causes of falls	37	48.1	26	33.8	16	20.8	68	88.3	6	7.8	3	3.9	30.526	<0.001**
Symptoms and signs of fall	49	63.6	14	18.2	14	**18.2**	67	87	7	9.1	6	**7.8**	8.272	0.016*
Complications of fall	27	35.1	36	46.8	14	18.2	56	72.7	11	14.3	10	13	24.097	<0.001**
Extrinsic factors that increase fall exposure	48	62.3	17	22.1	12	15.6	68	88.3	7	9.1	2	2.6	14.757	<0.001**
Risk factors that cause fall	12	15.6	37	48.1	28	36.4	64	83.1	7	9.1	6	7.8	70.268	<0.001**
Ways to make home safety	24	31.2	34	44.2	19	24.7	64	83.1	8	10.4	5	6.5	42.443	<0.001**
Measures used to prevent fall	8	10.4	45	58.4	24	31.2	65	84.4	6	7.8	6	7.8	85.13	<0.001**
Methods used to prevent fall	33	42.9	22	28.6	22	28.6	63	81.8	9	11.7	7	9.1	22.563	<0.001**

Statistically significant at p-value ≤ 0.005 ** Highly statistically significant at p-value ≤ 0.001.

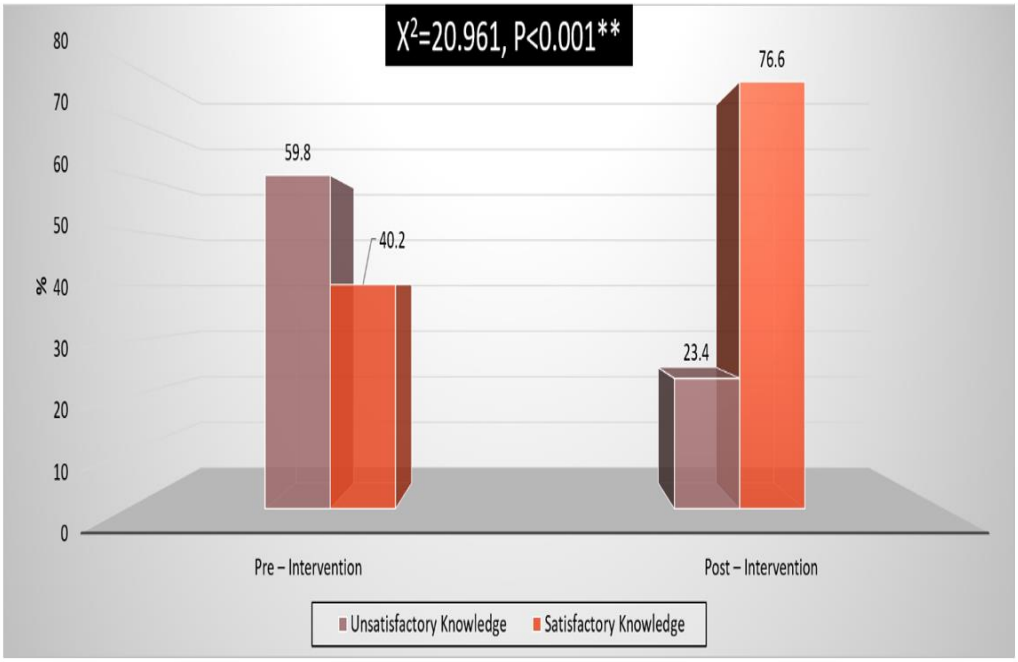

Figure (2): Percentage Distribution of the Elderly according to Total Knowledge Score Pre & Post Intervention Program (n=77)

Table (5): Statistical Difference of the Elderly reported practices according to Berg Balance Scale Pre and Post Intervention Program (n=77)

Berg balance scale items	Pre – Intervention										Post – Intervention										Chi – Square	
	Unable to do		Maximum assist needed		Moderate assist needed		Minimum assist needed		Independent		Unable to do		Maximum assist needed		Moderate assist needed		Minimum assist needed		Independent			
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	X^2	P- value
Setting to standing	34	**44.2**	33	42.9	5	6.5	5	6.5	0	0.0	10	**13.0**	16	20.8	12	15.6	30	39.0	9	11.7	48.7	<0.001**
Standing unsupported	36	46.8	37	48.1	3	3.9	1	1.3	0	0.0	8	10.4	26	33.8	31	40.3	12	15.6	0	0.0	52.1	<0.001**
Setting with back unsupported but feet supported on floor or on a stool	40	51.9	21	27.3	9	11.7	7	9.1	0	0.0	26	33.8	0	0.0	0	0.0	38	49.4	13	16.9	67.3	<0.001**
Standing to setting	38	49.4	22	28.6	5	6.5	12	15.6	0	0.0	26	33.8	8	10.4	12	15.6	31	40.3	0	0.0	20.1	<0.001**
Transfers	19	24.7	37	48.1	19	24.7	2	2.6	0	0.0	9	11.7	26	33.8	0	0.0	29	37.7	13	16.9	61.0	<0.001**
Standing unsupported with eyes closed	32	41.6	25	32.5	19	24.7	1	1.3	0	0.0	18	23.4	8	10.4	30	39.0	10	13.0	11	14.3	33.5	<0.001**
Standing unsupported with feet together	41	53.2	33	42.9	0	0.0	3	3.9	0	0.0	28	36.4	9	11.7	0	0.0	31	40.3	9	11.7	48.2	<0.001**
Reaching forward without stretched armed while standing	10	13.0	43	55.8	20	26.0	4	5.2	0	0.0	0	0.0	28	36.4	39	50.6	10	13.0	0	0.0	21.9	<0.001**
Pick up object from the floor from a standing position	21	27.3	48	**62.3**	4	5.2	4	5.2	0	0.0	2	2.6	28	**36.4**	7	9.1	40	51.9	0	0.0	51.2	<0.001**
Turning to look behind over left and right shoulder while standing	43	55.8	27	35.1	7	9.1	0	0.0	0	0.0	29	37.7	18	23.4	20	26.0	10	13.0	0	0.0	20.8	<0.001**
Turn 360 degrees	47	**61.0**	23	29.9	7	9.1	0	0.0	0	0.0	20	**26.0**	28	36.4	18	23.4	11	14.3	0	0.0	27.2	<0.001**
Place alternate foot on step or stool while standing unsupported	28	36.4	42	54.5	4	5.2	3	3.9	0	0.0	17	22.1	30	39.0	18	23.4	12	15.6	0	0.0	18.9	<0.001**
Standing unsupported one foot in front	38	49.4	35	45.5	2	2.6	2	2.6	0	0.0	20	26.0	18	23.4	8	10.4	31	40.3	0	0.0	40.1	<0.001**
Standing on one leg	42	54.5	29	37.7	6	7.8	0	0.0	0	0.0	28	36.4	9	11.7	29	37.7	11	14.3	0	0.0	39.4	<0.001**

** Highly statistically significant at p-value ≤ 0.001.

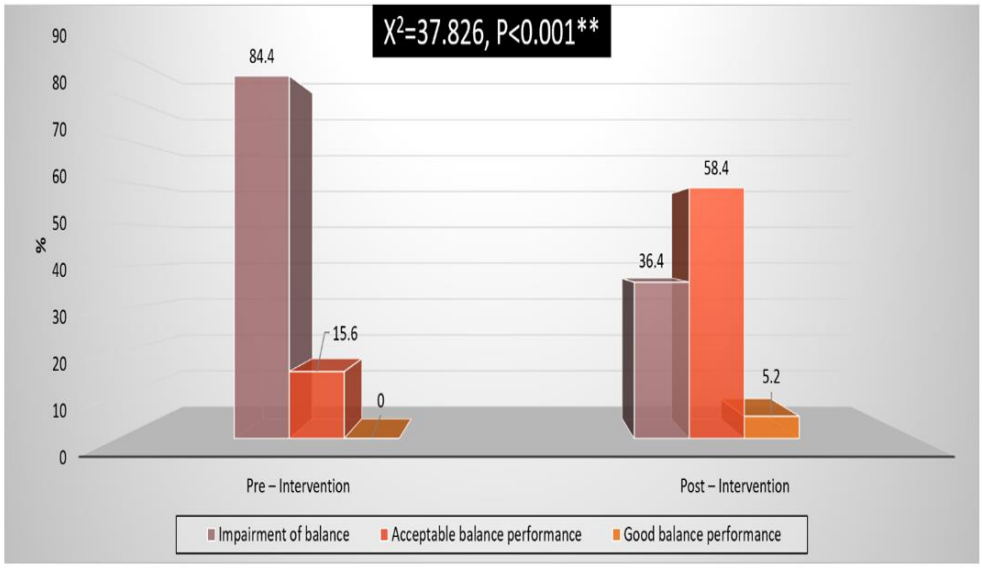

Figure (3): Percentage Distribution of the Elderly Reported Practices according to Total Score of Berg Balance Scale Pre and Post Intervention Program (n=77)

Table (6): Statistical Difference of the Elderly Reported Practices according to Hendrich II Fall Risk Model Score Pre & Post Intervention Program (n=77)

Fall Risk Factors	Pre – Intervention		Post – Intervention		Chi – Square	
	No	%	No	%	X^2	P- value
Confusion, Disorientation, Impulsivity						
Un-confused	39	50.6	48	62.3		
Confused	38	**49.4**	29	**37.7**	2.140	0.144
Symptomatic Depression						
Un-depressed	27	35.1	27	35.1		
Depressed	50	64.9	50	64.9	0.000	1.000
Altered Elimination						
Normal elimination	9	11.7	9	11.7		
Urinary incontinence	68	88.3	68	88.3	0.000	1.000
Dizziness Vertigo						
No history of dizziness and vertigo	10	13.0	10	13.0		
Have history of dizziness and vertigo	67	87.0	67	87.0	0.000	1.000
Male gender						
Women gender	28	36.4	28	36.4		
Male gender	49	63.6	49	63.6	0.000	1.000
Any administered antiepileptics						
No history of taking antiepileptics	36	46.8	36	46.8		
Have history of taking antiepileptic	41	53.2	41	53.2	0.000	1.000
Any administered Benzodiazepines						
No history of taking benzodiazepines	30	39.0	30	39.0		
Have history of taking benzodiazepines	47	61.0	47	61.0	0.000	1.000
Get up & Go test						
Ability to rise in single movement- no loss of' balance with step	0	**0.0**	38	**49.4**		
Pushes up, successful in one attempt	11	14.3	21	27.3		
Multiple attempts, but successful	20	**26.0**	4	**5.2**		
Unable to rise without assistance during rest	46	59.7	14	18.2	68.858	<0.001**

** Highly statistically significant at p-value ≤ 0.001.

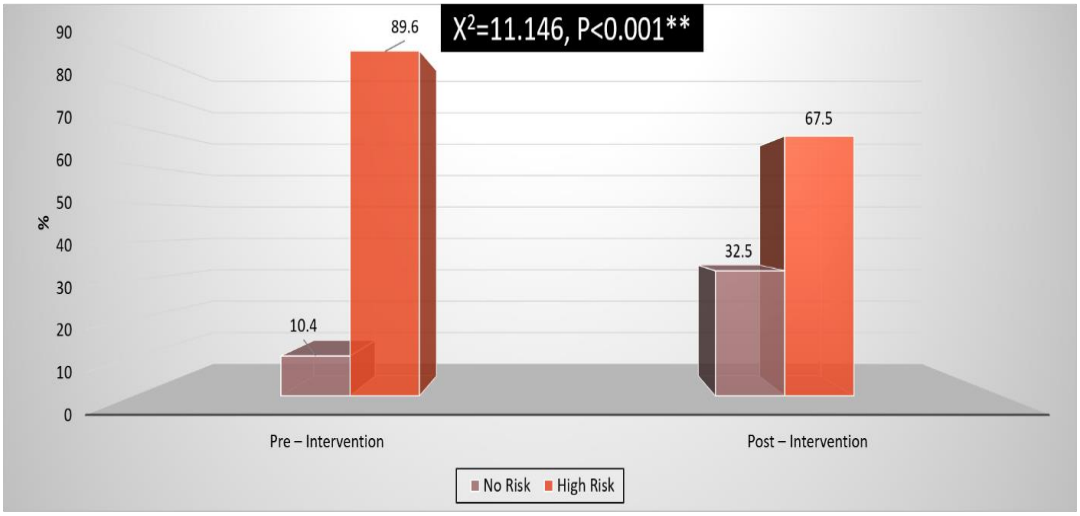

Figure (4): Percentage Distribution of the Elderly Reported Practices according to Total Hendrich II Fall Risk Model Score Pre & Post Intervention Program (n=77)

3. DISCUSSION

In the elderly population, falls are a major concern. Falls are common among people who have balance issues, and these worries and doubts may have negative psychological and physiological effects. Recent research has shown that older adults may benefit from an exercise program that targets many issues, such as flexibility, strength, balance, and patience, leading to increased stability, mobility, and physical performance and a decreased risk of falls and falls-related injuries [19]. The purpose of this research was to assess the efficacy of a health intervention program designed to treat and prevent balance issues in the elderly.

Part (I): Demographic characteristics of elderly:

The results of the current research indicate that a majority of the older population consisted of men, accounting for almost two thirds of the sample (Table 1). This research aligns with a previous study done in Portugal [20], titled "Effects of a 'modified' Otago exercise program on the functional abilities and social participation of older adults living in the community." The sample size for this study was 34 participants, and it revealed that 76.47% of the senior individuals included in the study were male. The research done in Thailand by [21] examined the effects of a modified-Otago exercise program on four components of real balance and perceived balance in a sample of healthy older persons (n = 16). The findings of this study revealed that 93.75% of the participants in the study were female. From a researcher's perspective, this finding may be attributed to the higher prevalence rate seen in older women. This might be attributed to the accelerated reduction in bone density that happens in women, particularly after menopause.

Regarding age, the findings of this study have provided clarification that a majority of the senior participants examined were aged 65 years or older. The findings of this study align with the results reported by researchers in Canada [22], who performed a study titled "Association of balance function with all-cause and cause-specific mortality among US adults" with a sample size of 5816 participants. Their investigation revealed that 61.9% of the participants were aged 65 years or over. From a researcher's

perspective, this outcome could be attributed to a higher incidence of this particular disease within the specified age group, as well as the increased prevalence of chronic conditions such as hypertension, diabetes, and dementia. These chronic diseases often require multiple medications (polypharmacy), which may result in elderly individuals forgetting to take their prescribed treatments or inadvertently repeating them. Consequently, these factors contribute to an elevated risk of experiencing balance impairment and falls.

With respect to income, the findings of the present study indicate that a minority of the senior participants relied primarily on pensions as their major source of income. Approximately 66% of respondents said that their income was insufficient. This finding aligns with the research conducted by [23] in Egypt, which investigated the information needs and behavior of elderly individuals residing in care homes. The study included a sample size of 63 participants and revealed that 28.6% of the participants belonged to the average-income group. This group received a monthly pension ranging from E£1501 to E£2000 (Egyptian pounds).

In a research done in Egypt by [24], titled "Factors Affecting Medication Adherence among Elderly in Rural Areas," a sample size of 120 participants was used. The findings of the study revealed that 56.7% of the elderly individuals included in the study had an adequate income.

Furthermore, the findings of this study align with the research conducted by [25] in Egypt. The study, titled "Vulnerable older populations without special health care in Egypt: A need for assessment & reform," examined a sample size of 53 participants. The study revealed that 71.3% of the participants identified a significant issue faced by elderly individuals, namely a decline in income resulting from factors such as the inability to work, insufficient pensions, or a lack of skills and competence to adapt to evolving work demands. The observed outcome might perhaps be attributed to the discrepancy between the pensions provided to senior individuals in Egypt and the prevailing inflationary circumstances inside the country.

Part (II): Medical history (past and present):

In relation to the historical experiences of the senior population, it has been observed that over 33% of the elderly individuals surveyed report the presence of certain familial illnesses. Among this group, a significant majority of the elderly individuals are afflicted with diabetes, and over 50% of them need hospitalization for medication administration (as shown in Table 2). The present findings align with a study conducted in Thailand by [26], titled "Effects of a simple home-based exercise program on fall prevention in older adults: A 12-month primary care setting, randomized controlled trial" (n=439). The study reported that 74.4% of participants had hypertension, 37.9% had diabetes, and 57.9% had osteoarthritis. From a researcher's perspective, these findings may be attributed to the natural physiological changes that occur throughout the aging process and perhaps influenced by hereditary factors.

The findings of the present study indicate that a majority of the older participants experienced falls over the last year, with less than two-thirds reporting such incidents. Furthermore, over half of the elderly individuals surveyed reported experiencing a single fall. A significant proportion, over 75%, of the individuals demonstrated the ability to independently rise to a standing position. Furthermore, the majority of these individuals had injuries as a result of their falls, and a significant majority expressed apprehension about the possibility of experiencing another fall. The results of this

study were incongruent with the findings of a previous study conducted by [27]. In their research, [27] observed that 58.82% of the participants did not have a history of falls during the last 12 months. Additionally, they discovered that 85.29% of the participants had fear of falling, and 73.53% relied on upper extremities help while standing up from a chair. From a researcher's perspective, this outcome could potentially be attributed to the presence of chronic diseases commonly found in the elderly population, such as hypertension and diabetes. Additionally, the natural process of aging may contribute to changes in gait, rendering them more susceptible to falls. Furthermore, a lack of awareness regarding environmental modifications tailored to the needs of the elderly may also contribute to the occurrence of falls.

This statement aligns with the findings of a study conducted in Egypt [28], titled "Effect of a fall prevention program for elderly persons attending a rural family medicine center." The study involved a sample size of 100 participants and revealed that certain home modifications have the potential to reduce falls. These modifications included the removal of tripping hazards (62% of participants), installation of grab bars near toilets and in bathing areas (5% of participants), use of non-slip mats in bathtubs and shower floors (43% of participants), placement of handrails on both sides of stairways (16% of participants), and improvement of home lighting (36% of participants).

In the context of contemporary history pertaining to the senior population, it is noteworthy that a significant proportion of the surveyed elderly individuals reported being afflicted by various ailments. Specifically, a majority of the elderly participants were found to be affected by hypertension, as shown in Table 3. The aforementioned finding was corroborated by a research done in Egypt [29], named "Otago exercise program: A golden technique on health status and risk of falls among older adults with chronic diseases." The study sample consisted of 48 participants, and it revealed that hypertension accounted for 60.4% of the chronic diseases seen among the senior population under investigation. From a researcher's perspective, it is plausible that this outcome might be attributed to typical physiological changes associated with age, as well as the influence of an unhealthy lifestyle and other stresses.

Regarding the issue of balance impairment, a majority of the older individuals examined, namely over 60%, saw a decline in their balance, while not experiencing any falls. Consequently, these individuals refrained from engaging in certain activities as a result of their compromised balance. In a study done in Turkey [30], the researchers examined the impact of fear of falling on balance and dual task performance in a sample of senior individuals (n=60). The findings revealed that 36.7% of the participants reported a history of balance loss without experiencing a fall incident during the previous year. From a researcher's perspective, it is possible that this outcome might be attributed to alterations in gait resulting from the aging process.

Regarding the self-care capabilities of the elderly individuals examined in the study, it was seen that a majority of them had the capacity to independently attend to their own needs. Additionally, it was found that a significant proportion of these individuals relied on their spouses for the provision of care. This finding was corroborated by a study conducted in Iran by [31], which focused on the design, implementation, and evaluation of an intervention program aimed at providing informal home care support for lonely older adults in the community. The study sample consisted of 32 participants, and it was found that 56.4% of the elderly individuals included in the study were capable of independently taking care of themselves. From a researcher's perspective,

this outcome might perhaps be attributed to the decline in motor function that is often associated with the natural aging process.

Research hypothesis:

The following results proved the research hypothesis which stated that health intervention program will improve elderly knowledge and reported practices about balance disorders and fall prevention.

Part (III): Knowledge of elderly about balance disorders and fall:

The findings of the present research demonstrate a considerable enhancement in the older population's understanding of balance issues and their susceptibility to falls after the implementation of an intervention program. This improvement was seen to be highly statistically significant. The findings indicate that a large proportion of the older participants demonstrated improved knowledge of the causes of balance disorders after the implementation of the intervention. This was supported by a majority of participants providing accurate responses, hence suggesting a statistically meaningful change. The data indicates that a significant proportion of the senior participants exhibited accurate comprehension of the signs and symptoms of falls subsequent to the execution of the intervention. (**Table 4).**

The aforementioned results were corroborated by a study conducted in Spain by [32], titled "Effectiveness of feedback-based technology on physical and cognitive abilities in the elderly." The study included a sample size of 200 participants and demonstrated that the implementation of the intervention led to improvements in the feedback received by the elderly individuals under investigation. Specifically, there was a significant enhancement in their understanding of signs and symptoms related to falls (97.5%) as well as the identification of causes contributing to balance disorders (95.8%) when compared to their pre-intervention results. From a researcher's perspective, this outcome could be attributed to the effective use of consistent presentation techniques, such as employing simple language, providing comprehensive explanations, and utilizing clear educational methods such as posters, PowerPoint handouts, and instructional videos. Additionally, the researcher allocated sufficient time for discussion and addressing questions to further enhance understanding and provide additional clarification.

The present research found a considerable increase in the knowledge of balance issues and fall prevention among senior individuals after an intervention program. This improvement was highly statistically significant ($p<0.001$). The data indicates that a significant majority of the senior participants in the study demonstrated a good level of overall knowledge after the implementation of the intervention program (Figure 2).

The findings align with the study conducted by researchers in Egypt [10], titled "Risk of falls and the impact of a health education program on fall prevention among elderly individuals in geriatric homes in Cairo, Egypt." The study involved 120 participants and demonstrated a statistically significant enhancement in the knowledge scores of the elderly individuals during both the post-intervention and follow-up phases, when compared to the pre-intervention phase ($P<0.01$).

Part (IV): Elderly reported practices about Berg balance Scale pre and post intervention program:

The present research demonstrated a considerable improvement in all aspects of balance reported by older individuals after their participation in an intervention program, as measured by the Berg Balance Scale. This improvement was shown to be highly statistically significant. As shown by the data, over 40% of the older participants examined exhibited an inability to perform the reaction of transitioning from a seated to a standing position before to the implementation of the intervention program. However, after the intervention program, this proportion fell significantly to a minority of the participants. Moreover, it was observed that over 50% of the senior participants under study required maximal assistance to pick up objects from the floor when in a standing posture. However, after the implementation of the intervention program, this percentage reduced to more than one third. In contrast, a majority of the older participants examined demonstrated an inability to do a full 360-degree rotation before to the implementation of the intervention program. However, after the intervention, this proportion fell significantly to around one quarter of the participants, as seen in Table 5.

This finding was corroborated by a study conducted by [33] in the United States. The study, titled "Disseminating the Otago exercise program: Perceived and actual physical performance improvements from participants" and involving a sample size of 210 individuals, demonstrated a significant enhancement in functional movements among the participants following the implementation of the Otago Exercise Program. Specifically, the subjects reported a notable reduction in difficulty when performing tasks such as walking across a room ($p = .008$), walking one block ($p = .003$), stooping/crouching/kneeling ($p = .001$), getting out of a straight-back chair ($p < .001$), and climbing one flight of stairs ($p = .004$). From a researcher's perspective, it is possible that this improvement might be attributed to an enhancement in the senior participants' understanding of balance issues. This increased knowledge may have influenced their adherence to the Otago exercise program, hence indicating a favorable effect.

Furthermore, the findings of this study align with a previous investigation conducted by researchers in Serbia [34]. The study, titled "The effectiveness of group Otago exercise program on physical function in nursing home residents older than 65 years: A randomized controlled trial," included a sample size of 38 participants. The results demonstrated a statistically significant improvement in participants' Berg Balance Scale scores ($p<0.001$) following the implementation of the Otago exercise program.

Regarding the overall score of the Berg Balance Scale before and after the implementation of the intervention program, the current research revealed a significant improvement. The data indicates that a significant proportion of the older participants examined had balance impairment before to the implementation of the intervention program. However, after the intervention, this percentage reduced to almost one third of the original value. Less than 20% of the participants demonstrated satisfactory balance performance initially, which subsequently increased to over 50% after the implementation of the intervention program. Prior to the intervention, none of the senior participants exhibited strong balance performance. However, after the implementation of the intervention program, a minority of participants demonstrated better balance performance, as seen in Figure 3.

The findings of this study were consistent with a previous study conducted in Egypt [35], which examined the impact of an exercise program on balance and the prevention of recurrent falls among elderly individuals. The study included a sample size of 80 participants and demonstrated that there was a significant improvement in balance scores. Specifically, the balance scores increased from 15% during the initial observation to 80% during the final observation after the intervention. From a researcher's perspective, it is plausible that this outcome may be attributed to the impact of the educational program and the Otago exercise intervention, both of which have been shown to enhance muscular strength and address issues related to balance disorders.

Part (V): Elderly reported practices about Hendrich II fall risk model score pre and post intervention program:

The findings of the present research indicate a modest reduction in the risk variables of falls both before and after the implementation of the intervention program. As substantiation, there is an observed increase in modified excretion and symptoms of dizziness and vertigo. There was a significant improvement seen in the Get up & Go test. As indicated by the data, none of the elderly participants under study demonstrated the capacity to stand up in a single fluid motion without experiencing any loss of balance prior to the intervention. However, this ability improved for less than half of the participants, while more than half of them were initially unable to rise without assistance during periods of rest. Following the intervention, the majority of participants showed improvement in this regard, with only a minority still requiring assistance (see Table 6).

The present study aligns with the findings of a previous study conducted in Pakistan [36]. The aforementioned study, titled "Effects of half-somersault and brandt-daroff exercise on dizziness, fear of fall and quality of life in patients with posterior canal benign paroxysmal positional vertigo: A randomised control trial," included a sample size of 20 participants. The results of this study indicated a statistically significant improvement in risk fall scores ($p < 0.05$) following the implementation of Epley's maneuver. From a researcher's perspective, this outcome might potentially be attributed to the impact of health interventions such as the Epley's maneuver and increased awareness of fall risk prevention methods. Based on the aggregate score derived from the Hendrich II fall risk model, it can be shown that a minority of the older individuals included in the study exhibited no risk prior to the implementation of the intervention program. After the intervention program, a significant proportion of individuals, namely more than one third, exhibited an increase in their post-intervention program outcomes. Notably, the majority of these individuals had initially presented with high-risk pre-intervention program profiles. This shift resulted in about two thirds of the participants demonstrating improved post-intervention program outcomes, as seen in Figure 4. The results of this study align with the findings of a previous study conducted in Canada [37]. The study, titled "Effect of a home-based exercise program on subsequent falls among community-dwelling high-risk older adults after a fall: a randomized clinical trial," involved a sample size of 172 participants. The study found a statistically significant difference ($P = 0.006$) in fall risk among the elderly participants following the intervention. From a researcher's perspective, this outcome might perhaps be attributed to the impact of a health intervention program that improved the balance of senior individuals. Additionally, it is worth noting that they expressed a keen interest in understanding methods for fall prevention.

4. CONCLUSION

Based on the study finding and research question. It can be concluded that:

There was a marked improvement in elderly's total knowledge about balance disorders and fall prevention post intervention program than pre intervention program. Additionally, there was statistically significant improvement in elderly's total reported practices as standing unsupported post intervention program in berg balance scale and minority of elderly had no risk for fall post intervention program in hendrich II fall risk model.

Recommendations

On the basis of the result of the study, the following recommendations' are suggested

- Continuous more health educational program for elderly about balance disorders and fall prevention.
- Continuous health educational program for elderly about fall prevention measures and perform balance exercise regularly.
- Make posters about methods of fall prevention put it in outpatient clinic at Elsalam hospital.
- Further studies are needed for elderly in a large sample and in another setting about balance disorders and prevent falls.

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