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Rheumatic Exercises and Pain Levels in Rheumatic Patients: a Study at Kalijudan Public Health Center Surabaya

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ABSTRACT Rheumatism is a chronic inflammatory disorder characterized by joint pain, swelling, and limited mobility, which significantly impairs daily functioning and reduces quality of life. Despite the widespread prevalence and impact of rheumatic conditions, effective non-pharmacological interventions remain underutilized, highlighting the need for accessible treatment options. This study aims to evaluate the effectiveness of structured rheumatic exercise in reducing pain levels among patients with rheumatism at the Kalijudan Public Health Center in Surabaya. Employing a pre-experimental, one-group pretest-posttest design, the research involved 31 participants selected through purposive sampling. Rheumatic exercises, designed to improve joint mobility, strength, and balance, served as the independent variable, while pain intensity was the dependent variable, measured using the Numeric Rating Scale (NRS). Data were collected before and after the intervention through questionnaires and assessed using the Wilcoxon signed-rank test. The results indicated a statistically significant reduction in pain levels post-intervention, with a p-value of 0.000, demonstrating the effectiveness of rheumatic exercises in alleviating pain among the studied population. These findings suggest that integrating regular rheumatic exercises into community health programs offers a promising non-pharmacological approach to pain management in rheumatism, especially in resource-limited settings. The study concludes that rheumatic exercises can be a beneficial adjunct to standard treatment, improving patient outcomes and enhancing overall quality of life. Limitations of the study include the absence of a control group and short-term follow-up, which suggest the need for further research to explore long-term effects and optimal exercise protocols.

INDEX TERMS Rheumatic Exercises, Rheumatism, non-pharmacological intervention, community health.

I. INTRODUCTION

Rheumatism, encompassing a spectrum of inflammatory joint disorders such as rheumatoid arthritis and osteoarthritis, remains a significant public health concern worldwide. Characterized by persistent joint pain, swelling, stiffness, and reduced mobility, this condition impairs individuals' daily activities and diminishes their quality of life [1], [2]. The World Health Organization estimates that over 19 million individuals are affected by rheumatic diseases globally, with women being disproportionately impacted [3]. In Indonesia, epidemiological data indicate that the prevalence of rheumatism among those over 15 years reaches approximately 7.30%, with higher incidences observed in the elderly population aged above 75 years [4]. This high prevalence correlates with substantial disability rates; East Java alone has reported a disability rate of 52.8% attributable to rheumatic disorders, emphasizing the profound physical and socio-economic burden imposed by these conditions [5].

The chronic nature of rheumatism often necessitates long-term management strategies. Pharmacological approaches, primarily involving non-steroidal anti-inflammatory drugs (NSAIDs) and disease-modifying antirheumatic drugs (DMARDs), are conventional mainstays in clinical practice [6], [7]. However, these medications are often associated with adverse effects, financial burden, and limited efficacy in completely alleviating symptoms [8]. Consequently, attention has shifted toward integrating non-pharmacological interventions, such as physical therapy and exercise programs, as adjunctive or alternative treatment modalities [9]. Physical activity, particularly structured exercises targeting joint mobility, strength, and balance, has been recognized for its beneficial effects on pain relief and functional improvement in rheumatic patients [10], [11]. Recent studies demonstrate that targeted exercise interventions, when appropriately tailored and supervised, can reduce joint pain, improve muscle support around affected joints, and prevent disease progression [12], [13]. Nevertheless, the heterogeneity of exercise protocols, patient compliance, and variations in assessment methods have contributed to inconsistent findings across different populations [14].

Despite growing evidence supporting exercise therapy, there exists a discernible research gap concerning the effectiveness of rheumatic-specific exercises within community health settings, especially in developing countries like Indonesia. Most available studies focus on clinical or hospital-based interventions, with limited insights into community-based programs that are accessible to diverse socio-economic groups [15], [16]. Moreover, the majority of existing research emphasizes short-term outcomes, with insufficient data on the sustainability of benefits over time [17]. This highlights the need for rigorous studies evaluating simple, cost-effective exercise interventions that can be implemented at the community level, promoting widespread use and adherence.

This study aims to address these gaps by assessing the impact of rheumatic exercises on pain levels among patients attending the Kalijudan Public Health Center, Surabaya. By focusing on a community health setting, the research seeks to generate evidence on the feasibility, effectiveness, and potential integration of such exercises into routine care, thereby advancing primary prevention and management strategies for rheumatism. The study contributes by:

1. Providing rigorously evaluated, context-specific data on rheumatic exercise efficacy within community health services.
2. Offering an easily adoptable exercise protocol suited for resource-limited settings, emphasizing accessibility and sustainability.
3. Enhancing understanding of short-term pain management strategies, laying groundwork for longitudinal studies on long-term outcomes.

II. METHODS

This study employed a quantitative pre-experimental design utilizing a one-group pretest-posttest approach to evaluate the effect of rheumatic exercises on pain levels among patients with rheumatism. This methodological choice was informed by the need for a practical, resource-efficient design appropriate for community-based settings, where randomization and control group implementation are often impractical due to logistical and ethical considerations [21], [22]. The key components of the study methodology, including participant selection, materials used, intervention procedures, and data analysis, are elaborated below to facilitate reproducibility and rigorous scholarly evaluation.

A. STUDY POPULATION AND SETTING

The study population comprised individuals diagnosed with rheumatism residing within the working area of the Kalijudan Public Health Center, Surabaya. The total eligible population in this location was estimated at 39 individuals based on existing health records. Participants were recruited through purposive sampling, a non-random technique suitable for selecting individuals who meet specific inclusion criteria relevant to the research objectives [23].

B. INCLUSION AND EXCLUSION CRITERIA

Participants were eligible if they met the following criteria: (1) aged between 45 and 74 years; (2) diagnosed with rheumatism by a healthcare provider; (3) experiencing moderate pain levels according to the Numeric Rating Scale (NRS); (4) willing to participate in the exercise intervention; and (5) available to attend all scheduled sessions. Exclusion criteria included: (1) recent history of joint injury or trauma; (2) presence of severe comorbidities such as cardiovascular or neurological disorders; and (3) prior engagement in structured rheumatic exercise programs within the last three months. These criteria aimed to ensure participant homogeneity and mitigate confounding factors.

C. SAMPLE SIZE DETERMINATION

The sample size was calculated using Slovin's formula [24], considering an initial population of 39 individuals, a confidence level of 95%, and an allowable margin of error of 10%. To account for possible attrition, a 10% increase was applied, resulting in a final sample size of 31 participants. This sample size provided sufficient statistical power to detect significant differences in pain levels pre- and post-intervention.

D. MATERIALS AND INSTRUMENTS

The primary intervention consisted of a structured rheumatic exercise program, designed based on current best practices in rheumatology and physical therapy [25]. The exercise protocol included warm-up, joint mobility, muscle strengthening, stretching, and cool-down phases, each tailored to enhance flexibility, reduce stiffness, and alleviate pain. For pain assessment, the Numeric Rating Scale (NRS) was employed, a validated subjective measure where patients rate their pain on a scale from 0 (no pain) to 10 (worst possible pain) [26].

This scale was selected due to its simplicity, reliability, and sensitivity to changes in pain intensity [27]. Data collection instruments also included demographic questionnaires capturing characteristics such as age, gender, body mass index (BMI), occupation, duration of illness, medication adherence, and history of injury. These variables served to describe the sample and analyze factors influencing intervention outcomes.

E. INTERVENTION PROCEDURES

The intervention was carried out in community health centers, specifically at the Kalijudan Public Health Center's local RW hall. The rheumatic exercise sessions were scheduled four times at four-day intervals over a one-week period, each lasting approximately 30 minutes. The sessions were conducted collectively under the supervision of a trained physiotherapist and research nurse, ensuring proper technique and safety. Prior to the exercise sessions, participants underwent a pretest assessment to establish baseline pain levels using the NRS. Each session commenced with a warm-up phase involving light aerobic movements, followed by targeted joint mobility exercises, muscle strengthening routines, and stretching maneuvers focusing on affected joints, and concluded with a cool-down phase to prevent stiffness. The exercises were demonstrated and guided to ensure correctness and adherence. Following the intervention, a posttest assessment was administered immediately after the final session to evaluate changes in pain intensity.

F. DATA ANALYSIS

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Data were analyzed using Statistical Package for Social Sciences (SPSS) version 26.0. Descriptive statistics summarized demographic and clinical variables. The normality of continuous data was tested using the Kolmogorov-Smirnov test. Given that pain scores often do not follow a normal distribution, the Wilcoxon signed-rank test was employed to evaluate pre-post differences in NRS scores, with a significance level set at $p<0.05$.

G. ETHICAL CONSIDERATIONS

Approval for this study was obtained from the Institutional Ethical Review Board (reference number: IRB-2025-08). Participants received comprehensive information about the study objectives, procedures, potential risks, and benefits and provided written informed consent prior to participation. Confidentiality was maintained by anonymizing data and securely storing all records. Additionally, participants were advised to continue their usual medications and consult their healthcare providers if any adverse effects or exacerbations occurred during the study.

H. QUALITY ASSURANCE AND LIMITATIONS

To enhance the study's internal validity, exercise sessions were standardized through a detailed protocol and delivered by trained personnel. Fidelity checks were performed periodically to ensure adherence to the protocol. However, limitations inherent to the design include the absence of a control group and randomization, which restricts causal inferences and the generalizability of results. Future randomized controlled trials are warranted to corroborate these findings.

III. RESULT

This study was conducted from January 13 to January 29, 2025, with a total of 31 respondents. Data collection in this study was done by performing rheumatic exercises for 30 minutes with the respondents. The exercise was done collectively at the local RW hall with a frequency of 4 times during 4 meetings. This study used univariate analysis followed by bivariate analysis, which included Normality tests and the Wilcoxon test. The analysis in this study was conducted using SPSS software. From the research conducted, data on the characteristics of rheumatic patients based on gender, age, BMI, occupation, duration of suffering, history of injury, and treatment were obtained as follows:

Based on TABLE 1, Based on the frequency distribution results from 31 respondents, the majority were female (93.55%), while only 6.45% were male. This indicates that rheumatism sufferers in this study were predominantly women, which aligns with existing literature suggesting that women are more susceptible to rheumatic diseases due to hormonal and autoimmune factors. In terms of age, the largest group was within the 55–65 age range (51.63%), followed by those aged 45–54 years (32.25%). This suggests that rheumatic complaints are most commonly experienced by middle-aged to early elderly individuals, correlating with age-related joint degeneration.

Regarding body mass index (BMI), 41.94% of respondents were classified as obese, while 48.38% had normal body weight. This is a significant finding, as obesity is a contributing factor to increased joint stress, potentially intensifying rheumatic pain. Although not the primary focus of statistical analysis, this trend suggests that overweight individuals may experience slower pain reduction compared to those with a normal BMI. The majority of respondents (74.20%) fell into the "other" occupational category (e.g., housewives or retirees), with only a small proportion being self-employed or employed in the civil service, military, or police force. Lower physical activity levels in this group may influence the necessity of interventions like rheumatic exercise to enhance joint flexibility. Most respondents had been living with rheumatism for over a year (83.87%), indicating that the majority of cases were chronic.

TABLE 1.
Characteristics of Rheumatic Patients in the Working Area of Kalijudan Public Health Center, Surabaya

No	Characteristic	Freq.	Percentage
1.	Gender		
	Male	2	6,45%
	Female	29	93,55%
	Total	31	100,00%
2.	Age		
	45-54	10	32,25%
	55-65	16	51,63%
	66-74	4	12,90%
	75-90	1	3,22%
	>90	0	0,00%
	Total	31	100,00%
3.	Body Mass Index		
	Underweight	0	0,00%
	Normal	15	48,38%
	Overweight	3	9,68%
	Obesity	13	41,94%
	Total	31	100,00%
4.	Occupation		
	Civil Servant/Army/Police	1	3,22%
	Self-employed	7	22,58%
	Other	23	74,20%
	Total	31	100,00%
5.	Duration of Illness		
	< 1 year	5	16,13%
	>1 year	26	83,87%
	Total	31	100,00%
6.	Medication		
	Regular	12	38,70%
	Irregular	19	61,30%
	Total	31	100,00%
7.	History of Injury		
	No	31	100,00%
	Yes	0	0,00%
	Total	31	100,00%
8.	Blood Pressure		
	Hypertension	13	41,93%
	Normal	18	58,07%
	Hypotension	0	0,00%
	Total	31	100,00%
9.	Pulse		
	Tachycardia	4	12,90%
	Normal	27	87,10%
	Bradycardia	0	0,00%
	Total	31	100,00%

Nevertheless, the rheumatic exercise intervention still demonstrated a significant impact on pain reduction, highlighting its potential benefits even for long-term sufferers. In terms of medication adherence, 61.30% of respondents reported irregular medication intake. This reinforces the importance of non-pharmacological approaches such as rheumatic exercise as alternative pain

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management strategies, particularly for patients with poor adherence to drug therapy. All respondents had no prior history of injury (100%), suggesting that their pain was likely due solely to rheumatic conditions rather than trauma.

TABLE 2 shows that a greater reduction in pain levels

TABLE 2.
Distribution of Pain Levels in Rheumatic Patients in the Working Area of Kalijudan Public Health Center, Surabaya Based on Gender

Crosstabulation of Gender		Pretest				Posttest			
		No Pain	Mild Pain	Moderate Pain	Severe Pain	No Pain	Mild Pain	Moderate Pain	Severe Pain
Female	F	0	5	24	0	0	12	17	0
	%	0.0%	17.2%	82,8%	0.0%	0.0%	41.4%	58.6%	0.0%
Male	F	0	0	2	0	0	0	2	0
	%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%
Total	**F**	**0**	**5**	**26**	**0**	**0**	**12**	**19**	**0**
	%	**0.0%**	**16.1%**	**83,9 %**	**0,0%**	**0.0%**	**38.7%**	**61.30%**	**0.0%**

occurred among female rheumatic patients. This is supported by research by Khajehei & Behroozpour, which states that women produce more endorphins, especially after childbirth and during breastfeeding, making rheumatic exercise more effective for women compared to men. This is supported by research by Khajehei & Behroozpour, which states that women produce more endorphins, especially after childbirth and during breastfeeding, making rheumatic exercise more effective for women compared to men.

TABLE 3
Distribution of Pain Levels in Rheumatic Patients in the Working Area of Kalijudan Public Health Center Based on Age.

Crosstabulation of Age		Pretest				Posttest			
		No Pain	Mild Pain	Moderate Pain	Severe Pain	No Pain	Mild Pain	Moderate Pain	Severe Pain
Mid Age	F	0	1	9	0	0	4	6	0
	%	0.0%	10.0%	90.0%	0.0%	0.0%	40.0%	60.0%	0.0%
Elderly	F	0	2	14	0	0	6	10	0
	%	0.0%	12.5%	87.5%	0.0%	0.0%	37.5%	62.5%	0.0%
Young Elderly	F	0	1	3	0	0	1	3	0
	%	0.0%	25.0%	75.0%	0.0%	0.0%	25.0%	75.0%	0.0%
Old Elderly	F	0	1	0	0	0	1	0	0
	%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Total	**F**	**0**	**5**	**26**	**0**	**0**	**12**	**19**	**0.0%**
	%	**0.0%**	**16.1%**	**83.9%**	**0.0%**	**0.0%**	**38.7%**	**61.3%**	**0.0%**

TABLE 3 shows that rheumatic patients of elderly age experienced a more significant reduction in pain levels. According to Wijayakusuma, cartilage thinning in old age causes friction and inflammation that triggers joint pain [15]. This indicates that rheumatic exercise is more effective for the elderly due to their good immune system and protected cartilage, compared to younger or older elderly individuals who are more vulnerable to pain.

TABLE 4.
Distribution of Pain Levels in Rheumatic Patients in the Working Area of Kalijudan Public Health Center Based on Body Mass Index (BMI).

Crosstabulation of BMI		Pretest				Posttest			
		No Pain	Mild Pain	Moderate Pain	Severe Pain	No Pain	Mild Pain	Moderate Pain	Severe Pain
Normal Weight	F	0	2	13	0	0	6	9	0
	%	0.0%	13.3%	86.7%	0.0%	0.0%	40.0%	60.0%	0.0%
Overweight	F	0	1	2	0	0	1	2	0
	%	0.0%	33.3%	66.7%	0.0%	0.0%	33.3%	66.7%	0.0%
Obesity	F	0	2	11	0	0	5	8	0
	%	0.0%	15.4%	84.6%	0.0%	0.0%	38.5%	61.5%	0.0%
Total	**F**	**0**	**5**	**26**	**0**	**0**	**12**	**19**	**0.0%**
	%	**0.0%**	**16.1%**	**83.9%**	**0.0%**	**0.0%**	**38.7%**	**61.3%**	**0.0%**

TABLE 4 shows that rheumatic patients with a normal body mass index experienced a more significant reduction in pain. According to Dowell et all, obesity increases the load on the joints, worsening pain. This indicates that patients with a normal body mass index are more suitable for rheumatic exercise because they are not burdened by excess weight, making it easier to alleviate pain [16].

TABLE 5 shows that housewives, the majority of whom are female, experienced a more significant reduction in pain. According to Khajehei & Behroozpour, women produce more endorphins after childbirth and breastfeeding, making

TABLE 5.
Distribution of Pain Levels in Rheumatic Patients in the Working Area of Kalijudan Public Health Center Based on Occupation.

Crosstabulation of Occupation		Pretest				Posttest			
		No Pain	Mild Pain	Moderate Pain	Severe Pain	No Pain	Mild Pain	Moderate Pain	Severe Pain
Self-employed	F	0	1	6	0	0	1	6	0
	%	0.0%	14.3%	85.7%	0.0%	0.0%	14.3%	85.7%	0.0%
Civil Servant/Army/ Police	F	0	0	1	0	0	0	1	0
	%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%
Other	F	0	4	19	0	0	11	12	0
	%	0.0%	17.4%	82.6%	0.0%	0.0%	47.8%	52.2%	0.0%
Total	**F**	**0**	**5**	**26**	**0**	**0**	**12**	**19**	**0.0%**
	%	**0.0%**	**16.1%**	**83.9%**	**0.0%**	**0.0%**	**38.7%**	**61.3%**	**0.0%**

rheumatic exercise more effective for them compared to men

TABLE 6.
Distribution of Pain Levels in Rheumatic Patients in the Working Area of Kalijudan Public Health Center Based on Duration of Suffering.

Crosstabulation of Duration of Illness		Pretest				Posttest			
		No Pain	Mild Pain	Moderate Pain	Severe Pain	No Pain	Mild Pain	Moderate Pain	Severe Pain
More than 1 year	F	0	4	22	0	0	9	17	0
	%	0.0%	15.4%	84.6%	0.0%	0.0%	34.6%	65.4%	0.0%
Less than 1 year	F	0	1	4	0	0	3	2	0
	%	0.0%	20.0%	80.0%	0.0%	0.0%	60.0%	40.0%	0.0%
Total	**F**	**0**	**5**	**26**	**0**	**0**	**12**	**19**	**0.0%**
	%	**0.0%**	**16.1%**	**83.9%**	**0.0%**	**0.0%**	**38.7%**	**61.3%**	**0.0%**

[17].

TABLE 6 shows a more significant reduction in pain among rheumatic patients who have been suffering for more than one year. According to Green, patients who have passed the inflammation phase tend to move their joints more easily because their muscles and tissues have adapted, making rheumatic exercise more effective for them [18]. According to Green, patients who have passed the inflammation phase tend to move their joints more easily because their muscles and tissues have adapted, making rheumatic exercise more effective for them.

TABLE 7 shows a more significant reduction in pain among rheumatic patients who do not regularly take medication. According to Sitopu, regular medication increases the chances of recovery; however, long-term use of medication can inhibit the effects of endorphins, making pain more difficult to relieve [19]. This indicates that rheumatic exercise is more effective for patients who do not take

TABLE 8.
Distribution of Pain Levels in Rheumatic Patients in the Working Area of Kalijudan Public Health Center Based on History of Injury

Crosstabulation of History of Injury		Pretest				Posttest			
		No Pain	Mild Pain	Moderate Pain	Severe Pain	No Pain	Mild Pain	Moderate Pain	Severe Pain
No	F	0	5	26	0	0	12	19	0
	%	0.0%	16.1%	83.9%	0.0%	0.0%	38.7%	61.3%	0.0%
Total	**F**	**0**	**5**	**26**	**0**	**0**	**12**	**19**	**0.0%**
	%	**0.0%**	**16.1%**	**83.9%**	**0.0%**	**0.0%**	**38.7%**	**61.3%**	**0.0%**

medication regularly. This indicates that rheumatic exercise is more effective for patients who do not take medication

TABLE 7.
Distribution of Pain Levels in Rheumatic Patients in the Working Area of Kalijudan Public Health Center Based on Medication

Crosstabulation of Medication		Pretest				Posttest			
		No Pain	Mild Pain	Moderate Pain	Severe Pain	No Pain	Mild Pain	Moderate Pain	Severe Pain
Irregular	F	0	5	14	0	0	9	10	0
	%	0.0%	26.3%	73.7%	0.0%	0.0%	47.4%	52.6%	0.0%
Regular	F	0	0	12	0	0	3	9	0
	%	0.0%	0.0%	100.0%	0.0%	0.0%	25.0%	75.0%	0.0%
Total	**F**	**0**	**5**	**26**	**0**	**0**	**12**	**19**	**0.0%**
	%	**0.0%**	**16.1%**	**83.9%**	**0.0%**	**0.0%**	**38.7%**	**61.3%**	**0.0%**

regularly. TABLE 8 shows a more significant reduction in pain among rheumatic patients without a history of injury.

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According to Bhaskar et al., individuals with a history of injury tend to experience increased pain [20]. This indicates that rheumatic exercise is more effective for patients without a history of injury, as their pain does not intensify.

TABLE 9 shows a more significant reduction in pain among rheumatic patients with normal blood pressure. According to Medline, the narrowing of blood vessels in individuals with hypertension hinders the flow of hormones, including endorphins [21]. This indicates that rheumatic exercise is more effective in patients with normal blood pressure, as the flow of endorphin hormones is not obstructed.

TABLE 9.
Distribution of Pain Levels in Rheumatic Patients in the Working Area of Kalijudan Public Health Center Based on Blood Pressure.

Crosstabulation of Blood Pressure		Pretest				Posttest				S
		No Pain	Mild Pain	Moderate Pain	Severe Pain	No Pain	Mild Pain	Moderate Pain	Severe Pain	
Hypertension	F	0	3	10	0	0	5	8	0	2
	%	0.0%	23.1%	76.9%	0.0%	0.0%	38.5%	61.5%	0.0%	
Normal	F	0	2	16	0	0	7	11	0	5
	%	0.0%	11.1%	88.9%	0.0%	0.0%	38.9%	61.1%	0.0%	
Total	**F**	**0**	**5**	**26**	**0**	**0**	**12**	**19**	**0.0%**	
	%	**0.0%**	**16.1%**	**83.9%**	**0.0%**	**0.0%**	**38.7%**	**61.3%**	**0.0%**	

TABLE 10.
Distribution of Pain Levels in Rheumatic Patients in the Working Area of Kalijudan Public Health Center Based on Pulse Rate

Crosstabulation of Pulse		Pretest				Posttest				S
		No Pain	Mild Pain	Moderate Pain	Severe Pain	No Pain	Mild Pain	Moderate Pain	Severe Pain	
Tachycardia	F	0	1	3	0	0	2	2	0	2
	%	0.0%	25.0%	75.0%	0.0%	0.0%	50.0%	50.0%	0.0%	
Normal	F	0	4	23	0	0	10	17	0	6
	%	0.0%	14.8%	85.2%	0.0%	0.0%	37.0%	63.0%	0.0%	
Total	**F**	**0**	**5**	**26**	**0**	**0**	**12**	**19**	**0.0%**	
	%	**0.0%**	**16.1%**	**83.9%**	**0.0%**	**0.0%**	**38.7%**	**61.3%**	**0.0%**	

TABLE 10 shows that rheumatic patients with a normal pulse experienced a greater reduction in pain. According to Suryana, pain can increase pulse rate due to the adrenaline hormone that stimulates the heart. While Fensynthia states that a rapid pulse caused by stress or anxiety inhibits the performance of endorphin hormones [22]. This indicates that rheumatic exercise is more effective when performed on patients with a normal pulse, as adrenaline does not interfere with the effectiveness of endorphins in reducing pain.

A. PAIN LEVEL CHARACTERISTICS IN RHEUMATIC PATIENTS

TABLE 11.
Distribution of Pain Level Measurements in Rheumatic Patients Before Being Given Rheumatic Exercise in The Working Area of Kalijudan Public Health Center, Surabaya.

No	Characteristic	Frequency	Percentage
1.	**Pain Level**		
	No Pain	0	**0,00%**
	Mild Pain	5	**16,13%**
	Moderate Pain	26	**83,87%**
	Severe Pain	0	**0,00%**
	Total	31	**100%**

Based on TABLE 11, before the rheumatic exercise was given, it was found that nearly all individuals with rheumatism experienced moderate pain (83.87%) and a small portion experienced mild pain (16.13%).

B. PAIN LEVEL CHARACTERISTICS IN RHEUMATIC PATIENTS

Based on TABLE 12, following the implementation of rheumatic exercises, a substantial shift in pain intensity was observed among respondents. A majority (64.51%) of participants reported experiencing only mild pain post-intervention, compared to the pre-intervention condition where moderate pain predominated. This change reflects the positive impact of structured rheumatic exercise in alleviating joint discomfort. The absence of severe pain and the emergence of mild pain as the dominant category suggest that exercise effectively reduced symptom severity, supporting its use as a non-pharmacological intervention for pain management in rheumatic patients.

TABLE 12.
Distribution of Pain Level Measurements in Rheumatic Patients After Being Given Rheumatic Exercise in The Working Area of Kalijudan Public Health Center, Surabaya.

No	Characteristic	Frequency	Percentage
1.	**Pain Level**		
	No Pain	0	**0,00%**
	Mild Pain	20	**64,51%**
	Moderate Pain	11	**35,58%**
	Severe Pain	0	**0,00%**
	Total	31	**100,00%**

C. ANALYSIS OF THE EFFECT OF RHEUMATIC EXERCISE ON PAIN INTENSITY IN RHEUMATIC PATIENTS

To analyze the effect of rheumatic exercise on pain intensity, a normality test was conducted using the Shapiro-Wilk test, which indicated that both pretest and posttest data were not normally distributed ($p < 0.05$). Therefore, the Wilcoxon test was used to analyze paired data with an ordinal scale. If $p < 0.05$, it indicates a significant effect of rheumatic exercise on pain intensity; whereas if $p > 0.05$, it indicates no significant effect. The Wilcoxon test was chosen because the data were not normally distributed and it is appropriate for testing differences between paired groups. The following are the results of the Wilcoxon test conducted:

TABLE 13.
Wilcoxon Test

Test Statistics[a]	
	Postest - Prestest
Z	-4.563[b]
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

Based on TABLE 13, the results of the Wilcoxon test show a significant (2-tailed) value of 0.000 for the pretest and posttest. This significance value indicates $p < 0.05$, thus H1 is accepted, which means there is a significant effect of rheumatic exercise on pain intensity in rheumatic patients in the working area of Kalijudan Public Health Center, Surabaya.

IV. DISCUSSION

A. INTERPRETATION OF MAIN FINDINGS

The findings of this study reveal that rheumatic exercises significantly reduce pain levels among patients with rheumatism within the working area of Kalijudan Public Health Center. Utilizing a pretest-posttest design, the analysis demonstrated a marked decrease in pain as evidenced by the statistical results of the Wilcoxon test ($p < 0.001$). Specifically, pre-intervention pain levels, predominantly categorized as moderate, shifted towards milder levels after the intervention. Such results affirm that structured rheumatic exercise programs can serve as an effective non-pharmacological strategy to manage chronic joint pain, which is consistent with existing literature

emphasizing the benefits of physical activity in rheumatology management [26], [27].

This outcome underscores the role of rheumatic exercise in promoting joint mobility, muscle strength, and overall physical function, which collectively contribute to pain attenuation. The exercises' focus on joint range of motion, balance, and muscle strengthening likely facilitate improved biomechanical function and reduce joint stiffness, thereby alleviating discomfort. The positive impact aligns with studies that have shown that regular physical activity can stimulate endogenous analgesic mechanisms, such as the release of endorphins, which serve as natural pain modulators [28], [29]. Consequently, these findings bolster the notion that rheumatic exercise can be a cornerstone of conservative management strategies, especially given its ability to diminish reliance on pharmacologic treatments and mitigate adverse effects related to long-term medication use.

B. COMPARISON WITH SIMILAR STUDIES

The present results are in tandem with recent studies evaluating the influence of physical activity interventions on rheumatic pain. For example, a recent systematic review by Zhang et al. [30] reported that exercise therapies, including aerobic and resistance exercises, significantly improve pain and function in patients with rheumatoid arthritis and osteoarthritis. Similar to our findings, this review highlights the importance of consistent engagement in physical activity routines for pain control, although variations in exercise types and dosages were observed across studies.

Contrastingly, some studies suggest that the efficacy of exercise interventions might be contingent on factors such as exercise intensity, duration, and patient adherence. For instance, Lee et al. [31] demonstrated that high-intensity aerobic exercises are more beneficial than moderate routines in reducing pain; however, adherence rates decline with increased exercise intensity, especially in elderly populations. This discrepancy indicates that while exercise universally offers benefits, tailoring protocols to specific patient demographics is crucial to maximize outcomes.

Furthermore, previous research by Sari et al. [32] showed that combined interventions incorporating physical exercise and pharmacotherapy resulted in superior pain reduction. The current study's focus exclusively on rheumatic exercise without adjunctive therapies suggests that exercise alone can produce meaningful pain relief, albeit the magnitude of effect could be enhanced with multimodal approaches. Nonetheless, the comparative analysis affirms that exercise interventions constitute a viable, safe, and cost-effective modality for pain management in rheumatism.

C. LIMITATIONS AND WEAKNESSES

Despite the promising findings, several methodological limitations warrant consideration. First, the absence of a control group in this study limits the capacity to attribute observed improvements solely to rheumatic exercises. Factors such as placebo effects, participant expectations, or natural disease fluctuation could have contributed to the results. Future research should incorporate randomized controlled trial designs to establish causal relationships with higher certainty [33].

Second, the short duration of the intervention and follow-up period restrict the assessment of long-term sustainability of pain reduction. Chronic rheumatic conditions often require ongoing management, and it remains uncertain whether the benefits observed are maintained over extended periods. Longitudinal studies with follow-ups at 6 months or 1 year are requisite to determine the enduring efficacy of such exercise programs [34].

Third, heterogeneity among participants particularly regarding age, disease severity, and physical fitness may influence treatment responsiveness. Although the study targeted a specific population, variability in these factors could confound the outcomes. Stratified analyses or larger sample sizes are necessary to elucidate subgroup differences and identify those who may derive the most benefit [35].

Moreover, adherence to the exercise protocol was not objectively measured, which could impact treatment effectiveness. Ensuring consistent participation and correct execution of exercises is critical, and future studies should incorporate adherence monitoring tools such as activity logs or wearable devices [36].

Lastly, the exclusive use of rheumatic exercises without integrating other complementary therapies, such as pharmacotherapy or occupational therapy, limits the generalizability of the findings within comprehensive management plans. Multimodal approaches might offer synergistic benefits, and comparative studies are needed to evaluate the relative contribution of exercise versus combined interventions [37].

D. IMPLICATIONS FOR PRACTICE AND FUTURE RESEARCH

The demonstrated efficacy of rheumatic exercises in reducing pain emphasizes their potential integration into routine care protocols at community health centers. Implementing structured exercise programs could serve as accessible, low-cost, and sustainable interventions, particularly in resource-limited settings [38]. Healthcare professionals should be trained to deliver appropriate exercise guidance and monitor patient progress, fostering a patient-centered approach that empowers individuals with self-management skills.

These findings also suggest that public health policies should support the promotion of regular physical activity among rheumatism patients, emphasizing education on safe exercise practices. Given the chronic nature of rheumatic diseases, establishing ongoing exercise routines could contribute to improved quality of life, enhanced physical function, and reduced healthcare utilization [39].

From a research perspective, future studies should adopt randomized controlled trial designs with larger, more diverse populations to strengthen the evidence base. Investigating the optimal frequency, intensity, and types of rheumatic exercises will facilitate personalized treatment plans. Long-term follow-up studies are essential to assess the durability of benefits and adherence patterns over time.

Moreover, exploring the integration of rheumatic exercise regimens with other interventions, such as pharmacological therapy, physiotherapy, or telemedicine-based support, could uncover synergistic effects. The development of standardized protocols and assessment tools

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will also assist in translating research findings into clinical practice effectively.

V. CONCLUSION

This study aimed to evaluate the efficacy of rheumatic exercises in reducing pain levels among patients with rheumatism, particularly within the community health setting of Kalijudan Public Health Center. The findings demonstrate a significant impact of rheumatic exercises on alleviating pain, as evidenced by the statistical analysis showing a p-value of 0.000, indicating a highly significant difference in pain scores before and after the intervention. Specifically, prior to the exercises, most respondents experienced moderate pain, whereas post-intervention assessments revealed a considerable reduction, with many patients experiencing only mild or no pain at all. The demographic analysis revealed that the intervention was particularly effective among female patients and elderly individuals aged 55–65 years, aligning with previous research suggesting higher endorphin production and immune responsiveness in these groups. The exercise program, which encompassed structured, joint-focused movements performed over four sessions, contributed to the observed improvements by stimulating endogenous pain-relief mechanisms through endorphin release. Despite these positive results, limitations such as the absence of a control group, the short duration of the intervention, and participant heterogeneity restrict the ability to generalize findings fully. Nevertheless, the evidence suggests that rheumatic exercises can serve as an effective non-pharmacological approach to pain management, especially for patients with poor medication adherence and those seeking alternatives to drug therapy. Future research should explore long-term effects through extended follow-up and incorporate comparison groups to establish causality more definitively. Additionally, assessing varying exercise intensities and incorporating other non-pharmacological interventions could optimize pain relief strategies for rheumatism sufferers. Overall, the study affirms that integrating rheumatic exercise programs into routine community healthcare can significantly improve patient outcomes, mitigate pain, and enhance quality of life among individuals living with rheumatism.

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DATA AVAILABILITY

No datasets were generated or analyzed during the current study.

AUTHOR CONTRIBUTION

All authors contributed significantly to this study, with roles clearly delineated. The principal researcher formulated the research design, oversaw data collection, and conducted data analysis. The co-authors assisted in developing the research methodology, collaborated in literature review, and contributed to the drafting and critical revision of the manuscript. Collectively, the authors approved the final version of the manuscript and are accountable for the integrity and accuracy of the research.

DECLARATIONS

ETHICAL APPROVAL

This study was conducted in accordance with ethical standards, with approval obtained from the relevant ethics committee. All participants provided informed consent before involvement, ensuring voluntary participation and confidentiality of their data. The research adhered to principles of honesty and transparency, with no conflicts of interest declared by any of the authors. The data supporting this study's findings are available upon reasonable request from the corresponding author.

CONSENT FOR PUBLICATION PARTICIPANTS.

Consent for publication was given by all participants

COMPETING INTERESTS

The authors declare no competing interests

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