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Relationship between the Cognition and Fear of Fall among Elderly People

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Abstract

Aging is a dynamic process that varies from one individual to another and is marked by a reduction in physiological function. With changes caused by aging, it becomes more difficult to maintain balance because motor function involves an interaction of information from visual, vestibular, and proprioceptive systems that are integrated in the central nervous system. These functional changes may predispose the elderly to balance problems and increase the likelihood of falling. The Aim and Objective of the present study were to evaluate the relationship between Cognition and Fear of falls among elderly people. A correlation study that included 40 subjects of both genders and a mean age of 58.7 ± 4.57 was conducted. Participants' cognitive function and fear of falls were assessed using the Mini-Mental State Examination and the Activity-specific Balance Confidence Scale. The data were analyzed using the Pearson Correlation Coefficient. Results showed that there was a positive correlation between Cognition and Fear of Fall among elderly people ($r=0.8967$, $p> 0.01$). The study concludes that older adults with possible cognitive decline have lower balance confidence and greater fear of falling, which addresses the need for early attention in the management of falls.

Keywords

Elderly, Cognition, Fear of fall, MMSE, ABC scale

Introduction

Aging is the inevitable, irrevocable decline in organ function that happens over time, even in the absence of injury, sickness, hazardous conditions (or) poor lifestyle changes. Senescence refers to the biological process of ageing. By 2012, the number of older persons had increased to almost 810 million. It is projected to more than double by 2050, reaching 2 billion. The population aged 60 or over is growing at a faster rate than the total population in almost all world regions. Globally,

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the population aged 80 years or over is growing faster than any younger age group within the older population (UNFPA, 2012). Falls are considered as the most common causes of injury among older population. 40% of traumatic injuries-related hospitalizations are due to falls (Ungar et al., 2013). Each year, 37.3 million falls are encountered among older people aged 65 and above (WHO, 2018). These are the accidental events in which a person falls when his/her center of gravity is lost and no effort is made to restore balance (or) when this effort is ineffective. Report generated by the WHO, has estimated 17 million disability-adjusted life year lost globally due to fall. Fall account for 40% of all injury death (Burns et al., 2018).

According to the WHO, among elderly, nearly 37.5million falls require medical attention every year and 646,000 individuals die from fall every year. Fall rate increase when age increases, resulting in morbidity, mortality, and loss of independence (Lee, et al., 2016; Herman et al.,2016; Scheffer, et al, 2008). Frequent falls in the elderly population can lead to serious health consequences and efforts to reduce their incidence are necessary. Fall can also attributed to consumption of medication such as hypnotics, sedatives, antipsychotics antidepressants leading to sedation, impaired balance and co-ordination. Cognitive impairment has been identified as a risk factor for falls in aging (Holtzer et al., 2007). Recent evidence has demonstrated that cognitive impairment and falls are related; gait impairments and falls are more prevalent in people with dementia, and the prevalence of gait impairments and falls increases with the severity of cognitive impairment (Montero-Odasso et al., 2018).

Methodology

This study design was a Correlational study and conducted at K.G Pain Relief Centre and K.G College of Physiotherapy, Tamil Nadu. Ethical approval was obtained from KG Institutional Research and Ethical Committee. This study was conducted over a period of 6months from August 2021 – January 2022. A total of 40 subjects who fulfilled the eligibility criteria were selected by Convenient Sampling method. The inclusion criteria are subject with the age range 55 to 70 years, irrespective of gender, community dwelling elderly people, history of falls more than twice in the past 6 months, fear of falling, meanwhile the exclusion criteria includes, uncontrolled angina, acute systemic illness, older adults with poor balance, Impaired cognition (to the extent of being unable to follow simple movement instruction), Older adults with visual and hearing problem, Older adults with neurological and Neuro-psychiatric disorder, any recent trauma or surgery of lower limb, older adults with severe musculoskeletal disorder (joint replacement, RA), Older adults with severe cardio vascular impairments, Polypharmacy. Following that, all the participants were assessed using the Mini-Mental State Examination (MMSE Score), the Activity-specific Balance Confidence Scale (ABC scale) to assess the Cognition level, and fear of fall. The data were analyzed using Pearson Correlation with SPSS software, version 23.

Results

The purpose of the study was to find out the relationship between the Cognition and Fear of Fall among elderly people. Cognition was measured by Mini Mental State Examination (MMSE) score and Fear of Fall was measured by Activities-specific Balance Confidence (ABC) scale. Our current

study results indicated that elderly persons with impaired cognition had a higher odd of experiencing a high Fear of Fall.

The Results showed that there was a significant relationship between Cognition and Fear of Fall when evaluated with the Mini-Mental State Examination score and the Activities-specific Balance Confidence scale (Table 2). There is a positive correlation between the Cognition and Fear of Fall. The value of 'r' is 0.8794. This was a strong positive correlation, which means that low X variable scores (MMSE score) go with low Y variable scores (ABC scale).The 'p' value is <.00001. The result is significant at p<.05. ('r' value is 0.8794, p value is <.05.)

Table 1. Socio demographic data

Characteristics		**N (%)**
Age	58.725 ± 4.577	
Gender	Male	26 (65%)
	Female	14 (35%)
BMI	25.525 ± 1.83	
Education	Less than Senior High School level	18 (45%)
	Senior High School	12 (30%)
	University degree or higher	10 (25%)
Socio-economic level	Low	5 (12.5%)
	Moderate	27 (67.5%)
	High	8 (20%)

Table 2. Relationship between MMSE and ABC

S.NO	**N**	**Mean MMSE $(\bar{x})$**	**Mean ABC $(\bar{y})$**	**'r' value**
1.	40	20.725	61.598	0.8794

Discussion

In this study, with an increase in age, the cognitive abilities are decreased, and thereby the Fear of falls increases. This finding correlates with previous studies, which suggest that with advanced age, attention and memory are the two aspects of cognition that are most severely affected (Herman et al., 2016). Fear of Falling is a serious problem in elderly. Fear of Falling increases with age and is associated with mental and functional decline. Elderly with cognitive impairment were approximately 2times more likely to have a high FOF than those with normal cognition (Hidehiko et al., 2016). Studies showed that elderly persons with possible cognitive decline had a greater risk of fall and fear of falling compared with those in the group with no cognitive decline. The cognitive deficits usually observed during the aging process are forgetfulness of recent events, difficulty in performing calculations, decreased attention and reasoning, and slowness in performing fine motor activities. The study indicated that elderly persons with impaired cognition had a higher odd of experiencing FOF (Tavares et al., 2020). A study by Quach et al., (2019) also described that decline in cognitive function reduce elderly people's access to and processing of external information, speed and execution. In addition, elderly individuals with cognitive impairment may act and react

slowly and have visual and hearing impairments. When the environment changes unexpectedly, they cannot respond effectively and in a timely manner and easily fall. Also in this study we had more male (N=26) population than with female (N=14), states that cognitive decline is more possibly seen in male than in female, yet we are in need to find the gender differences with different domains of Cognition.

Conclusion

The study concludes that older adults with possible cognitive decline have lower balance confidence, and greater fear of falling which address the needs of early attention in the management of falls. The presence of subjective cognitive decline was significantly positively associated with falls.

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