

THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

The Impact of fall on the Quality of Life among Older Adults

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Abstract:

Background: Falls are one of the major health problems that affect the quality of life among older people. The aim of this study was to explore the relationship between quality of life (Short Form12) and the risk factors of falls (functional mobility and fear of falling) in older adults. Methods: One hundred people aged 65 or older and living in the two welfare homes (Cheras in Selangor, and Seremban) in Malaysia participated in the study. Functional mobility (Timed Up and Go) and fear of falling (Visual Analogue Scale) were assessed as risk factors for falls. The quality of life was measured by Short Form-12 (SF-12). Results: There was negative correlation between Physical Health Component Summary of SF-12, General Health Perception and fear of falling, functional mobility ($p < 0.05$). Conclusion: We concluded that the risk factors for falls (functional mobility, fear of falling) in older adults are associated with decrease quality of life.

Keywords: Elderly people, fall, quality of life

1. Introduction

The ageing population has become a global phenomenon. World Health Organization revealed that the cohort of 60 years and above is expected to increase globally from 600 million in 2000 to 1.2 billion in 2050 [1]. Malaysia like many other countries world-wide is experiencing the population aging phenomenon, owing to declining fertility rates combined with increasing life expectancy over the latter half of the 20th century [2]. Quality of life is a term used in a number of disciplines, and definitions and conceptualization vary from utility of health states to life satisfaction, and from possession of socially desirable characteristics to positive affect [3]. Quality of life has recently become commonly used both as a concept and as a field of research [4]. Studies have also demonstrated that older people expressed higher life satisfaction/quality of life than younger ones. There are many socio-demographic characteristics that may contribute to the quality of life such as age, socio-economic status, and marital status in older adults. Falls are one of the major health problems that affect the quality of life among older adults [4-7]. The Short-Form 36 (SF-36) is a widely used quality of life instrument. However, its length could affect response rates, particularly in older adults. The SF-12 has proved to be suitable for older adults because of the limited number of questions. The 12 items in SF-12 represent one physical component summary score and one mental component summary score and assess a person's perceived health-related quality of life. Many factors were originally considered as possible risk factors for falls based on a review of currently available literature. These factors include age, number of chronic diseases, body composition, muscle strength, functional mobility and performance measures related to balance function [5-6-8]. Impaired balance and functional mobility are major risk factors for falls. There are many studies investigating the relationship between falling and contributory factors [9]. However, no study investigating the correlation between risk factors for falls and quality of life in older adults could be found. Since falls and its consequences have a major role in quality of life, rehabilitation programs, which aim to decrease the risk of falling by considering all contributing factors such as functional mobility and fear of falling have the potential to both decrease the risk of falling and improve the quality of life. Due to this interaction, the relationship between risk factors for falls and the quality of life becomes significant. Based on a review of literature, this study was designed to explore the relationship between the quality of life (Short Form-12) and two risk factors for falls (functional mobility and fear of falling) in older adults.

2. Methods

A total of 100 participants aged 65 or older with or without a history of falls were recruited from the 425 registered residents of two welfare homes in Malaysia for this study. Ambulatory individuals having no disability in self-care formed the population of this study and a report stating sound mental health from a psychiatrist of a state clinic was required at the registration of all participants. The exclusion criteria were as follows: being aged less than 65, being unable to walk less than 10 meters, amputation, having had a stroke recently, unstable medical conditions such as diabetes mellitus, hypertension, 2 or more fractures due to osteoporosis, resting angina, recurrent heart failure or recurrent arrhythmias and uncontrolled seizure disorder. Also, the residents who were assessed as mentally oriented by the

psychiatrist were included the study. After checking health documents of residents, and considering the inclusion criteria, 323 residents were approached about the study. 127 subjects did not agree to participate. 196 subjects accepted the invitation to participate in the study and 134 of them came and were evaluated. The evaluation of 34 subjects couldn't be completed the assessment because they were not able to take some positions of tests physically. Informed consent was taken from the patients, immediately prior to the data collection. After giving informed consent, all subjects completed a health status questionnaire which provided information on age, medical history, alcohol consumption, self-reported history of fall, use of devices to assist ambulation and medication. The same physiotherapist did all assessments.

2.1. Quality of life

The items in the SF12 instrument were used to calculate two scales, the Physical Component Scale and the Mental Component Scale. Scores range from 0 to 100, a higher score indicates better mental health, physical health and general health perception [10].

2.2. Functional Mobility

The Timed Up and Go (TUG) test was used to measure basic functional mobility. The time taken to complete rising from a chair, walking 10 ft (3 m), and turning, walking back to the chair and sitting was recorded in seconds. The starting position was standardized so that the subjects commenced the test with their feet flat on the floor and their arm resting on the armrests. No physical assistance was given. Each subject was asked to perform three test trials. The mean score was recorded [11].

2.3. Fear of Falling

As an indication of fear of falling in daily life a visual analogue scale (VAS) was used. Subjects were asked to express their overall feelings of fear of falling by drawing a mark on a vertical line of exactly 10 centimeters connecting the two statements: "no fear of falling" (below) and "very afraid of falling" (above). The score was the number of centimeters between "no fear of falling" and the subject's mark [12]. Statistical analysis

Applying SPSS version 20.0 for statistical analyses, we considered differences of two-tailed $p < 0.05$ as statistically significant. All data were shown as means with standard deviations (means \pm SD) and ranges were added. Pearson's correlation coefficient was used to analyses the relationship between the SF-12 and functional mobility and fear of falling. Results Demographic characteristics of the subjects and medical history were summarized in Table 1. Means \pm SD and range of all measurements performed are given in Table 2. It was found that as the body mass index (BMI) increases the quality of life decreases. Physical Health Component, Mental Health Components of SF-12 and General Health Perception of SF-12 showed the same results for BMI. The correlation analyses between fear of falling and SF-12 showed that as the fear of falling increases, the quality of life (with the exception of the mental health component) decreases. When the correlation of TUG with SF-12 was evaluated, it was found that there was a strong negative correlation between Physical Health Component of SF-12, General Health Perception and TUG. On the other hand, quality of life increased with improving functional mobility. Correlation coefficients (r) and levels of significance (p) between risk factors for falls and SF-12 were given in Table 3.

n	%		
Age	(X \pm SD) (Range) (years)	76.65 \pm 5.19	(65–95)
BMI	(X \pm SD) (Range) (kg/m ²)	26.92 \pm 3.28	(20.9–40.0)
Sex (n)	Female	38	42
	Male	62	58
Assistive device	No	84	88
	Yes	16	12
Alcohol consumption	No	84	92
	Yes	16	8
Fall(s) in the previous year	No	75	62
	1 time	15	48
	2 times or more	10	
Reported medical conditions	Osteoarthritis	43	
	Hypertension	51	
	Osteoporosis	28	
	Low back pain	18	
	Visual and hearing problems	28	
	Cardiac problems	16	
	Urinary incontinence	5	
	Peripheral vascular disease	6	
	Asthma	3	
No of medications (X \pm SD) (Range)			

Table 1: Demographic characteristics of Subjects (n=100)

Mean \pm SD	Range	
SF-12 (Mental health component summary score)	49.98 \pm 18.52	18-100
SF-12 (Physical health component summary score)	53.67 \pm 14.79	16-100
SF-12 (Total-General Health Perception)	54.62 \pm 13.66	15-100
Fear of falling (VAS) (cm)	3.58 \pm 3.12	0-10
Functional mobility (TUG) (sec)	14.60 \pm 5.84	6-62

Table 2: Mean and SD of All Measurements

3. Discussion

In our study, the relationship between risk factors for falls and quality of life was investigated in older adults. Functional mobility and fear of falling were shown to correlate with General Health Perception (SF-12). In the study, it was found that quality of life was not correlated with age. This result suggested that the quality of life does not change with aging but age affects the risk factors for falls. While BMI increased, physical, mental and general health perception scores of SF-12 decreased. This relationship is important because increased BMI causes functional limitation and affects physical, mental and general health perception in older adults. In addition, the mental health component only correlated with BMI. There are many studies which state that TUG test results are the most important risk factor for falls [13]. Physical and general health perception scores of SF-12 strongly correlated with TUG test (negative). These results demonstrated that poor functional mobility was associated with a decreased quality of life.

SF-12 Mental Health Component	SF-12 Physical Health Component	SF-12 General Health Perception	
Age	NS	NS	
Body Mass Index	r = -0.212 P= 0.020 p= 0.004 p=0.003	r = -0.252	r = -0.262
Fear of falling (VAS)	NS	r = -0.246 r=0.221 P= 0.006 p=0.015	
Functional mobility (TUG) P=0.000 p=0.006	NS	r= -0.344 r=-0.241	

Table 3: Pearson Correlation Coefficients (R) and Levels of Significance in a Comparison of Risk Factors for fall and SF-12
NS: Not significant

There is a need for some further study concerning the relationship between the risk of falling, and quality of life. When older adults worry about falling, it may indicate that their physical condition is affected, possibly due to a lack of balance. Therefore, the fear of falling is an important risk factor for falls in older adults. Hence VAS is a simple, practical and easy method of assessment for this subject and so this method was preferred. Several studies have explored the strong association between muscle strength and the risk of falling in older adults [9, 14]. Similarly, in this study, it was found that muscle strength and factors relating to the risk of falling correlated with physical and general health perception scores of SF-12. Fear of falling correlated with Physical Health Component and General Health Perception of SF-12. Suzuki stated that fear of falling is increasingly recognized as a factor that may affect activity, function and physical condition in older adults [6]. In general, while risk factors for falls were associated with physical component and general health perception of SF12, only the body mass index correlated with the mental component of SF-12 in this study. This result pointed out that risk factors for falls affect the physical health component and general health perception but not the mental health component in older adults. As it is seen in our study some physical function parameters may or may not related to physical component score of quality of life. As this study is cross sectional, the associations that were demonstrated may or may not be causal. Various factors can affect the physical or mental component scores and general quality of life in older adults. Assessing correlations only between some risk factors for falling and quality of life is the major limitation of this study. Older adults who live in two welfare homes are independent in their daily living activities. Only food and room cleaning services are provided for them. They do not spend all of their time in their own rooms but take part in activities such as visiting relatives, shopping, short holidays, taking walks etc. For this reason, some of them did not wish to participate in this study and some of them could not be reached. Prevention of falls and their subsequent injuries is an important goal of geriatric evaluation. Proper physical therapy programs minimizing the risk of falls may increase quality of life in older adults.

4. Conclusion

The risk factors for falls (functional mobility and fear of falling) in older adults are associated with quality of life. Future studies should focus on other factors that affect quality of life in larger elderly populations and investigate the effect of such programs on quality of life in relation to risk factors for falls.

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