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Original Article

Health Related Quality of Life Among Frail and Pre-Frail Older Adults in Taiwan☆

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SUMMARY

Background: The frail older population is increasing rapidly. More understanding for the frail status and quality of life (QOL) among older adults is important.
Methods: This study was a cross-sectional survey. The Fried Frailty Criteria (FFC), Barthel Index scale, and World Health Organization Quality of Life questionnaire (WHOQOL-BREF) were used as measurements for all participants. In total, 180 frail or pre-frail older adults were recruited and completed all questionnaires.
Results: The slow working speed and weakness of grip strength were two significant FFC criteria for lower scores of QOL ($t = 2.89, 2.41$; $p < 0.01, <0.05$). The multiple regression model showed that the significant predictors of better total QOL mean scores were full scores of Barthel index, slow walking speed and better perceived happiness. The explanatory power of the regression model was 48.3%.
Conclusion: More effective interventions, such as regular walking or rehabilitation program, are needed for frail older adults to facilitate full scores on the Barthel index, to improve their perception of happiness.

1. Introduction

With the advance of medical treatment in the past few decades, the average life expectancy has increased. Taiwan is one of the most rapidly aging countries and its population of older adults over 65 has been 12.69% in March 2016.[1] Previous studies showed that about half of the older adults would encounter the problems of disability, multiple chronic diseases and frailty.[2,3] Frail older adults frequently experience poor health related quality of life (QOL).[4] Inferior QOL could increase the overall health demands for older adults and lead to poorer health outcomes.[5]

With better understanding about the QOL among older adults, early preventive interventions can be implemented to improve functional status and perceived health for frail older adults.[6–8] However, there is little information regarding the QOL among frail older adults in Taiwan. In response to the health needs of frail older adults, health care professionals should be more sensitive to understand the frail status and QOL among older adults, in order to design the proper interventions to improve their health status.

QOL is a kind of subjective feelings for individual's life situation based on their own goals, expectations, standards and concerns in their own culture contexts and value systems.[9] QOL is a multidimensional variable and can be changed when the contexts of the subjects are different.[10] Past studies have reported that QOL were associated with demographic, health and social behavioral factors. Age, gender, physical health, mental health and participation in physical activities all contributed to QOL.[12] In a study that aimed to explore the associated factors of QOL in diabetes patients, results showed that the associated factors with poor QOL were female, old age, obesity, lack of exercise, use of sleeping pills, the presence of depression, cognitive impairment and cerebrovascular diseases.[13] Comans et al.[14] reported that reduced QOL curtails participation in daily activities. Another study found that older adults living alone in rural areas, with depression tendency, particularly women with less education, predicted lower QOL.[15] Several studies also demonstrated that poorer QOL was associated with the presence of

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depression and dysthymia,[14,16,17] as well as anxiety and functional dependence.[18] Poor QOL was also seen among people with more chronic diseases, participating in low level of physical activity, slow walking speed and with poor outdoor environmental conditions for exercise.[19] In summary, demographic characteristics and physical and psychological health and functional statuses are factors associated with QOL. Another study has shown that lower QOL scores were related to more frailty status.[20] Studies have also indicated that frailty predicts immobility and disability in the elders.[21] Frailty often leads to a later feature of co-morbidity[22] and causes older adults to face greater health risks. As a result, QOL in older adults, particularly frail older adults, is extremely important and need further investigation. Previous studies related to QOL mostly focused on elder populations with specific chronic disease.[5,23,24] Very few studies focused on frail elders and their QOL in community settings. Therefore, this study aimed to investigate QOL of frail older adults and to explore associated factors.

2. Methods

2.1. Design, setting and participants

This study was a cross-sectional survey. Potential study participants were clients attending rehabilitation clinic in a community hospital. A trained research assistant contacted all potential participants, gave brief study information and asked for their willingness to participate in this study. If clients were willing to participate, a home visit for each individual would be arranged for obtaining informed consent and conducting assessment. The inclusion criteria for participants were being 65 years old or older, living in communities, capable of communicating in Taiwanese or Chinese and having intact cognition. The exclusion criteria were severe impairment of cognitive ability or unable to communicate the content of the study, or not willing to sign the consent. Approval for this study was gained from the Human Subject Review Board of the National Taiwan University Hospital (No.20090842R). Participation was voluntary and participants could freely withdraw anytime during the study process.

2.2. Instruments

2.2.1. Demographic information and health status

The participants' demographic information, such as gender, age, education, marital status and living condition were collected in this study. Self-reported health status (5 = "very good" and 1 = "very poor") and perceived happiness (5 = "very happy" and 1 = "very unhappy") were rated by 5-point Likert scales. The Barthel Index is a 10-item ordinal scale that measures functional independence in the domains of personal care and mobility in ten aspects, including bathing, climbing stairs, dressing, walking, transferring, feeding, toilet use, grooming, presence or absence of urinary incontinence and fecal incontinence. Each aspect is rated on a 0 to 10 point scale and a higher score means a more independent status. Score of 100 indicates independence and scores at or below 99 indicate slightly to total dependency.

2.2.2. Assessment of frail status

The Fried Frailty Criteria (FFC) was used as an assessment tool for all participants' frail status.[2] Frailty was defined as a clinical syndrome in which three or more of the following criteria were present: unintentional weight loss, self-reported exhaustion, weakness (grip strength), slow walking speed, and low physical activity.[2] The "pre-frail" status was defined by the presence of 1 or 2 criteria. Unintentional weight loss was measured by self-reported loss of at least 4.5 kg, or 5% of body weight, in the previous year. Self-reported exhaustion was identified by two questions from the Center for Epidemiological Studies-Depression (CES-D) scale, including (a) I felt that everything I did was an effort and (b) I could not get going. Weakness (grip strength) was measured with a dynamometer in the dominant hand, and adjusted for gender and body mass index. Slow walking speed was measured by the gait speed test, measured in seconds (4-m distance), and adjusted for gender and height. If the older adults with handgrip strength and gait speed allocated in the lowest quartile of the sample, they were considered to be in decline for these components. The level of physical activity was measured by the short version of the Minnesota Leisure Time Activity questionnaire. If the older male (female) adult had weekly energy expenditure < 383 (270) Kcals, they were considered to be low physical activity. The FFC has been used effectively to define status of frail and used to predict falls, mobility, disability, hospitalization and death among elder adults.[25]

2.2.3. Quality of life (QOL)

There were many different tools measuring QOL. Among them, a health-related QOL measurement tool developed by World Health Organization (WHOQOL-BREF), with good reliability and validity, has been widely used in the study of many different populations globally.[11] The above QOL Taiwan Version was used to measure participants' health related quality of life in our study that made comparisons with other groups in Taiwan or other countries possible. There are four domains in the questionnaire: physical (7 items), psychological (6 items), social relationship (4 items) and environmental (9 items). Total scores of QOL (28 questions each with 1–5 points) ranged from 28 to 140 with higher scores indicating a better QOL. For each domain, the averaged item score (range 1–5) was obtained by using the sum of total item scores divided by the number of items. In order to make comparisons among four domains, the averaged item score of each domain was amplified by four which was followed the calculation method provided by the WHOQOL-BREF group. Therefore, the score range for each domain will be equally 4 to 20.[11] This questionnaire has been reported with good internal consistency (Cronbach's alpha was 0.97), appropriate content validity and concurrent validity.[11] The Cronbach's alpha values in this study ranged from 0.70 to 0.86.

2.2.4. Statistical analysis

The demographic information and health status were analyzed by using descriptive statistics. The QOL differences among various demographic factors and frailty conditions were assessed by the two sample *t*-test. Based on the results of univariate analysis, the significant associated factors were then chosen as possible independent variables and were entered into the multiple regression model. Statistical significance was set at $p < 0.05$. The SPSS 21.0 statistical computer software (IBM Corp., Armonk, NY, USA) was used in this study to analyze the data.

3. Results

We approached 519 clients by phone calls. One hundred and thirty-nine clients (26.7%) rejected, 160 (30.8%) clients could not be directly researched, and finally 220 (42.4%) clients participated in the current study. After completing home visits, there were 180 older adults recruited and successfully evaluated. They were 65–95 years of age (mean = 76.9, SD = 7.1); 50.6% were female and 66.1% married. Overall, 44.4% of the participants had higher than 6 years education and 13.9% rated as dependent in activities of daily living. Most of them had at least one chronic disease. The mean scores for self-reported health status and perceived happiness were 3.1 (SD = 0.7) and 3.2 (SD = 0.8), respectively, on the 1 to 5 scale. According to the FFC, 149 participants (82.8%) were "pre-frail" and 31

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