Effect of Health Promotion Intervention on Daily Living Activities among Older Adults with Frailty

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Abstract

Background: Frailty is considered as a complex concept involving a variety of physical, mental, nutritional, and social aspects that are linked to adverse health outcomes in older adults. **Aim**: This study aimed to evaluate the effect of health promotion intervention on daily living activities among older adults with frailty. **Subjects and Method: Design**: A quasi- experimental design was utilized. **Setting:** The study was carried out at Medicine and Cardiology Outpatient clinics at Benha Teaching Hospital at Benha City in Egypt. **Subjects**: A purposive sample of 133 older adults was included. **Tools**: Three tools were used in this study; **I:** An interviewing questionnaire composed of four parts as older adults' socio-demographic characteristics, medical history, older adults' knowledge about frailty and older adults reported practices for health promotion. **II**: Frailty scale to assess frailty degree among older adults. **III**: Barthel index scale to assess older adults' activities of daily living. **Results**: There was a highly significant improvement in the older adults' total levels of knowledge, reported practices and dependency levels of activities of daily living post and after three months of health promotion intervention. Also, there was a highly statistically significant correlation between total reported practices, dependency levels of activities of daily living and frailty degree among older adults pre, post and after three months of health promotion intervention. **Conclusion**: Health promotion intervention was efficient in improving frail older adults' knowledge, reported practices, and enhancing dependency levels of activities of daily living. **Recommendations**: Developing continuous health promotion intervention for all older adults to enhance their knowledge and practices regarding prevention of frailty.

Keywords: Health Promotion, Intervention, Daily Living Activities, Older Adults, Frailty.

Introduction

Old age is a transitional stage in which older people experience changes in physical health and psychological aspects. These changes are considerable and have unfavorable consequences, such as the emergence of frailty. Frailty among older adults is a condition that can be treated, is common, and is thought to be an independent indicator of impairment, which has economic, social, psychological, and physical components. Frailty, however, is a lifelong disorder; it is not a natural outcome of aging. (1)

Older adults who have several chronic illnesses are more likely to be frail and more dependents because of physical and cognitive disability. (2) The geriatric syndrome of frailty is characterized by decreased ways of dealing with stressful circumstances and increased susceptibility for adverse outcomes. Frailty can be observed as a broad concept that encompasses multiple components, including physical and mental wellness, psychological disorders, social variables, environment, and economic aspects. These components are linked to each other, increasing the risk of

mortality, loss of function, admission to the hospital, and falls. [3]

Frailty is triggered by a variety of risk factors, that include sociodemographic status (older age, being a female, low level of education, and economic status), chronic illness, inadequate nutrition, lack of activity, cognitive decline, poor functioning, and previous experiences of falling. [4]

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. [5]

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. [6]

Activities of Daily Living (ADLs) include a variety of self-care activities that are essential to make an independent life or important for survival, representing daily tasks needed for self-care. ADLs are more vulnerable to early cognitive deterioration and include a slightly more complex range of behaviors. Additionally, ADLs can offer essential information on functional and cognitive capacities, loss of independence, and a deterioration in wellbeing. [7]

Community Health Nurses (CHNs) have an important role in prevention, assessment, and diagnosis of frailty as well as providing immediate interventions to protect pre frail people from frailty. CHNs who work with older adults in primary health care and community settings are skilled in implementing the appropriate actions and minimizing its adverse consequences. CHNs can perform a variety of interventions, such as techniques for improving education, mood, and cognition. [8]

Significance of the study:

Frailty increases with age, according to the findings from the Middle Eastern nations, 47% of individuals in the United Arab Emirates, 40% in Saudi Arabia, 66.3% in Egypt, 60% in Iran, 28.7% in Turkey, and 81.3% in Lebanon are frail suffering by the age of 60 or more. [9]

Frailty affects many older adults in community residents experiencing prevalence rates of between 5 and 10%. According to a recent meta-analysis, long-term care institutions (51.5%) and hospital settings (26.8% average prevalence) have a higher prevalence of frailty. The prevalence rates are significantly higher in low-middle income countries. Although the prevalence of frailty develops with age and is more prevalent in women, the relationship between sex and a rate of frailty progressing reveals significant demographic variation. [10]

Aim of the study

This study aimed to evaluate the effect of health promotion intervention on daily living activities among older adults with frailty.

- Assessing older adults' knowledge and reported practices regarding frailty.
- Identifying frailty degree among older adults.
- Assessing dependency level of older adults in performing activities of daily living.
- Designing, implementing, and evaluating health promotion intervention on older adults' knowledge, practices, and dependency level of performing activities of daily living.

Research hypotheses:

Health promotion intervention will improve older adults' knowledge, reported practices regarding frailty and dependency level in performing activities of daily living.

Subjects and method

Research design:

A quasi-experimental design was used in this study (one group pre/post-test and three months follow up).

Setting:

The study was conducted at Benha Teaching Hospital's Internal Medicine and Cardiology Outpatient Clinics in Egypt.

Subjects:

Sample type: A purposive sample of 133 older adults from the total 720 who attended the previously mentioned setting were included according to the inclusion criteria: Suffering from frailty (based on frail scale), independent or partially dependent and not suffering from mental illness. Exclusion criteria included: Completely dependent older adults, and inability to cooperate with the researchers.

Sample size: The sample size was calculated using the following equation: **Stephen Thampson s equation**. [11]

$$n = \frac{N \times p\,(1-p)}{\left((N-1 \times (d^2 \div z^2)) + p\,(1-p)\right)} = 133$$

N = Population size is 720 older adults, **p** = Ratio provides a neutral property is equal to 0.12, **d** = the error rate is equal to 0.05, **z** = Class standard responding to the level of significance equal to 1.96. **The sample size=**133 frail older adults.

Data collection tools:

Three tools were employed for data collection.

Tool I: An interviewing questionnaire: It was created by the researchers and translated into comprehensible Arabic language and divided into four parts to evaluate the following**:**

First part: **Socio-demographic characteristics** of older adults including age, sex, level of education, marital status, occupation, residence, monthly income and type of family.

Second part: Older adults' medical history such as chronic diseases, previous hospitalization, regular follow up and medications used.

Third part: Older adults' knowledge regarding frailty adopted from Palermo (2021)[12] and Zhou et al. (2023) [13] and composed of (8) multiple choice type questions covered areas related to (meaning, risk factors, causes, signs and symptoms, diagnosis, treatment, complications, and prevention of frailty).

Scoring system:

The knowledge score for each response was given a value of "2" for correct complete response, "1" for correct incomplete response, and "0" for don't know. The total score= 16 points. Three levels were used to categorize the total score: Good knowledge level ≥75% (≥ 12 score), average knowledge level 50-<75% (8<12score), and poor knowledge level <50% (<8 score).

Fourth part: Older adults reported practices adopted from Silva et al. (2019) [14] and Klen, (2023) [6], and modified by researchers to assess older adults' health promotion practices which included 39 items divided into: Good nutrition (8 items), physical activities (6 items), periodic follow-up (5 items), social engagement (7 items), fall reduction (6 items) and improving cognitive function (7 items).

Scoring system:

Practices items that were (done) received a score of "one" while those that were (not done) received a score of "zero." The total score=39 points and divided into the

following two levels: Unsatisfactory total practice level is below 60% (<23 score), and satisfactory total practice level is more than or equals 60% (≥23 score) of the total reported practices score.

Tool II: Frail scale adopted from Woo et al. (2015) [15] and used by the researchers to assess frailty degree in older adults. The scale consists of (5) questions covering criteria of fatigue, resistance, ambulation, illness, and loss of weight. The scale is not a self-reported instrument.

Scoring system:

The total score is the sum of the 5 questions. Every question has a score, which ranges from 0 to 1. The frail scale had a total score that ranged from 0 to 5. Frailty is classified into three categories, each of which is the sum of the older adult criteria present (0 assigned for not 'frail' or 'robust', 1, 2 assigned for 'prefrail' and 3,4,5 assigned for 'frail') the researchers taken the frail older adults. Based on total score of frail scale for frail older adults which ranges from 3-5; frailty is classified into three levels mild frailty (<60% scores), moderate (60-80%) and advanced (>80%).

Tool III: Barthel index of activities of daily living, adopted from Farag et al. (2022) [16] and modified by the researchers to assess functional status by assessing dependency level of older adults in performing activities of daily living. The scale consisted of (10) categories covering feeding, bathing, grooming, dressing, bowels, bladder, toilet use, transfers, mobility, and stairs. It was used three times pre, post and post three months of health promotion intervention.

Scoring system:

The scoring system of older adults' dependency level regarding activities of daily living was calculated as (0) score for dependent, (1) score for need help and (2) score for independent. The total score ranged from 0-20 and categorized as follows: (0-6 score) assigned for completely dependent, (7-13 score) assigned for semi dependent and (14-20 score) assigned for independent. The researchers excluded dependent older adults. The higher scores reflect the higher dependency level.

Administrative process:

A formal letter was sent from the Dean of the Nursing Faculty at Benha University to the director of Benha Teaching Hospital to get official hospital permission and written approval to carry out the study. This was done to get agreement to accomplish the research after explaining its purpose and obtaining statistics on the number of older adults who attend the hospital each year.

Ethical consideration:

The Scientific Research Ethical Committee of the Nursing Faculty at Benha University approved this study. To obtain informed consent for study participation, the researchers explained the study's objectives to each older adult. They also mentioned that older adults had the freedom to withdraw from the study at any time. The participants were additionally informed by the researchers that all data was used only for research purposes.

Tools development:

After reviewing pertinent literature regarding the different aspects of the research problem, the researchers constructed data collection tools. These tools were then written and translated into clear Arabic language to accommodate with older adults' level of understanding.

Tools validity:

A group composed of 5 specialists in Community Health Nursing reviewed the tools to confirm the accuracy of the

information and ensure its appropriateness, applicability, and comprehensiveness.

Tools reliability:

According to the Cronbach's Alpha coefficient test that was employed to determine reliability, the tools included homogenous items, as shown by the tools' moderate to high reliability. The knowledge questionnaire's internal consistency was 98. Older adults reported practices' internal consistency was 949. The Barthel index scale's internal consistency was 961, while the frail scale's internal consistency was 80.

Pilot Study:

It was carried out on 10% (13 older adults), of the study sample. It was used to make sure that the study tools were simple to understand and applicable. Additionally, to identify any difficulties or issues that the researchers might find when gathering data. Since no modifications were made, the older adults who participated in the pilot were also included.

Data collection:

Assessment, planning, implementation, and evaluation were the main phases used to carry out the study. The study was carried out over a period of nine months started from the beginning of December 2022 to the end of August 2023, covering a period of six months for health promotion intervention then three months for follow up. the researchers attended to the previous setting three days/week from 9 am. to 1 pm. Data were collected from older adults while they are waiting in front of the clinics or after doing their examination. The researchers planned sessions and make session schedules with the older adults to be able to implement the intervention and provide them with the educational content and learning material.

The study was achieved through:

A. Assessment phase:

The older adults were interviewed during the assessment phase to gather baseline data. This phase took approximately eight weeks (pretest), and the researchers were present three days a week (Saturday, Tuesday, and Thursday) from 9.00 am until 1:00 pm. The researchers greeted each older adult, discussed the objectives, timeline, and study activities, and obtained oral consent at the beginning of the interview. The researchers used frail scale to assess older adults' degree of frailty. The researchers collected data from frail older adults through asking them to complete the questionnaire to assess their knowledge, reported practices, and daily living activities. It required 20 to 30 minutes. The telephone numbers of older adults were taken to make phone calls schedules for follow up. The number of older adults who were interviewed varied according to their attendance and readiness to participate in the study.

B- Planning phase:

The health promotion intervention was constructed by the researchers based on the needs that were noted in the assessment phase from older adults and in the context of the pertinent literature. The researchers determined the number of sessions, contents, different teaching methods, and media based on the older adult’s level of understanding using simple Arabic language. After that, objectives of the program were made as follows:

General objectives:

The general objective of the health promotion intervention was to enhance older adults' knowledge and reported practices about frailty and enhance dependency level of older adults in performing activities of daily living.

Specific objectives:

After the health promotion intervention, the studied older adults should be able to:

A-Knowledge skills

- Define frailty.
- Mention risk factors, causes, and signs and symptoms of frailty.
- Discuss diagnosis and treatment of frailty.
- Identify complications and prevention of frailty.
- Discuss the importance of older adults' involvement in improving dependency levels of activities of daily living.

B- Practical skills

- Perform good nutritional practices.
- Apply steps to enhance physical activity.
- Perform periodic checkups and follow up.
- Practice appropriate activities to be socially engaged.
- Perform appropriate practices to reduce falls.
- Do the proper activities to improve cognitive functions.

C- Implementation phase:

The health promotion intervention was applied in the implementation phase. The intervention included six scheduled sessions. Each session lasted between 45 and 50 minutes. Older adults were divided into small groups of 7–10 older adults. A combination of methods, such as lectures, group discussions, questions and answers, and educational slides were utilized. On the first day of the health promotion intervention, all older adults were given an educational booklet. A brief introduction to the health promotion intervention and its purpose took place at the start of the first session. Before each session, a review of the prior one was presented. the program sessions were used to implement the health promotion intervention. The older adults received a total of (6) sessions. 3 practical sessions and 3 sessions for the theoretical part. These sessions were provided to each group.

Theoretical sessions (3 sessions)

- **The first session:** Included an explanation about frailty meaning, risk factors, causes, signs& symptoms of frailty.
- **The second session:** Included diagnosis, treatment, complications, and prevention of frailty.
- **Third session: For ADL** included meaning, importance, illustration of ADL, and relation between older adults' performance of ADL and frailty.

Practical sessions (3 sessions)

- **The first session:** The researchers declared to frail older adults how to perform the **appropriate nutritional practices and physical activity** through intake of balanced diet, intake of adequate amounts of calcium and vitamin D, drink enough fluids to maintain hydration, take enough calories, avoid stimulants as coffee and tea, intake of nutritional supplements and adequate amount of fibers, exercise regularly, such as walking, do light exercises and then gradually increase the intensity, avoid strenuous activities such as: running, carrying heavy objects, practice daily life activities and practice activities that require simple effort.
- **The second session:** Included an emphasis on how to perform **periodic checkups and follow-up** through contact with the doctor if any complications occur, make regular appointments to monitor health status, avoid taking medications without instructions. And how to **reduce falls** by avoiding walking in dark places, make the home furniture organized, wear anti-slip shoes, use the handrails to prevent falls, keep good lighting especially at night.

-The third session: The researchers provided the frail older adults with the appropriate actions to be **socially engaged** through visiting relatives, participate in social events with family and friends, participate in

community programs and activities, avoid isolation from people to prevent feeling of loneliness, and how they **improve the cognitive function** through care of physical health, take enough sleep and rest, keep their mind active by playing chess and memory training that improve attention and concentration, participate in social activities, and control stress and perform relaxation techniques.

D- Evaluation phase:

The effect of the health promotion intervention was evaluated through post-test after one month, and follow-up after three months was carried out through further visits to the outpatient clinic using the same tools utilized pre-program. During the follow up period, telephone calls were made with older adults (1 call/week) to ensure their compliance with the intervention.

Statistical analysis:

The software of SPSS version 26 was applied to examine the data after it had been entered and coded by using SPSS. Frequencies, percentages, means, and standard deviation were used to present the data using descriptive statistics. The statistically significant differences were estimated using chi square tests and the pearson correlation coefficient. The distribution of the numbers and percentages was determined using chi square, and the relations between the overall knowledge, practices, and ADLs score was determined using the Pearson correlation test (r). When the P-value was below 0.05, it was considered significant, and when it was below or equal to 0.001, it was highly significant.

Results

Table (1): Shows that; 51.9 % of the studied older adults were age ranged from 65 years and more with mean age 68.73±3.740 years, 66.9 % of them were females, and 38.3% of them had secondary education and 45.1% of the studied older adults were widowed. Additionally, 83.5% of studied older adults were not working, 67.7 % of them didn't have enough monthly income, and 59.4% of them had extended family.

Table (2): Shows that; 89.5% of the studied older adults were suffering from musculoskeletal disease, 85.0 % of them had previous hospitalization, 42.9% of them performed regular follow up once every month, and 95.5 % of them took anti-inflammatory medication.

Figure (1): Illustrate that; 8.3% of the studied older adults had good knowledge level regarding frailty pre health promotion intervention which improved to 60.1% and 56.4% post and 3 months post health promotion intervention implementation respectively. While 76.7% of them had poor total knowledge level pre health promotion intervention and reduced to 15.8% and 15.0 % post and 3 months post health promotion intervention implementation respectively.

Table (3): Clarifies that; there were highly statistically differences between total reported practices items pre, post, and 3 months post health promotion intervention implementation ($p<0.001$). The highest percentages (satisfactory) were noticed (95.5%, 89.5%, and 78.2%) and (89.5%, 91.0% and 80.5) in relation to reduction of falls, periodic follow-up and physical activities post and 3 months post health promotion intervention implementation respectively.

Figure (2): Demonstrates that; 17.3% of the studied older adults had satisfactory total reported practices regarding frailty pre health promotion intervention and which improved to 78.9% and 75.9% post and 3 months post health promotion intervention implementation respectively, while 82.7% of the studied older adults had unsatisfactory reported practices regarding frailty pre health promotion

intervention compared by 21.1% and 24.1% post and 3 months post health promotion intervention implementation respectively.

Table (4): Displays that there was highly statistically difference between all items of daily living activities in older adults pre, post, and 3 months post health promotion intervention implementation ($p<0.001$). The highest percentages(independent) were observed (83.5% and 82%) and (77.7% and 78.2%) in relation to feeding and mobility post and 3 months post health promotion intervention implementation respectively.

Figure (3): Illustrates that; 54.1% of the studied older adults were partially dependent pre health promotion intervention and decreased to 22.1% and 22.6% post and 3 months post health promotion intervention implementation respectively, while 45.9% of the studied older adults were independent pre health promotion intervention compared by 77.9% and 77.4% post and 3 months post health promotion intervention implementation respectively.

Figure (4): Illustrates that; 33.8% of the studied older adults had mild frailty degree pre health promotion intervention which increased to 45.9 % post health promotion intervention and 45.1% 3 months post health promotion intervention, and while 6.8% of them had advanced frailty degree pre health promotion intervention and reduced to 1.5% post health promotion intervention and 1.5% 3 months post health promotion intervention.

Table (5): Shows that; there were highly positive statistically significant correlation between studied older adults' total knowledge score, and total reported practices score regarding frailty pre, post, and 3 months post health promotion intervention ($p<0.001$).

Table (6): Reveals that; there was highly positive statistically significant correlation between studied older adults total reported practices, and total dependency level of daily living activities regarding frailty pre, post, and 3 months post health promotion intervention ($p<0.001$).

Table (7): Reveals that; there was highly statistically negative significant correlation between studied older adults' total reported practices, and total dependency level on activity daily living regarding frailty and total frailty degree, at pre, post, and 3 months post health promotion intervention ($p<0.001$).

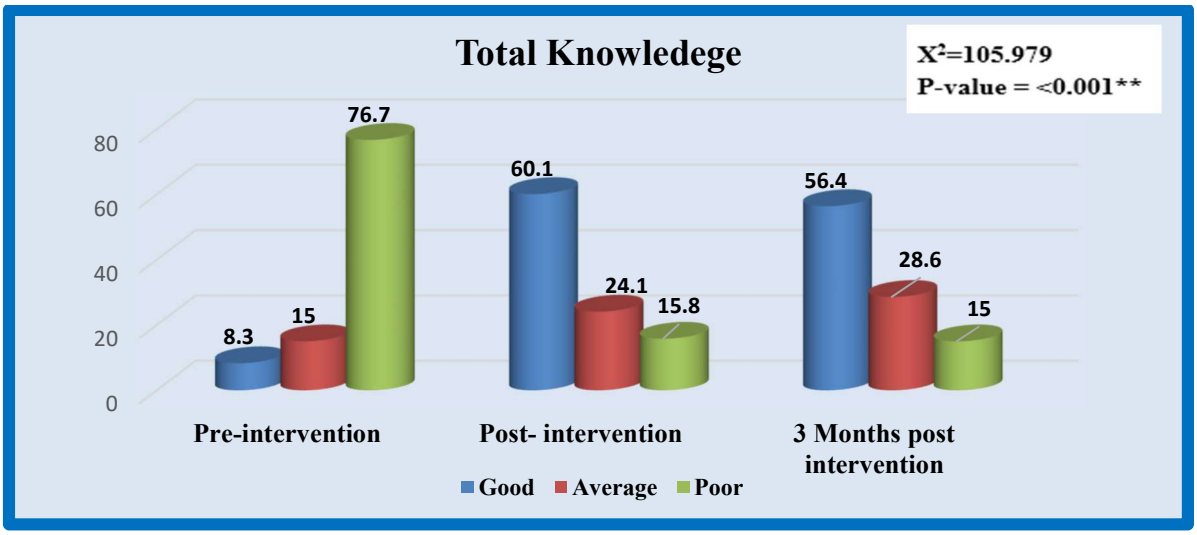
Table (1): Distribution of the studied older adults regarding their socio demographic characteristics (n=133)

Socio-demographic characteristics	No.	%
Age / years		
60 -	17	12.8
65-	69	51.9
70+	47	35.3
$\bar{x} \pm$S.D 68.73±3.740		
Sex		
Male	44	33.1
Female	89	66.9
Educational level		
Illiterates	27	20.3
Basic education	42	31.6
Secondary education	51	38.3
University education	13	9.8
Marital status		
Single	4	3.0
Married	50	37.6
Widowed	60	45.1
Divorced	19	14.3
Occupation		
Working	22	16.5
Not working	111	83.5
Residence		
Urban	45	33.8
Rural	88	66.2
Monthly income		
Enough and save	17	12.8
Just enough	26	19.5
Not enough	90	67.7
Family type		
Nuclear family	50	37.6
Extended family	79	59.4
Single	4	3.0

Table (2): Frequency distribution of the studied older adults regarding their medical history (n=133)

Medical history	No.	%
*** Chronic diseases patients suffer from**		
Diabetes mellitus	53	39.8
Liver disease	9	6.7
Heart disease	57	42.9
Musculoskeletal disease	119	89.5
Autoimmune disease	10	7.5
Gastrointestinal disease	30	22.6
Previous hospitalization		
Yes	113	85.0
No	20	15.0
Regular follow up		
Once/month	57	42.9
Twice/month	39	29.3
As needed	37	27.8
***Medications**		
Steroids	5	3.8
Antihypertensive	57	42.9
Thyroid medications	18	13.5
Antidepressants	3	2.2
Diabetic medications	53	39.8
Anti inflammatory	127	95.5
Anti seizures	7	5.3
Chemotherapy	1	0.7

* Results was not mutually exclusive



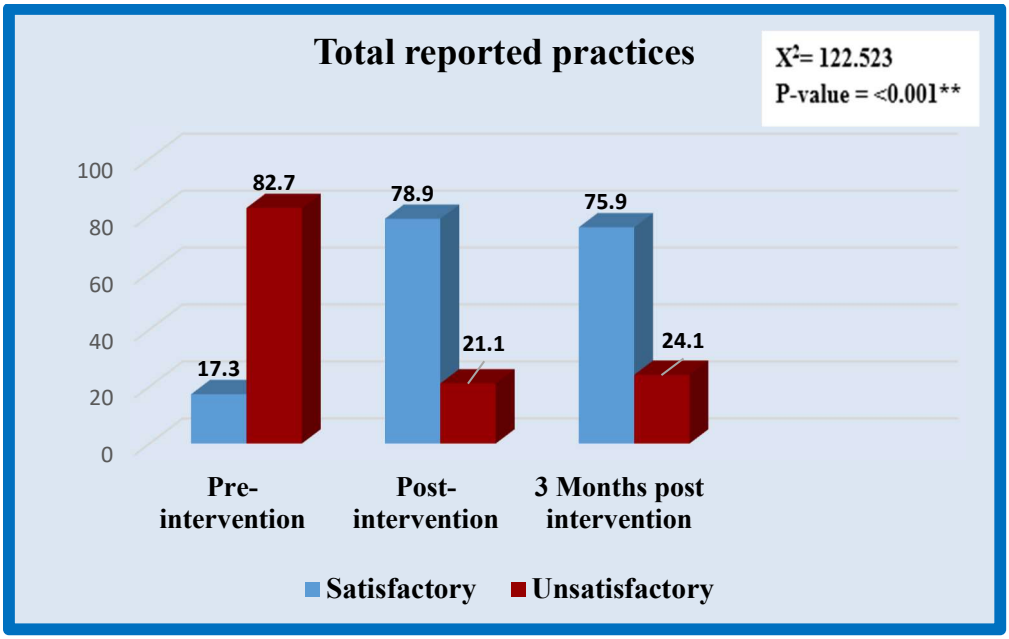
**Highly statistically significant (p<0.001)

Figure (1): Percentage distribution of the studied older adults regarding their total knowledge level regarding frailty pre, post, and 3 months post intervention (n=133).

Table (3) Frequency distribution of the studied older adults regarding their reported practices level pre, post, and 3 months post health promotion intervention (n=133)

Total reported practices	Pre intervention				Post intervention				3 Months post intervention				X^2 p-value (1)	X^2 p-value (2)
	Satisfactory ≥ 60%		Un-satisfactory < 60%		Satisfactory ≥ 60%		Un-satisfactory < 60%		Satisfactory ≥ 60%		Un-satisfactory < 60%			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Nutrition	19	14.3	114	85.7	99	74.4	34	25.6	92	69.2	41	30.8	12.270 <0.001**	10.802 <0.001**
Physical activities	11	8.3	122	91.7	104	78.2	29	21.8	107	80.5	26	19.5	18.441 <0.001**	20.356 <0.001**
Periodic follow-up	41	30.8	92	69.2	119	89.5	14	10.5	121	91.0	12	9.0	14.614 <0.001**	16.528 <0.001**
Social engagement	29	21.8	104	78.2	88	66.2	45	33.8	80	60.2	53	39.8	10.341 <0.001**	8.980 <0.001**
Reduction of falls	43	32.3	90	67.7	127	95.5	6	4.5	119	89.5	14	10.5	10.868 <0.001**	7.394 <0.001**
Improving cognitive function	17	12.8	116	87.2	99	74.4	34	25.6	103	77.4	30	22.6	12.913 <0.001**	14.289 <0.001**

**Highly statistically significant difference ($p<0.001$)
p-value 1 between pre-intervention and post-intervention
p-value 2 between pre-intervention and follow-up



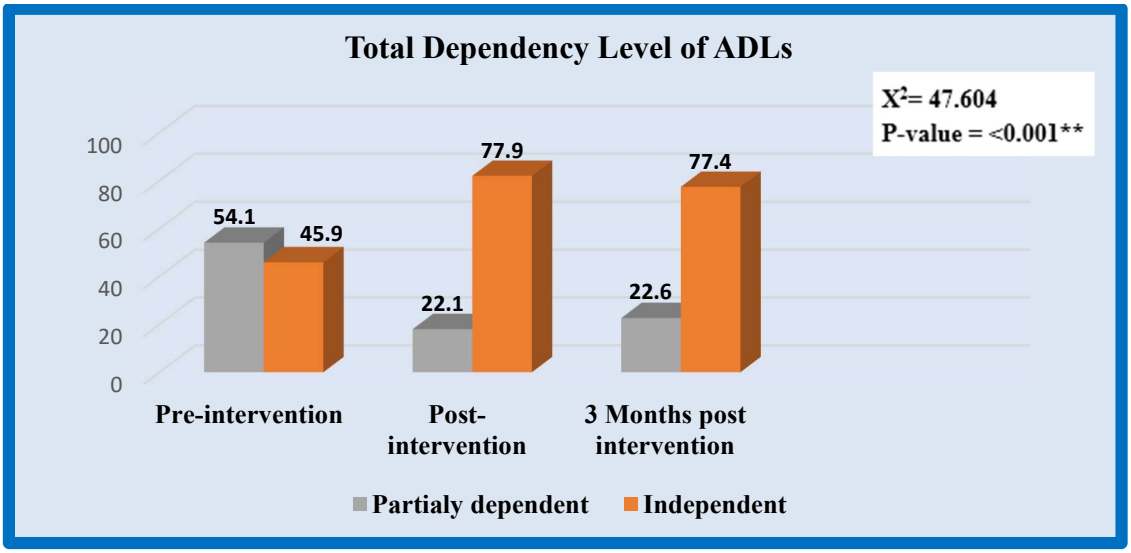
**Highly statistically significant (p<0.001)

Figure (2): Percentage distribution of the studied older adults regarding their total reported practices level pre, post, and 3 months post health promotion intervention (n=133)

Table (4): Frequency distribution of the studied older adults regarding their daily living activities level pre, post, and 3 months post health promotion intervention (n=133)

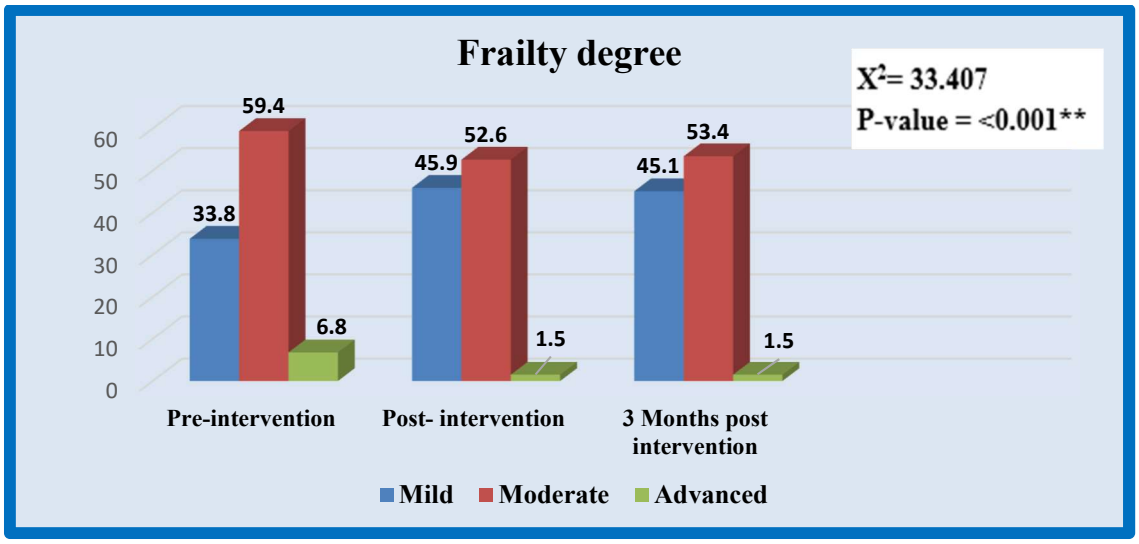
Daily living activities	Dependency level	Pre intervention		Post intervention		3 Months post intervention		X^2 P-value (1)	X^2 P-value (2)
		No	%	No	%	No	%		
Feeding	• Need help. • Independent.	84 49	63.2 36.8	22 111	16.5 83.5	30 103	22.6 77.7	22.597 0.000**	15.377 0.000**
Bathing	• Need help • Independent.	74 59	55.6 44.4	27 106	20.3 79.7	35 98	26.3 73.7	37.872 0.000**	27.010 0.000**
Grooming	• Need help. • Independent.	71 62	53.4 46.6	31 102	23.3 76.7	38 95	28.6 71.4	46.456 0.000**	35.298 0.000**
Dressing	• Need help. • Independent.	72 61	54.1 45.9	36 97	27.1 72.9	37 96	27.8 72.2	43.429 0.000**	41.820 0.000**
Bowels habits	• Occasional. Control bowel.	33 100	24.8 75.2	7 126	5.3 94.7	9 124	6.8 93.2	29.252 0.000**	22.391 0.000**
Bladder habits	• Occasional. • Continent.	28 105	21.1 87.3	15 118	11.3 88.7	12 121	9.0 91.0	115.364 0.000**	90.003 0.000**
Toilet use	• Need help. • Independent.	73 60	54.9 45.1	34 99	25.6 74.4	36 97	27.1 72.9	40.571 0.000**	37.543 0.000**
Transfers	• Need help. • Independent.	79 54	59.4 40.6	64 69	48.1 51.9	67 66	50.4 49.6	92.289 0.000**	84.324 0.000**
Mobility	Walk with help. • Independent.	74 59	55.6 44.4	24 109	18.0 82.0	29 104	21.8 78.2	29.569 0.000**	23.348 0.000**
Using stairs	• Need help. • Independent.	90 43	67.7 32.3	38 95	28.6 71.4	43 90	32.3 67.7	30.360 0.000**	25.418 0.000**

**Highly statistically significant difference ($p<0.001$)
p-value 1 between pre-intervention and post-intervention
p-value 2 between pre-intervention and follow-up



**Highly statistically significant (p<0.001)

Figure (3): Percentage distribution of the studied older adults regarding their total dependency level of daily living activities pre, post, and 3 months post health promotion intervention (n=133)



**Highly statistically significant (p<0.001)

Figure (4): Percentage distribution of the studied older adults regarding their total frailty degree pre, post, and 3 months post health promotion intervention (n=133)

Table (5): Correlation between the studied older adult's total knowledge, and total reported practices pre, post, and 3 months post health promotion intervention (n=133)

Items	Total reported practices					
	Pre intervention		Post intervention		3 Months post intervention	
	r	p-value	r	p-value	r	p-value
Total knowledge	0.235	.000**	0.927	.000**	0.899	.000**

**Highly statistically significant (p<0.001)

Table (6): Correlation between the studied older adult's total reported practices, and total dependency level of ADL pre, post, and 3 months post health promotion intervention (n=133)

Items	Total dependency level of ADLs					
	Pre intervention		Post intervention		3 Months post intervention	
	r	p-value	r	p-value	r	p-value
Total reported practices	0.501	.000**	0.982	.000**	0.970	.000**

**Highly statistically significant (p<0.001)

Table (7): Correlation between the studied older adult's frailty degree, total reported practices, and total dependency level of activity daily living pre, post, and 3 months post health promotion intervention (n=133)

Items	Frailty degree					
	Pre intervention		Post intervention		3 Months post intervention	
	r	p-value	r	p-value	r	p-value
Total reported practices	- 0.997	.000**	- 0.721	.000**	- 0.755	.000**
Total dependency level of ADLs	- 0.981	.000**	- 0.745	.000**	- 0.777	.000**

**Highly statistically significant (p<0.001)

Discussion:

Frailty is a complicated progressive medical issue that is marked by impairment in physiological ability through multiple organ systems, leading to severe susceptibility to poor resolution of homeostasis adhering to anxiety, and decreases quality of life, and is associated with adverse health outcomes. [17] Frailty increases the risk of hospitalization, necessitates clinical intervention, and has an adverse effect on daily living activities. [18]

Regarding socio-demographic characteristics of studied patients, the findings of the current study revealed that, more than half of the

studied older adults their age ranged from 65 years and more with mean age 68.73±3.740 years, two thirds of them were females, and more than one third of them had secondary education and approximately two fifths of the studied older adults were widowed. Additionally, the majority of studied older adults were not working, approximately two thirds of them didn't have enough monthly income, and more than half of them had extended family.

These findings agreed with **Huang et al. (2023)** [19], who studied multidomain intervention for frailty prevention in Taiwan and documented that 70.7% of study participants were female, 53.8% of them were widows and 99.1% of them weren't employed. Also, these findings were congruent with **El-Abdeen et al. (2021)** [1], who performed a study in Egypt about frailty among community-dwelling older adults and reported that 62.5 % of studied sample aged from 65-70 years old with mean age was 67.99 ± 6.32, 62.7% of them lived in rural areas, 87.6% of them had not enough monthly income, and 60.1% of them lived with a spouse. However, the findings of the current study disagreed with **Tosi et al. (2021)** [20], who performed a study in Brazil about a multidimensional program to reduce sedentary behavior in frail older adults and reported that the mean age of study participants was 82.9 ± 6.7 and 47.6% of them had less than primary school.

As regard the medical history, the current study confirmed that majority of the studied older adults were suffering from musculoskeletal disease and had previous hospitalization, approximately two fifths of them performed regular follow up once every month, and most of them took anti-inflammatory medications. These findings were symmetrical with **El-Abdeen et al. (2021)** [1], who reported that 82.9% of studied older adults had previous hospitalization, 53.3% of them had periodic checkup, 80.3% of them had osteoporosis and 74.9% of them had osteoarthritis.

Regarding total knowledge level of studied older adults, The present study illustrated that a minority of studied patients had good total knowledge level regarding frailty pre health promotion intervention and improved to three fifths post health promotion intervention. This might be related to the effect of health promotion intervention that helped in increasing knowledge of older adults regarding frailty. This finding was not in the same line with **Zhou et al. (2023)** [13], who carried out a study in China on older adults regarding frailty knowledge level and its influencing factors and stated that most of participants knew little about frailty and had misunderstandings about frailty. Also, this finding disagreed with **Liu et al. (2022)** [21], who reported that two thirds of the studied older persons` knowledge attributed to frailty was inadequate.

Concerning older adults` reported practices items, the present study revealed that there was highly statistically significant improvement of studied patients reported practices regarding nutrition pre, post and post three months of the intervention. This might be due to the effect of health promotion intervention that enhanced nutritional practices of studied sample because malnutrition and lack of balanced diet can significantly exacerbate development of frailty. These findings agreed with **Shin et al. (2023)** [22], who conducted a study in South Korea among community-dwelling older adults about nutritional status and frailty improvement and denoted that nutritional status of studied elderly patients improved from 22.9 ± 3.7 pre-educational program to

23.6 ± 3.4 after ten nutrition education programs. Also, this finding was compatible with **Ha and Park (2020)** [2], 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. The existing study revealed that less than tenth of older adults had satisfactory reported practices regarding physical activities pre intervention increased to more than three quarters and majority post and post three months of the intervention respectively. This might be due to effectiveness of the health promotion intervention and exercises that were included in frail older adults' daily routines helping in strengthening their muscles, these findings were supported by **Tosi et al. (2021)**[20], who documented that the multidimensional program that included simple exercises that could be done at home was effective. These activities helped elderly people who were already frail to stand and challenge the semi-static balance, which led to greater mobilization of the lower limb muscles.

The results of the present study revealed that there was highly statistically significance improvement of studied patients practice regarding prevention of fall through intervention phases. This might be due to the health promotion intervention succeeded to enhance physical activity and maintain independence of older adults. In addition, older adults were afraid of fractures and injuries related to falls so they were attentive to how to prevent falls. These findings were congruent with **Kapan et al. (2017)** [23], who studied fear of falling reduced by allayed home–based program in frail older adult in Austria and reported that home program can reduce falling by about 10% post program.

The results of the present study revealed that there was highly statistically significance improvement of studied patients practice regarding improving cognitive function through intervention phases, this might be because of health promotion intervention and the older adults were keen to enhance their cognitive functions and prevent themselves from cognitive deterioration. This finding was consistent with **Huang et al. (2023)** [19], who reported that there was an improvement in cognitive function of studied elderly patients from pre and posttest.

Regarding total reported practices of studied older adults, the current study showed that less than one fifth of the studied older adults had satisfactory total reported practices pre health promotion intervention which improved to more than three quarters and three quarters post intervention and three months post health promotion intervention respectively. This might be due to effect of the health promotion intervention that helped in enhancing studied older adults' health promotion reported practices regarding frailty.

The results of the present study revealed that there was significant improvement in total dependency level on daily living activities of studied older adults through health promotion intervention phases. This might be attributed to health promotion intervention which aimed to enhance health promotion practices, in turn; this was reflected on improving dependency level of activities of daily living. This was consistent with **Walters et al. (2017)** [24], who carried out a study in in London and Hertfordshire about home-based health promotion intervention for older people with mild frailty and found significantly better functioning in activities of daily living (Barthel Index +1.68; p = 0.004) among mild frail older community-dwelling adults.

As regard frailty degree, the results of the current study showed that one third of the studied older adults had mild frailty degree and improved to less than half post and 3 months post intervention respectively, while less than tenth of them had advanced frailty degree pre health promotion intervention and reduced to minority post and 3 months post intervention respectively. This might be related to the positive effect of health promotion intervention that led to the improvement of health promotion practices and enhancement of dependency level of daily living activities resulting in significant improvement of frailty degree among frail older adults. This finding disagreed with **Amblàs-Novellas et al. (2021)**[25], who studied frailty degree and illness trajectories in older people in Spain and reported that 18.8%, 35.1% and 38.1% of older people presenting mild, moderate, and advanced frailty, respectively. Also, these findings were supported by **Shin et al. (2023)**[22], who reported that the frailty level of studied intervention group slightly improved post five months of intervention. Moreover, these findings were consistent with **Ha and Park (2020)** [2], who stated that the frailty index lowered from 1.45 to 0.70 in the intervention group but raised from 1.25 to 1.80 in the control group, showing a significant difference between the two groups following the 24-session over 12 weeks.

The current study declared that was a highly positive statistically significant correlation between studied older adults' total knowledge score, and total reported practices score regarding frailty pre, post, and 3 months post health promotion intervention. This might be because knowledge served as the basis supporting practices and had positive effects.

The present study showed that; there was highly positive statistically significant correlation between studied older adults total reported practices, and total dependency level of daily living activities regarding frailty pre, post, and 3 months post health promotion intervention. This could be due to practices serving as important role and had a favorable effect on dependency level of daily living activities.

The current study declared that there was highly statistically negative significant correlation between studied older adults' reported practices, and dependency level of activities of daily living and frailty degree, pre, post, and 3 months post health promotion intervention. This might be because effect of health promotion intervention that had a significant effect in enhancing reported practices that by its role increase dependency level of activities of daily living and improve health and functional status of frail older adults. These findings were compatible with **Ferreira et al. (2018)** [26], who conducted research on frail elderly in Brazil about effects of a 12-week exercise training program on physical function and found that the training program in elderly patients with frailty was efficient in improving aspects of their functional capacity, involving muscle strength, speed, and agility. Additionally, the intervention reduced the number of frailty syndrome criteria, and a sizable number of older participants in the program had a reversal of the frailty condition.

Also, these findings were compatible with **El-Abdeen et al. (2021)** [1], who reported that there was a strong negative correlation between frailty, and instrumental activities of daily living of older patients. In addition, these findings were congruent with **Ng et al. (2015)**[27], who studied combination interventions and frailty reversal among older adults in Singapore and found that the dietary and mental interventions lowered frailty by

three times pre intervention and the physical actions by four times.

Conclusion

Health promotion intervention efficiently improved older adults' knowledge, reported practices regarding frailty and enhanced dependency level of older adults` daily living activities. So, the research aim and hypotheses were achieved.

Recommendations

- Developing continuous health promotion intervention for frail older adults to improve their knowledge and practices regarding management of frailty.
- Disseminating educational guidelines regarding to prevention of frailty at all outpatient clinics in Benha City to be provided to all older adults.
- Further research about frailty and its effects on performing activities of daily living with increasing sample size at different settings.

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