CORRELATION BETWEEN BALANCE, COGNITION AND QUALITY OF LIFE AMONG ELDERLY PEOPLE.

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ABSTRACT Ageing, is an inevitable process which is commonly understood by chronological age and, as an agreement, a person aged 65 years or more is often denoted as ‘elderly’. During old age, balance and falling is most common health problem. Due to aging process, there is a gradual decline of cognitive function and difficulty in conducting daily life activities and can affect Quality of Life. So objectives of the study to find correlation between balance, cognition and quality of life among elderly people. In the study, total of 52 patients in which males and females who are 60-80 years of age and willing to participate with MMSE score 18 or more than 18 were included. The data were analyzed by using Pearson coefficient of correlation to check the relationship between balance by using BBS, cognition by using MMSE and Quality of Life by using WHOQOL-BREF. This study concludes that there was a correlation between balance, cognition and quality of life.

Keywords: Balance, Cognition, Quality of Life

Introduction
Ageing in India is exponentially increasing due to the impressive gains that society has made in terms of increased life expectancy. With the rise in elderly population, the demand for holistic care tends to grow. The geriatric population is expected to be 840 million in the developing countries by end of 2025 [1]. It is projected that the proportion of Indians aged 60 and older will rise from 7.5% in 2010 to 11.1% in 2025 [2]. In 2010, India had more than 91.6 million elderly and the number of elderly in India is projected to reach 158.7 million in 2025 [2]. Ageing, is an inevitable process which is commonly understood by chronological age and, as an agreement, a person aged 65 years or more is often denoted as ‘elderly’ [3]. During old age, balance and falling is most common health problem and falling it is the fifth leading cause of death [4,5]. Both components can affect the quality of life among older adults [6-9]. Several factors contribute to an adequate balance confidence and control, and consequently promote mobility, improve balance, prevents falls.

Essential factors are reliable sensory information from the visual, vestibular, and proprioceptive and mechanoreceptive systems; a well-functioning central nervous system (CNS) with feedback and feed forward loops able to withstand external and internal volitions; as well as muscular factors like adequate musculoskeletal strength and sufficient range of motion in the joints for adequate movement [10]. The another severe problem associated with the aging process are decreased physical and cognitive function [11]. As poor balance is one of the major risk factors for falls it affects between 20% and 50% of those adults aged 65 years or older [12]. Poor balance has been shown to cause a 3-fold increased risk of falling [12,13]. It is also possible that cognition plays a key role in balance regulation in older adults, where the motor and sensory systems are integrated through higher order neurological processes [14]. Cognitive dysfunction is an umbrella term describing any characteristic impeding the cognition process, ranging in severity from mild cognitive impairment [15,16] to dementia [15] and Cognitive function includes learning, perception, deduction, problem solving, memory, and others. Due to aging process, there is a gradual decline of cognitive function and difficulty in conducting daily life activities, and severe mental illness related to senility can develop [17]. Deficits in cognitive dimensions such as memory, attention, orientation, language, and executive function may negatively affect people’s life on various aspects. Impaired verbal abilities may lead to communication difficulties which hinder a person’s ability to maintain social roles at desirable levels [18]; attention deficits may result in physical impairments, self-reported disability [19] and poor functioning of activities indaily living such as eating, bathing, and personal hygiene [20]; deficits in attention, memory, and executive function may be linked with the mechanisms of pain chronicity [21]; awareness of cognitive dysfunction may cause depression [22]. So balance and cognitive dysfunction are the factors which may be correctable and the quality of life among older adults can be improved [23-26]. Moreover, age-related degeneration and a variety of diseases, more common with older age, can afflict all functions and systems involved in balance control. [27,28] this all problem can affect the quality of life. However, there has been less previous study about the correlation between balance, cognitive and...
quality of life function in elderly. Therefore, it is unknown whether assessment of balance ability is useful as a predictor of early cognitive decline. Previous studies which are showing correlation between balance, risk of fall and quality of life in elderly as well as stroke, but very less studies showing correlation between balance, cognitive and quality of life function in elderly so the aim of the study to find a relation between balance, cognition and quality of life.

Materials and Methodology:

The Experimental Study was conducted on the elderly population of the senior citizen of Surat, Gujarat, India by Purposive sampling. Total 52 elderlies were included in the study. The sample size was calculated in G power 3.1.9.2 with effect size 0.50 and \( \alpha = 0.05 \) at 80% power. Sample size calculated was 42, with a drop out chances of 20% the total sample size was 52. The inclusion criteria for the study were males and females who are 60-80 years of age and willing to participate with MMSE score 18 or more than 18 were included. Elderly who were having difficulty in Speech problem (Communication disability), Hearing loss, Visual problems, Any neurological known disorder (Stroke, Parkinson's disease, traumatic brain injury etc.), Any recent surgery or trauma of lower limb, any musculoskeletal disorder (joint replacement, rheumatic arthritis) were excluded. In this study Pen and Pencil, Paper, Measure Tap, Stop Watch, Stepper, Chair with and without armrest, Consent form, MMSE Form, Assessment Form, BBS sheet were used.

Outcome measures were - BBS, MMSE and WHO-QOL BREF

Procedure:

Ethical clearance was taken by the institutional ethical committee. Formal permission was obtained from the head of the old age home. A written consent seeking the permission to conduct the research was taken. First, the demographic data and subject Performa sheet was filled. Subjects were screened for the inclusion and exclusion criteria. And Written consent was taken from all the subjects. After screening the subjects, they were asked to fill the following sheet BBS sheet for balance measurement, MMSE to check cognitive function and WHO-QOL BREF for checking the quality of life in elderly.

RESULT:

All the test and calculations were performed using SPSS version 20.00 software. Total 52 patients were recruited, all the subjects are equally distributed. The mean \( \pm \) value for BBS was 49.33 \( \pm \) 3.88, for MMSE was 27.92 \( \pm \) 1.29 and for WHOQOL-BREF was 91.15 \( \pm \) 4.37. Here Pearson coefficient correlation was used to examine relationship between the BBS and WHOQOL-BREF and MMSE and WHOQOL-BREF. Pearson coefficient correlation value between BBS and WHOQOL-BREF \( r = 0.601 \) which is showing highly significant. Pearson coefficient correlation value between MMSE and WHOQOL-BREF \( r = 0.430 \) which is showing highly significant.

Figure-1 Correlation between BBS and WHOQOL-BREF

![Figure-1 Correlation between BBS and WHOQOL-BREF](image1)

Figure-2 Correlation between MMSE and WHOQOL-BREF

![Figure-2 Correlation between MMSE and WHOQOL-BREF](image2)
DISCUSSION: -

The aim of this study was to find the correlation between balance, cognition and quality of life among elderly people. The result showed that there was correlation between Balance and Quality of life and also between cognition and Quality of life. Many previous studies have also same results. As the degenerative chances are started in the body in the older ages there may be chances of balance affection and risk of fall. All the factors affect the person QOL. Our finding also indicates that elderly individuals with cognitive impairment and balance impairment. Furthermore, cognition plays a vital role in the balance regulation in older adults. [14]

The decline in cognitive function observed might explain the increased risk of falling in this sampled population. The elderly may suffer from illness, disabilities, and functional impairments, that are related to cognitive problems, which make them dependent on others for care and help in their daily life. [29,30] Muir et al. [14] suggested that MMSE scores at and below 26 were strongly associated with the high risk of severe fall-related injury. Mirelman et al. [31] and Mitchell [32] concluded that the MMSE test tool was not strongly associated with fall risk among community-living older adults. In contrast, our results supported the findings of Gleason et al. [33] which suggested that a decrease in MMSE scores was associated with elevations in the rate of falls. One study by Suzuki was done and stated that fear of falling is increasing recognized as a factor that may affect activity, function and physical condition in older adults. [34]. This supports our study. One study by the Kalpak et al. [35] observed that poorer visual attention/memory was associated with poorer QOL. A limitation of this study is that only few senior citizens were observed. Division of the patients according to age group was not done in the study.

Conclusion

In conclusion, findings revealed that elderly people had the highest chances of quality of life impairment, because both balance and cognitive functions are affected. Balance ability and cognitive functioning levels were the biggest risk factors for falls. This relationship indicates that the MMSE and BBS tools could be incorporated into a routine primary care assessment and that can be beneficial for rehabilitation. Future studies can also be done to predict the risk factors for falling and factors affecting cognitive function.

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References