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Effects of Callanetics Exercises on Mental Health Among Occupational Women in the Federal Capital Territory

***Ogunleye, O.R., & Waziri, B.K.**
National Open University of Nigeria, Abuja

***Corresponding author email**: oogunleye@noun.edu.ng

Abstract
The mental health of occupational women has become a critical concern, particularly in urban settings like the Federal Capital Territory, where work-related stress and societal expectations contribute to anxiety and depression. This study examines the effects of Callanetics exercises on the mental well-being of occupational women. A quasi-experimental design with a pre-test and post-test control group was employed, involving 100 participants divided into an experimental group and a control group. Mental health outcomes were assessed using the Generalized Anxiety Disorder-7 scale and the Beck Depression Inventory-II. The results indicate a significant reduction in anxiety symptoms ($F(1,97) = 37.31$, $p < .05$, $\eta^2 = 0.28$), suggesting that callanetics accounted for 28% of the observed variance in anxiety symptoms. Similarly, depression symptoms significantly decreased in the experimental group ($F(1,97) = 12.16$, $p < .05$, $\eta^2 = 0.11$), confirming the positive impact of callanetics on emotional well-being. Also, the interaction effect between treatment and age was statistically significant, $F(4, 89) = 2.65$, $p = .04$, $\eta^2 = .10$, which suggests that the effect of treatments differs across age categories. These findings support the integration of callanetics exercises into mental health interventions for occupational women, particularly in high-stress environments. Given its accessibility, minimal equipment requirements, and focus on mindfulness, Callanetics presents a non-pharmacological approach to improving psychological well-being. The study highlights the need for workplace and community-based exercise programmes to enhance mental health outcomes among working women. Future research should explore long-term adherence and potential adaptations for different populations.

Keywords: Depression, Anxiety, Low-impact Exercise, Exercise Intervention and Stress

Introduction

The pursuit of optimal mental health has become a critical concern in contemporary society, particularly for occupational women who juggle the dual burden of professional responsibilities and domestic obligations. Occupational stress, defined as the imbalance between job demands and available resources, has been strongly linked to a range of adverse mental health outcomes, including anxiety, depression, and burnout (World Health Organization, 2021). For women in urban environments like the Federal Capital Territory (FCT) of Nigeria, this stress is often intensified by societal norms that impose expectations of caregiving and emotional labor, regardless of their employment status (Ekwueme & Okoye, 2020). The rapid pace of urbanization and limited access to mental health support services further exacerbate their vulnerability, leaving many without adequate coping mechanisms. Moreover, the stigma surrounding mental health in Nigerian society discourages open discussions and help-seeking behaviours among women, allowing psychological distress to go unaddressed. These intersecting challenges require the urgent need for easily accessible mental health interventions tailored to occupational women to improve workforce productivity and foster healthier families and communities. Exercise training has been consistently highlighted as a vital tool for promoting mental health. More so, Ajayi et al. (2013) emphasize the positive effects of exercise on mental well-being by relieving tension and stress, boosting physical and mental energy, and enhancing well-being by

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releasing endorphins. Exercise improves mental health by reducing anxiety, depression, and negative mood and by improving self-esteem and cognitive function. Exercise has also been reported to alleviate symptoms such as low self-esteem and social withdrawal (Guszkowska, 2004). Exercise is especially important in patients with schizophrenia since these patients are already vulnerable to obesity and also because of the additional risk of weight gain associated with antipsychotic treatment, especially with the atypical antipsychotics. Among various forms of exercise, callanetics is a low-impact, high-intensity workout designed to improve flexibility, posture, and strength that has emerged as an effective intervention. Originating in the 1980s, callanetics exercises involve small, precise movements that target specific muscle groups, fostering a mind-body connection (Pinckney, 1984). Studies have shown that such exercises not only enhance physical fitness but also reduce symptoms of depression and anxiety by promoting the release of endorphins and improving overall body image (Ajala et al. 2020). This makes it particularly appealing for women who seek holistic approaches to mental health management.

The efficacy of callanetics exercises in alleviating mental health challenges has been supported by research in various contexts. For instance, a study by Johnson et al. (2018) revealed that regular participation in Callanetics significantly improved self-esteem and reduced perceived stress levels among female participants. Additionally, callanetics has been found to promote mindfulness, as its focus on controlled movements encourages participants to concentrate on the present moment, thereby mitigating the effects of ruminative thoughts (Brown & Ryan, 2003). Such findings are particularly relevant for occupational women in the FCT, who often grapple with the psychological strain of balancing work and family responsibilities. In Nigeria, the adoption of structured exercise regimens like callanetics remains limited, particularly among women in the workforce. Cultural barriers, time constraints, and limited awareness of the mental health benefits of exercise could have hindered the widespread implementation of such interventions (Andersson, et al., 2013). Additionally, research by Toriola and Monyeki (2024), highlighted time constraints and physical exertion as major perceived barriers to engaging in exercise. Yet, the growing prevalence of mental health disorders among occupational women necessitates innovative and culturally adaptable strategies to address these challenges. Callanetics offers a practical solution, as its low-impact nature makes it accessible to women of varying fitness levels and its minimal equipment requirements align with the resource constraints in many Nigerian settings. Furthermore, the urban lifestyle in the Federal Capital Territory exacerbates mental health challenges due to factors such as long commutes, high job demands and limited recreational spaces. These stressors disproportionately affect women, who often bear the dual burden of professional and domestic responsibilities (Adewuyi et al., 2020). Evidence from similar interventions in other countries highlights the potential of such programmes to enhance mental health outcomes and foster a supportive community among participants (Dunn et al., 2017). In light of the above, this study examined the effects of callanetics exercises on the mental health of occupational women in the Federal Capital Territory through the provision of empirical evidence to support its integration into health promotion strategies targeting women in the workforce.

Objectives of the Study

1. To examine the effect of Callanetics exercises on reducing anxiety symptoms among occupational women in the Federal Capital Territory.
2. To assess the impact of Callanetics exercises on the reduction of depressive symptoms among occupational women in the Federal Capital Territory.
3. To determine the overall effect of Callanetics exercises on the mental health status of occupational women in the Federal Capital Territory.

Hypotheses

1. There will be no significant effect in reducing anxiety symptoms among occupational women in the Federal Capital Territory after participating in Callanetics exercises.
2. There will be no significant effect in the decrease of depressive symptoms among occupational women in the Federal Capital Territory after participating in Callanetics exercises.
3. There will be no significant overall effect of Callanetics exercises on the mental health status of occupational women in the Federal Capital Territory.

Materials and Methods

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The data collection involved standardized and validated instruments to measure the selected variables. Anxiety was assessed using the Generalized Anxiety Disorder-7 (GAD-7) Scale and depression was measured with the Beck Depression Inventory-II (BDI-II). Also, Hana portable weight measuring scale (RA 9012) made in England was used to measure the weight of the participants in kilograms (kg), SECA 213 portable stadiometer height rod to measure their weights in meters (m) and blood pressure was measured using Omron Digital Blood Pressure Machine in mmHg. The Body Mass Index was determined using Weight in kg/Height in m2 and was recorded in kg/m2. This study adopted a quasi-experimental design utilizing a pre-test and post-test control group format. This design is appropriate for establishing cause-and-effect relationships between the independent variable (callanetics exercises) and the dependent variables, which include anxiety and depression. This structure allows for a comparison of mental health outcomes before and after the intervention to determine its effectiveness. The target population for this research consists of occupational women in the Federal Capital Territory, Nigeria. A purposive sampling technique was employed to select participants who meet specific inclusion criteria, such as women aged 30–54 years, actively employed in either the formal or informal sectors, and having no existing physical conditions that contraindicate exercise participation. A total of 100 participants were recruited, with 50 assigned to the experimental group (Callanetics exercise) and 50 to the control group (meditation training) to ensure adequate statistical power for meaningful analysis. The experimental group participated in a 12-week callanetics exercise programme, with sessions conducted three times per week, each lasting 45 minutes. The exercise sessions included a 5-minute warm-up involving light stretching, followed by 35 minutes of core callanetics exercises focusing on small, precise and repetitive movements designed to improve muscle tone and flexibility. Each session concluded with a 5-minute cool-down involving relaxation and breathing exercises. The sessions were supervised by fitness instructors to ensure proper technique and reduce the risk of injury. Meanwhile, the control group engages in a meditation training during the study period. Descriptive statistics such as means and standard deviations was used to summarize demographic data. Additionally, Analysis of Covariance (ANCOVA) was applied to control for any baseline differences between the groups at a 0.05 level of significance.

Results

Descriptive Statistics of Demographic Data

Table 1: Table Showing Characteristics of the Respondents

Characteristics	Descriptions	Experimental Group	Control Group
Age	30–34	12	10
	35–39	14	13
	40–44	10	11
	45–49	7	8
	50–54	7	8
Marital Status	Single	10	9
	Married	35	36
	Divorced	3	2
	Widowed	2	3
Total		50	50

Source: Authors own work

This section presents the findings of the demographic data of the Occupational Women in the Federal Capital Territory**.** Based on Table 1, both groups have a similar age distribution, with the highest concentration of participants between 30 and 34 years. The marital status distribution is comparable across both groups, with a majority being married.

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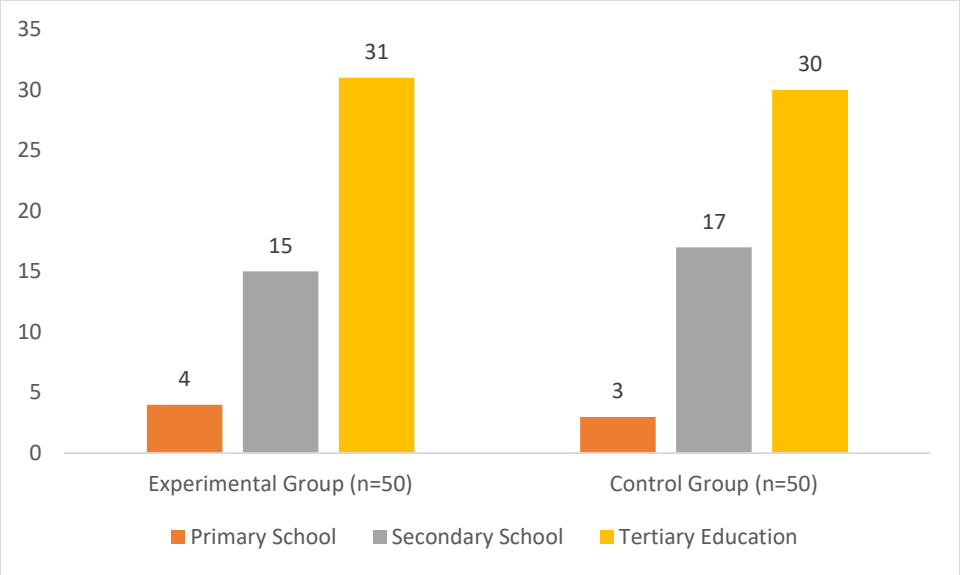
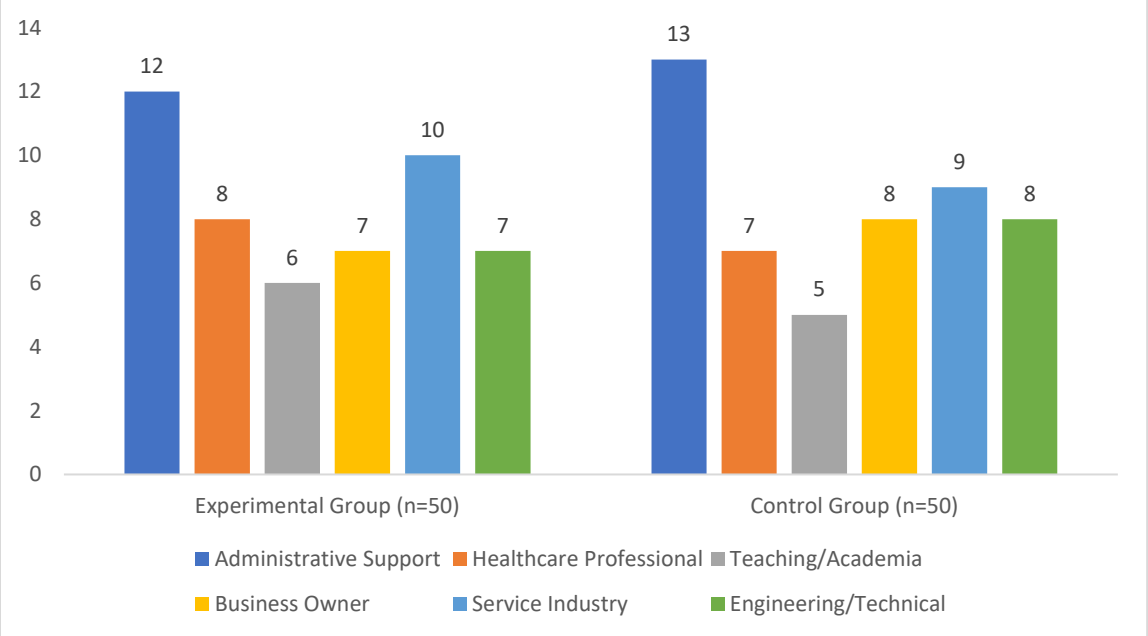


Source: Authors own work

Figure 1: Bar Chart of Participants' Level of Education

Figure 1 shows that the educational background of participants is largely similar across both groups, with the majority having tertiary education.



Source: Author's work

Figure 2: Bar Chart of Participants' Occupation

The figure 2 shows the occupational backgrounds of participants are also quite balanced across both groups, ensuring the diversity needed for generalizability.

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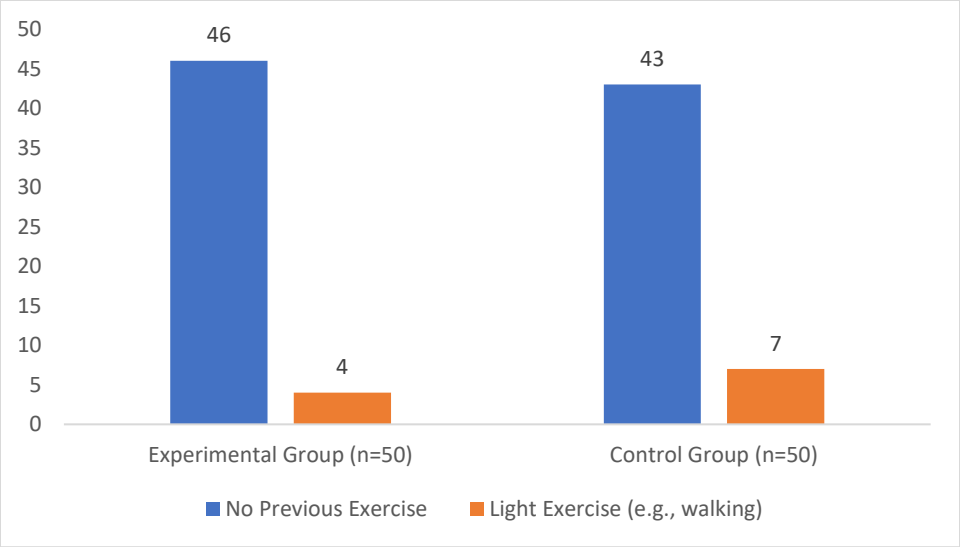
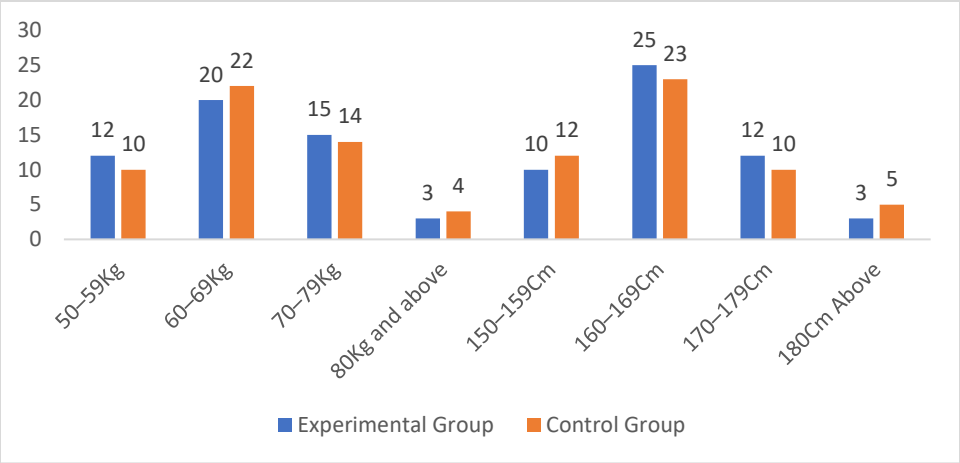


Source: Authors own work

Figure 3: Bar Chart of Previous Exercise Experience

Figure 3 shows that both groups have a similar exercise background, with most participants having little or no previous exercise experience prior to the study.



Source: Authors own work

Figure 4: Bar Chat Distribution of Respondents Body Weights and Heights

The bar chart in figure 4 presents a comparison between an Experimental Group and a Control Group based on two variables: weight categories (kg) and height categories (cm). For weight distributions, the 60–69kg category has the highest number of participants in both groups (Experimental: 20, Control: 22). The 80kg and above category has the lowest number of participants (Experimental: 3, Control: 4). For Height Distribution, the 160–169cm category has the highest number of participants (Experimental: 25, Control: 23) and for 180cm and above category, Experimental group had 3 respondents and Control had 5.

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Table 2. Descriptive Statistics of Body Mass Index (BMI) and Blood Pressure

Characteristics	Descriptions	Experimental Group	Control Group
BMI	Underweight (<18.5)	3	4
	Normal Weight (18.5–24.9)	25	24
	Overweight (25–29.9)	15	14
	Obese (≥30)	7	8
Blood Pressure	Hypotension (<90/60)	2	3
	Normal (90/60–119/79)	35	33
	Prehypertension (120/80–139/89)	10	11
	Hypertension (≥140/90)	3	3
Total		50	50

Source: Authors own work

Table 2 presents Body Mass Index (BMI) and Blood Pressure characteristics for both the experimental and control groups, each consisting of 50 participants. In the experimental group, three participants (6%) were underweight, 25 (50%) had normal weight, 15 (30%) were overweight, and seven (14%) were classified as obese. Similarly, in the control group, four participants (8%) were underweight, 24 (48%) had normal weight, 14 (28%) were overweight, and eight (16%) were obese. The distribution suggests a relatively similar BMI composition between the two groups, with slight variations in the number of participants in each category. Regarding blood pressure classification, the experimental group had two participants (4%) classified as having hypotension, 35 (70%) with normal blood pressure, 10 (20%) in the prehypertension category, and three (6%) diagnosed with hypertension. The control group showed a slightly different distribution, with three participants (6%) having hypotension, 33 (66%) with normal blood pressure, 11 (22%) in the prehypertension range, and three (6%) classified as hypertensive. These results indicate that the majority of participants in both groups had normal blood pressure, with a small percentage experiencing either hypotension or hypertension.

Hypothesis Testing

HO_1: There will be no significant effect in reducing anxiety symptoms among occupational women in the Federal Capital Territory after participating in Callanetics exercises.

Table 3. ANCOVA Summary of the Effect of Callanetics Exercises on Anxiety Symptoms

Source	Sum of Squares	Df	Mean Square	F	Sig	Partial η^2
Corrected Model	2698.76	2	1349.38	165.99	0.00	0.77
Intercept	88.47	1	88.47	10.89	0.00	0.10
Pre-Test (Covariate)	2395.1	1	2395.1	294.25	0.00	0.75
Group	303.66	1	303.66	37.31	0.00	0.28
Error	789.55	97	8.14			
Total	189204.3	100				
Corrected Total	3488.31	99				

Source: Author's work

The result in Table 3 shows that there was a significant main effect of treatments in reducing anxiety symptoms among occupational women in the Federal Capital Territory after participating in Callanetics exercises ($F(1,97)=37.31$, $P<.05$,

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η2=.28). Hence, the hypothesis is rejected. The partial eta square of .28 indicated that the treatments of callanetics training and control accounted for 28% of the observed variance on anxiety symptoms.

HO_2: There will be no significant effect in the decrease of depressive symptoms among occupational women in the Federal Capital Territory after participating in callanetics exercises.

Table 4. ANCOVA Summary of the Effect of Callanetics Exercises on Depressive Symptoms

Source	Sum of Squares	Df	Mean Square	F	Sig.	Partial η^2
Corrected Model	1892.64	2	946.32	48.12	0.00	0.50
Intercept	112.43	1	112.43	5.72	0.019	0.06
Pre-Test (Covariate)	1653.27	1	1653.27	84.01	0.00	0.46
Group	239.37	1	239.37	12.16	0.001	0.11
Error	1891.32	97	19.5			
Total	145763.8	100				
Corrected Total	3783.96	99				

Source: Author's work

The ANCOVA results in Table 4 reveal a statistically significant effect of callanetics exercises on depressive symptoms ($F(1,97) = 12.16$, $p < 0.05$, $\eta^2 = 0.11$). The effect size of 0.11 indicates that 11% of the variance in post-test depressive symptoms is attributable to the callanetics intervention, suggesting a moderate effect. Given the significant group effect ($p < 0.05$), the hypothesis is rejected, confirming that callanetics exercises significantly reduced depressive symptoms among occupational women in the Federal Capital Territory.

HO_3: There will be no significant effect in the decrease of depressive symptoms among occupational women in the Federal Capital Territory after participating in callanetics exercises.

Table 5: Two-Way ANCOVA Summary Table Showing the Interaction Effect of Treatment and Age on Depressive Symptoms

Source of Variation	Type III Sum of Squares	df	Mean Square	F	p-value	η^2
Covariate (Pre-test)	198.25	1	198.25	30.62	0.00	0.24
Treatment (Group)	85.42	1	85.42	13.20	0.00	0.12
Age Category	52.30	4	13.08	2.02	0.10	0.08
Treatment * Age (Interaction)	68.53	4	17.13	2.65	0.04	0.10
Error	609.31	89	6.84			
Corrected Total	1013.8	99				

Source: Author's work

Table 5 shows the interaction effect between treatment and age was statistically significant, $F(4, 89) = 2.65$, $p = .04$, $\eta^2 = .10$. This suggests that the effect of Callanetics exercises on depressive symptoms differed across age categories, with a moderate effect size.

Discussion

The findings from Table 3 align with existing literature on the effectiveness of exercise interventions, particularly low-impact fitness programmes such as callanetics, in reducing anxiety symptoms among occupational women. Research has consistently demonstrated that physical activity plays a crucial role in mental health by alleviating anxiety, stress, and depression. For instance, a meta-analysis by Stubbs et al. (2017) found that exercise interventions

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significantly reduce anxiety symptoms, with moderate to large effect sizes across various populations. This supports the observed significant main effect of callanetic exercises in this study. Furthermore, callanetics is a low-impact, isometric exercise programme known for its deep muscle engagement and relaxation benefits. These exercises enhance muscle control, flexibility, and breathing, which contribute to a reduction in stress-related physiological responses. The significant partial eta squared value ($\eta^2 = .28$) in this study further supports that callanetics contributed meaningfully to reducing anxiety symptoms, which is consistent with findings from prior research that emphasize the substantial impact of structured exercise programmes on mental well-being. Additionally, occupational women often experience high levels of anxiety due to workplace stress, work-life balance challenges, and social responsibilities.

The literature suggests that structured physical activity can serve as a coping mechanism to manage these stressors. For example, Rebar et al. (2015) confirm that regular physical activity, including low-impact exercises such as Callanetics, leads to improvements in anxiety and overall psychological well-being. The descriptive statistics further show that the pre-test scores indicate that both the experimental and control groups had similar baseline anxiety levels, confirming their initial equivalence. However, after the intervention, the experimental group that engaged in callanetics exercises exhibited a substantial reduction in anxiety symptoms ($M = 34.26$, $SD = 6.45$), whereas the control group showed only a slight decrease ($M = 46.73$, $SD = 7.21$). This notable difference in post-test scores suggests that treatment had a significant impact on reducing anxiety, highlighting their effectiveness as an intervention for anxiety management. Research has shown that exercise interventions significantly influence anxiety reduction by modulating physiological and psychological mechanisms associated with stress and emotional regulation. Studies such as those by Ensari et al. (2015); Abass and Ojo (2016) have demonstrated that even low-to-moderate-intensity exercises lead to significant reductions in anxiety symptoms. Callanetics, being a low-impact, isometric exercise, likely facilitated this reduction by promoting muscle relaxation, enhancing circulation and improving breathing patterns factors that contribute to overall stress relief. The substantial decrease in anxiety symptoms observed in the experimental group aligns with findings from Jayakody et al. (2014), which emphasize that mind-body exercises such as callanetics, yoga, and pilates are effective in managing anxiety due to their emphasis on controlled movement, flexibility, and mindfulness. Moreover, the initial similarity in pre-test scores between the experimental and control groups supports the validity of the study's findings, as it indicates that both groups started with comparable anxiety levels. The post-intervention results, however, demonstrate that the callanetics programme led to a meaningful improvement in anxiety symptoms, reinforcing the literature's assertion that structured physical activity can be an effective non-pharmacological intervention for anxiety management (Stubbs et al., 2017).

The ANCOVA results presented in Table 4 align with extensive research highlighting the beneficial effects of structured exercise interventions, particularly low-impact exercises like callanetics, in alleviating depressive symptoms. Numerous studies have demonstrated that physical activity plays a crucial role in reducing depression by influencing neurochemical, physiological, and psychological factors. Research by Schuch, et al. **(2018)** confirms that exercise interventions have a significant effect on depressive symptoms, with moderate-to-large effect sizes reported across various populations. The observed effect size of 0.11 in this study, indicating that 11% of the variance in depressive symptoms can be attributed to callanetics exercises, is consistent with previous findings suggesting that structured exercise has a moderate impact on mental health outcomes. Furthermore, **Craft and Perna (2004)** highlight that exercise-induced mood improvements are linked to increased endorphin production, enhanced serotonin levels, and better stress regulation, all of which contribute to reducing depressive symptoms. Additionally, callanetics, as a low-impact isometric exercise, incorporates slow, controlled movements and deep muscle engagement, which have been associated with psychological relaxation and stress reduction. **Dong et al. (2024)** suggest that mind-body exercises have positive effects on improving anxiety and depression in older adults. This supports the finding that callanetics significantly reduced depressive symptoms among occupational women in the study. The significance of the group effect ($p < 0.05$) further reinforces the conclusion that callanetics played a meaningful role in improving mental well-being. According to Rebar et al. (2015) structured physical activity can serve as an alternative or complementary treatment for depression, particularly in populations experiencing high levels of work-related stress. Occupational women often face multiple stressors, including work-life balance challenges, social responsibilities, and workplace pressures, all of which can contribute to depressive symptoms. The findings from Table 4 align with studies emphasizing that exercise interventions not only improve physical fitness but also contribute significantly to emotional resilience and mental health improvements.

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Furthermore, the descriptive statistics show that the pre-test scores indicate that both the experimental and control groups had similar baseline levels of depressive symptoms, confirming their initial equivalence. However, after the intervention, the experimental group that participated in callanetics exercises experienced a significant reduction in depressive symptoms, whereas the control group showed only a mild decrease. This substantial decline in the experimental group's post-test scores suggests that callanetics exercises were effective in alleviating depression symptoms among occupational women in the Federal Capital Territory. Several studies have demonstrated that age plays a moderating role in how individuals respond to exercise-based interventions aimed at reducing depression. For example, Paluska and Schwenk (2000) emphasized that the psychological benefits of physical activity, including reductions in depressive symptoms, are often more pronounced in middle-aged and older adults, who may face increased psychosocial stress and physiological vulnerability. This aligns with the finding in Table 5, where the effect of Callanetics exercises on depression varied by age. Also, Blumenthal et al. (2007) found that while exercise significantly reduced depressive symptoms across all age groups, the magnitude and sustainability of these effects differed, often influenced by age-related differences in motivation, neuroplasticity, and social support systems. Younger participants may engage in exercise for physical appearance or energy, while older adults may view it as a coping mechanism or therapeutic routine, affecting their psychological response.

Conclusion

In conclusion, the findings of this study confirm the effectiveness of callanetics exercises in improving mental health among occupational women. The significant reduction in anxiety symptoms among participants in the experimental group aligns with existing literature that highlights the therapeutic benefits of structured, low-impact physical activity in managing stress and anxiety. Similarly, the ANCOVA results revealed that callanetics exercises play a crucial role in reducing depressive symptoms, further reinforcing their value as an intervention for mental well-being. These results support the growing body of evidence advocating for exercise-based approaches to mental health management, particularly for women in high-stress occupational roles.

Recommendations

1. Health promotion campaigns in the FCT should incorporate Callanetics as a recommended physical activity, emphasizing its simplicity, accessibility, and mental health benefits for women balancing professional and domestic responsibilities.
2. Continuous research should be conducted to monitor the long-term mental health impacts of Callanetics among diverse groups of occupational women as it will help fine-tune programme design and policy intervention strategies.
3. Mental health practitioners should consider recommending Callanetics as a complementary non-pharmacological intervention for women experiencing work-related stress, anxiety, or mild depression

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