



Effect of Health promotion intervention on frailty prevention among elderly.

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Article History: Received 10th June, Accepted 5th July, published online 10th July 2023

Abstract

Frailty is a major concern for older adults and is a syndrome involving physical decline that might lead to adverse consequences such as disability, falls, hospitalization, and death. Therefore, this study aimed to evaluate the effect of health promotion intervention on frailty prevention among elderly. Design: A quasi-experimental design (pre – post test) design was used. Setting: at the village of Elzankloun in Zagazig city, Sharqia Governorate, Egypt. Sample: A purposive sample consisted of 60 elderly. Tools: three tools used; Tool I: A structured interview questionnaire (contained two parts; Demographic characteristics, Health related data). Tool II: Frailty Status. Tool III: questionnaire to assess knowledge regarding frailty, nutrition & physical activity. Results: the mean age of the studied elderly was 65.17±3.88 years and 73.3% of them were males, also the studied elderly frailty post-intervention were non-frail 21.7%, pre-frail 73.3% and frail 5% while, pre-intervention 100% of them were pre-frail. Conclusion: there was a statistically significant difference between the studied elderly at pre and post-intervention regarding their total frailty status, and their knowledge. Recommendation: Replicate the study on a larger group; selected from different geographical areas in Egypt to obtain more generalized findings in relation to current study.

Keywords: Elderly, Frailty, Health promotion intervention.

DOI: 10.53555/ecb/2023.12.Si12.304

Introduction:

Old age represents a transitional period where older adults meet changes in physical health and social roles; these transitional changes are significant, resulting in significant adverse outcomes including frailty development (Sun et al 2021).

Frailty is a major concern for older adults and is a syndrome involving physical decline that has been shown to lead to adverse consequences such as disability, falls, hospitalization, institutionalization, and death. Frailty is associated with negative health outcomes, such as falls, health care resource use, disability, and death, and can have a devastating impact on older people. Evidence shows that frailty is also associated with increased health care costs. Given that the number of older people worldwide is expected to increase as a result of ongoing population aging, frailty is considered a public health priority (Huang et al., 2023).

Prevention of frailty encompasses three overlapping approaches across the lifespan: Primary prevention; increasing intrinsic capacity reserves in early aging. Secondary prevention; preserving function in late aging and tertiary prevention; restoring function in frail older adults. Care needs span across physical, environmental, and psychosocial domains, with the more frail patients having more unmet needs (Akatsu et al., 2022).

Health promotion is a preventative strategy that emphasizes self-actualization and motivates people to actively build new, good behaviors while improving or preserving health. Exercise, quitting smoking, limiting alcohol intake, and enhancing learning and social activities are all examples of healthy behaviors for older adults. Eliminating sedentary habits and increasing physical exercise can enhance physical performance, lessen stress, and enhance quality of life of older adults (**Abdel Rahman et al., 2023**).

The degree of physical fitness was found to be relatively poorer among frail older adults than pre-frail older adults. All in all, appropriate interventions for enhancing physical fitness could contribute to delaying and preventing frailty among older adults. Regular exercise intervention has been shown to prevent and improve frailty and to enhance physical health and general functional fitness (**Chou et al., 2022**).

The gerontological nurse's role involved assisting, helping, and caring for elderly with frailty and their families, so that they can have access to education, information, and social resources that will help them to maintain satisfying lives and help in improving their cases. Gerontological Nurses (GN) who work with the frailty elderly must use their assessment skills to measure the effect of disabilities on their patient's health and care (**Huang et al., 2023**).

Significance of the study:

Pre-frail individuals have more than twice the risk of becoming frail compared to non-frail people. However, because frailty appears to be a dynamic process and potentially reversible, implementing interventions for pre-frail elderly may prevent the development of frailty. Evidence shows that pre-frail elderly may respond better to interventions than elderly who have already moved to a frail state, probably due to less disability than that of the frail elderly (**Suffian, 2020**). Hence the current study aimed to evaluate the effect of health promotion intervention frailty prevention among elderly.

Research Hypotheses :

- Frailty will be prevented among elderly after the health promotion intervention.

Aim of the study:

The study aimed to evaluate the effect of health promotion intervention on frailty prevention among elderly.

Subjects and Method:**Design:**

A quasi-experimental (pre\ posttest) design was used to conduct the study.

Setting:

The study was conducted at a village called " Elzankloun "; that was randomly selected from 75 villages of " Zagazig center" which located in Sharqia governorate, Egypt. Sharqia governorate is in the northern part of Egypt.

✓ A multistage cluster technique was used in recruiting study subjects according to the eligibility criteria, as followed:

A- First stage (selection of district): The study was conducted in Sharkia Governorate, which consists of 23 districts. The researcher used a simple random sampling technique to pick up district, it was Zagazig district, (consists of 75 main villages).

B- Second stage (selection of village): The researcher picked up one village from the 75 main villages, (randomly called " Elzankloun ").

C- Third stage (selection of participants): The selected village was divided into several clusters. From each cluster five streets were selected randomly and finally building from these streets included (door to another door) to yield the desired sample.

The sample size calculation:

1. A statistical computer program was used to calculate the sample size (Epi-Info software version 6.04) with study power 80% and at confidence level 95%. A sample of 300 elderly was determined. The sample size was estimated according 66.3% prevalence of frailty in Egypt ([Alqahtani et al, 2022](#)) and total elderly population in El-zankloun village is (1930) aged (60 - 75) years. Accordingly, the estimated sample size was 60 participants; those who were diagnosed as pre-frail (using the tools of the study).

Subjects:

A purposive sample consisted of the 60 elderlies, from the above-mentioned setting. The sample was selected according to the following eligibility criteria:

- **Inclusion criteria:**
 2. Aged 60 years and older.
 3. Able to cooperate and agree to participate in the study.
 4. Free from communication problems (speech and hearing problems).
 5. Diagnosed as pre-frail (using the tools of the study).
- **Exclusion criteria:**
 1. Self-reported chronic diseases (chronic obstructive pulmonary disease (COPD), stroke, cancer, asthma, renal dysfunction).
 2. Already involved or still participating in any health interventional study.
 3. Any sustained fracture (hip, vertebrae) in past six months.
 4. Any surgery (hip, abdominal area) in the past six months.

Tools of data collection:

An interview questionnaire form was used to collect the study data to achieve the purpose of this study; it included three tools, as following:

Tool I: A structured interview questionnaire: It was developed by the researcher to collect the necessary data for the current study. It consisted of two parts:

- **Part 1: Demographic characteristics:** It composed of 10 items; included data about socio-demographic characteristics of the study sample such as name, age, sex, monthly income, and source of income.
- **Part 2: Health related data:** which was composed of 6 items such as medical history of chronic diseases, intake of medications, previous hospitalization, and previous surgery.

Tool (II): Frailty Status (pre - post): The frailty status was assessed using the well-established phenotype of the frailty questionnaire; as proposed by ([Fried et al., 2001](#)), the tool was translated into Arabic by the researcher. The questionnaire evaluated five components of the frailty syndrome (weight loss, exhaustion, weakness, slowness, and low activity).

Scoring system: frailty was categorized into three levels as the sum of the score of individual criteria present ([Fried et al., 2001](#)). The scale scores range from 0–5 (i.e., 1 point for each component; 0=best to 5=worst) and represent frail (3–5), pre-frail (1–2), and robust (0) health status.

Tool (III): questionnaire to assess knowledge regarding frailty, nutrition & physical activity (pre - post): This questionnaire was developed by the researcher to assess knowledge of elderly pre & post the health promotion intervention. It composed of three parts:

- A. **Elderly knowledge regarding frailty:** which included questions about definition of frailty & pre-frailty, signs & symptoms of frailty, risk factors and prevention of frailty.

- B. **Elderly knowledge regarding healthy diet:** which included questions about component of healthy diet, malnutrition, vitamin deficiencies, healthy fats, importance of vit D, where it found, the most important meal, food rich in fiber, harms of sugar & salt increase, food should be avoided for diabetic patient, bad habits that harm the heart and ways to decrease cholesterol.
- C. **Elderly knowledge regarding physical activity:** which included questions about best rate for walking, exercises allowed for elderly, health problems related physical activity decrease, the best time for exercising, forbidden exercise for diabetic elderly, exercise allowed for hypertension, importance of swimming, sport that improve balance and health problems result from physical activity.

Scoring system: -

- The total number of elderly knowledge regarding frailty is five, items were scored 1 for "completely correct answer" and Zero for "wrong answer or I don't know ". The knowledge scores depended on the numbers of grades the participant obtained regarding all questions. The total grade was computed out of five (5) grades and knowledge was considered satisfactory if the percent was 60% and unsatisfactory if less than 60%.
- The total number of elderly knowledge regarding healthy diet is 14, items were scored 1 for "completely correct answer" and Zero for "wrong answer or I don't know ". The knowledge scores depended on the numbers of grades the participant obtained regarding all questions. The total grade was computed out of (14) grades and knowledge were considered satisfactory if the percent was 60% and unsatisfactory if less than 60%.
- The total number of elderly knowledge regarding physical activity is 11, items were scored 1 for "completely correct answer" and Zero for "wrong answer or I don't know ". The knowledge scores depended on the numbers of grades the participant obtained regarding all questions. The total grade was computed out of (11) grades and knowledge were considered satisfactory if the percent was 60% and unsatisfactory if less than 60%.

Method:

Official permission was obtained using proper channels of communication. This was done through letters addressed from the Dean of the Faculty of Nursing, Zagazig University; explaining the aim and procedures of the study and asking for cooperation to the authored person (who was the village mayor) at the village Elzankloun, Sharqia governorate, Egypt. The title and objectives of the study had been explained to them to obtain their conducting of the study to facilitate data collection.

- 1- Informed oral consent was obtained from the elderly after explaining the aim of the study and assuring them about the confidentiality of the information.

Field work:

- This design involves a description of the preparatory phase, and actual phase.
Preparatory phase:
- The researcher conducted an intensive review of the past and current related literature covering various aspects of the "frailty prevention" and health promotion for elderly patients. This was done using available textbooks and articles in scientific periodicals and journals. Based on this review, the tools were prepared in their preliminary forms, and reviewed by a panel of nursing and medical specialist professors for face and content validation. The review also helped in developing a basic framework of the intervention program.

Pilot study:

Before performing the main study, a pilot study was carried out on 6 elderly from the study setting, constituting about 10% of the calculated sample for main study numbers. They were selected randomly from the selected village, to assure stability of the answers. The tools were finalized according to the pilot study results; no modifications were needed so the 6 elderly of the pilot study were included in the main study after that.

Content validity:

Once prepared, the tools were presented to a panel of 3 experts from the Community Health Nursing, Zagazig University, and the department of Community medicine at the Faculty of Medicine, Zagazig University. They assessed the tools for clarity, relevance, application, and comprehensiveness. This constituted the content validation of tools. All recommended modifications were applied.

Reliability:

- Frailty Status: at Cronbach alpha 0.891
- questionnaire to assess knowledge regarding frailty, nutrition & physical activity: at Cronbach alpha 0.857

Actual phase:

- Once permission was granted to proceed with the study, the researcher started to prepare a schedule for collecting the data. The fieldwork was carried out within the period of seven months, starting from the beginning of June 2022 up to the end of December 2022. Each elderly was interviewed individually at the elderly's home and in small homogeneous groups in homes for others. The researcher allocated two days weekly from 3 pm to 8 pm. This included the phases of assessment, planning, implementation, and evaluation of the program.
- Assessment phase: This phase involved the pre-intervention data collection for baseline assessment. Upon obtaining necessary official permissions, the researcher visited the selected area and started to meet the elderly.
- The researcher introduced herself and explained the purpose of the study briefly to the elderly. This was done individually and an oral consent for participation was obtained if the elderly fulfilled the eligibility criteria. The researcher then started the interview; she read and explained each item of the study scales to the elderly and recorded his/her response to each item. The time consumed for completing the interview and filling the form ranged from 30 to 45 minutes .
- Immediately after the interview, the researcher checked the completeness of the form. Measures were taken to ensure privacy and confidentiality through using a code number for each elderly rather than the name. The data were preliminarily analyzed to provide the basis for the design of the intervention program .
- Planning phase: Based on the results obtained from assessment phase, the researcher designed the intervention program and sessions contents according to the identified elderly needs and in view of the related literature. Identified needs, requirements and deficiencies in knowledge were translated into aim and objectives of the intervention sessions. Moreover, the researcher prepared an educational booklet to help them follow the educational sessions and to serve as a reference for them after that.

Description of the program:

- General objective of the program: Educating the elderly about the importance of proper nutrition, exercise, and physical activity to prevent frailty.
- Specific objectives: By the end of this program, the elderly will be able to:

- Discuss simple information about frailty and Pre-frailty stage.
- Summarize the main risk factors for frailty.
- Schedule daily activities to prevent frailty.
- Organize their nutrition.
- Acquire some ways to prevent frailty through exercise .

The program consisted of two main components: The first component was for giving a theoretical background of frailty and Pre-frailty stage such as definition, risk factors, signs and symptoms, etiology and stages, complications and co-morbidity, medical treatment and precautions associated with medication, and its related side effects. The second main component of the program addressed some practical sessions for the elderly to improve their daily activities, nutrition and acquire some ways to prevent frailty through exercise .

- Implementation phase:
 - The intervention was implemented in the form of 10 sessions. The duration of each session ranged between thirty minutes and forty-five minutes. The program was implemented individually for some elderly, and in small homogeneous groups in homes for others who were relatives or friends with each other's; For grouping; each group consisted of 3-5 elderly according to their times, also, the groups were formed based on their mutual cases and needs. The sessions were administered twice per week for each study group, and for individually elderly. They were held on Saturdays and Wednesdays.
 - To ensure exposure of all participants to the same learning experience, all of them received the same content using the same training methods, discussion, and same booklet. The training methods included demonstration-re-demonstration, group discussions, role-play, and reinforcement. The sessions were aided by using pictures and posters .

The sessions were as follows:

- Session 1: (Duration: 45 minutes): Initial session for acquaintance, the main objective of this session was to explain the aim of the program, procedures, the rules, and introduction about the problem. Mini-lecture, group discussion was used as teaching methods.
- Session 2: (Duration: 45 minutes): The main objective of this session was to focus on imparting knowledge of the frailty definition, risk factors, signs and symptoms, etiology, and complications of illness. PowerPoint and handout were used as teaching methods.
- Session 3: (Duration: 30 minutes): The main objective was to help elderly to gain insight about pre frailty stage, possible treatment, treatment side effects, management of common side effects, and precautions associated with medical treatment. The mini-lecture and group discussion were used as teaching methods.
- Session 4: (Duration: 30 minutes): The objective was to help elderly to understand the relationship between nutrition and prevention of frailty & enumerate components of healthy food. Mini-lecture, group discussion, PowerPoint and handout were used as teaching methods.
- Session 5, 6: (Duration: 45 minutes): The main objective of this session was to teach the elderly about healthy diet for pre-frailty stage and healthy diet for diabetic patients.
- Session 7: (Duration: 45 minutes): The main objective was to enhance elderly knowledge regarding healthy diet for hypertension and for cardiovascular disease. Posters and pictures were used as teaching methods.
- Session 8: (Duration: 30 minutes): The main objective was to improve the elderly's knowledge about the importance of exercises on prevention of pre-frail diseases as hypertension and diabetes. Pictures and videos were used as teaching methods.

- Session 9: (Duration: 45 minutes): The main objective was to enhance elderly knowledge about the best exercises for elderly. Group discussion, pictures, videos were used as teaching methods.
- Session 10: (Duration: 45 minutes): Ending session, this session involved global summarization and revision of the aim of the program and termination of the intervention sessions do the post test. The researcher acknowledged the elderly active participation; give everyone the program educational booklet. Also, the researcher took the elderly suggestions for follow-up and to set a communication link for further support.
- The researcher started each session by a summary of what was given through the previous session, reviewed the homework if found, followed by the objectives of the new one and ended every session with conclusion of what taken during the session, take the participant's' feedback and give homework if found. This was done to ensure that the elderly understand the content and follow the educational sessions attentively. Moreover, the researcher used simple language to suit all educational levels of the elderly. Motivation and reinforcement techniques were used as praise and recognition during the session to enhance interest and learning. Also, the researcher played a facilitator role during the session through control and regulates the discussion based on the initiation session rules.
- Evaluation phase : The evaluation of the effect of the intervention program was done immediately after its implementation by comparing the change in elderly knowledge, and practice through applying the same tools used in the pretest .

Ethical considerations

- Anonymity, confidentiality, and privacy of the elderly were assured.
- Voluntary participation and right to refuse to participate in the study was emphasized to the subjects.

Statistical analysis:

Data entry and statistical analysis were done using SPSS 20.0 statistical software package.

Results:

Table (1): Showed that the mean age of the studied elderly was 65.17+3.88 years and 73.3% of them were males. Regarding their marital status, 66.7% of them were married. Moreover, 31.7% of them had a primary educational level. Additionally, 75% of them worked before retirement as employees 47.1% and farmers 35.3%. Furthermore, 73.3% of them lived with their spouses, 53.3% of them had enough monthly income and 76.7% of them reported pension as a source of their current income.

Figure 1: Revealed the studied elderly frailty post-intervention were non-frail 21.7%, pre-frail 73.3% and frail 5% while, pre-intervention 100% of them were pre-frail.

Table (2): - Elicited that 35% of the studied elderly were hospitalized before and only a decile 10% of them had surgery during the previous year. Additionally, 75% of them suffered from chronic diseases with 50% of them suffering from diabetes. Moreover, 91.1% of them reported taking medications with 41.15% taking painkillers.

Table (3): demonstrated that, there is a highly statistically significant association between the studied elderly`s total knowledge post-program and their gender, educational level, and work before retirement ($p < 0.01$). moreover, there is a statistically significant association between the studied elderly`s total knowledge post-program and their age and having chronic diseases ($p < 0.05$). On the other hand, there is no statistically significant association between the studied elderly`s total knowledge post-program and their marital status, live with, monthly income and previous hospitalization ($p > 0.05$).

Table (4): showed that a highly significant model was detected through f-test 8.500, p-value < .001. This explains 47% of the variation at total knowledge detected through r 0.47. As well, it reflects that the Work before retirement (Employee) and education level (High) of the studied elderly have a positive effect on their total knowledge at p-value < .001. Also, gender (male) and chronic disease (Yes) has positive effect on their total knowledge at p-value < .005. Additionally, it reflects that the age of the studied elderly has a negative effect on their total knowledge at p-value < .005.

Figure (2): Presented that 88.3% of the studied elderly had a total satisfactory knowledge post-test while 35% of them had a total satisfactory knowledge pre-test. On the other hand, 11.7% of the studied elderly had a total unsatisfactory knowledge post-test while 65% of them had a total unsatisfactory knowledge pre-test.

Discussion:

Frailty is a geriatric syndrome characterized by a cumulative decline in a person's functions across multiple physiological systems and increased susceptibility to stressors. As a result, various health indicators of older adults are negatively affected, resulting in the deterioration of their physical health, mental health, and social engagement. The implementation of frailty prevention and intervention requires close collaboration among physicians, rehabilitation therapists, and nurses. In addition, it is crucial to raise frailty knowledge in older adults, which allows them to actively participate in the prevention and treatment of frailty (Zhou et al., 2023).

The aim of this study was to evaluate the effect of health promotion intervention on frailty prevention among elderly. This was achieved through pre- assessment the pre-frailty among elderly, and then health promotion intervention on prevention frailty among elderly was implemented and evaluate this intervention. The study findings indicated enhancement of the elderly knowledge of elderly regarding frailty, nutrition, and physical activity after attending the nursing intervention program, which leads to acceptance of the research hypotheses.

For all current sample, the studied elderly characterized by the following, the mean age of the studied elderly was 65.17 ± 3.88 years with most of them were males, and more than two thirds of them were married. This results not as the same of **Boyer et al., (2022)** in their cohort study in France, as they mentioned that the cohort was composed of 1085 subjects in advanced age (mean: 83.7 ± 6.0 years) and of women in majority (68.3%).

Moreover, about one third of current elderly had a primary educational level; Furthermore, most of them lived with their spouses. Those results disagreed with the characteristics of the subjects' educational level of **Shalini et al., (2020)** in their Indian study as they found that 86.7% of the subjects were baccalaureate graduates. Additionally, those results not as the results of **AL-Helih et al., (2020)** in their research among older adults in Alexandria, Egypt as they said that 55% of the study older adults are living with their spouse, while 45% of them are living alone. From the viewpoint of researcher these differences in results might be due to differences in subjects or might be due to the differences in settings of the studies.

Furthermore, most of our subjects lived with their spouses, more than half of them had enough monthly income. From viewpoint of researcher, this could be explained by the Egyptian cultures in which everyone thanks Allah for his income and usually said it is enough based on religious beliefs. Those results are the same as **Mohamed et al., (2022)** as they said that 86 % of studied older adults were living with their spouse but otherwise 51% of their studied older adults reported that their monthly family income was not enough.

Regarding the medical history of the studied elderly, the present study revealed that more than third of the studied elderly were hospitalized before during the previous year. Additionally, most of them suffered from chronic diseases with half of them suffering from diabetes.

From the point of the researcher's view, those results might be due to their aging and frailty, as normal aging process is distinguished by a set of changes in multiple domains including physical, psychological, and social, that can be widespread in nature including deteriorating health and the development of chronic health circumstances or mobility limitations that often predispose older adults to functional decline and disability. This point of view is supported by the view of **Takele et al., (2023)** as they said that frailty increases the risk of hospitalization, necessitates clinical intervention, and has an adverse effect on daily living activities.

Those present results agreed with **Abdel Rahman et al., (2023)** in their Egyptian study in which they confirmed that most of the studied older adults had previous hospitalization but were suffering from musculoskeletal disease. Also, the Egyptian paper which published by **Mohamed et al., (2020)** showed that Hypertension diabetes, mellitus and musculoskeletal diseases are the most prevalent chronic diseases which reported by about half of their subjects among Community Dwelling Older Adults in the Pre-Frail Stage.

These findings were unsymmetrical with **El-Abdeen et al. (2021)**, who reported that the majority (82.9%) of studied older adults had previous hospitalization, most (80.3%) of them had osteoporosis and most (74.9%) of them had osteoarthritis. Also, all of them smoked cigarettes and slightly less than half of them smoked shisha.

As related to the frailty status of the studied subjects; the current research revealed that the studied elderly frailty post-intervention were non-frail for one fifth of them, pre-frail for most of them and the minority of the subjects had frailty, while, pre-intervention all of them were pre-frail; these results reflexed a statistically significant difference between the studied elderly at pre and post-intervention regarding their total frailty status with ($p=0.012$), the results also demonstrated that there was a statistically significant difference between the studied elderly at pre and post-intervention regarding their frailty status in fatigue, resistance, ambulation, illness and loss of weight with ($p<0.05$).

From the point of the researcher's view, those results might be due to the positive effect of health promotion intervention that enhanced the pre-frailty status of the studied sample; as health promotion intervention could help people in identifying the early warning signs of frailty complications, understanding the value of proactive interventions, and motivating the older adults to adopt adjustments to lifestyles that support healthy aging. Another explanation that might be due to the cooperative and the interest of the elderly around the health promotion intervention and their commitment of the intervention sessions and items.

The current statistically improvement in the results agreed with **AL-Helih et al., (2020)** in their Egyptian study, as they reported concerning the study subject's pre-frailty status, their study findings illustrated that, the study subjects' pre-frailty status is significantly decreased after the completion of the health promotion intervention with a high statistically significant difference as ($p=0.000$). On other hand, this study result is congruent with that of the study performed by **Yu et al., 2020**, who revealed that physical exercise is more beneficial to frail and pre-frail elders when compared with other types of interventions. Similarly, this finding was congruent with that of the study performed by **Losa-Reyna et al., (2019)**, who revealed that the exercise intervention enhanced pre-frailty status and it is a safe procedure to raise physical performance and enhance function as well as to prevent frailty in pre-frail older adult.

Otherwise, the results of the current study in its pre intervention phase disagreed with **Shalini et al., (2020)** in their study which done among Urban Older Adults in South India, as they found among the study population, 20% of the participants were frail and 80% were non-frail.

Regarding multiple linear regression model for total frailty status, the current study presented a highly significant model that was detected through f-test 6.720, p-value < .001. This explains 37% of the variation at total frailty status detected through r 0.37. As well, it reflects that the age and chronic disease (yes) of the studied elderly have a positive effect on their total frailty status at p-value < .001. In addition, living with (alone) has positive effect on their total frailty status at p-value < .005.

That results agreed with the results demonstrated by **Damar et al., (2023)** to investigate frailty and factors affecting it among older people living in nursing home in Turkey; in which they revealed the predictors of frailty in older adults were found to be advanced age, being single, having chronic diseases in the past year fractures due to falling, and pain scores.

The present results demonstrated that there was a highly statistically significant difference between the studied elderly at pre- and post-intervention regarding their knowledge about frailty definition, signs & symptoms, risk factors and prevention and pre frailty definition with (p<0.01). In addition, the study presented that the majority of the studied elderly had a total satisfactory knowledge post-test while more than one third of them had a total satisfactory knowledge pre-test. From the researcher's point of view, this could be explained by the positive effect of health promotion intervention of the study.

Those results agreed with **Schoenborn et al., (2018)** as they reported a total improvement in their studied subject's knowledge regarding frailty after implementation of their program with (p<0.01). On other hand, he studies disagreed with the Chinese research done by **Zhou et al., (2023)** as they found that only 17.17% obtained frailty knowledge in the community.

Conclusion:

Based on the results of the present study and answers to the questions; It was concluded that there was a statistically significant difference between the studied elderly at pre and post-intervention regarding their total frailty status with (p=0.012). Furthermore, there was a highly statistically significant difference between the studied elderly at pre- and post-intervention regarding their total knowledge with (p=0.000).

Recommendation:

Based on the study findings, the following recommendations can be deduced:

- Replicate the study on a larger group; selected from different geographical areas in Egypt to obtain more generalized findings in relation to current study.
- Implement an educational program about frailty among elderly and other ages.
- Educational program improve knowledge about frailty and its prevention methods among older adults.

Acknowledgements:

We would like to thank all the elderly who participated in the study for their help and cooperation during the study period.

Table (1): Distribution of the studied elderly according to their demographic characteristics (n=60).

Items	N	%
Age (Year)		
60 - < 70	50	83.3
70 - 80	10	16.7
\bar{x} S.D 65.17±3.88		
Gender		
Male	44	73.3
Female	16	26.7
Marital status		
Single	5	8.3

Married	40	66.7
Widow	10	16.7
Divorced	5	8.3
Level of education		
Illiterate	6	10.0
Read & write	7	11.7
Primary education	19	31.7
Secondary education	16	26.7
University education	8	13.3
Postgraduate	4	6.7
Work before retirement		
Work	51	75.0
Not work	9	15.0
If the answer works what is the job (n=51)		
Artisanal worker	9	17.6
Farmer	18	35.3
Employee	24	47.1
Live with		
Alone	10	16.7
With spouse	44	73.3
With children or relatives	6	10.0
Monthly income		
Enough	32	53.3
Not enough	28	46.7
Source of current income		
Pension	46	76.7
Helping children	14	23.3

Table (2): Distribution of the studied elderly according to their medical history (n=60).

Items	N	%
Hospitalized before		
Yes	21	35
No	39	65
Had any surgery during the previous year		
Yes	6	10
No	54	90
Suffer from any chronic diseases		
Yes	45	75.0
No	15	25.0
*If yes, it is n=45		
Hypertension	10	22.2
Diabetes	11	50.0
Kidney disease	3	6.7
Heart disease	14	31.1
Orthopedic diseases	15	33.3
Currently taking medication (n=45)		

Yes	41	91.1
No	4	8.9
*If yes, it is n=41		
Painkiller	17	41.5
Anticoagulants	9	21.9
Treatment of hypertension	10	24.4
Diabetes treatment	11	26.8

*More than one answer

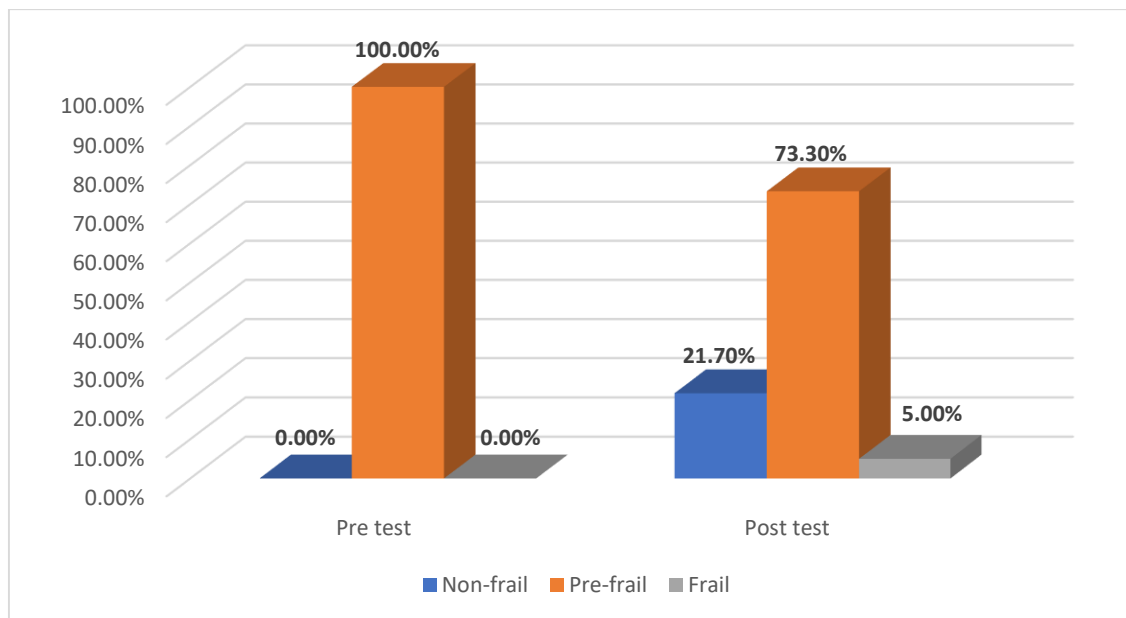


Figure (1): Comparison between the studied elderly at pre and post intervention regarding their total frailty status (n=60).

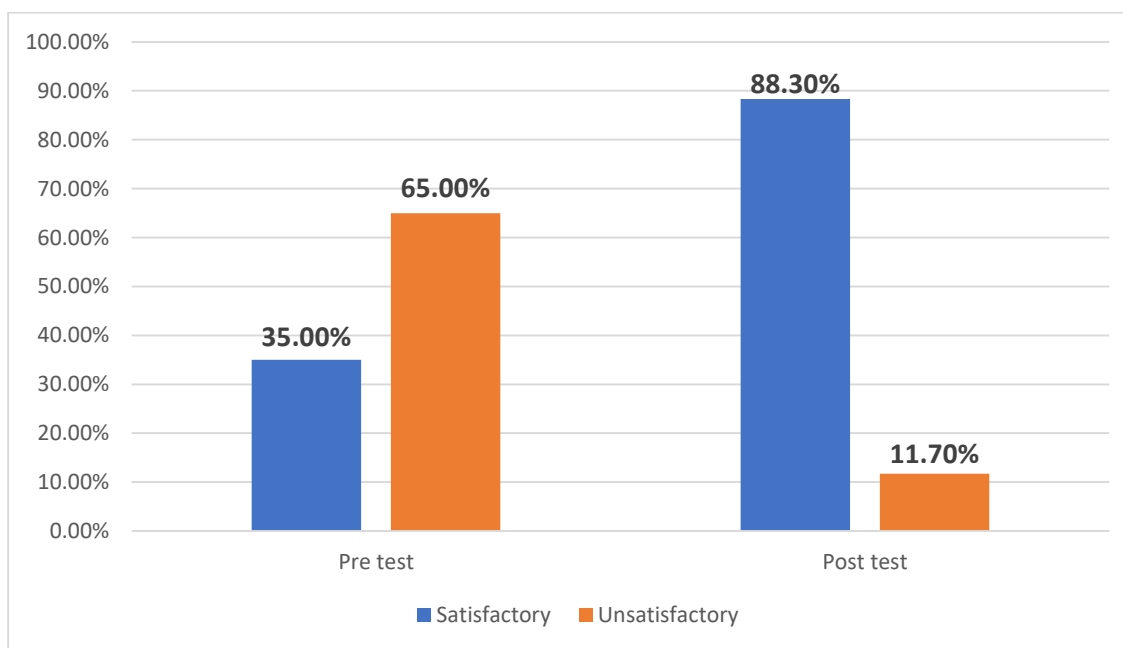


Figure (2): Comparison between the studied elderly at pre and post intervention regarding total knowledge about frailty, nutrition & physical activity (n=60).

Table (3): Relation between socio-demographic data of the studied elderly and their total knowledge post program (n=60).

Items		Total knowledge				X ²	P-Value
		Satisfactory (n=53)		Unsatisfactory (n=7)			
		No	%	No	%		
Age	60 < 70	48	90.6	2	28.6	3.114	.025*
	70 < 80	5	9.4	5	71.4		
Gender	Male	43	81.1	1	14.3	7.112	.008**
	Female	10	18.9	6	85.7		
Marital status	Single	4	7.5	1	14.3	1.506	.098
	Married	36	67.9	4	57.1		
	Widow	9	16.9	1	14.3		
	Divorced	4	7.5	1	14.3		
Level of education	Illiterate	1	1.9	5		13.400	.000**
	Read & write	6	11.3	1	14.3		
	Primary education	18	33.9	1	14.3		
	Secondary education	16	30.2	0	0		
	University education	8	15.1	0	0		
	Postgraduate	4	7.5	0	0		
	Work	49	92.5	2	28.6		

Work before retirement	Not work	4	7.5	5		9.672	.004**
Live with	Alone	8	15.1	2	28.6	1.570	.091
	With spouse	40	75.5	4			
	With children	5	9.4	1	14.3		
Monthly income	Enough	28	52.8	4	57.1	0.762	.209
	Not enough	25	47.2	3	42.9		
Previous hospitalization	Yes	18	33.9	3	42.9	1.022	.098
	No	35	66.1	4	57.1		
Chronic disease	Yes	44	83	1	14.3	4.187	.013*
	No	9	17	6	85.7		

*Significant at $p < 0.05$. **Highly significant at $p < 0.01$. Not significant at $p > 0.05$

Table (4): Multiple Linear regression model for total knowledge

	Unstandardized Coefficients		standardized Coefficients		
	<i>B</i>		<i>B</i>	<i>T</i>	<i>P. value</i>
Gender (male)	0.240		.199	3.987	<0.01**
Age	-0.198		.143	2.901	<0.05*
Work before retirement (Employee)	0.265		.218	4.713	<0.01**
Education level (High)	0.311		.264	6.908	<0.01**
Chronic disease (Yes)	0.173		.119	2.700	<0.05*

Model	R ²	Df.	F	P. value
Regression	0.47	4	8.500	<0.01**

a. Dependent Variable: **Total knowledge**

b. Predictors: Gender (male), Age, Work before retirement (Employee), Education level (High), chronic disease (yes)

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