

Comparative Study Of History Causes And Risk Of Fall Among Elderly People And People With Parkinson's Disease

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Abstract

Objective

This cross sectional survey research compares history causes and risk of fall among normal ambulatory elderly people and people with Parkinson's disease aged above 50 years old, during last one year. The secondary objective of this research was to establish the preventable measures for individual who are at risk of fall.

Materials and Method

This survey include two groups of 100 participants, (50 participants/ group) one group of ambulatory elderly individual's age above 50 years old and second group includes elderly individuals with diagnosed Parkinson's disease. Both groups were interviewed during this research study. Non probability, purposive sampling were used in this study to collect data.

Results

The findings of this study show that extrinsic risk factors are major cause of fall in ambulatory individuals and intrinsic factors are major causes of fall in Parkinson's disease patients.

Individuals in both groups reported loss of balance and muscle weakness as their major cause of fall.

Conclusion

This study concluded that the causes of fall for every individual is different which depends upon individual's life style, presence of any disease or pathology and individual's self care attitude while performing daily life's activities. External factors may greatly affect risk of fall. So, there is a need to promote programs on preventable measures of fall to minimize the risk factors of fall.

INTRODUCTION

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Approximately 6.5 million people around the world are suffering from Parkinson's disease. And about 450,000 people of Pakistan experience this disease (1) and about 44.9 percent of community-dwelling elderly persons experience a fall every year (2). Fall is the second most leading cause of accidents, injuries and death (3). Fall can significantly affect an individual's long term care facilities (4). Parkinson's disease is a chronic neurological state or condition which progressively affects brain cells (5). Early stage of Parkinson's disease patients are functionally independent with minimal impairments as the disease progresses, patients enter into middle stage, symptoms start getting worse and limitations in activities appear with independent slow gait and less efficient performance. Late stage of Parkinson's disease is more severe and leads to severe complications, patient becomes dependent, and bed bound and may be wheelchair bound (6). The management of Parkinson's disease involves both medical treatment and physical therapy interventions (7). A

normal ambulatory elder adult individual and individuals with Parkinson's disease both may experience a single fall, two time fall or multiple/ repeated fall, which causes increase in chances to multiple injuries. a single fall significantly affects their quality of life and functional status and individuals developed fear of falling, loss of confidence, difficulty in ambulation overall decrease in activities can increase joint stiffness, muscle weakness and greatly effects mobility (8). ambulatory Individuals with pre existing co morbidities (e.g. Osteoporosis), a single fall significantly affects their quality of life and functional status and individuals developed fear of falling, loss of confidence, difficulty in ambulation overall decrease in activities can increase joint stiffness, muscle weakness and greatly effects mobility (9). Use of medications can be the reason for increased number of future fall (E.g. Central nervous system Drugs) (10). The risk factors for fall may be intrinsic including Age, past history of fall, fear of falling, weakness in muscle, balance and co ordination problem, postural hypotension, vision problems, some chronic conditions like Parkinson's, stroke, arthritis, diabetes, dementia, and incontinence" And extrinsic risk factors for fall may be Environmental hazards, lightening problem, uneven and slippery surfaces, use of medications and improper use of canes and devices" (11). Therefore, to prevent an individual from future fall we should first identify the modifiable risk factors of fall, injuries related to fall and complications to improve patient's condition, functional/ mobility status, independence in activities of daily life (ADL's). Use of an asstive device (e.g. cane, walker or wheel chairs) can improve patient's overall life style (12). Environmental modifications contribute an independent and active life style for an individual with history fall (13). To prevent an individual from future fall we should first identify the modifiable risk factors of fall, injuries related to fall and complications to improve patient's condition, functional/ mobility status, independence in activities of daily life (ADL's) (14). Therefore this study compares history causes and risk of fall among normal ambulatory elderly people and people with Parkinson's disease aged above 50 years old, during last one year and to design Physical therapy programs to improve balance problems, increase in functional mobility status, to improve gait and intervention should be modified to manage specific needs and problems of patients (15).

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METHODOLOGY

Research design

Cross sectional, non experimental, survey research design was used in this study. This survey based study include two groups, one group of ambulatory elderly individual's age above 50 years old and second group includes elderly individuals with diagnosed Parkinson's disease. Both groups were interviewed during this research study. Sample size was consisting of hundred elderly individuals. 50 elderly individuals with history of fall and 50 individuals with diagnosed Parkinson's disease. Non probability, purposive sampling were used in this study. The participants were selected in this study on the basis of Age, Diagnosed Parkinson's disease, History of fall, intact cognitive functions, Good communication, Individuals who scored 22 in mini mental scale examination were included in this study And Individuals age below 50 years not included in this study, Pain (at rest and during movements) in the musculoskeletal system of more than 5 out of 10 on visual analogue scale were also excluded, Uncontrolled

hypertension Other signs and symptoms that might influence the tests used in this study such as dizziness, acute illness or injury, unstable heart disease (e.g. angina) were excluded and Individuals who scored below 22 in mini mental scale examination were also excluded.

Instrument / Tool used

This study used a (health status and fall questionnaire) tool to interview and to collect the data of health information and fall status. This questionnaire was previously used in study (Thiwabhorn ThaweeWannakji, Patcharawan Sunwannarat, Lugkana Mato, Sulgalya Amatachaya, 2016). The health status and fall questionnaire is divided into 3 parts, part 1; Demographics include data of Gender, Age and Marital status. Part 2; health status information includes information of having any underlying neurological condition, use of medication. Visual problem and use of any walking aid and part 3; fall information includes location of fall, causes of fall, fall characteristics, physical consequences, functional consequences, treatment of fall and risk factors related to fall. The questionnaire was based on multiple choice questions and scoring of this questionnaire is based on maximum number of each option selected by participants.

Procedure

After approval of institutional review board (IRB), Data collection was started. Target the population through different hospitals and home bound individuals of province Sindh, Pakistan. Aims, objective and purpose of this study were described to individuals and offers to participate. After they agree for participation, consent forms were administered. And then Mini Mental state examination test (MMSE) was conducted to meet inclusion criteria of this study. After the selection of potential participants for this study, questionnaire was administered to eligible individuals and 10 to 15 mints interview based survey was conducted.

Data analysis

Descriptive statistics will be applied to explain History causes and risk of fall information of fall among participants. All data were analyzed using the SPSS software (SPSS Statistic version 17.0, IBM Corporation, Armonk, NY, USA)

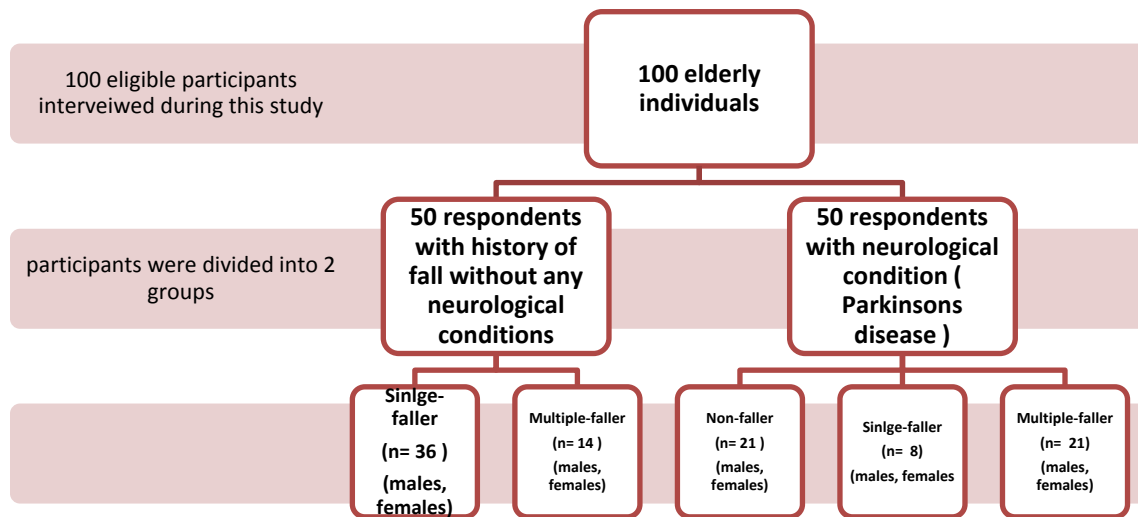
Ethical approval

Before started the data collection, an ethical approval was taken from the institutional review board (IRB) of Jinnah post graduate medical center (JPMC) Karachi, Pakistan.

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RESULTS

The data of 100 respondents was collected and two groups of respondents were formed. First group of 50 respondents with history of fall without any neurological conditions was formed. Second group was formed with neurological condition (Parkinson's disease) and out of 50 respondents in second group, 29 respondents were resulted in the history of fall and 21 respondents were resulted without history of fall. Further analysis is given below (Figure-1)



(Figure-1)

Most of the participants in Parkinson’s disease patients, that out of 29 participants, 8 participants (27.6%) were single/one time faller and 21 participants (72.4%) were two time or multiple fallers (Table-I) and the number of fall in normal ambulatory individuals, that out of 50 participants, 36 participants (72.0%) were single/one time faller and 14 participants (28.0%) were two time or multiple fallers (Table-II). And out of that 100 participants among 50 Parkinson’s disease patients, 15 participants (51.7%) with history of fall use walking device and 4 participants (19.0%) with no history of fall, use walking device and among 50 normal ambulatory individuals there were 13 participants (26.0%) use walking device after history of fall. the location of majority of fall among both the groups were fall within the house. lower limb muscle weakness as one of their cause of fall among Parkinson’s disease patients, and loss of balance as one of their cause of fall among normal ambulatory individuals. Whereas intrinsic factor were the most common cause for fall found in Parkinson disease patients (Figure I) and for normal ambulatory individuals extrinsic factor were the most common cause for fall (Figure-II).

(Table-I) Number of fall for respondents with neurological condition (Parkinson’s disease)

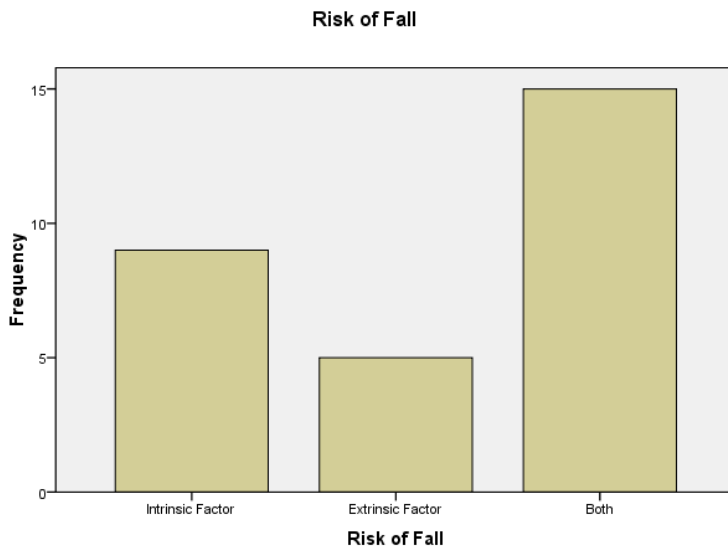
Number of Fall

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single Faller	8	27.6	27.6	27.6
	Multiple Faller	21	72.4	72.4	100.0
	Total	29	100.0	100.0	

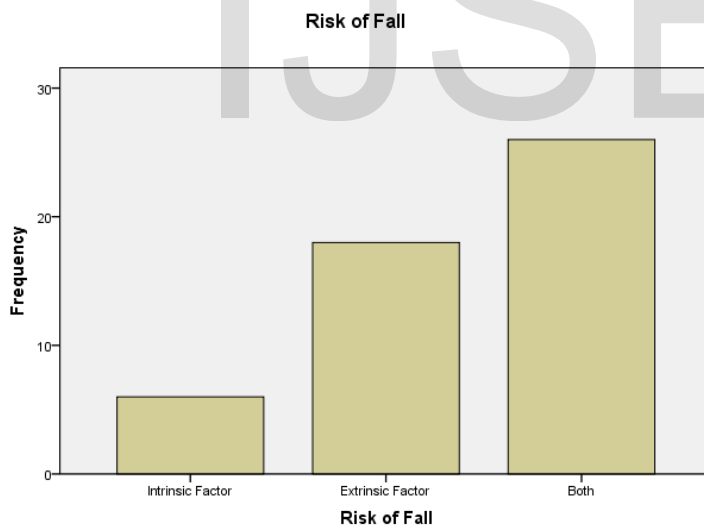
(Table II) Number of fall for respondents with history of fall without any neurological condition

Number of Fall

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single Faller	36	72.0	72.0	72.0
	Multiple Faller	14	28.0	28.0	100.0
	Total	50	100.0	100.0	



(Figure-I) risk of fall among respondents with neurological condition (Parkinson's disease)



(Figure-II) risk of fall among respondents with history of fall without any neurological conditions

Discussion

This study compares the History causes and risk of fall among normal ambulatory individuals and Parkinson's disease patient's of age 50 years and above. Two groups were formed on the basis of history of fall, normal ambulatory individuals and Parkinson's disease patient's, both groups were sub-grouped into non-faller, single faller and multiple faller. Results show significant difference between History causes and risk among both the groups. Result shows that Parkinson disease suffers fall in age group seventy to seventy five years of age group, as the disease progress with age significantly increases the history of fall in Parkinson disease patients, while normal ambulatory individuals often suffers a fall in age of fifty to fifty five years. A previous study a finding confirms that Severity of disease, balance impairment, depression, and previous falling were associated factors of fall (16). Although the routine usage of medications greatly effects on history of fall, A study was conducted to identify modifiable medical causes of falls in Parkinson's disease patients founds that antidepressant use was significantly associated with fall (17). current study analysis that both the groups had visual problems except the sub-group of non-faller Parkinson's disease patients, significantly indicated that visual problem can be the reason of fall. Previous study reported that severe visual impairment in the worse eye significantly increased the risk of falling although mild or moderate visual impairment was not significantly associated with fall (18). These findings shows that use of walking device do not significantly indicated a future fall, use of walking device after a single fall may be the cause of next fall due to its improper use. Previous study has reported that a large proportion of canes and walkers users experience difficulties in ambulation and risk of fall may increase by using such devices (19). Analysis shows that significant difference between number of fall between both the groups that disease affected person may experience greater number of fall as compare to normal ambulatory individual, The result of the previous study shows age, sex, and neurological problems greatly effects on the history and number of individuals experience (20). Further analysis indicates that the lower limb muscle weakness were significantly greater in Parkinson's disease patients as compare to normal ambulatory individuals as cause of fall and loss of balance were more found cause of fall in both the groups. (Natalie El Haber 2008) found that muscle, balance, strength and activity decline with age and

decline in overall health status (21). Physical consequence is a major issue after a fall which an individual suffers to a long time of one's life's journey. Previous findings of a study shows that muscle strength (especially in lower extremity) should be one of the factor that is assessed and treated in older adults at risk of fall (22). thus, After fall elder individuals by comparing both groups, ambulatory individuals had fractures, dislocations, sprain and strain that leads to hospital admission and requires medical care and need rest for long period of time after a fracture can also effects in performing activities of daily life (ADL's) and difficulty in having interactions with others and do not get out in the community, The results of a previous study concluded that 50% of women and 20% of men aged over 50 years will experience an osteoporosis-related fracture after fall (23). This study further explores that there is a significant difference in risk of fall among both the groups, normal ambulatory individuals in their working life's were fall due to Extrinsic factor of fall involves slippery floors, poor lightening and uneven surfaces leads to fall, while in individuals suffers from Parkinson's disease fall due to Intrinsic factor of fall involves muscle weakness, gait and balance impairment, cognitive impairment and confusion that results fall. A previous study confirms that fear of falling is common in peoples with Parkinson's disease (24). Depending on the severity of disease Parkinson's disease patients having difficulty in interactions with others but after a fall they do not get out in the community and having fractures, bruise, sprain and strain also leads to hospitalization and greater medical attention and more sever condition due to progressive nature of disease's a study confirms that as compare to the general population Parkinson's disease patients have more stay duration required for hospitalization (25).

Conclusion

This study concluded that significant differences found in history, causes and risk of fall between both the groups were different. Increasing age increases co morbidities which are specific to gender and disease. Normal ambulatory individuals with the age were more prone to have a fall due to less attention, environmental hazard and loss of balance while in Parkinson's disease patient's disease related symptoms leads to fall e.g. muscle weakness. physical and functional consequences of fall e.g. fractures leads a person to a bed or home bound condition results in decrease ability to self care which affect on and individual's personal social and mental life. The results of this study can help in making preventable measures of fall for both the groups.

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