

## Effect of Nursing Interventions on the Physical Performance Self-Efficacy among Community Dwelling Older Adults in the Pre-Frail Stage

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### Abstract

**Background:** Prefrailty prevalence increases with age, and can lead to negative healthcare outcomes. Prefrailty prevention and management are very important actions to prolong independence in older adults. Self-efficacy is one of the psychological factors that are the most reliable predictors of older adults' initiation and uptake of physical activity. Gerontological nurses play a crucial role in the early identification of older adults with pre-frailty and tailoring preventive and rehabilitative multicomponent exercise interventions which are considered a key factor in decreasing, preventing, or even reverse decline associated with prefrailty.

**Aim of the study:** To determine the effect of nursing intervention on the physical performance self-efficacy among community dwelling older adults in the pre-frail stage. **Settings:** El-Waffa club for older adults which affiliated to the Ministry of Social Solidarity, in Alexandria, Egypt. **Subjects:** Forty pre-frail community dwelling older adults were included in this study. **Tools:** Six tools were used to collect data ; Frailty Index for Elders, Short Physical Performance Battery, Socio-demographic and Clinical Data of Community-dwelling Elders, Barthel Index, Instrumental Activities of Daily Living, and Exercise Self-efficacy Scale. **Results:** statistically significant differences were found in the studied older adults' pre-frailty status, physical performance, and their self-efficacy after the implementation of the study intervention as (P= 0.000 for all of these variables). **Conclusion:** physical performance self-efficacy and prefrailty status of all studied pre-frail community dwelling older adults improved after the implementation of the multicomponent exercise program.

**Recommendations:** Prefrailty screening should be performed for all community dwelling older adults. The multicomponent exercise program can be safely and effectively incorporated into standard nursing practice in caring for pre-frail community dwelling older adults.

**Key Words:** Multicomponent physical exercise, physical performance, self-efficacy, pre-frail community dwelling elders.

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### Introduction:

The normal aging process is distinguished by a set of changes in multiple domains including physical, psychological and social, which can be

widespread in nature. Some of these changes may be considered positive while others may be perceived as less desirable, which include deteriorating health and the development of chronic health circumstances or mobility

limitations that often predispose older adults to functional decline, disability and greater risk of frailty [1, 2].

Frailty syndrome refers to a clinical state of excess susceptibility that is determined by continuing multisystem deterioration, decreased biological store capacity and capability to deal with severe stressors, and excess unfavorable health consequences. Underprivileged clinical incidents such as frequent falls and injuries, recurrent hospitalization, or increasing inability regularly provide clues that older adults is stricken with frailty [3, 4]. The process of frailty is progressive and rises with age, from functionally robust to declining and is expressed as robust, pre-frail, and frail. Pre-frailty is a multi-dimensional concept, with an initial and modifiable threat prior to frailty that can result in adverse healthcare effects. Pre-frailty is described clinically using frailty examination and assessment instruments [5, 6].

Prefrailty prevalence increases with age, resulting in higher healthcare costs. The frailty prevalence in elders differs not only as claimed by the frailty meaning and standards, but also based on their age, area of residence, and living arrangement (community dwelling against being-in healthcare organizations). The frailty prevalence for elders residing in the community has been rated as 11%–17%, whereas the pre-frailty prevalence has been reported to be approximately 42% [7-

9]. Moreover, an interesting finding revealed that frailty increased with age: 4% for ages 65 to 69; 7% for ages 70 to 74; 9% for ages 75 to 79; 16% for ages 80 to 84; and 26% for ages 85 and over [9].

There have been a number of studies on frailty in industrial countries such as China, Japan, and India. While Egypt is one of the most developing countries in Africa with increasing an aging population accounting for 6.5 million, limited research has been conducted on the Egyptian population [10]. Two studies were found in the literature discussing the prevalence of frailty in rural areas in Egypt, and frailty related to low consumption of nutrients in older adults residing in institutions in Alexandria. These studies showed that, the prevalence of frailty in institutionalized elderly individuals was 58.7%, and 23.9% among community-dwelling elders [11, 12].

Prefrailty prevention and treatment are very important actions for prolonging independence in older adults. Exercise interventions are considered a key factor for preventing, delaying, reversing prefrailty or reducing the severity of frailty among older adults. The multicomponent exercise program which is composed of *strength, endurance, balance and flexibility* exercises seems to be the most effective non pharmacological nursing intervention for enhancing the health state of pre-frail elders [13-15]. Physical performance or planned

exercise has enormous advantages for all individuals, of any age. These advantages include enhancing cardiovascular health, balance, strength, mobility, aerobic fitness, and intellectual functions [16-18]. Moreover, the importance of these exercises includes a decline in adipose tissue, risk of falls, and risk of disease. For elderly people, the highest benefits are in decreasing all risks that increase mortality, as well as decreasing the risks of falling and disease [19, 20].

Engaging older adults in exercises is complicated and interferes with a set of obstacles. Self-efficacy is a psychological factor that has been confirmed to be responsible for the success of the exercise process among older adults [21]. Self-efficacy is a social cognition concept that most reliably appears to be related to physical activity in the elderly [22]. Exercise self-efficacy is an important issue because faith in an individual's ability to exercise, even with the presence of restrictions and barriers such as feeling of being tired or busy, is linked with a greater probability of performing it. When elders participate in exercise regularly, it gives them a greater feeling of competence and dominance in their environment. They can then convey to other daily tasks that lead to enhancement in physical performance and quality of life, and prevent further disabilities, hospitalization, and institutionalization [21-24].

Gerontological nurses are in a good position as health care experts to

offer physical activity instructions to elders, early identification of older adults with pre-frailty or vulnerability to frailty and tailoring preventive and rehabilitative interventions to decrease, prevent, or even reverse decline associated with prefrailty. Working on the pre-frailty stage helps decrease rates of frailty, as it necessitates decreasing immobility which is one of the major predisposing causes of frailty [25, 26].

### **Aim of the study:**

This study aimed to determine the effect of nursing interventions on the physical performance self-efficacy among community dwelling older adults in the pre-frail stage.

### **Study hypothesis:**

Pre-frail community dwelling older adults who received the proposed nursing interventions achieved higher scores on physical performance self-efficacy after the application of the interventions than before.

### **Materials and Method:**

#### **A. Materials:**

#### **Study design:**

The study followed a quasi-experimental research design (one group pretest posttest).

#### **Setting:**

This study was conducted in the El-Waffa club for older adults,

which is affiliated to the Ministry of Social Solidarity, Alexandria, Egypt.

### **Subjects:**

A convenience sample of forty pre-frail community dwelling older adults selected from the above-mentioned setting was included in this study. The Epi info program V 7 was utilized to estimate the required sample size considering the following parameters; population size 90, expected frequency 50%, acceptable error 5% and confidence coefficient 95%. The inclusion criteria were as follows; aged 60 years and above, able to communicate, read and write, ambulate with or without mobility aids, be in the pre-frailty state [score of 7-9 in the short physical performance battery (SPPB), and a score of 1-3 in the frailty index for elders], and not having; myocardial insufficiency, uncontrolled hypertension, and upper or lower extremity fracture in the past 3 months.

### **Tools of the study: -**

Six tools were used in this study to collect the necessary data:

#### **Tool (I): Frailty Index for Elders (FIFE):**

This tool was developed by **Tocchi et al., 2014 [27]**, which includes mood,

cognition and social resources with physiological components in describing frailty, and includes a 10-items assessment instrument with scores ranging from (0-10). A score of (0) indicates no frailty; a score of (1-3) indicates pre-frailty or frailty risk; and a score of (4 or greater) indicates frailty. This tool was translated into Arabic by the researcher and tested for its validity and reliability. The results indicated that it is valid and reliable ( $r=0.724$ ).

#### **Tool (II): Short physical performance battery (SPPB):**

This tool was established by **Guralnik et al 1994 [28]**, and is a set of procedures that gather the results of the balance, chair stand up and gait speed tests. It is used to determine functional capacity and assess the risk of falling in older adults. The scores range from 0 (worst performance) to 12 (best performance). The scores of the three tests are added together to determine the stage of frailty, which is categorized as follows: (A) Person with disability (SPPB 0-3), (B) Person with frailty (SPPB 4-6), (C) Person with pre-frailty (SPPB 7-9) and (D) Robust or healthy strong person (SPPB 10-12). This tool was translated into Arabic by the researcher and tested for its validity and reliability. The results indicated that it is valid and reliable ( $r=0.750$ ).

#### **Tool (III): Socio-demographic and Clinical Data of Community Dwelling Elders Structured Interview Schedule:**

This tool was established by the researcher based on related literature to collect the following information from the study subjects; it includes items such as age, sex, marital status, educational level, income, medical history, diagnosis, and pharmacological treatment.

#### **Tool (IV): Barthel Index:**

This tool was constructed by **Barthel et al 1965 [29]**. It is used to assess elderly people's activities of daily living. It consists of 10 items. The total score of the scale was 20. Score from 0 to 7 indicates dependent, score from 8 to 12 indicates partially dependent and score from 13 to 20 indicates independent. This tool was translated into Arabic language by the researcher, tested for its validity and reliability and the results indicated that it is valid and reliable ( $r=0.741$ ).

#### **Tool (V): Instrumental activities of daily living (IADL):**

This tool was created by **Lawton & Brody 1969 [30]**, it is used to assess more complex activities necessary for functioning in community settings, this tool includes 8 items that are scored from 0 (low functioning) to 8 (high functioning). The tool was tested for its validity and reliability by the researcher, and the results indicated that it is valid and reliable ( $r=0.762$ ).

#### **Tool (VI): Exercise Self-efficacy Scale:**

This tool was established by the researcher grounded on pertinent literature to assess the older adults'

own beliefs in his/her capabilities to successfully execute exercises. The total score was categorized as follow; a score of (15-24) indicating low self-efficacy, whereas the score of (25-34) indicating the moderate self-efficacy, and the score of (35-45) indicating high self-efficacy. The tool was tested for its validity and reliability and the results indicated that it is valid and reliable ( $r=0.762$ ).

#### **Method:**

**Content validity:** The tools I, II & IV were translated into Arabic language by the researchers and revised by a panel of seven specialists in the related fields; gerontological nursing, psychiatric nursing and community health nursing. These experts assessed these tools for its comprehensiveness, clarity, relevance, and applicability.

The data collection process started from the beginning of December 2019, until the end of August 2020, in which the study was carried out through three phases as follows; preparation phase, implementation phase and evaluation phase. *The preparation phase* encompasses two parts as follows;

**Part one** in which the necessary approval has been taken to conduct the study and the study tools were prepared. Then a pilot study was performed on five pre-frail older adults who attended at the club and the tools were tested for reliability. Moreover, the proposed nursing intervention was prepared by the

researcher according to the Vivifrail project.

**Part two** of the preparation phase, the researcher prepare the environment and ensure that it is well lit, ventilated, calm, safe and free from any obstacles, and preparation of the equipment needed to implement the program. The equipment include 2 bottles of water, towels, stopwatch, and adhesive tape or similar. Also, preparation of the study subjects is done in this part as follows; the researcher interviewed individually with the study subjects, explained the proposed interventions and the purpose of the study and ensured that the subjects were seated comfortably, wear comfortable clothes and sports shoes or similar. Booklet was prepared to be distributed to the study subjects.

Regarding *the implementation phase* it was carried out as follows; the physical exercise program was prepared to be carried out in 12 weeks from Sunday to Thursday (5 sessions per week) with a total of 60 sessions of physical exercise. Then the older adult was instructed to complete the wheel of strengthening, balance and flexibility exercises, for 3 non-consecutive days and in the other days he/she only instructed to walk. After that the researcher developed a diary record for each pre-frail older adult in order to track his/her progress. The multicomponent exercise program is composed of strengthening, balance, flexibility and cardiovascular endurance exercises. Strengthening exercises include twisting a towel, lift a bottle, and getting up from a chair. Balance exercises include

walking over obstacles, and walking in a figure of eight while flexibility exercise includes leg and arm stretching. Moreover, this program includes cardiovascular training exercise in which the older adults were instructed to walk 3 sets of 10 minutes with a total of 30 minutes, and resting 1minute between the sets. Then walking time was increased gradually from the 7th week to be 15 minutes each time in three sets with a total of 45 minutes. The researcher distributed a booklet to all study subjects with attractive and clear pictures to help them adhere to the exercise program.

As for **the evaluation phase**, the researcher follow up each study participant through the diary record which provide information about the study subjects performance of the exercises wheel and the walking sessions. After the implementation of the study interventions, the researcher performed the posttest immediately at the end of 12<sup>th</sup> week using tools (I, II, IV, V, &VI).

#### **Ethical considerations:**

Approval to carry out the study was gained from the responsible authorities which are the Faculty of Nursing, Alexandria University and administrator of the El-waffa club after explanation of the study purpose, the date and the time of data collection. Ethical considerations were considered all over the study phases. The informed consent was attained from all the study subjects. Privacy and anonymity of the study subjects and confidentiality of

the collected data was maintained throughout the study.

### Statistical analysis

After data were gathered it was reviewed, coded and fed to IBM SPSS statistical software version 25. The given figures were created by using Microsoft excel software. The tools' reliability was tested by Cronbach's alpha. Frequency tables and cross tabulation were utilized to elucidate the results. Quantitative data were summarized by the arithmetic mean, standard deviation and mean score percent. All statistical analysis was done using two tailed tests as independent sample t-test, paired t- test and one way ANOVA test. P value less than or equal to 0.05 was considered to be statistically significant.

### Results:-

**Table (1)** indicates that the mean age of the studied older adults is  $67.5 \pm 5.013$  years and range from 60 to 84 years. 50% of the study older adults are between 65 to 70 years of age. 90% of the studied older adults are female and 10% of them are male. Regarding the marital status, 50% of the study older adults are married and 47.5% of them are widowed. Concerning the education level, 45% of the study older adults have a secondary education, whereas 2.5% of them are able to read and write. As for the current living arrangement; 55% of the study older adults are living with their spouse, while 45% of them are living

alone. 80% of the study older adults are having chronic diseases. Hypertension diabetes mellitus and musculoskeletal diseases are the most prevalent chronic diseases which reported by 65%, 55% and 47% of the study older adults respectively.

**Table (2)** shows that all the study older adults are pre-frail and achieved a mean score of  $(2.3500 \pm 0.622)$  on the frailty index for elders before the implementation of the study program. While, they achieved a mean score of  $(1.6250 \pm 0.628)$  after the application of the study program (after the 12<sup>th</sup> week), with a highly statistically significant difference between the scores pre and post the implementation of the study program as ( $P= 0.000$ ).

**Table (3)** displays that the study subjects' mean exercise self-efficacy is  $(27.2000 \pm 4.25592)$  before the implementation of the program, after implementation of the program the mean is  $(39.3000 \pm 2.73814)$  and the difference is statistically significant as ( $p= 0.000$ ).

**Table (4)** reveals that the studied older adults' mean performance of the instrumental activities of daily living is  $(7.675 \pm 0.888)$  before the implementation of the program and it is increased to  $(7.850 \pm 0.579)$  after the program implementation with a statistically significant difference between the both means of (IADLs) as ( $P=0.033$ ).

**Table (1): Distribution of the studied older adults according to their socio-demographic and clinical data.**

Socio-demographic data	Total (N=40)	
	Frequency	%
<b>Age (years)</b>		
▪ 60-	8	20.0
▪ 65-	20	50.0
▪ 70-	8	20.0
▪ ≥75	4	10
Min. – Max.	60.0 – 84.0	
Mean ± SD.	67.5 ± 5.013	
<b>Sex</b>		
▪ Female	36	90
▪ Male	4	10
<b>Marital status</b>		
▪ Married	20	50
▪ Widowed	19	47.5
▪ Divorced	1	2.5
<b>level of education</b>		
▪ Read and write	1	2.5
▪ Basic education	6	15.0
▪ Secondary education	18	45
▪ University and more	15	37.5
<b>Income</b>		
▪ Sufficient	40	100
<b>Living arrangement</b>		
▪ Husband/wife	22	55
▪ Alone	18	45
<b>Medical history of chronic diseases</b>		
▪ No	8	20
▪ Yes #	32	80
▪ Hypertension	26	65
▪ Diabetes mellitus	22	55
▪ Musculoskeletal diseases	19	47.5
<b>Consuming medications</b>		
▪ Yes #	40	100
▪ Antihypertensive medications	26	65
▪ Anti-diabetic medications	24	60
▪ Vitamins	33	82.5
▪ Musculoskeletal medications	19	47.5
▪ Anticoagulant medications	1	2.5

# Multiple responses questions

**Table (2): Distribution of the studied older adults according to their pre-frailty status, before and after the implementation of the study intervention.**

Item	Total (n=40)		t	p
	Pre-intervention	Post-intervention		
	Mean ±SD	Mean ±SD		
Pre-frailty status	2.350±0.622	1.625±0.628	7.164	0.000*

t = Paired t test                      \* Significant at p ≤0.05

**Table (3): Distribution of the studied older adults according to their self-efficacy before and after the implementation of the study intervention.**

Item		Pre-intervention (N=40)		Post-intervention (N=40)		Significant test	Sig. (2-tailed)
		No.	%	No.	%		
Self-efficacy	Low	9	22.5	0	0.0	X <sup>2</sup> =14.333	0.000**
	Moderate	28	70.0	3	7.5		
	High	3	7.5	37	92.5		
	Mean ± SD	27.2000 ± 4.25592		39.3000 ± 2.73814		t=22.898	0.000**

\*\* P value of p ≤0.01 (highly significant)                      X<sup>2</sup>= Chi Square test                      t = Paired t test  
 Low self-efficacy (15-24)                      Moderate self-efficacy (25-34)                      High self-efficacy (35-45)

**Table (4): Distribution of the studied older adults according to their performance of instrumental activities of daily living before, and after the implementation of the study intervention.**

Item	Pre-intervention (N=40)	Post-intervention (N=40)	t	P
	Mean ± SD	Mean ± SD		
Performance of Instrumental activities of daily living	7.675± 0.888	7.850 ± 0.579	2.211	0.033*

t = Paired t test                      \* P value of p ≤0.05 (significant)

**Table (5)** illustrates the studied older adults' mean score of standing balance, standing balance and chair standing up which are (3.775±0.423, 2.600±0.632 and 1.750±0.669) respectively before the implementation of the program. These mean scores increased to (3.950±0.221, 3.375±0.490 and 3.125±0.335) respectively after the

implementation of the program. Regarding the older adults' mean score of the total physical performance, it is increased from (8.075±0.797) before the application of the study program to (10.475±0.598) after the program with statistically significant differences as (p=0.000).

**Table (6)** shows that the effect size of the program on the pre-frailty state of the study subjects is (0.5) which is significantly medium effect. Moreover, the effect size on the studied older adults' self-efficacy level is (0.86) and on their physical performance is (0.81)

which is significantly large effect on both. Furthermore, it can be seen from this table that the program shows small effect size (0.06) of the program on the study subjects' performance of IADLs, but no effect is shown on their performance of ADLs.

**Table (5): Distribution of the studied older adults according to their physical performance before, and after the implementation of the study intervention.**

physical performance	Total (n=40)		Test of Significance	
	Before	After	t	p
	Mean ±SD	Mean ±SD		
Standing Balance	3.775±0.423	3.950±0.221	t= 2.876	P= 0.006*
Gait speed	2.600±0.632	3.375±0.490	t= 9.240	P= 0.000*
Chair standup	1.750±0.669	3.125±0.335	t= 13.029	P= 0.000*
Total	8.075±0.797	10.475±0.598	t= 22.595	P= 0.000*

t = Paired t test

\* P value of p ≤0.05 (significant)

**Table (6) Distribution of the studied older adults according to the intervention's effect size on their pre-frailty status, self- efficacy, ADL, IADL, and physical performance mean scores.**

Items	Study Group (n=40)		Mean Change	Effect size
	Before	After		
	Mean ±SD	Mean ±SD		
Pre-frailty status	2.350±0.622	1.625±0.628	0.725	<b>0.50</b>
Self-efficacy	27.20±4.256	39.30±2.738	-12.1	<b>0.86</b>
ADL	20.00±0.000	20.00±0.000	0.00	-
IADL	7.950±0.221	7.975±0.158	-0.025	<b>0.06</b>
Physical Performance	8.075±0.972	10.40±0.672	-2.325	<b>0.81</b>

Effect size 0.0-0.2 Small effect 0.3 -0.7 Medium effect ≥ 0.8 Large effect

**Discussion:**

Grounded on the recent literature, physical exercise interventions are considered a critical instrument to offset frailty status, as robust or pre-frail elders have about 4–7% probability of being frail annually[4, 31,32]. For elders, regular physical

exercise is linked with many positive health outcomes. These include prohibition of various chronic diseases, enhancement in functional status as well as cognitive and psychosocial status. Thus, trials ought to be done to inhibit frail elders from developing disability state, as well as to inhibit

progression of healthy or pre-frail elders to the frail state [31, 33].

The findings of the present study showed that, females constituted the majority of studied subjects, half of the studied older adults were married, about half of them having secondary education and more than one third of them having university education. Regarding the living arrangement; around half of them are living with their husbands and wives, and the second half are living alone. Concerning the clinical data of the study subjects, more than one half of them having diabetes mellitus, and about half of them having musculoskeletal diseases.

Concerning the study subject's pre-frailty status, the current study findings illustrated that, the study subjects' pre-frailty status is significantly decreased after the completion of the study intervention with a high statistically significant differences as ( $p=0.000$ ). This result can be explained by, the effect of multicomponent exercise program on the community dwelling elders in the pre-frail stage, that include cardiovascular exercise, flexibility exercise, balance exercise, and strength exercise, which are considered to be the most effective strategy for reversing pre-frailty by improving gait speed, balance, strength and flexibility, and consequently maintaining the functional performance during the aging process.

This study finding is in the same line with that of the study conducted by **Sadjapong et al., 2020 [34]**, who

revealed that the multicomponent exercise program delays frailty in community dwelling elders. Furthermore, this study result is congruent with that of the study performed by **Yu et al., 2020 [35]**, who revealed that the physical exercise is more beneficial to frail and pre-frail elders when compared with other types of interventions. Similarly, this finding is congruent with that of the study performed by **Losa-Reyna et al., 2019 [36]**, 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.

Instrumental activities of daily living (IADLs) are described as important competencies required for independent living in a community. Regarding the study subject's performance of IADLs, this study shows that the older adults' IADLs score is enhanced after the implementation of the study intervention than before it as ( $p=0.033$ ). This can be explained by that the multicomponent physical exercise program is influential on IADLs independency. Since the majority of this study subjects were females, a reasonable justification is that performing IADLs tasks-for example, meal preparation and performance of household activities might be a challenge as women habitually do these tasks. Moreover, the study subjects are participating in leisure activities which provided by the club.

This finding came in agreement with that of studies done by **Crevenna & Dorner 2019, van Lieshout et al., 2018, and Osuka et al., 2018 [37-39]**, who showed that the physical activity improves the IADLs performance. On the other hand, the finding of this study is contradicting with that of the study conducted by **Manini et al., 2017 [40]**, who revealed that the structured physical exercise doesn't affect the IADLs among pre-frail older adult.

Physical performance is an objective measure of the entire body function linked with mobility which exceeds measures of muscle function; because it includes numerous body systems and organs, recently the physical performance assessed by gait speed, time to get up from a chair, and other tests which is used to determine the disabilities of elders. The results of this study show that the physical performance of the pre-frail community dwelling older adults was significantly improved after the application of the study intervention than before as (effect size= 0.81) (as shown in table 7). This finding can be explained by using of multicomponent physical training that is considered as a strategy for physical gains in the pre-frail community dwelling older adults, specially this multicomponent exercise program which includes; cardiovascular exercise, flexibility exercise, balance exercise, and strength exercise which is carried out for 12 weeks 5 sessions/week with the total of 60 sessions.

Moreover, this result can be interpreted by that older adults have more free time after retirement than previously as they become not overloaded with different family responsibilities. This allows them to participate in the multicomponent exercise program and attending the exercise sessions to improve their physical performance. As this program is costless and require simple equipment, which may be more acceptable and sustainable for elderly population. This result is congruent with that of the studies conducted by **Haider et al., 2017, Tarazona Santabalbina et al., 2016, Kim et al., 2015, Ng et al., 2015, Cadore et al., 2014 & Gine-Garriga et al., 2014 [14, 26, 41-44]**, who revealed that the multicomponent exercise interventions are well designed to enhance physical performance and capabilities in pre-frail older adults. Otherwise, this study result is in contrast with that of the study done by **Serra-Prat et al., 2017 [45]**, who found the exercise intervention of his study did not demonstrate an effect on certain indicators of functionality such as chair standup , short physical performance battery, and Barthel score.

Self-efficacy of physical capacities influences several health and fitness dimensions. Higher exercise self-efficacy affects the levels of physical activity. Additionally, physical activity has an effect on function. The beliefs of one's self-efficacy influence the extent of effort and time a person will spend in an activity and higher self-efficacy level leads to higher level of

effort. Moreover, exercise self-efficacy is an important causative factor to involvement of elders in physical activity, the finding of this study revealed that exercise self-efficacy improved after the application of the study intervention than before it with a high statistically significant differences as ( $p=0.000$ ) (as shown in table 4).

This finding may be explained by four factors; firstly, the study older adults become more interested in physical exercise because of the support which they gain from the researcher, club, and their peers as the exercise sessions carried out in group format. So, they stayed motivated to exercise and make the exercise sessions more enjoyable. Secondly, the characteristics of the multicomponent exercise program which designed to start slowly and advance the exercise program gradually. Thirdly, even there is a lack of community exercise program that motivate and support the community dwelling older adults to initiate and perform the exercise, the social activities which provided by the club to older adults help them to some extent to stay physically active. Fourthly, the researcher provides an exercising memo inside the program booklet which make the older adult to track their achievements which is the best way to keep the study subjects motivated and to measure and celebrate their successes. This study result is in agreement with that of studies done by **Elbers et al., 2018, Ory et al., 2018 & Greene et al., 2017 [46-48]**, who revealed enhanced exercise self-efficacy in older adults

after the application of a moderate-intensity strength and endurance training program.

The study findings support the study hypothesis as pre-frail community dwelling older adults who received the proposed nursing intervention achieved higher scores of physical performance self-efficacy after the application of the study intervention than before it.

### **Conclusion:**

Based on the results of the current study, it can be concluded that the physical performance self-efficacy of all the studied pre-frail community dwelling elders improved after the implementation of the multicomponent exercise program than before it. Highly statistically significant differences were found in the studied older adults' physical performance and their self-efficacy after the implementation of the study intervention. Moreover, the prefrailty mean score of all the studied subjects improved after the implementation of the study intervention than before it.

### **Recommendations:**

**Based on the results of the present study the following recommendations are suggested:**

1. Prefrailty screening is to be done for all community dwelling older adults who attend the clubs and the outpatient clinics by the responsible health care providers.

2. Workshops about multicomponent exercise program are to be provided for the pre-frail older adults and their formal and informal care givers in the clubs and outpatient clinics to enhance their practice and to help the pre-frail older adults to return to the robust stage.
3. The multicomponent exercise program can be safely and effectively incorporated into the standard nursing practice in caring for community dwelling pre-frail older adults who attend clubs and outpatient clinics.
4. Multicomponent exercise program is to be included in the clinical curriculum of bachelor nursing students in the gerontological nursing department.

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