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Original Article

THE EFFECT OF EXERCISE TRAINING AT HOME ON LIFE QUALITY OF OSTEOARTHRITIS ELDERLY PATIENTS

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ABSTRACT

Background. Osteoarthritis (OA) is a degenerative joint disease characterized by chronic pain, stiffness, and decreased joint function, which significantly impairs the quality of life in older adults. As OA progresses, it limits mobility and daily functioning, leading to psychological distress and reduced independence. This study aimed to evaluate the effectiveness of Home-Based Exercise Training (HBET) in improving the quality of life among elderly patients with osteoarthritis.
Research Methods. A quasi-experimental study with a one-group pretest and posttest design was conducted at the Surabaya Square Public Health Center. Sum of 26 elderly patients diagnosed with knee osteoarthritis were selected through consecutive sampling, meeting specific inclusion criteria. Participants performed HBET knee exercises at home for 2 weeks under guidance. The Osteoarthritis of Knee and Hip Quality of Life (OAKHQOL) questionnaire was used to assess the quality of life before and after the intervention. Data were analyzed using the paired t-test with a significance level set at $p < 0.05$.
Findings. Statistical analysis revealed a significant improvement in life quality after the intervention, p-value 0.0001. Participants experienced notable enhancements in physical functioning, pain reduction, emotional well-being, and social engagement after performing regular HBET knee exercises**.**
Conclusions. Home-Based Exercise Training (HBET) effectively enhances life quality for older patients knee osteoarthritis. It is a practical, low-cost, and sustainable intervention that can be implemented in community health programs. Further research is recommended to explore HBET's benefits in other aging-related conditions.

Keywords: Elderly, Home-Based Exercise Training, Osteoarthritis, Quality of life.

BACKGROUND

The biochemical degradation of articular (hyaline) cartilage in the knee synovial joint results in osteoarthritis, a degenerative joint disease that damages cartilage [1]. Degeneration of joint cartilage and the growth of new bone (osteophytes) at the joint borders are the hallmarks of this asymmetrical, non-inflammatory, slowly developing condition [2]. A symptom of knee osteoarthritis is the presence of knee pain. The presence of knee pain causes individuals to fear performing activities or movements, thereby reducing their quality of life. People who suffer from osteoarthritis will have joint and muscle dysfunction, which will impair their strength, balance, and range of motion. About 18% of people have trouble

with activities, have limited ability to work, and have a lower quality of life [3]. Therefore, measuring the quality of life is a relevant and important assessment in evaluating the physical, social, and emotional conditions resulting from suffering from OA.

The prevalence of OA in Indonesia reaches 5% at age <40 years, 30% at ages 40-60 years, and 65% at age >61 years [4]. Patients with OA at the Health Center in Surabaya District in March-April 2017 averaged 100 individuals over the last 3 months, with various ages ranging from adulthood to the elderly, residing either outside or within the city of Gresik. Based on preliminary studies, not all patients observed the recommendation to exercise at home.

Nonpharmacological therapies recommended include workout or knee training. Other forms of exercise include range-of-motion (ROM) exercises, strengthening exercises for the hamstrings and quadriceps, and cardiovascular workouts like swimming, cycling, and walking [5]. The goals of these exercises include boosting physical fitness, avoiding disability, strengthening joints, preventing injury by lowering joint stress, and improving joint function. These exercises are, of course, tailored to the conditions and capabilities of the patients [6]. Research by Thomas showed that a simple home-based exercise program can lead to significant pain reduction over two years. The program is suitable for primary care [7]. This study aimed to determine the effects of home-based exercise training on the quality of life of older adults with osteoarthritis.

RESEARCH METHODS

A quasi-experiment (one-group prepost test design) was the study design that was employed. This kind of study is characterized by the utilization of a single subject group to demonstrate cause-and-effect correlations. Prior to the intervention and following the intervention, the group of individuals was monitored [8]. The aim of this study was to analyze the impact of Home-Based Exercise Training on the quality of life of patients with osteoarthritis [9]. The dependent variable, the quality of life of patients with osteoarthritis, was measured using the Osteoarthritis of Knee and Hip Quality of Life questionnaire (OAKHQOL).

The sample size in this study is determined based on the inclusion and exclusion criteria established by the researchers during the data collection period, which is April-May 2024. The determination of respondents was conducted by reviewing existing patient data in Surabaya, as well as directly asking patients to confirm the data previously obtained. The

process of determining respondents was also assisted by community health workers to provide considerations regarding the families of patients who are cooperative for the research. Respondents are selected based on the following inclusion of these criteria. Patients who are willing to be respondents and Patients aged 45 to 64 years, they (Patient) must can read and write with minimum education of elementary school, and surely, they can mobilize by walking. Furthermore, there also some exclusion criteria; The Patients whose suffering from paralysis and mental disorders, The Clients with unstable heart and respiratory disorders. The patient with Uncontrolled hypertension (blood pressure > 160/90) was also one of the exclusion criteria. This research was conducted in the area of the Surabaya Subdistrict Health Center from, April to June 2024, as stated in the research Gantt chart. Research permission from the head of Surabaya Square Public Health Center was issued on March 31, 2024, with letter number 445/68/437.52.01/2024.

FINDINGS

Table 1. Impact of Home-Based Exercise Training on the Quality of Life of Elderly Patients with Osteoarthritis

Variable		N	Mean	SD	p
Quality of Life	Pre	26	62.69	16.65	0.0001
	Post	26	81.11	16.14	

Results of the Home-Based Exercise Training on Quality of Life of elderly patients with osteoarthritis for both the first measurement (pretest) and the second measurement (posttest). Table 1 shows the changes the quality of life between the pretest and posttest after receiving the Home-Based Exercise Training intervention. The results of the statistical test using the paired t-test yielded p=0.0001, concluding that there is a significant effect of home-based exercise training on the quality of life before and after the intervention. The pre-test measurement of the respondents quality of life was an average of 62.69 (SD 16.65), and the post-test measurement was an average of 81.11 (SD 16.14), showing an increase in the quality of life scores after the Home-Based Exercise Training intervention.

Table 2 shows the differences in quality based on the intensity of Home-Based Exercise Training (HBET) performed. The results of the one-way ANOVA test yielded a p=0.054 for quality of life, indicating no significant difference in quality of life based on the three groups of HBET intensity. The ANOVA test results (p=0.054) indicate no difference in the quality of life based on the intensity of HBET performed. However, the ANOVA test conducted on each subscale of quality of life showed significant differences in the Functional

Scale (p=0.025) and General Health Status (SKU) with p=0.037 result. This indicates that HBET performed does not affect the overall quality of life, but can influence the functional scale and general health status.

Table 2. Effect of Home-Based Exercise Training on Quality of Life Based on Exercise Intensity

	N	Mean	SD	N	a	SD	N	Mean	SD	p
Quality of life	5	6.00	12.86	12	19.83	11.07	9	23.55	13.30	0.054
SF	5	-	0.49	12	-	1.40	9	-	1.26	0.025
SKU	5	6.60	7.05	12	16.75	14.61	9	24.22	7.71	0.037
SG	5	-	12.56	12	-	15.68	9	-	12.64	0.069

SF: Functional Scale, SKU: General Health Status, SG: Symptom Scale

The research results show that in the pre-test data, 14 individuals (53.85%) had a quality of life in the moderate category before being given home-based exercise training, which was evaluated using the OA knee and hip QoL questionnaire (OAKHQOL). According to the researchers, patients diagnosed with osteoarthritis will be impacted their lives both psychologically, physically, and socially. The changes in conditions related to the disease are experienced differently by each patient. Therefore, this condition will affect the quality of life of osteoarthritis sufferers.

DISCUSSIONS

The results of the paired t-test statistical analysis used to see the effect of home-based exercise training on the quality of life during the pre-test and post-test show a p-value <0.0001, which means there is an effect of Home-Based Exercise Training on the quality of life of elderly patients with osteoarthritis [10,11]. The scoring principle of OA KNEE AND HIP QOL (OAKHQOL) indicates that a higher score on the scale reflects a higher level of quality of life. A high score on the functional scale indicates a higher level of health function, while a high score on the general health status indicates a high quality of life. However, a high score on the symptom scale indicates a higher level of problems or symptoms present [12-14]. With a scale range of 1-100, the meaning of the quality of life can be seen from the difference in the score changes; a score difference of 5-10 indicates a change.

Minor change, 10-20 means moderate change and ≥ 20 means significant change [15]. The results of the posttest measurement after the HBET were obtained, showing that most respondents were in the moderate quality of life category (84.6%). There were 3 respondents (15.38%) who remained in the poor quality of life category, and one respondent

even experienced a decrease in the quality of life score. Based on the results of the questionnaire using the OA knee and hip QoL (OAKHQOL), it was found that 12 patients (46.15%) experienced a significant change in quality of life after undergoing HBET. The ANOVA test results also showed a significant effect of HBET on functional status (p=0.025) and general health status (p=0.037). In this study, the Home-Based Exercise Training provided can be one of the recommended interventions to prevent the deterioration of health conditions in elderly patients with osteoarthritis [16,17]. It is expected to help improve the quality of life of patients during therapy and even after the therapy is completed. This improvement in the quality of life is also evident in the patients' ability to perform daily activities, which is consistent with the research stating that strength training can be recommended as a strategy to prevent injuries due to falls in patients with osteoarthritis [18-20].

The ANOVA test results in this study showed p=0.054, indicating that no significant difference in the life quality based on the three groups of HBET intensity performed. Research conducted in England stated that quality of life is a phenomenon that encompasses various aspects, not only physical but also psychological and social [16,17]. The findings of the study indicate that the exercises performed have varying impacts on each respondent's quality of life, although improvements were observed in both physical and psychological aspects. One of the studies also mentioned that the social aspect of respondents did not improve after completing the exercise sessions fully [20,21]. This occurred in exercises performed individually. The same results were found in this study, which likely refers to the exercises performed independently at home also having minimal social impact. Although there was an improvement in the general health status related to psychological aspects, the quality of life is a complex aspect, so all its aspects will be interconnected [16]. Home-based exercise training for various degenerative conditions requires more investigation.

CONCLUSION

Home-based exercise training can improve the life quality of elderly patients with osteoarthritis. Home-based exercise training can affect both physical and psychological aspects, which will enhance emotional and physical well-being, thereby improving the quality of life.

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