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Comparison of the Effect of Community-Based Group Aerobic Exercise vs Home-Based Tele-Exercise Program on Exercise Adherence, Functional Capacity, and Quality of Life in Over Weight Female Adults

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Abstract: ***Background: Overweight is a major public health concern that increases the risk of cardiovascular diseases, reduced functional capacity, and poor quality of life. Regular aerobic exercise is an effective physiotherapy intervention that improves cardiovascular fitness, physical function, and overall well-being. Community-based group exercise provides supervision, motivation, and social support, whereas home-based tele-exercise offers greater accessibility and flexibility through digital technology. However, evidence comparing the effectiveness of these two exercise approaches in overweight female adults remains limited. Therefore, this study investigates the effect of community-based group aerobic exercise versus home-based tele-exercise on exercise adherence, functional capacity, and quality of life in overweight female adults. Objectives: To compare the effect of community-based group aerobic exercise and home-based tele-exercise programs on exercise adherence, functional capacity, and quality of life in overweight female adults. Study Design: Randomized Experimental Comparative Study. Place And Duration Of Study: College of Physiotherapy, Sri Venkateswara Institute of Medical Sciences (SVIMS Hospital), Tirupati, over a period of 12 weeks. Methodology: The study is conducted on 30 overweight female adults aged 18–35 years with a BMI of 25–29 kg/m². Participants are randomly allocated into two groups: Community-Based Group Aerobic Exercise (n = 15) and Home-Based Tele-Exercise Program (n = 15). Baseline and post-intervention assessments are performed after 12 weeks using the Exercise Adherence Rating Scale (EARS), Six-Minute Walk Test (6MWT), and WHOQOL-BREF questionnaire to evaluate exercise adherence, functional capacity, and quality of life. Results: The findings of the study demonstrated that both the community-based group aerobic exercise program and the home-based tele-exercise program significantly improved exercise adherence, functional capacity, and quality of life in overweight female adults following the 12-week intervention ($p < 0.05$). However, participants in the community-based group exhibited significantly greater improvements than those in the home-based tele-exercise group. The community-based intervention resulted in higher exercise adherence scores, greater enhancement in six-minute walk distance, and superior quality of life outcomes, indicating that supervised group exercise provided additional clinical benefits beyond those achieved through remote exercise delivery. Conclusion: The present study concludes that both community-based group aerobic exercise and home-based tele-exercise programs are effective physiotherapy interventions for improving exercise adherence, functional capacity, and quality of life among overweight female adults. Nevertheless, the community-based group aerobic exercise program demonstrated significantly greater effectiveness across all outcome measures. The findings suggest that supervised, group-based rehabilitation enhances participant motivation, adherence, and functional improvement, making it a preferred rehabilitation strategy for overweight female adults. Home-based tele-exercise remains a practical and accessible alternative, particularly for individuals with limited access to supervised rehabilitation services.***

Keywords: Overweight female adults, Community-based aerobic exercise, Home-based tele-exercise, Telerehabilitation, Exercise adherence, Functional capacity, Quality of life, Six-Minute Wal Test (6MWT), WHOQOL-BREF.

1. Introduction

Overweight is a growing global health concern associated with physical inactivity and increased risks of cardiovascular and metabolic diseases. Excess body weight increases cardiac workload and respiratory effort, contributing to reduced aerobic capacity and early fatigue.[1,2] Aerobic exercise improves cardiovascular fitness, metabolic health, exercise tolerance, and quality of life.[3] However, exercise adherence is

often affected by motivational, occupational, and accessibility barriers.[4]

Community-based group aerobic exercise provides structured supervision and social support, whereas home-based tele-exercise offers flexible and accessible rehabilitation through digital platforms.[5,6] Although both approaches have potential benefits, their comparative effectiveness among overweight female adults remains insufficiently established.[7]

Exercise adherence, functional capacity, and quality of life are important rehabilitation outcomes, assessed using the Exercise Adherence Rating Scale (EARS), Six-Minute Walk Test (6MWT), and WHOQOL-BREF, respectively.[8]

Therefore, this study aims to compare the effects of Community-Based Group Aerobic Exercise and Home-Based Tele-Exercise on exercise adherence, functional capacity, and quality of life in overweight female adults[12].

Materials:

1) Paper
2) Pen
3) Pulse oximeter
4) Stopwatch
5) Cones
6) Measuring tape

2. Methodology

- **Study setting**: Sri Venkateswara Institute of Medical Sciences, SVIMS Hospital, Tirupathi.
- **Study design**: Experimental study.
- **Sample size**: 30
- Group A: Community-based -15
- Group B: Home-based tele exercise-15
- **Study Duration**: 6months
- **Sampling method**: Random sampling [lottery method]

Inclusion Criteria:

- Women aged 18-35 years
- BMI 25-29 kg/m² (Overweight category)
- Willing to participate for the full duration of the study - 12 weeks.
- Access to a smartphone/internet for tele exercise program.

Exclusion Criteria:

- Severe cardiovascular instability or uncontrolled hypertension
- Severe orthopedic or neurological limitations affecting mobility
- Cognitive impairment affecting ability to follow instructions
- Participants already enrolled in other structured exercise programs
- Lack of access to basic technology (for home based - tele aerobic exercise program group).
- low level physical activity [categorized according to IPAQ],
- Subjects diagnosed with polycystic ovarian disease [PCOD], or have any other thyroid disorders.

Study Procedure

- The study commences after obtaining permission from the Institutional Ethics Committee.
- The study procedure is explained to the subjects who fulfill the inclusion criteria, and written informed consent is obtained before participation.
- The baseline measurements of height, weight, BMI, exercise adherence using the Exercise Adherence Rating Scale (EARS), functional capacity using the Six-Minute Walk Test (6MWT), and quality of life using the World Health Organization Quality of Life–Brief Questionnaire (WHOQOL-BREF) are assessed at the beginning of the study and again after 12 weeks.
- Participants are randomly divided into two groups using the lottery method.
- **Group A:** Community-Based Group Aerobic Exercise Program.
- **Group B:** Home-Based Tele-Exercise Program.

Treatment Protocol:

Week	Community Based Exercise Program	Tele Exercise Program
WARMUP	Warm up [10minutes]- Marching on the spot, Arm circles Side steps, Dynamic stretches	Warm-Up (10 min) Guided video of warm-up routine Instructions via audio/video Marching on the spot, Arm circles Side steps, Dynamic stretches
1-4	Brisk walking in group (20 min) Low-impact step-ups using staircase or stairs Basic aerobic routines (e.g, knee lifts, toe touches)	Brisk walking in group (20 min) Low-impact step-ups using staircase or stairs Basic aerobic routines (e.g., knee lifts, toe touches (follow-along video)
5-8	Interval movements (e.g., 2 min brisk movements + 1 min rest Interval movements jacks in low-impact form) -style, low-impact)	Interval movements (e.g., 2 min brisk movements + 1 min rest) Increased walking pace or interval walking Bodyweight circuits (e.g., squats, lunges, jumping jacks in low-impact form) Aerobic group dance routines (Zumba-style, low-impact)
9-12	Moderate aerobic exercises (30min continuous)	Moderate continuous aerobic exercises 30min.
Cool Down	Cool down (5-10min) gentle stretching , diaphragmatic breathing exercises.	Cool down (5-10min) gentle stretching, diaphragmatic breathing exercises

Outcome Measures:

- Exercise adherence is assessed using the Exercise Adherence Rating Scale (EARS).
- Functional capacity is assessed using the Six-Minute Walk Test (6MWT).
- Quality of life is assessed using the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF).

3. Statistical Analysis

Data were analysed using IBM SPSS Statistics Version 20. Descriptive statistics, Shapiro–Wilk test, paired samples t-test, and independent samples t-test were used for statistical analysis. Microsoft Excel was used for tables and graphical representations.

1) Descriptive Statistics

Both groups consisted of 15 participants. Baseline characteristics, including age, height, weight, BMI, 6MWT, WHOQOL, and EARS scores, were comparable between groups. Following the intervention, both groups demonstrated improvements in body weight, BMI, functional exercise capacity, quality of life, and exercise adherence. Greater mean improvements were observed in the Community-Based Rehabilitation group.

2) Normality Test

The Shapiro–Wilk test demonstrated p-values greater than 0.05 for all baseline study variables in both groups, indicating normal distribution of the data. Therefore, parametric statistical tests were used for further analysis.

3) Intra-Group Analysis

Paired samples t-tests demonstrated statistically significant differences between pre-test and post-test values in both groups ($p = 0.000$).

In the Tele-Rehabilitation group, mean weight decreased from 67.59 ± 3.97 to 64.64 ± 3.05 kg, and BMI decreased from 26.67 ± 1.14 to 25.49 ± 0.68 kg/m². The 6MWT distance increased from 428.93 ± 13.86 to 489.00 ± 13.84 m. WHOQOL scores improved from 64.00 ± 2.67 to 75.67 ± 2.85, while EARS scores increased from 13.40 ± 0.99 to 19.33 ± 1.05.

Similarly, in the Community-Based Rehabilitation group, mean weight decreased from 69.57 ± 4.52 to 64.33 ± 3.80 kg, and BMI decreased from 27.33 ± 1.14 to 25.26 ± 0.81 kg/m². The 6MWT distance increased from 429.67 ± 12.91 to 555.00 ± 13.36 m. WHOQOL scores improved from 64.33 ± 2.58 to 87.00 ± 2.67, while EARS scores increased from 13.93 ± 1.28 to 23.13 ± 0.83.

4) Inter-Group Analysis

Independent samples t-tests revealed statistically significant differences in mean improvements between the two groups ($p = 0.000$).

The Community-Based Rehabilitation group demonstrated greater improvements than the Tele-Rehabilitation group in body weight reduction (5.24 vs. 2.95 kg; $t = 5.48$), BMI reduction (2.07 vs. 1.18 kg/m²; $t = 5.64$), 6MWT distance (125.33 vs. 60.00 m; $t = -103.71$), WHOQOL scores (22.67 vs. 11.67; $t = -61.74$), and EARS scores (9.20 vs. 5.93; $t = -15.50$).

Overall, both interventions demonstrated statistically significant improvements in all outcome measures. However, Community-Based Rehabilitation showed greater mean improvements compared to Tele-Rehabilitation.

4. Discussion

The present study compared the effectiveness of community-based group aerobic exercise and home-based tele-exercise programs on exercise adherence, functional capacity, and quality of life among overweight female adults over 12 weeks. Both groups demonstrated statistically significant improvements; however, the community-based group showed greater improvements across all outcome measures.

Exercise adherence, assessed using the Exercise Adherence Rating Scale (EARS), improved significantly in both groups ($p < 0.05$), with greater improvement in the community-based group. This may be attributed to direct physiotherapist supervision, structured sessions, peer interaction, and social motivation. These findings are supported by de Araújo Pio et al. (2019) and Ambrosetti et al. (2021), who highlighted the importance of professional supervision and behavioural support in improving rehabilitation adherence.

Functional capacity, measured using the Six-Minute Walk Test (6MWT), improved significantly in both groups, with a greater increase in the community-based group. Regular aerobic exercise enhances cardiovascular endurance, oxygen utilization, peripheral circulation, and muscular efficiency, thereby improving exercise tolerance. These findings are consistent with Keteyian et al. (2008) and Martin et al. (2013), who reported improvements in aerobic capacity and functional performance following structured rehabilitation.

Quality of life, assessed using the WHOQOL-BREF questionnaire, also improved significantly in both groups, with greater improvement in the community-based group. Supervised group exercise may enhance psychological well-being, confidence, motivation, and social interaction. Thomas et al. (2019) demonstrated the benefits of home-based cardiac rehabilitation on quality of life, while Scherrenberg et al. (2021) emphasized the accessibility and effectiveness of tele-rehabilitation alongside the behavioural benefits of supervised exercise.

Physiologically, regular aerobic exercise improves cardiovascular efficiency, mitochondrial density, endothelial function, and oxygen delivery to working muscles. It also contributes to reductions in body weight and BMI and improvements in metabolic function. Community-based exercise may further enhance these benefits through professional guidance, correct exercise technique, progressive training, and continuous monitoring.

Although tele-exercise produced significant improvements, its effectiveness may be influenced by limited direct supervision, home environment, internet connectivity, self-motivation, and participant compliance. Nevertheless, it remains a practical rehabilitation alternative for individuals facing transportation, geographical, occupational, or accessibility barriers.

Overall, both interventions were effective in improving exercise adherence, functional capacity, and quality of life among overweight female adults. However, the greater improvements observed in the community-based group suggest additional benefits from structured supervision, peer

support, and group motivation. Therefore, community-based group aerobic exercise may be considered an effective rehabilitation strategy, while home-based tele-exercise remains a valuable alternative for improving access to physiotherapy services.

5. Strength

This study compared the effectiveness of community-based group aerobic exercise and home-based tele-exercise in improving exercise adherence, functional capacity, and quality of life among overweight female adults. The randomized study design and the use of validated outcome measures (EARS, 6MWT, and WHOQOL-BREF) enhanced the reliability of the findings. The study also highlights the potential role of tele-exercise as an accessible rehabilitation option.

6. Limitations

The study had a small sample size and included only overweight females aged 18–35 years, limiting the generalizability of the findings. The intervention lasted only 12 weeks, with no long-term follow-up. In addition, dietary habits, lifestyle factors, and internet accessibility in the tele-exercise group were not fully controlled.

7. Future Recommendations

Future studies should include larger and more diverse populations with longer follow-up periods to evaluate long-term outcomes. Combining exercise with dietary interventions and using wearable or mobile health technologies may further improve adherence and rehabilitation outcomes. Multicenter studies are also recommended to strengthen the applicability of the findings.

8. Conclusion

The findings of the present study establish that structured aerobic exercise, whether delivered through Community-Based Group Aerobic Exercise or Home-Based Tele-Exercise, effectively enhances exercise adherence, functional capacity, and quality of life while reducing body weight and BMI in overweight female adults. Although both intervention models produce clinically and statistically significant improvements, Community-Based Group Aerobic Exercise consistently demonstrates superior outcomes across all assessed parameters.

The enhanced effectiveness of the community-based approach reflects the positive influence of supervised exercise sessions, individualized professional guidance, structured progression, and social support, all of which contribute to greater adherence and improved functional recovery. These findings reinforce the importance of supervised community-based rehabilitation in achieving optimal health outcomes and support its wider implementation in physiotherapy practice.

While Community-Based Group Aerobic Exercise represents the more effective rehabilitation model, Home-Based Tele-Exercise continues to provide a practical and evidence-based option for individuals with limited access to supervised services. Therefore, both interventions have an important role in rehabilitation; however, Community-Based Group Aerobic Exercise offers greater overall clinical benefit for improving body composition, functional performance, exercise adherence, and quality of life among overweight female adults.

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Why it fits: Very strong recent evidence for **aerobic exercise in adults with overweight/obesity**; 116 RCTs and 6880 participants, with 61% female. It supports the aerobic-exercise component of your study.

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Why it fits: This is the **original WHOQOL-BREF development paper** and should be cited because WHOQOL-BREF is one of your primary outcome measures. It established the four major domains: physical health, psychological health, social relationships and environment.