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Research Article

The Relationship Between Knee Pain and Quality of Life in the Elderly

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Abstract
The quality life of elderly people would be better of, if they have independency, good physical health and if they stay active doing daily activity. One of the cause in decrease health quality on elderly people is disability.Where the most cause of disability in some cases turn out to be joint pain with prevalence of 54,8. Joint pain cause a decreased quality of life on elderly people because of the hardtime and the limitation in doing activity. Goals: evaluate prevalence of knee pain in elderly at Panti Sosial Tresna Werdha Budi Mulia 2, evaluate risk factor of pain in elderly. Sample consist of 123 people and collected using consecutive non random sampling. Respondent data was acquired by interview and questionnaire. The data was analyzed using SPSS program and Chi-square test. The study show that most of the elderly suffered from knee pain which consist of 91 people (74%). It also show that theres a meaningful association between body mass index with knee pain (p=0,001), while age, gender, educational level, smoking habit, do not have an association with knee pain. This study show theres a meaningful association between knee pain with quality of life knee pain could affect the quality of life on elderly.

Keywords: knee pain, elderly, quality of life

INTRODUCTION

Elderly, or commonly known as seniors, refers to individuals aged over 60 years, as stated in Law No. 13 of 1998 on the Welfare of the Elderly. In 2015, the elderly population in Indonesia reached 21.68 million people, which is a significant portion of the total population.

This percentage is predicted to continue increasing to 11.83% by 2025. In Jakarta, the elderly population in 2015 accounted for 6.5% of the total population, and it is expected to rise to 11.2% in the next 15 years. The growing elderly population may become a burden if they face health-related issues.

One of the common health issues faced by the elderly is disability. According to the 2013 Riskesdas data, women are more likely to experience disability, with the prevalence for those aged over 75 years at 55.9%, and for those aged 65-74 years at 34.6%. A significant portion of these disabilities, 54.8%, is caused by joint pain.

Joint pain is a frequent problem among the elderly and can be caused by degenerative processes or trauma. Common joint diseases found in the elderly include gout, fibromyalgia, and osteoarthritis. According to the 2013 Riskesdas data, the highest prevalence of joint pain occurs in individuals aged over 75 years, ranging from 33% to 54.8%. The prevalence of joint pain in women is 13.4%, higher than the 10.3% in men.

Knee pain is the most common joint pain among the elderly, often caused by degenerative processes such as osteoarthritis. The prevalence of osteoarthritis in elderly men is 15.5%, while in women it is 12.7%. Osteoarthritis causes joint and muscle dysfunction, leading to limited movement, reduced muscle strength, and balance issues. Joint pain significantly impacts the quality of life in the elderly, as it hinders their ability to perform daily activities.

Quality of life is defined as an individual's perception of their life situation, in relation to the cultural and societal norms of the environment they live in, and is associated with their goals, expectations, standards, and concerns during their lifetime. The quality of life in the elderly is better when they have independence, good physical health, and remain active in their daily activities. According to the WHOQOL Group (World Health Organization Quality of Life Group), quality of life is measured across various domains important to understanding individual well-being.

Measuring the quality of life in the elderly is essential for healthcare professionals and the community to understand their condition. One of the tools used to assess quality of life in the elderly is the Short Form-36 questionnaire.

Knee pain can affect the quality of life in the elderly. A study by Hyung-joon Jhun (2013) found that individuals with knee pain have a much lower quality of life compared to those without knee pain. However, research by Kim et al. (2011) suggests that there is no relationship between knee pain and age.

Based on the data above, there is a discrepancy in the results regarding the relationship between knee pain and the quality of life in the elderly. This has motivated the researcher to assess the relationship between knee pain and the quality of life in the elderly.

METHOD

4.1 Research Design

The research design used in this study is an observational analytical design. The collected data will be processed and tested using statistical techniques. This study employs a cross-sectional

design, where the researcher measures the variables at a specific time and collects data in a single measurement.

4.2 Research Location and Time

This study will be conducted at Panti Sosial Tresna Werdha (PSTW) Budi Mulia 2, Jl Cendrawasih X No.8 RT.006/07 Cengkareng, West Jakarta. The study will take place from August to December 2017.

4.3 Population and Sample

The target population of this study is the elderly. The accessible population consists of elderly individuals aged over 60 years. The sample for this study will be drawn from the accessible population that meets the inclusion and exclusion criteria.

4.3.1 Sample Size and Sampling Method

The sampling method will be consecutive non-random sampling, where the samples will be selected in sequence from elderly individuals residing at PSTW Budi Mulia 2, Cengkareng, West Jakarta, based on the inclusion and exclusion criteria. The estimated sample size will be calculated using the following formula:

Infinite Population Formula:

$n0 = Z\alpha 2PQ / d2$

$n0 = (1.96)2 \times 0.41 \times 0.59 / 0.052$
$n0 = 0.9292 / 0.0025$
$n0 = 371$

- n0 = Optimal sample size required
- Zα2 = At a significance level of 95%, the value is 1.96 (fixed)
- P = Prevalence of knee pain in the elderly is 41% → 0.41
- Q = Prevalence without knee pain (1 - 0.41) = 0.59
- d = Desired absolute precision (fixed)

Finite Population Formula:

$n = n0 / (1 + (n0 / N))$

$n = 371 / (1 + (371 / 150))$
$n = 371 / (1 + 2.47)$
$n = 371 / 3.47$
$n = 107$

- n = Sample size for finite population
- n0 = Sample size from infinite population → 371
- N = Total population at PSTW Budi Mulia 2 → 150

Considering a 15% dropout rate, the final sample size is:

n = (107 × 15%) = 123

4.4 Sample Selection Criteria

The sample taken for this study will consist of subjects who meet the inclusion and exclusion criteria.

4.4.1 Inclusion Criteria

The inclusion criteria for this study are:

- Ability to communicate
- Willingness to participate in the study

4.4.2 Exclusion Criteria

The exclusion criteria for this study are:

- Elderly individuals who are immobile (bedridden)
- Individuals with hearing impairments

4.5 Research Materials and Instruments

This study collects primary data. The tools used for data collection include questionnaires and interviews. The primary data collected in this study are:

4.5.1 Knee Pain Interview

Knee pain is measured using the Numerical Rating Scale (NRS) to assess the intensity of pain. Respondents will be asked to mark a point on the scale that represents the level of knee pain they are experiencing.

4.5.2 SF-36 Quality of Life Questionnaire

Quality of life will be measured using the Short Form-36 (SF-36) questionnaire. The SF-36 consists of 36 questions grouped into eight different domains: physical function, physical limitation, body pain, general health, vitality, social function, emotional limitation, and mental health.

This measurement produces a scale score for each domain, with values ranging from 0 to 100, where higher scores indicate better quality of life.

4.6 Data Analysis

The data analysis in this study will be conducted in two stages: univariate and bivariate analysis.

4.6.1 Univariate Analysis

Univariate analysis will be used to describe the characteristics of each variable being studied. In this study, univariate analysis will be conducted on knee pain and quality of life.

4.6.2 Bivariate Analysis

Bivariate analysis will be used to determine the relationship between the variables studied. The Chi-Square test will be used to examine the relationship between independent and dependent variables. Data will be processed using the SPSS (Statistical Package for Social Science) software.

RESULT AND DISCUSSION

Result

This research was conducted from August to September 2017 at the Budi Mulia 2 Social Welfare Home in West Jakarta, with a sample size of 123 people. The study used a questionnaire.*short form*36 (SF-36), and when filling out the questionnaire the researcher accompanied the research subjects.

5.1 Respondent characteristics

The table below is a frequency distribution of respondent characteristics based on age, gender, body mass index, and smoking.

Table 6. Frequency Distribution of Respondent Characteristics

Variables	Frequency	
	Number (n)	Percentage (%)
Age		
- 60 – 70 years	81	65.9
- 71-80 years	35	28.5
- > 80 years	7	5.7
Gender		
- Man	31	25.2
- Woman	92	74.8
Body mass index (BMI)		
- Underweight	24	19.5
- Normal	32	26.0
- Overweight	35	28.5
- Obesity	32	26.0
Smoke		
- Yes	22	17.9
- No	101	82.1

Based on the data obtained, of the 123 elderly people, the majority were found to be elderly aged 60-70 years, namely 81 people (65.9%), and dominated by women, numbering 92 people (74.8%). Based on*Body mass index* (BMI) most elderly people have an excess body mass index*(overweight)*namely 35 people (28.5%). Based on smoking habits, many elderly people who do not smoke are 101 people (82.1%).

5.2 Knee pain in the elderly

Table 7. Frequency distribution of knee pain in the elderly

Variables	Frequency

	Number (n)	Percentage (%)
Knee pain		
- Yes	91	74.0
- No	32	26.0
Amount	123	100.0

Based on data obtained from 123 elderly people, the majority of elderly people complained of knee pain, namely 91 people (74.0%).

5.3 Intensity of knee pain in the elderly

The table below shows pain intensity. Pain intensity is categorized as no pain, mild pain, moderate pain, and severe pain.

Table 8. Frequency distribution of knee pain intensity in the elderly

Variables	Frequency	
	Number (n)	Percentage (%)
Intensity of knee pain		
- No pain	32	26.0
- Mild pain	18	14.6
- Moderate Pain	24	19.5
- Severe Pain	49	39.8
Amount	123	100.0

5.4 Quality of life in the elderly

Table 9. Frequency Distribution of Quality of Life in the Elderly

Variables	Frequency	
	Number (n)	Percentage (%)
Quality of life		
- Not enough	62	50.4
- Good	61	49.6
Amount		
123	100.0	

The study found that there was not much difference between elderly people with a good quality of life and those with a poor quality of life.

Sixty-two (50.4%) elderly people had a poor quality of life, while 61 (49.6%) elderly people had a good quality of life.

5.5 Risk Factors for Knee Pain

Table 10. Relationship of Risk Factors with Knee Pain

Variables		Knee Pain						P
		Yes		No		Total		
		n	%	n	%	n	%	
Age								
-	60-70 years	55	67.9	26	32.1	81	100.0	
-	71-80 years	30	85.7	5	14.3	35	100.0	0.102¶
-	> 80 years	6	85.7	1	14.3	7	100.0	
Gender								
-	Woman	72	78.3	20	21.7	92	100.0	0.063¶
-	Man	19	61.3	12	38.7	31	100.0	
Body Mass Index (BMI)								
-	Underweight	12	50.0	12	50.0	24	100.0	
-	Normal	23	71.9	9	28.1	32	100.0	0.001¶
-	Overweight	25	71.4	10	28.6	35	100.0	
-	Obese	31	96.9	1	3.1	32	100.0	
Smoke								
-	Yes	13	59.1	9	40.9	22	100	
-	No	78	77.2	23	22.8	101	100	0.079¶

Note: ¶ Chi-Square Test

Based on table 5.5, there is a significant relationship between BMI and knee pain (p = 0.001), while age, gender, and smoking habits do not have a significant relationship with knee pain.

Discussion

Data from the Central Statistics Agency in 2014 showed that the number of elderly women was greater than that of men, namely 10.77 million elderly women and 9.47 million elderly men. This is consistent with the findings of this study, which found that the majority of elderly people were women. The ratio of elderly people with knee pain to those without knee pain was higher in women than in men. Knee pain is common in women due to menopause, which causes a drastic decrease in estrogen levels, while in men, estrogen levels decline more slowly.Estrogen is known to play a role in bone formation.

Most of these studies involved older adults aged 60-70. This aligns with a 2013 study by Hyung Joon, which assessed the relationship between knee pain and quality of life in older adults in Korea. The study, involving 3,054 respondents, found that the majority of respondents were aged 60-69.

This study showed a significant association between BMI and knee pain. This aligns with research conducted by Jhun et al., who found that elderly people with a BMI >25 kg/m2or obese elderly people are at risk for knee pain. Research conducted by Asyifa using statistical tests with ANOVA tests showed something in line with Jhun's research that elderly people who have a BMI >27.0 showed a significant relationship with the occurrence of knee pain.

Based on the theory, it was found that obesity is a risk factor for knee pain, due to the excessive load on the joints, which causes mechanical trauma and cartilage damage which has the potential to cause knee pain and osteoarthritis.

In this study, there was no significant relationship between smoking and knee pain p = 0.079 (p > 0.05) and it can be concluded that this is in line with the research conducted by Abledu, et al. which was conducted on 148 respondents. This is not in line with the theory that tobacco smoke has a damaging effect on chondrocyte function and cell matrix formation. Perhaps this is because in this study most of the elderly did not smoke.

The results of the bivariate statistical test showed a significant relationship between knee pain and quality of life in the elderly (p=0.000). This study aligns with research conducted by Hyung-Joon Jhun et al. in 2013 on assessing the severity of knee pain in the elderly, along with risk factors and impacts on quality of life, involving 3,054 respondents using the method.*multistage stratified probability*shows that there is a significant relationship between elderly people who have pain severity and quality of life, elderly people with knee pain have a lower quality of life compared to elderly people without knee pain (p<0.01).

Based on research conducted by Aghdam, Kolahi, et al., it was stated that there is a significant relationship between physical function, pain, joint stiffness, and duration of the disease which will affect the ability to carry out daily living activities.

The relationship between knee pain intensity and quality of life is significant, this is in line with research by Kim et al. with a sample size of 504 people in Korea, it was stated that elderly people with severe pain intensity had limited activities so that their quality of life decreased. This aligns with the theory that elderly people experience knee pain due to a degenerative process. This pain is a sensory sensation of pain and discomfort, leading to reduced activity and a diminished quality of life.

6.1 Limitations of the assessment
This study still uses interview techniques to determine whether the subjects have knee pain. Supporting data such as radiological images and medical records are not yet available.

CONCLUSION

Based on the research that has been conducted, several conclusions can be drawn as follows:

1. The prevalence of elderly people at the Budi Mulia 2 Tresna Werdha Social Home who have complaints of knee pain is 74.0%, and knee pain with severe intensity is 39.8%.
2. As many as 50.4% of the elderly at the Budi Mulia 2 Social Home for the Elderly have a poor quality of life.
3. There is a significant relationship between body mass index (BMI) and knee pain in the elderly.
4. There is a significant relationship between knee pain, pain intensity and quality of life.

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