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Frailty decreases physical health domain of quality of life in nursing home elderly

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ABSTRACT

BACKGROUND

Approximately 10-27% of the population aged ≥65 years suffers from frailty. The percentage increases with age so that the prevalence of frailty in the population aged ≥85 years reaches 45%. The objective of this study was to determine the relationship between frailty and quality of life (QOL) in nursing home elderly.

METHODS

This was a cross-sectional study of 138 subjects aged ≥60 years who were recruited from 4 nursing homes in West Jakarta. Participants with frailty status were evaluated by the Survey of Health, Ageing and Retirement in Europe (SHARE) instrument and QOL was evaluated by the WHOQOL-BREF questionnaire. One-way ANOVA and chi-square tests were used to find relations between the frailty syndrome and QOL.

RESULTS

The percentages of respondents with pre-frail, frail, and non-frail status were 30.4%, 52.2%, and 17.4%, respectively. A decline in QOL scores of pre-frail and frail respondents was found for almost all QOL domains (physical, psychological and environment domains), except social relationships. The subdomains most influenced were "energy and fatigue" in the physical health domain, "thinking, learning, memory and concentration" in psychological health, and "opportunities for acquiring new information and skills" in the environment domain.

CONCLUSIONS

More than half of the nursing home elderly were frail and one-third were pre-frail. The main factor of frailty was weakness. The frailty syndrome in the elderly has a negative impact on QOL, especially in the physical health, psychological and environment domains in nursing home elderly.

Keywords: Frailty syndrome, quality of life, elderly, nursing homes

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Frailty *menurunkan kualitas hidup pada domain kesehatan fisik pada lanjut-usia di panti werdha*

ABSTRAK

LATAR BELAKANG

Sekitar 10-27% populasi lanjut usia (lansia) berusia ≥65 tahun menderita frailty. Presentasenya meningkat dengan bertambahnya usia sehingga prevalensi frailty *pada populasi berusia ≥85 tahun mencapai 45%. Tujuan dari penelitian ini adalah untuk menentukan hubungan antara* frailty *kualitas hidup pada lansia di panti werdha.*

METODE

Penelitian ini merupakan studi cross-sectional *pada 138 subyek dengan usia ≥60 tahun yang didapatkan dari 4 panti werdha di Jakarta Barat. Status* frailty *subyek diukur dengan* Survey of Health, Ageing and Retirement in Europe *(SHARE) dan kualitas hidup dilakukan penilaian dengan kuesioner WHOQOL-BREF. Uji* One Way Anova *dan uji* Chi-square *digunakan untuk mendapatkan hubungan antara sindrom* frailty *dan kualitas hidup.*

HASIL

Persentase responden dengan status pre-frail *(30,4%),* frail *(52,2%) dan normal (17,4%). Penurunan skor kualitas hidup lansia dengan status* frailty *dan* pre-frail *ditemukan hampir di semua domain kualitas hidup (domain fisik, psikologis dan lingkungan), kecuali domain hubungan sosial. Subdomain yang paling dipengaruhi adalah "energi dan kelelahan" pada domain kesehatan fisik, "berpikir, belajar, memori dan konsentrasi" pada domain kesehatan psikologis, serta "peluang untuk memperoleh informasi dan keterampilan baru" pada domain lingkungan.*

KESIMPULAN

Lebih dari setengah lansia mengalami frailty *dan sepertiga lansia dengan status* pre-frail *di panti werdha. Faktor utama* frailty *adalah kelemahan. Sindrom* frailty *pada lansia berdampak negatif pada kualitas hidup, khususnya pada domain kesehatan fisik, psikologis dan lingkungan pada lansia di panti werdha.*

***Kata kunci**: Sindrom* frailty*, kualitas hidup, lansia, panti werdha*

INTRODUCTION

An aging population is a challenge that affects both the developed and developing countries. The growth of the elderly population needs resources and health services to take care of.[1] Lately, geriatricians and gerontologists have been focusing their attention on frailty in the elderly, which is increasing significantly. Approximately 10-27% of the population aged ≥65 years is suffering from frailty [2] and the percentage increases with age, so that the prevalence of frailty in the population aged ≥85 years reaches 45%.[3] Several studies in Europe found that 61.8% of the elderly population were suffering from frailty.[2] Frailty is a heterogeneous clinical syndrome that may include several different medical conditions, such as cardiovascular disease, musculoskeletal disorders (arthritis, osteoporosis and fractures), gastrointestinal disease and cognitive disorders.[4] Muscular strength, physical performance, nutritional status and psychological status are the parameters that are useful to evaluate the frailty status of elderly.[5]

Several studies have found a significant relationship between frailty and quality of life (QOL), with lower QOL scores in respondents with frailty.[6] Similar results were also found in the Taiwanese elderly population.[7]

There has been little research on the effect of frailty on the QOL of elderly residing in nursing homes. The objective of the present study was to determine the relationship between frailty and QOL in nursing home elderly.

METHODS

Research design

The design of this study was cross sectional and the study was conducted between April 2014 and December 2015 at four nursing homes in West Jakarta.

Research subjects

The size of the sample was calculated based on the formula of the sample size to test a planned proportion at 95% confidence level to achieve a 5% margin of error for the study. From previous studies, the prevalence of frailty was known to be 24.74% in elderly <85 years old and 45% in elderly ≥85 years old. From the results of these calculations, the minimum sample size was 132. This study comprised 138 subjects aged 60-95 years and living in four nursing homes in West Jakarta (Panti Sasana Tresna Werdha Budi Mulia Jelambar, Panti Usila Santa Anna, Panti Sosial Tresna Budi Mulia 2, Panti Sosial Tresna Werdha Usada Mulia 5). The subjects were recruited through the head of each nursing home, according to the inclusion and exclusion criteria. All of them gave signed informed consent.

Measurements

Frailty was measured by means of the Survey of Health, Ageing and Retirement in Europe (SHARE) instrument.[8] The computations were done using two SHARE-FI calculators, one for males and one for females, which assessed the following five factors: 1) fatigue; 2) loss of appetite; 3) grip strength; 4) functional difficulties (walking 100 m and climbing stairs) and 5) physical activity. Based on these factors, frailty was categorized into three groups, i.e. normal, pre-frail and frail.

Quality of life measurement was performed with WHOQOL-BREF consisting of 26 questions and 4 domains: 1) physical health; 2) psychological; 3) social relationships; 4) environment and also to assess overall quality of life and satisfaction about health. This is a valid and reliable instrument to measure QOL in the elderly.[9,10]

Statistical analysis

The one-way Anova test was used to analyze the relationship between QOL and frailty status. The chi square test was used to analyze the effect of overall QOL, satisfaction about health and the characteristics of respondents on frailty status. A p-value lower or equal to 0.05 (≤0.05) was considered as statistically significant.

Ethical clearance

The research had been approved by Ethical Clearance Committee, Faculty of Medicine, Atma Jaya Catholic University of Indonesia on 3 April 2014.

RESULTS

Based on the characteristics, 51.4% of the respondents were female, 81.2% were ≥65 years old, 64.5% had elementary education or lower, and 55.8% were divorced or widowed. This study found that the percentages of normal or non-frail, pre-frail, and frail respondents were 17.4%, 30.4%, and 52.2%, respectively. Regarding overall QOL and satisfaction about health, 16.6% of respondents had poor QOL, 47.1% had sufficient QOL, and 36.3% good QOL, while 28.3% was not satisfied, 28.3% moderately satisfied and 43.5% satisfied about their health. The assessment of the five components of frailty resulted in 34.8% with exhaustion, 22.5% with loss of appetite, 53.6% were weaker on the right handgrip and 49.3% on the left handgrip, 56.5% had difficulty in walking and climbing stairs, and 36.2% had never done physical activity (Table 1).

Table 1. Demographic characteristics, frailty status, overall quality of life, and satisfaction about health in elderly

Variable	n (%)
Age (years)	71.8 ± 7.9
< 65 years	26 (18.8)
>= 65 years	112 (81.2)
Level of education	
Elementary or lower	89 (64.5)
Junior high school	21 (15.2)
Senior high school or higher	28 (20.3)
Sex	
Male	67 (48.6)
Female	71 (51.4)
Marital status	
Single	22 (15.9)
Married	39 (28.3)
Divorced or widowed	77 (55.8)
Frailty status	
Non-frail	24 (17.4)
Prefrail	42 (30.4)
Frail	72 (52.2)
Overall quality of life	
Poor	23 (16.6)
Sufficient	65 (47.1)
Good	50 (36.3)
Satisfaction about health	
Not satisfied	39 (28.3)
Moderately satisfied	39 (28.3)
Satisfied	60 (43.4)

The results of the analysis between frailty status and each of the QOL domains showed that respondents who were pre-frail had a QOL score for physical health of 2.10 points, lower than the QOL score in normal (non-frail) respondents (p=0.018). Similarly, respondents who were frail had a QOL lower than that in normal respondents (p=0.018). From these results we can conclude that pre-frail and frail respondents had worse QOL scores for the physical health domain than normal respondents.

The pre-frail respondents had lower QOL scores for the psychological domain of 1.58 points, as compared to those who were normal (p=0.024). This means that the pre-frail respondents did not have better QOL for the psychological domain as compared to those who were normal. Respondents with pre-fail or frail health status did not show a significant relationship with QOL for the domain of social relations (p=0.228). The respondents with frail health status had QOL scores for the environment domain of 2.79 points, lower than those in the normal (non-frail) respondents (p=0.007). It can be concluded that frail respondents have worse QOL scores for the environment domain compared to the normal (non-frail) respondents (Table 2).

Post-hoc analysis showed that in elderly who were frail the physical health, environment and psychological domain was significantly declined compared to normal elderly (Table 3).

The chi square test for frailty on overall QOL and satisfaction about health, resulted in significant relationships (p=0.035; p=0.009). The largest percentage of those with low scores for QOL and satisfaction about health of 53.4% and 55.1%, respectively, was found in frail respondents, followed by those who were pre-frail, with respective scores of 35.2% and 34.6% (Table 4).

DISCUSSION

The respondents in this study comprised 138 elderly living in nursing homes in West Jakarta. They were mostly women aged ≥65 years, had elementary education or lower, and most of them were divorced or widowed. Frailty is a health condition that deals with aging and dependence.

Table 2. Distribution of the means of four QOL domains and total quality of life by frailty status in elderly

Domain	Frailty status			p
	Normal (n=24)	Pre-frail (n=42)	Frail (n=72)	
Physical health	22.83 ± 2.77	20.73 ± 2.82	20.87 ± 2.91	0.018
Psychological	18.95 ± 2.19	17.37 ± 2.74	17.91 ± 2.51	0.024
Social relation	9.37 ± 2.58	9.38 ± 1.88	8.82 ± 1.73	0.228
Environment	26.75 ± 4.75	25.09 ± 4.09	23.96 ± 4.43	0.007

Table 3. Post-hoc analysis of physical health, psychological and environment domain with frailty status

Domain	Mean difference	p
Physical health		
Normal Pre-frail	2.10	0.01
Frail	1.96	0.00
Pre-frail Frail	0.14	0.80
Environment		
Normal Pre-frail	1.66	0.15
Frail	2.79	0.01
Pre-frail Frail	1.13	0.18
Psychological		
Normal Pre-frail	1.58	0.02
Frail	1.04	0.08
Pre-frail Frail	0.63	0.28

A reduction or delay in frailty status can improve the quality of life of elderly. In this research, the percentages of respondents with pre-frail, frail, and non-frail status were 30.4%, 52.2%, and 17.4%, respectively.

Research conducted in Taiwanese communities found that 9.9% elderly were frail, 44.5% pre-frail and 45.6% non-frail. A cross-sectional study showed that about 7% of elderly aged 65 years was suffering from frailty and the number would have increased to over 45 % after the age of 85 years.[11] Based on Fried's criteria about frailty, there were 5.9% frail, 62.8% pre-frail and 31.3% non-frail subjects among elderly who received health services in Taiwan.[12]

Based on the findings above, the number of elderly with frailty in this research was found to be greater than that in other studies. This is because the respondents were living in nursing homes so that their daily activities were less than those of elderly who are living in the community. This statement is supported by Barthalos et al (2012) who informed that lifestyle and nursing-home dwelling with slight variations in daily activities negatively affect the status of physical fitness, body composition, and quality of life. Self-motivation, active lifestyle, regular and varied programs seem to have a major role in the quality of life of the elderly population.[13]

An advanced age was predicted relating to sensory, motoric and cognitive changes that potentially prevent the elderly to function effectively.[14] In advanced age, the physiological system will have abnormalities in structure and function. Age-related physiological changes influence many tissues, organ systems and functions, and cumulatively can impact on activities of daily living (ADL).[15]

The findings of Fried et al.[16] showed that frailty was associated with a significant reduction in QOL. The results of other studies are consistent with their findings. Other investigators discovered that frail subjects had worse overall QOL than pre-frail and non-frail subjects.[17,18] Lin et al. reported that elderly who did not experience weakness (frailty) significantly had better health compared to the elderly with pre-frail and frail conditions at all scales. Similarly, those with pre-frail status had reportedly better QOL than those with a frail condition. Similarly, frail elderly had significantly worse health related quality of life (HRQOL) than non-frail elderly in the same population.[7] Other findings reported that outpatient subjects at health centers in Taiwan with frail status had significantly lower QOL scores (on physical and mental health scale) as compared to the non-frail subjects.[12] Bilotta et al.[19] discovered a negative relationship between frailty status and QOL of older subjects, measured using the Older People's Quality of Life (OPQOL) questionnaire. Nearly all QOL dimensions correlated inversely with frailty, except for "social

Table 4. Frailty, overall quality of life and satisfaction about health in elderly

Frailty status	Overall quality of life		p	Satisfaction about health		p
	Poor (%)	Sufficient (%)		Not or moderately satisfied (%)	Satisfied (%)	
Normal	10 (11.4)	14 (28)	0.035	8 (10.3)	16 (26.7)	0.009
Pre-frail	31 (35.2)	11 (22)		27 (34.6)	15 (25)	
Frail	47 (53.4)	25 (50)		43 (55.1)	29 (48.3)	

relations and participation" as well as "financial circumstances".

The findings of the present study indicate that respondents suffering from pre-frail and frail condition had lower QOL scores for the physical health domain, from the normal (non-frail) respondents. Likewise, the psychological domain score was lower in pre-frail respondents. In the environment domain score was lower in frail respondents, while in the domain of social relationships, the relationship was not statistically significant. Fontecha et al.[20] stated that functional judgment was the most important factor in determinating frailty. Masel et al.[6] found that in Mexican communities pre-frail and frail respondents were significantly associated with lower QOL scores on physical and mental health domains than elderly who were not frail.

The frailty syndrome is closely related to HRQOL of the elderly community in Taiwan who are using the Taipei health services. For frailty phenotypes, slowness is a major factor in the SF-36 physical component scale, and fatigue is a major factor in the mental component scale.[14] The results of the present study are consistent with other findings stating that the QOL score in the physical and mental health domains was lower in frail or pre-frail respondents. Bilotta et al.[19] also found consistent findings of no association between "social relationships and participation" with frailty. A study consisting of 590 patients aged 65 years or older showed that frailty score was not associated with QOL in nursing home residents.[20]

One of the limitations of this study is related to the cross-sectional design that does not allow establishing of cause-and-effect relations. Another limitation is the self-report nature of several key variables. On the other hand, the results could guide gerontological nursing care professionals in their practice with frail, pre-frail and non-frail elderly.

CONCLUSIONS

The frailty status in the elderly has a poor impact on quality of life, particularly in the physical health, psychological, and environment domains. The subdomain most influenced was "energy and fatigue" in the physical health domain, "thinking, learning, memory and concentration" in the psychological health domain, and "opportunities for acquiring new information and skills" in the environment domain.

CONFLICT OF INTEREST

None declared.

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