Effect of Home Based Intervention on Falling Risk Reduction among Elderlyin a Rural Community

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Abstract: Many falls result in fractures and also soft tissue injuries, longstanding pain, functional impairment, reduced quality of life, increased mortality, and excess in healthcare costs. Purpose: This study aimed to examine the effect of home based- intervention on falling risk reduction of elderly in a rural community. Design: A quasi- experimental design (pre-posttest) was utilized to conduct.Setting: The study was carried out at two villages (Ghemreen village and Manshat Sultan village) in Menoufia governorate through home visits-Egypt. Sample: the researcher selected only elderly people who have history of falling. They were 130 elderly people. The sample divided into two groups (case and control), 65 (case) and 65 (control). Tools: I: - A structured Interview questionnaire developed by the researcher II: - Berg Balance scale, III: - Timed Up and Go test scale, IV: - Modified Fall Efficacy Scale.   Results: After intervention, there was remarkable reduced number of falls and fall related injuries. Functional mobility was improved in study group than control group. Conclusion: Implementation of home based-intervention was effective in risk reduction of falling among study group compared to control group. It was successful in reducing number of falls and fall related injuries. Moreover, it was effective in increasing functional mobility in the study group than control group. Recommendations: Awareness programs targeted for all elderly people, their family caregivers and the general public about exercises and its importance for strengthen muscles and joints and increase body balance.
Keywords: Home based- intervention, Elderly, falling, risk reduction

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I.   Introduction

Falling is considered one of the most global problems in the elderly population around the world (Sulaiman, et al., 2018). It is a major cause of death and illness in older people. Approximately 20–35% of elderly peoplesuffer a fall worldwide every year, (Peixia et al., 2018).Older population is more likely to fall and its negative consequences for their quality of life and result in burden to their families One third of community-dwelling people aged over 65 years fall each year and almost half of them experience recurrent falls (Vieira, Palmer &Chave, 2016).

Falls are considered one of the common causes of unintentional injury and premature death worldwide(Hamed, Mohammed &Aly, 2017). Theseverity of injuries varies, and 40-60% of falls lead to major lacerations, fractures, or traumatic brain injuries. Incidents of falls among older people are strongly associated with hospitalization, severe functional impairment, care dependency and early admission to institutional care. falls can have serious consequences and constitute a major cause of morbidity and mortality in the elderly population, since in old age there is an increasing risk of osteoporosis, and therefore of bone fractures (WHO, 2017).

Gerontological nurse has an important role to reduce fall and its related injuries through guidelines provided about safety measures, modification for living environment, risk factors elimination and improving the balance through exercise training program. Health education must be directed toward helping elderly persons to identify potential hazards and changing their health practice and habits accordingly. Adequate rehabilitation physically, socially and psychologicallyfor elderly people with a history of falls and injury has been reported to prevent further falls (El-Gilany et al., 2013).

Home Based Care is recommended when elders receiving care would like to remain in their home environment although they require additional healthcare that cannot be provided by the family (WHO, 2015).Home based care makes the client remains in his familiar environment and participates in daily family routines that maintain daily contact and a healthy family relationship. The care worker has the knowledge and

skills to deal with the client's medical needs and help to improve functional independence. The burden on the family decreased, whereas the client able to become more independent (The National Clinical Homecare Association, 2015).

Aim of the study:
The aim of the current study is to examine the effect of home based- intervention on falling risk reduction of elderly in a rural community.

Research Hypothesis
* Elderly people, who will receive home based intervention about falling prevention (study group), will have a reduced number of falls and fall related injuries than elderly people who will not receive any intervention (control group).
* Elderly people, who will receive home based intervention (study group), will increase their functional mobility than elderly people who will not receive any intervention (control group).

Subjects and Method:
Design:A quasi- experimental design (pre-post-test) was utilized to conduct this study.
Setting: The study was carried out at two villages (Ghemreen village and Manshat Sultan village) in Menoufia governorate through home visits.
Subjects: Amultistage random selection was used to select one district from Menoufia Governorate, which composed of nine districts; the selected district was Menouf district. The researcher selected only elderly people who have history of falling. They were 130 elderly people. The researcher divided them into two groups (case and control), 65 (case) and 65 (control). According to the following criteria:

Inclusion criteria:
* Are 60 years or older
* Both genders; (male & female)
* Have history of falling
* Agreed to participate in the study.

Tools of data collection:
Tool (1):An Interviewing questionnairewhich includes:
A. Demographic data: include age, sex, marital status, educational level, job.....etc
B. History of falls: questions about the date of fall, the number of falls, and injuries related to falls… etc
C. History of medication taking: questions about the name and number of medications taken by the participants… etc.The questionnaire contained four assessment items about number of drugs taken per day (Polypharmacy). The elderly who taking 2-3 drugs is considered as "Minor polypharmacy", taking 4-5 drugs as "Moderate polypharmacy", and taking more than 5 drugs as "Major Polypharmacy.
D.   Medical history: questions about medical Problems as presence of chronic diseases… etc.

Tool (2):Berg Balance scale:developed by Berg et al., (1992) to measure elderly people body balance.
Scoring used for Berg Balance scale: The elderly body balance was evaluated giving a score of 0- 4, with a range of total score of 0-24. The total score of each elderly was categorized into "high fall risk" when the elderly achieved 0-8 of the total score, and "moderate fall risk" was considered when the elderly achieved 9-17 of the total score. The total score of each elderly was categorized into "low fall risk" when the elderly achieved 18-24 of the total score.
Tool (3):Timed Up and Go test scale: developed by Podsiadlo et al., (1991) to measure basic functional mobility.
Categories used for Timed Up and Go test scale: Regarding assessing the elderly basic functional mobility using "Timed up and go test scale. The elderly' basic" functional mobility was evaluated as "freely mobile " if he/she did these basic functional mobility in less than 10 seconds (0-9 seconds), "mostly independent" if he/she did these basic functional mobility in less than 20 seconds (10- 19 seconds), and "impaired mobility " if he/she did these basic functional mobility in (20 - 30 seconds).
Tool (4):Modified Fall Efficacy Scale (MFES):developed by National Aging Research Institute (adapted from Tinetti et al., 1990)to determine how confidently clients feel they are able to undertake each activity on a scale of 0 (not confident at all) to 10 (completely confident).
Scoring used for Modified Fall Efficacy Scale: Regarding assessing the elderly modified fall efficacy scale, the total score was (0 – 140), with higher scores reflect more confidence, less fear of falling. Lower scores reflect less confidence, more fear of falling. Each elderly was categorized into "low satisfaction" when he/she

achieved (0-46), "moderate satisfaction" when he/she achieved (47-93), and "high satisfaction "when he/she achieved (94-140).

Validity of the tools:

Validity of the tools was assessed using content validity by jury of three community health and medical surgical experts. The relevancy, clarity, fluency, and simplicity of each component in the tools were examined by the Experts and they found the tools are useful and helpful, and suggestions were incorporated into the tools.

Reliability of the tools:

Reliability was estimated among 10 participants by using test retest method with two weeks apart between them. Then correlation coefficient (Cronbach's alpha) was calculated between the two scores for each tool. Correlation coefficients range from 0.82 to 0.89 which indicates that the tools are reliable to detect the objectives of the study.

Pilot study:

The pilot study was conducted on 10% of the study sample (13 elderly people) from the target population to evaluate the applicability of the study tools, clarity, techniques, acceptance of the study sample and time needed to fill the questionnaire. Based on the findings of the pilot study, the necessarily modifications were done. This sample was excluded from the study.

Ethical considerations and human rights:
- Approval of ethical research committee was obtained at Faculty of Nursing –Menoufia University.
- The agreements for participation were taken after the purpose of the study was explained.
- Before data collection, the elderly people were informed about the aim of the study and what would be done with the results. They were given an opportunity to refuse to participate and they were notified that they could withdraw at any time. Also they were assured that, the information would remain confidential and used for the research purpose only.
- The researcher gave copies from general information package (booklet) about falling risk reduction to elderly people for achieving the ethical principles of research as the principle of beneficence that all subjects should benefit from the research's knowledge.

Data collection procedure:
- A review of available and related past and current literature covering the various aspects of the topic was done using books, articles, magazines and studies related to falling, its risk factors and its preventive strategies.
- The period of data collection starting from July 2017 to the end of December 2018 with continuous follows up during this period.
- The initial visit (pre- test): first time meeting with the participants was considered the baseline for the study. At first, it was important for the investigator to introduce herself, the elderly were assured of confidentiality, elderly people was provided with an explanation about the purpose of the study and the significance of their contribution. They provided verbal consent to share in the study. Each elderly was interviewed individually through home visits.
- A questionnaire was performed to obtain data about socio-demographic data, history of falls in the previous 12 months, history of medication taking and Medical history. Data was collected through face to face interviewing with elderly (study and control groups).
- Elderly people were asked about history of falling in the last 12 months, if the answer was "yes", then they were asked about effect of fall. Inclusion criteria: being at least 60 years old, accept to answer the questionnaire and accept for participation in the study. Then the investigator began to measure scales used in the study as berg balance scale to measure elderly body balance, The total score of each elderly was categorized into "high fall risk" when the elderly achieved 0-8 of the total score, and "moderate fall risk" when the elderly achieved 9-17, "low fall risk" when the elderly achieved 18-24 of the total score.
- After measuring berg balance scale, the investigator complete modified fall efficacy scale by asking the elderly people the degree to which he /she was confident to perform fourteen daily living activities and rating them on a scale of 0 (not confident at all) to 10 (completely confident). High scores indicate more confidence and less fear of future falling. Lower scores indicate less confidence and so more fear of future falling.
- Then, the investigator completed other test "timed up and go test scale" to measure elderly functional mobility, The researcher explain the scale steps to each person and make role play in front of the elderly people then asked the elderly to perform the test. The investigator classified elderly functional mobility into

"freely mobile " if he/she perform the test in less than 10 seconds (0-9 seconds), "mostly independent" if the person did the test in less than 20 seconds (10- 19 seconds), and "impaired mobility " if the test is performed in (20 - 30 seconds).

- The study group received three-part intervention by the investigator through a 10-week period to reduce fall-associated risk factors. Intervention involved education about fall risk, exercise programand medication review. Control group then, took a delayed intervention (booklet) after collecting posttest.

- **Fall risk education:** General information package (booklet) was given to all persons in the intervention group. The booklet contained information about most common risk factors and simple falls prevention strategies. It is provided to improve awareness, identification of falling risk factors and the importance of different interventions. All elderly people in the intervention group received verbal and written information about fall prevention strategies by the investigator. The oral information consisted of discussion about risk factors of falling.

- **Exercise or physical activity:**Proceeding to the beginning of the exercise program, all of the elderly in the intervention group were informed on the significance of fall prevention and risk reduction. The investigator spent twenty minutes educating the elderly about the relationship between falling and risk factors as reduce vision and hearing, polypharmacy, sedatives use, hypotension, and decrease physical activity.

- The ten week exercise program was presented in a four-page brochure, focuses on increase balance, coordination, muscle strength and functional mobility through 7 chair-based exercises and 2 exercises during standing position to improve balance. Exercises could be performed in sitting or standing position according to elderly health and basic functional status.The elderly received one hour-long introduction to the exercise program. Throughout this time elderly taught how to do each exercise properly and allowed to ask questions. The elderly were encouraged to make these exercises three times per week by using the brochure. Every exercise session took about fifteen minutes.

- The elderly documented how often they did the exercises. Adherence to the exercise program was defined as performing the exercises at least 12 times during the 10-week intervention. The subjects were encouraged to exercise three times a week so that the more motivated subjects would benefit from additional exercise.

- **Medication Review:** During the pretest visit, the investigator collect data about medication history as questions regarding name and number of medications taken by the elderly, number of drugs taken per day (Polypharmacy). Taking 2-3 drugs is considered as "Minor polypharmacy", taking 4-5 drugs considered as "Moderate polypharmacy", and taking more than 5 drugs considered as "Major polypharmacy. The investigator give guidance and directions to elderly people during intervention to decrease psychotropic drugs as benzodiazepines and associated drugs, drugs causing orthostatic hypotension, central nervous system medications.

Statistical Analysis:

Data was coded and transformed into specially designed form to be suitable for computer entry process. Data was entered and analyzed by using SPSS (Statistical Package for Social Science) statistical package version 22. Graphics were done using Excel program.**Quantitative data**were presented by mean (X) and standard deviation (SD). It was analyzed using student t- test for comparison between two means, and ANOVA (F) test for comparison between more than two means.**Qualitative data**were presented in the form of frequency distribution tables, number and percentage. It was analyzed by chi-square ($\chi 2$) test. However, if an expected value of any cell in the table was less than 5, Fisher Exact test was used(if the table was 4 cells) , or Likelihood Ratio (LR) test (if the table was more than 4 cells). Level of significance was set as P value <0.05 for all significant tests. The Non parametric two-Way Repeated Measures Friedman test was used for comparison of each history of falling items, Berg balance scale items, basic functional mobility items, modified fall efficacy items between the three levels of intervention (Pre, immediate, after, and one year after intervention), in both the study group, and control.

II. Results

Table 1:showed the socio-demographic characteristics of the studied elderly distributed by groups. This table showed that, younger age groups were predominant than older age groups, 38.5% of study group and 56.9 % of control group were aged 60 -69 years, while 26.1% and 15.4% of study and control groups respectively were aged 80-90 years. Approximately, more than half (56.9%) were females. In addition, near to half of participants were illiterate, 16.2% of them had secondary school or a technical diploma. As regards marital status, 50% of them were married. Concerning job, fifty nine percent of participants were not work, while skilled works had the lowest percentage(13.9%). Regarding elderly living, 60.8% mentioned that they live with their family.

Figure1. Medical history distributed by studied groups. This figure demonstrated that the highest percentages of chronic diseases suffered by studied elderly were: vertigo 84.6%, for study group and 56.9% for control group

followed by joint pain 72.3%, 75.4% respectively for study and control group followed by hypertension 43.1%, 61.5 % respectively for study and control group then low back pain 50.8%, 40% respectively for study and control group, then diabetes 41.5%, 35.4% for study and control group respectively.

Table 2: Effect of home based intervention on studied elderly' history of falling, pre, post1, and post2-intervention. This table highlights efficacy of the home based- intervention on history of falling among studied elderly. Immediate and one year post intervention revealed a highly significant improvement (p<0.000) in the different aspects of history of falling. Regarding number of falling, elderly who were fall from 7-12 times among study group showed diminished percentage from 21.5% in pre intervention to 0% immediately and one year after intervention, while the percentage among the control group are 30.8%, 38.5%, 21.5% pre, immediately and one year after intervention respectively. This difference was highly statistically significant (P=0.000).

Figure2: Effect of home based intervention on studied elderly' fear of fall in the future, pre, post1, and post2-intervention. This Figure Illustrates that, elderly people who have fear of falling in the future among study group showed diminished percentage from 66.2% pre intervention to 33.8% immediately after intervention, and 4.6% one year after intervention while the percentage among the control group was 60%, 50.7%, 44.6% pre intervention, post1 and one year after intervention respectively. This difference was highly statistically significant (P=0.000).

Figure3: Effect of home based intervention on studied elderly 'Berg balance scale pre, post1and post2. This figure illustrates that, There was a highly significant improvement (p<0.000) in the different aspects of Berg balance scale.

Table 3: Effect of home based intervention on studied elderly 'basic functional mobility pre, post1,and Post2-intervention. This table reveals efficacy of the home based- intervention on basic functional mobility among studied elderly. Immediate and one year post intervention revealed a highly significant improvement (p<0.000) in the different aspects of basic functional mobility.

Figure4: Effect of home based intervention on studied elderly' modified fall efficacy scale pre, post1 and Post2-intervention. This figure illustrates that, high satisfaction showed increased percentage from 21.5% in pre intervention to 33.8% immediately after intervention (post1) and 46.2% one year after intervention (post2). However, low satisfaction showed diminished percentage from 33.8% in pre intervention to 1.5% immediately after intervention (post1) and 0% one year after intervention (post2) (study group).

Table (1): Socio-demographic characteristics of the studied elderly (N = 130)

Socio-demographic data		Groups				Total		P value
		Study No.	%	Control No.	%.	No.	%	
Age groups	60 -	25	38.5	37	56.9	62	47.7	X^2=4.7, P=0.09, NS
	70 -	23	35.4	18	27.7		41 31.5	
	80 – 90 Y	17	26.1	10	15.4		27 20.8	
gender	Male	29	44.6	27	41.5	56	43.1	X^2=0.13, p=0.72 NS
	Female	36	55.4	38	58.5	74	56.9	
Education	Illiterate	33	50.8	30	46.1	63	48.4	X^2=0.54, P=0.9, NS
	Basic	15	23.1	18	27.7	33	25.4	
	Moderate	11	16.9	10	15.4	21	16.2	
	University	6	9.2	7	10.8	13	10	
Job	Not work	39	60	38	58.4	77	59.2	X^2=1.6, P= 0.44, NS
	Free work	15	23.1	20	30.8	35	26.9	
	Skilled work	11	16.9	7	10.8		18 13.9	
Marital status	Single	0	0	4	6.2	4	3.1	X^2=4.9, P=0.17, NS
	Married	36	55.4	29	44.6	65	50	
	Widow	21	32.3	22	33.8	43	33.1	
	Divorced	8	12.3	10	15.4		18 13.8	
Live Alone		25	38.5	26	40		51 39.2	X^2=0.03, P=0.85, NS
	With family	40	61.5	39	60		79 60.8	
Total		65	100%	65	100%	130	100	

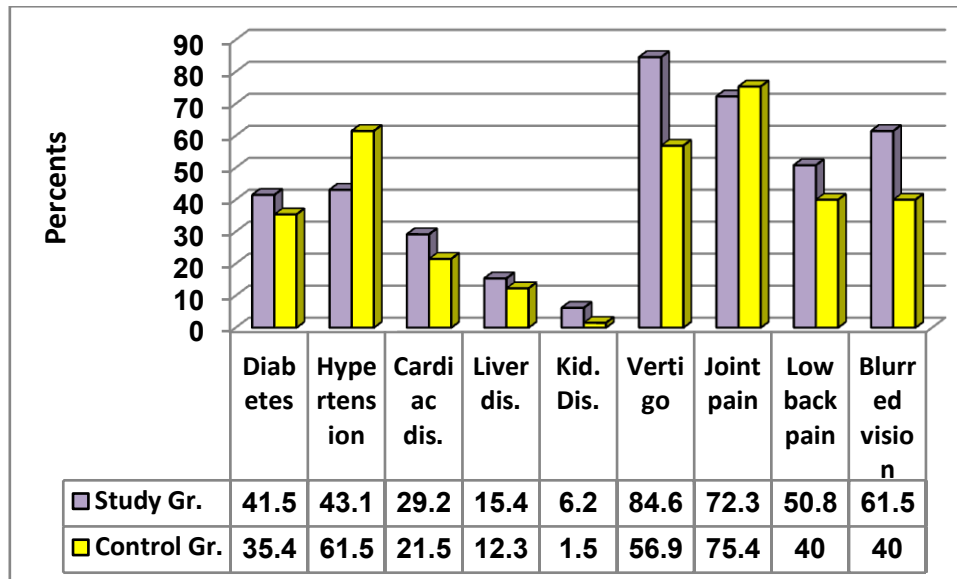| Percents	Diabetes	Hypertension	Cardiac dis.	Liver dis.	Kid. Dis.	Vertigo	Joint pain	Low back pain	Blurred vision
Study Gr.	41.5	43.1	29.2	15.4	6.2	84.6	72.3	50.8	61.5
Control Gr.	35.4	61.5	21.5	12.3	1.5	56.9	75.4	40	40

Figure1. Medical history distributed by studied groups (N = 130)

Table 2: Effect of home based intervention on studied elderly' history of falling, pre, post1, and post2-intervention (N = 130)

History of falling	Pre-intervention						Immediate after intervention						One year after intervention						P4 Friedman test, P
	Study group		Control		X²test, P1		Study group		Control		X²test, P2		Study group		control		X²test, P3		
	No	%	No	%			No	%	No	%			No	%	No	%			
Times of elderly fall:																			
2 - 6 falls	51	78.5	45	69.2	X²=01.4, P=0.23 NS		65	100	52	61.5	X²=14.3, P=0.000 HS.		65	0	51	78.5	X2=15.6, P=0.000 HS.		Fr=42.4 P=0.000 HS
7 - 12 falls	14	21.5	20	30.8			0	0	13	38.5			0	0	14	21.5			
Causes of falling																			
No falling	-	-	-	-	X2=1.6 P=0.7 NS		-	-	-	-	X2=2.7, P=0.09 NS		26	40	0	0	X2=16.2 P=0.000 HS		Fr=21.3 P=0.000 HS
Slippery	13	20	19	29.2			16	24.6	13	20			9	13.8	17	26.2			
Tripping	14	21.5	13	20			16	24.6	10	15.4			8	12.4	11	16.9			
Drowsy	28	43.1	25	38.5			19	29.2	20	30.8			13	20	23	35.4			
Without cause	10	15.4	8	12.3			14	21.6	22	33.8			9	13.8	14	21.5			

Sig. = Significant   HS= High significant   NS = Not Significant   Fr test= Friedman ANOVA for repeated measurements test

P1= Comparison of each history of falling item pre- intervention in the study and control groups.

P2= Comparison of each history of falling item in the study and control groups, immediately after intervention.

P3= Comparison of each history of falling item in the study and control groups, one year after intervention.

P4=   Non parametric two-Way Repeated Measures Friedman test for comparison of each history of falling item, between the three levels of intervention (Pre, immediate after, and one year after intervention), in both the study group, and control.
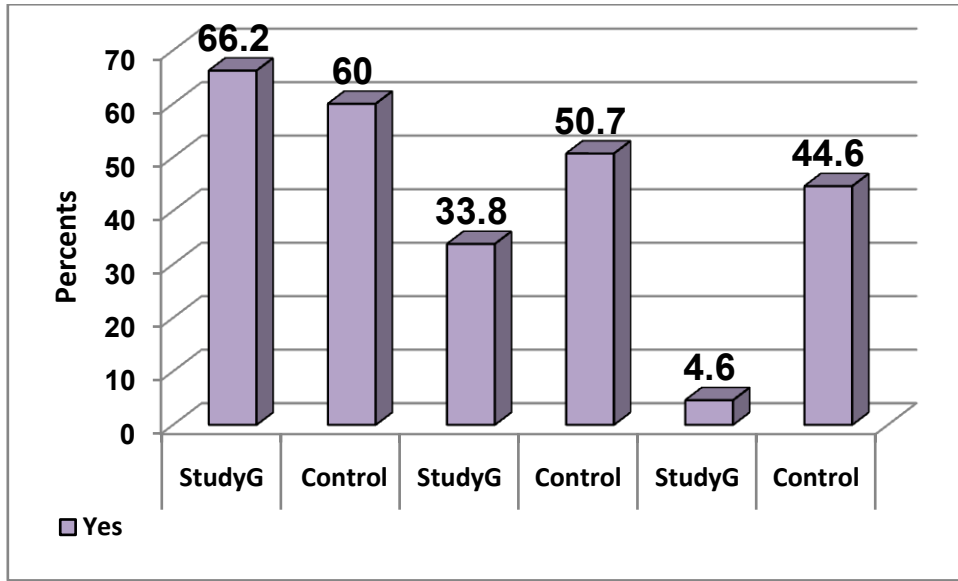
Fig.2: Effect of home based intervention on studied elderly' fear of fall in the future, pre, post1, and post2-intervention (N = 130)
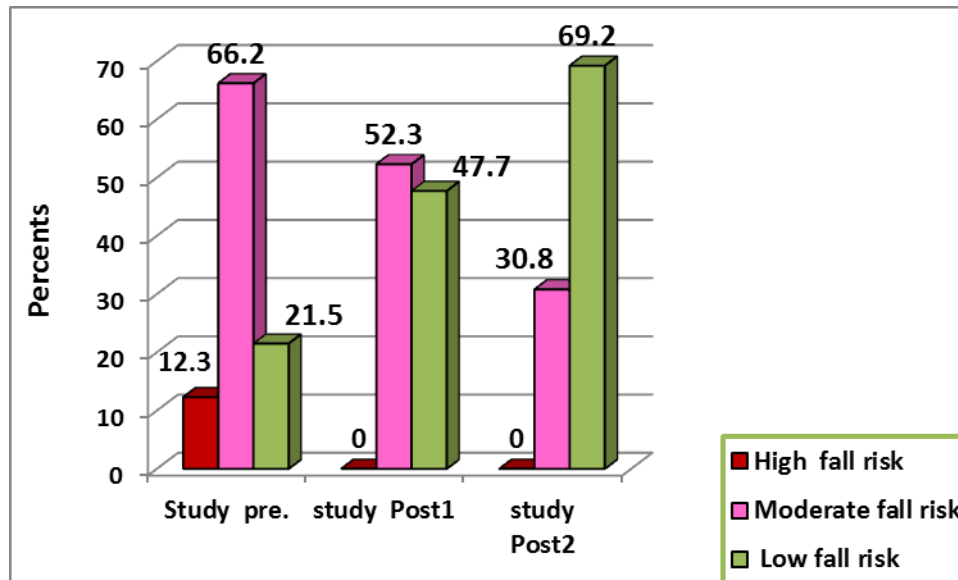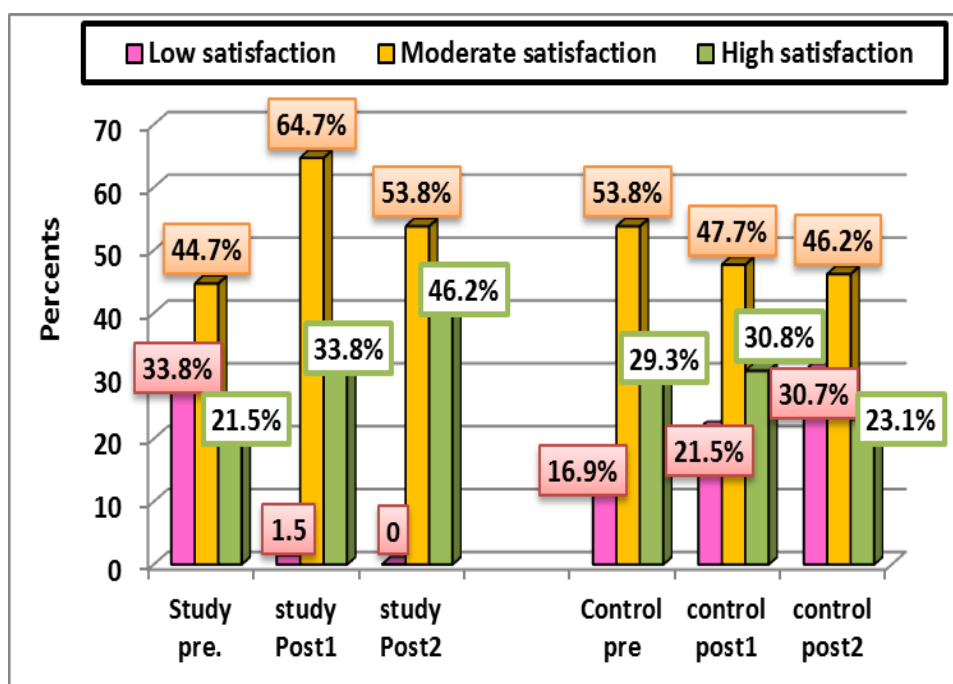

Fig.3: Effect of home based intervention on studied elderly 'Berg balance scale pre, post1and post2

Table 3: Effect of home based intervention on studied elderly 'basic functional mobility pre, post1, andPost2-intervention (N = 130)

basic functional mobility	Pre-intervention				Immediate after intervention				One year after intervention				P4 Friedman test, P
	Study group		Control		X²test, P1	Study group		Control		X²test, P2	Study group		control		X²test, P3	
	N0	%	N0	%		N0	%	N0	%		N0	%	N0	%		
Freely mobile	5	7.7	13	20	X2=4.1 p=0.12 NS	12	18.5	11	16.9		17	26.2	14	21.5	X2=15.6 P=0.000 HS	
Mostly independent	33	50.8	29	44.6		34	52.3	30	46.2	X2=0.14	46	70.8	26	40		Fr=12.4 P=0.000 HS
Impaired mobility	27	41.5	23	35.4		19	29.2	24	36.9	P=0.7 NS	2	3.1	25	38.5		
Total	65	100	65	100		65	100	65	100		65	100	65	100		

Sig. = Significant   HS= High significant   NS = Not Significant   Fr test= Friedman test for repeated measurements test

P1= Comparison of each basic functional mobility item pre- intervention in the study and control groups.

P2= Comparison of each basic functional mobility item in the study and control groups, immediately after intervention.

P3= Comparison of each basic functional mobilityitem in the study and control groups, one year after intervention.

P4= Non parametric two-Way Repeated Measures Friedman test for comparison of each basic functional mobility item, between the three levels of intervention (Pre, immediate after, and one year after intervention),in both the study group, and control

Fig.4: Effect of home based intervention on studied elderly' modified fall efficacy scale pre, post1and Post2- intervention

III. Discussion:

Falls in older persons are a major public health issue. They are the most frequent type of accidents in people aged 65 and older, and are the major cause of injury-related hospitalization in this age group. Injurious falls are associated with disability; elderly people become more dependent and increased mortality. When falls do not result in physical injury, they can cause older people to have fear of falling, with consequent restrictions on daily activities and onset of functional decline (Gale, Cooper &Sayer, 2016). The present study aimed to examine the effect of home based- intervention on falling risk reduction of elderly in a rural community.

Regarding Medical history results of the current study revealed that, the majority of the studied elderly demonstrated that chronic diseases suffered by them were: joint pain or arthritis, vertigo, kidney disease, hypertension and blurred vision. However, the lowest percentages of chronic diseases suffered by studied rural elderly were: liver diseases, urinary incontinence, tingling in limbs and hearing problems. Findings of the current study, are similar to what was reported by Paliwal, lattum & Ratliff , (2017) who studied "Chronic health conditions as a risk factor for falls among older adults". They found that chronic conditions such as depression, arthritis, diabetes and chronic kidney disease show a significant association with falls.

Also, This finding is consistent with the results of a study by Kistler, Khubchandani ,Jakubowicz , Wilund&Sosnoff , (2018) who studied "Falls and fall-related injuries among elderly population aged 65 or older". They reported that comorbid conditions (diabetes, cancer, and arthritis) were found to significantly influence the probability of falls and fall-related injuries. Also, study by Kamińska, Brodowski, Karakiewicz, (2015) who studied "Fall risk factors in community-dwelling elderly depending on their physical function, cognitive status and symptoms of depression". They found that falls were associated with chronic medical conditions.

Moreover, other studies by McAdams-DeMarco , Suresh , Law , Salter , Gimenez, Jaar& et al., (2015), Abdel-Rahman , Yan , Turgut&Balogun, (2013) and Rossier , Pruijm , Hannane , Burnier&Teta , (2014) and Di

Fabio R., et al, (2015). They showed that chronic conditions as "diabetes and arthritis, vertigo, dizziness" were associated with history of falling. This may be related to medications prescribed for chronic medical conditions have more side effects as vertigo, dizziness and drowsiness and so increasing the risk of falling in addition to the risk associated with the chronic condition itself.

Regarding number of fallings, the current study showed that, there was diminished number of fallings among study group after intervention. This result is supported by study conducted by Kistler ,Khubchandani , Jakubowicz , Wilund&Sosnoff , (2018) who studied "Falls and fall-related injuries among adults aged 65 or older ". They reported that after exercise programs (that target strength and balance), there was an effective reduction in number of falls and fall-related injuries among elderly people.

Also, this finding is on the same line with the results of a study by Kendrick et al., (2014) who studied "Exercise for reducing fear of falling in older population living in the community". They showed that exercise reduced the risk and number of falls among studied participants. Moreover, this finding is in agreement with study by Gillespie et al., (2015) who studied "Interventions for preventing falls in elderly people living in the Community". They indicated that home based exercise programs, containing balance and strength training exercises, effectively reduced number of falls.

In addition, this finding is in agreement with other studies by El-Khoury, Cassou, Charles Marie &Dargent, (2015), Vieira, Palmer &Chave, (2016), Karlsson, Vonschewelov, Karlsson et al., (2016) andMoncada& Mire, (2017). They concluded that fall prevention exercise programs for older people reduce the rates of falls and prevent injuries resulting from falls in older community dwelling people. Moreover, this finding is in agreement with Sherrington et al., (2019) who studied "exercise for preventing falls in older people living in the community". They showed that exercise programs reduce the prevalence of falls and the number of people experiencing falls in older people living in the community. This may be because of physical activity, physical fitness, exercises and the interaction between them directly lead to improve health status, muscles strength, flexibility, increase functional mobility and balance and so reduce number of falls and fall-related injuries.

Concerning fear of falling in the future, the current study revealed that home based interventions reduced fear of falling among study group. This result is congruent with study by Furtado, Sousa, Simão, Pereira &Alves, (2015) who studied "Physical exercise and functional fitness in independently living vs. institutionalized elderly women". They reported that that sufficient physical activity and higher physical fitness contribute to preventing falls and fear of falling. This may be because physical activity and exercise improve balance and functional mobility and so reduce fear of falling.

This finding is consistent with the results of study by Kendrick et al., (2014) who studied "Exercise for reducing fear of falling in older people living in the community". They showed that Exercise programs lead to a small to moderate reduction in fear of falling immediately post intervention. This difference may be attributed as advanced age is associated with a decline in functional reserve and that the perception of these losses can generate a feeling of low self-esteem and fear of falling.

Regarding functional mobility, the current study revealed that exercise is more effective in improving functional mobility (there was highly significant improvement in the different aspects of basic functional mobility). This result is supported by study conducted by Brandão et al., (2018) who studied "Effect of a home-based exercise program on functional mobility and quality of life in elderly people". They indicated that physical exercise result in significant improvements in strength, balance, functional mobility, and quality of life in elderly people. Also, this result is in the same line with the results of the study by Haripriya, Kumar, Samue&Soman, (2018) who studied "Effect of a multi-component exercise program on functional mobility, exercise capacity and quality of life in older adults". They reported that a 10-week multi-component exercise program comprising of aerobic, resistance, functional and balance exercises significantly improved the functional mobility and health- related quality of life in elderly individuals.

Moreover, this finding is supported by study by Tomás, Galán-Mercant, Carnero&Fernandes, (2018) who studied "Functional capacity and levels of physical activity in aging: a 3-year follow-up". They suggested that exercise and physical activity improve balance and functional mobility among elderly people. Also, this result is consistent with study conducted by Ferreira et al., (2018) who studied "Effects of a 12-week exercise training program on physical function in institutionalized frail elderly". They suggested that 12-week exercise program for frail elderly was efficient in improving muscle strength and functional mobility among elderly people. This can be attributed to physical activity and exercises lead to improve muscles strength, flexibility and so improve functional mobility among elderly people.

IV.   Conclusion:

Implementation of home based-intervention was effective in risk reduction of falling among study group compared to control group. It was successful in reducing number of falls and fall related injuries in the study group than control group. Moreover, it was effective in increasing functional mobility in the study group than control group.

V.   Recommendations:

Awareness programs targeted for all elderly people, their family caregivers and the general public about exercises and its importance for strengthen muscles and joints and increase body balance. Emphasize the need for the elderly to use assistive devices that help to reduce the risk of falls and its complications. Instruct the elderly people and their caregivers to review the medication regimen with their physician as it is one of the most important aspects of decreasing polypharmacy and its complications.

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