

# Effect of Nursing Intervention to Improve Functional and Nutritional Status among Pre Frail Elderly

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## Abstract

Frailty is an age-related state of decreased physiological reserves characterized by an increased risk of poor clinical outcomes. Therefore, this study aimed to evaluate the Effect of Nursing intervention to improve functional and nutritional status among pre frail elderly. Design: A quasi-experimental design (pre – post test) design was used. Setting: at the village of Elzankloun in Zagazige city, Sharqia Governorate, Egypt. Sample: A purposive sample consisted of 60 elderly. Tools: four tools used; Tool I: A structured interview questionnaire (contained two parts; Demographic characteristics, Health related data). Tool II: Frailty Status. Tool III: functional status and Tool (IV): mini nutritional questionnaire. 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. Additionally the study illustrated that there was a highly significant statistically negative correlation between total frailty status and the studied total functional status at ( $P < 0.01^{**}$ ,  $r = -0.670$ ), in addition to a significant statistically negative correlation among total frailty and total nutritional status at ( $P < 0.05^{*}$ ,  $r = -0.389$ ). Conclusion: there was a statistically significant difference between the studied elderly at pre and post-intervention regarding their total frailty status, functional status, and nutritional status. 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, Functional status, Nutritional status.

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## Introduction:

Aging is associated with changes in skin, hair, teeth, gums, hearing, vision, bones, muscles, joints, heart, brain, and more. Aging is not a disease, but a natural and inevitable part of life that can be

slowed down by healthy habits and interventions. There is no typical older person (Izquierdo et al., 2021).

Frailty is a common geriatric syndrome affecting the physiological function of multiple systems, which is tightly associated with disability, mobility, hospitalization, and mortality in geriatric populations. Previous observational studies suggested that smoking and alcohol consumption were associated with the risk of frailty. However, other studies suggested that there was no significant association between smoking and frailty among elders. It is worth noting that the results of observational studies are often distorted by confounding factors and reverse causality. As both smoking and alcohol drinking are modifiable lifestyle factors, cessation or postponing the age of initiation of smoking and alcohol intake may be beneficial for preventing frailty (Guo et al., 2024).

Frailty refers to a loss of physiological reserve and increased vulnerability to external stressors. It is known to be associated with ageing but is not an inevitable consequence of the ageing process. In addition to conferring increased mortality risk on older adults, frailty is accompanied by a range of adverse health outcomes, including falls, fractures, and functional impairment. It impairs quality of life, results in earlier institutionalization and increases healthcare usage, with healthcare-associated costs for frail older adults multiple times that of the non-frail (Bambrick et al., 2021).

Nutrition at the old age group has emerged as a concern because of the manifold consequences of malnutrition on the overall health, well-being, and autonomy of older persons. Diet and lifestyle, coupled with maintenance of a healthy body weight are important in the maintenance of health for all age groups but are vital for healthy aging. Preserving a good nutritional status has substantial implications for health and wellbeing, delaying and reducing the risk of developing disease, maintaining functional independence, and thus promoting continued independent living (Miller and Wolfe, 2018).

Changes in the secretion and action of hormones that govern hunger, changes in gastrointestinal motility, taste loss and the functional decline of many systems can all influence nutritional status, as people get older. Malnutrition is a state of being undernourished, which can be caused by an excess of nutrients (over-nutrition) or a deficiency of nutrients (malnutrition/ under-nutrition). Undernutrition in the elderly is a serious problem observed in hospitals, nursing homes and the community. Under-nutrition is on the rise among the elderly, and it is linked to a drop in functional status, impaired muscle function, decreased bone mass, immune dysfunction, anemia, reduced cognitive function, poor wound healing, delayed surgery recovery, higher hospital readmission rates, severe morbidity and mortality (Shuremu et al., 2023).

Nursing care planning and management for geriatric patients focuses on promoting optimal health, independence, and quality of life in older adults. It involves comprehensive assessments, addressing age-related changes and chronic conditions, promoting functional abilities and mobility, managing medications and promoting [medication safety](#), providing education on healthy aging practices, and ensuring a safe and supportive environment (Naeem et al., 2020).

### Significance of the study:

The ageing process has been associated with various geriatric issues including frailty. Without early prevention, frailty may cause multiple adverse outcomes. Nutritional status and functional status are associated with the elderly's health and can be affected with their frailty (Kwon et al., 2015). Hence the current study aimed to evaluate the effect of nursing intervention to improve functional and nutritional status among pre frail elderly.

### Research Hypothesis :

The functional and nutritional status will be improved among elderly after the implementation of the nursing intervention.

### Aim of the study:

The study aimed to evaluate the effect of nursing intervention to improve functional and nutritional status among pre frail 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 a 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): functional status (pre- post):** This scale was developed by (Katz et al., 1970) as a standardized quantitative measure of the client's ability to perform activity of daily livings (ADL) independently. It was translated into Arabic and proved to be valid and reliable scale ( $r = .830$ ) by a study done in Alexandria by Sorour, et al (2019). This scale included six main activities of daily living, bathing, dressing, feeding, transfers, continence, and ambulation. The six different functions are measured and scored according to the individual's actual performance of these functions.

**Scoring system:** Each item was evaluated regarding two Likert scale. Each item can be graded 0 or 1 point; totally, the maximum degree was 6 points which indicated high independent, and the minimum degree was 0 which indicated very dependent. These scores were summed up and converted into a percentage score.

**Tool (IV): mini nutritional questionnaire (pre - post):** (Guigoz, 2006) developed This questionnaire in France. This tool has been used to identify malnourished or at risk of malnutrition among elderly people. This tool consists of six questions including: decrease in food intake, weight loss, mobility, psychological stress, neurological problems and calculate body mass index by the following equation ( $\text{weight [k.g]} / \text{height [m}^2\text{]}$ ).

**Scoring system:**

- Total cores from 12 to 14; indicated normal nutritional status.
- Total scores from 8 to 11; indicated risk of malnutrition.
- Total score from 0 to 7; indicated malnourished.

**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.

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:**

- The researcher met with the elderly, introduced herself and explained to them the aim of the study to obtain their consent to participate in the study and gain their cooperation and confidence.
- The elderly were interviewed individually to collect the baseline data using all study tools. This interview took about 30 to 45 minutes.

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
- Mini nutritional questionnaire: at Cronbach alpha 0.976
- functional status: at Cronbach alpha 0.830

#### **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).** Showed that there is a highly statistically significant difference between the studied elderly at pre- and post-intervention regarding their total functional status with ( $p=0.008$ ). Moreover, 90% of the studied elderly had a total high functional status post-test while 63.3% of them had a total high functional status pre- test.

**Table (4):** Showed that there is a highly statistically significant difference between the studied elderly at pre- and post-intervention regarding their total nutritional status with ( $p=0.006$ ).

**Table (5):** clarified the correlation between the studied variables. There was a highly significant statistically negative correlation between total frailty status and the studied total functional status at ( $P < 0.01^{**}$ ,  $r = -0.670$ ), in addition to a significant statistically negative correlation among total frailty and total nutritional status of the studied elderly at ( $P < 0.05^{*}$ ,  $r = -0.389$ ). Furthermore, the table shows a statistically significant positive correlation among the studied functional status and their total nutritional status at ( $P < 0.05^{*}$ ,  $r = 0.333$ ).

### 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  $65.17 \pm 3.88$  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:  $83.7 \pm 6.0$  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.

**Related to functional status;** the current study showed that there was a highly statistically significant difference between the studied elderly at pre- and post-intervention regarding their total functional status with ( $p=0.008$ ). Moreover, the majority of the studied elderly had a total high functional status post-test while slightly more than two thirds of them had a total high functional status pre- test. From the researcher's view, this could be due to the effect of the health promotion intervention.

The pre intervention results agreed with the results of **Ali et al., (2023)** in their study among frailty older adults as they found that 63.1% of the studied older adults was highly functional status and were dependent on their selves at their daily activities. Otherwise, those results disagreed in its post phase with **Amer et al., (2022)** in their Egyptian study, as they reported regarding function level of their studied participants, they found 36.5% of frail participants needed assistance in activity of daily living (ADL) and 7.7% were dependents, while 63.5% needed assistant in instrumental activity of daily living (IADL) and only 8.7% were dependents.

Regarding total nutritional status of the studied elderly, the current study showed that there was a highly statistically significant difference between the studied elderly at pre- and post-intervention regarding their total nutritional status with ( $p=0.006$ ).

From the point of the researcher's view, those results might be due to the positive effect of health promotion intervention that enhanced their nutritional habits, as poor nutritional status accelerates the transition to frailty and dependency. In addition, this might be explained by the present study results regarding the studied elderly dietary habits and patterns, as mentioned before that the majority of them ate three meals per day, and also regarding fruit and vegetable consumption, most of them took two or more fruits or vegetables per day; those positive dietary habits might contributed to the improvement in their nutritional status after the conducting of the health promotion nursing intervention.

Those results were in the same line with the Egyptian results of **Fahmy et al., (2024)** who demonstrated statistically significant differences between the mini nutrition assessment score ( $P=0.024^*$ ) at their study in the hemodialysis unit at Assiut university hospital among elderly patients. Furthermore, this finding was compatible with **Ha and Park (2020)**, who conducted a study in Korea on prefrail older adults about effects of a person-centered nursing intervention for frailty and reported a significant improvement in participant nutritional status after 24-session in 12 weeks.

In addition to that, the present study elicited that a highly significant model was detected through f-test 5, p-value < .001. This explained 52% of the variation at total mini nutritional detected

through  $r = 0.52$ . As well, it reflects that the education level (high) and chronic disease (yes) of the studied elderly have a positive effect on their total mini-nutritional at  $p\text{-value} < .001$ . Also, previous hospitalization (yes), marital status (married) and living with (with spouse) has positive effect on their total mini-nutritional at  $p\text{-value} < .005$ . Additionally, it reflects that the age of the studied elderly has a negative effect on their total mini-nutritional at  $p\text{-value} < .005$ . From the researcher's view, those present results could submit an explanation of the factors that contributed to the improvement in the nutritional status of the studied elderly as mentioned before.

These results disagreed with Abdelrahman, & Elawam, (2024) in their Egyptian study as they mentioned that sex did not show a significant difference between well-nourished and malnourished patients [ $P: 0.35$ ]. Also, marital status did not show significant affection of nutritional status [ $P: 0.254$ ]. While Abdelrahman, & Elawam, (2024) submitted our current results in education level and employment status factors as they said in their results that education level and living with spouse showed significant difference between well-nourished and malnourished patients [ $P: < 0.001$ ] and positively affected the nutritional status.

Regarding the correlation between the studied variables, the present study clarified that there was a highly significant statistically negative correlation between total frailty status and the studied total functional status at ( $P < 0.01^{**}$ ,  $r = -0.670$ ), in addition to a significant statistically negative correlation among total frailty and total nutritional status of the studied elderly at ( $P < 0.05^*$ ,  $r = -0.389$ ) respectively. This means when total functional status, total nutritional status, increased, the total frailty status among those elderly will be decreased.

Those results compatible with the results of Ruiz-Margáin et al., (2023) as they revealed in their research that there was a statistically significant negative correlation between frailty status and the nutritional and functional status of their subjects. Also, the results agreed with the results of Hong et al., (2019) in their Chinese research as they found that the relationship between frailty and malnutrition in community-dwelling older people has been demonstrated negatively at ( $r = -0.642$ ). Moreover, a study done by Liang et al., (2021) showed that comprehensive nutritional assessment, whether as a categorical variable or a continuous variable, was significantly correlated positively with frailty ( $P < 0.05$ ), their Model showed that the risk of frailty in malnourished patients was 3.381 times higher than that in well-nourished patients ( $P = 0.036$ ) and the other Model showed that the risk of frailty decreased by 13.8% for every 1 point increase in nutrition score ( $P = 0.009$ ). the study also agreed with the Egyptian study done in Ismailia by Saudi et al., (2021), as they mentioned in their results that Furthermore, frailty was associated with poor general health status, history of falls and a lower body mass index, Frailty was also significantly related to lower scores in both activities of daily living and instrumental activities of daily living.

Furthermore, the table shows a statistically significant positive correlation among the studied functional status and their total nutritional status at ( $P < 0.05^*$ ,  $r = 0.333$ ).

## 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 ( $p = 0.012$ ). Also, the majority of the studied elderly had a total high functional status post-test while more than two thirds of them had a total high functional

status pre- test. Additionally, there was a highly statistically significant difference between the studied elderly at pre- and post-intervention regarding their total nutritional status with ( $p=0.006$ ). Finally, There was a highly significant statistically negative correlation between total frailty status and the studied total functional status at ( $P < 0.01^{**}$ ,  $r = -0.670$ ), in addition to a significant statistically negative correlation among total frailty and total nutritional status of the studied elderly at ( $P < 0.05^{*}$ ,  $r = -0.389$ ).

### 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.
- It is recommended that further research about frailty and its effects on performing activities of daily living, and functional status with increasing sample size at different settings.

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

Items	N	%
<b>Age (Year)</b>		
60 - < 70	50	83.3
70 - 80	10	16.7
$\bar{x}$ S.D 65.17±3.88		
<b>Gender</b>		
Male	44	73.3
Female	16	26.7
<b>Marital status</b>		
Single	5	8.3
Married	40	66.7

Widow	10	16.7
Divorced	5	8.3
<b>Level of education</b>		
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
<b>Work before retirement</b>		
Work	51	75.0
Not work	9	15.0
<b>If the answer works what is the job (n=51)</b>		
Artisanal worker	9	17.6
Farmer	18	35.3
Employee	24	47.1
<b>Live with</b>		
Alone	10	16.7
With spouse	44	73.3
With children or relatives	6	10.0
<b>Monthly income</b>		
Enough	32	53.3
Not enough	28	46.7
<b>Source of current income</b>		
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	%
<b>Hospitalized before</b>		
Yes	21	35
No	39	65
<b>Had any surgery during the previous year</b>		
Yes	6	10
No	54	90
<b>Suffer from any chronic diseases</b>		
Yes	45	75.0
No	15	25.0
<b>*If yes, it is n=45</b>		
Hypertension	10	22.2
Diabetes	11	50.0
Kidney disease	3	6.7
Heart disease	14	31.1
Orthopedic diseases	15	33.3
<b>Currently taking medication (n=45)</b>		
Yes	41	91.1
No	4	8.9
<b>*If yes, it is n=41</b>		
Painkiller	17	41.5
Anticoagulants	9	21.9
Treatment of hypertension	10	24.4
Diabetes treatment	11	26.8

\*More than one answer



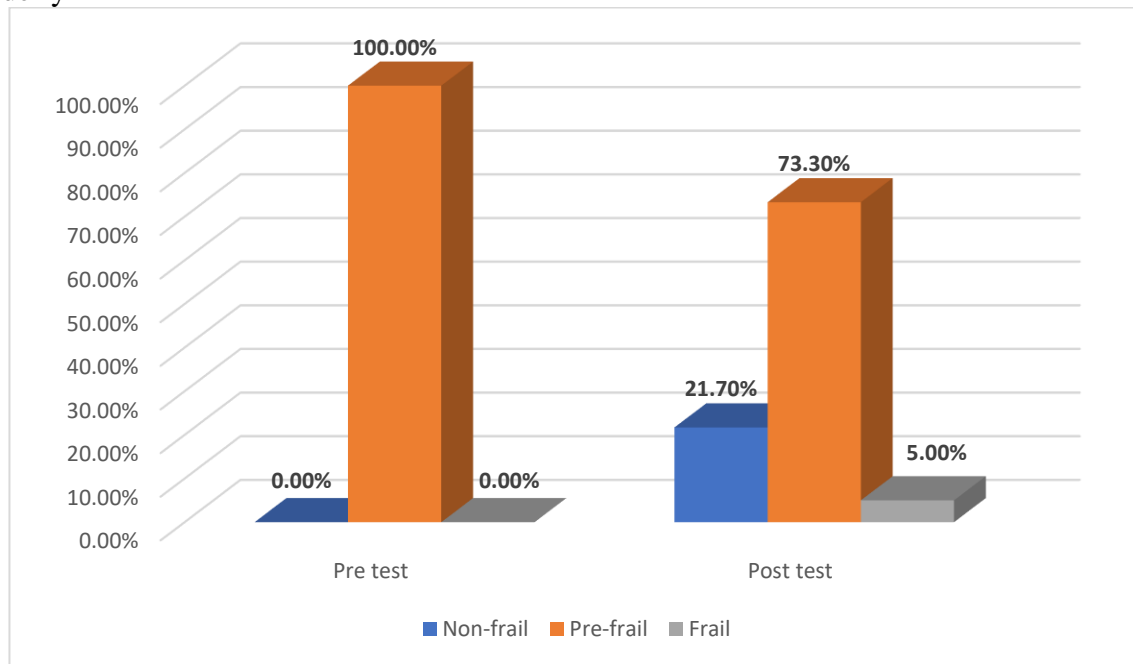


Figure (1): Comparison between the studied elderly at pre and post intervention regarding their total frailty status (n=60).

Table (3): Comparison between the studied elderly at pre and post intervention regarding their total functional status (n=60).

Items	Pre- test		Post- test		Chi-square p-value
	N	%	N	%	
High	38	63.3	54	90	5.669 0.008**
Low	22	36.7	6	10	

Table (4): Comparison between the studied elderly at pre and post intervention regarding their total nutritional status (n=60).

Items	Pre- test		Post- test		Chi-square p-value
	N	%	N	%	
Well-nourished	31	51.7	46	76.7	7.801 0.006**
Risk of malnutrition	20	33.3	11	18.3	
Malnutrition	9	15	3	5	

Table (5): Correlation between studied variables post program (n=60).

		frailty status	functional status	Nutritional Status
1. Total frailty status	r			
	p			
2. Total functional status	r	-0.670		
	p	<0.01**		
3. Total nutritional status	r	-0.389	0.333	
	p	<0.05*	<0.05*	

(\*\*) Statistically significant at  $p < 0.01$ .  $r$  Pearson correlation

No Conflict of interest.

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