

The Effect of Non-Pharmacological (Home-Based
Exercise) Intervention on Psychological Distress of
Patients Undergoing Hemodialysis at Al Suwaiq Renal
Dialysis Center

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Background and Rationale

Patients undergoing hemodialysis experience multiple physical and psychological challenges, with depression and anxiety being highly prevalent. These psychological burdens negatively affect quality of life, treatment adherence, and long-term outcomes. While pharmacological treatments are commonly used, non-pharmacological interventions such as exercise have shown promising benefits in improving mental health.

However, structured facility-based exercise programs are often inaccessible to many dialysis patients due to physical, logistical, and economic limitations. Home-based exercise programs, which are low-cost and simple to implement, may represent a feasible alternative. This study aims to assess the effect of a home-based walking exercise program on reducing psychological distress among patients undergoing hemodialysis.

Study Aim and Objectives

Aim: To investigate the effectiveness of a non-pharmacological, home-based exercise program in reducing psychological distress, depression, and anxiety in patients undergoing hemodialysis.

Objectives:

1. To assess the baseline level of psychological distress among patients undergoing hemodialysis.
2. To evaluate the effectiveness of a home-based walking exercise program in reducing depression and anxiety scores compared to a control group receiving standard care.

Hypotheses

H1: There is a high level of psychological distress among patients undergoing dialysis treatment.

H2: Home-based exercise intervention significantly reduces psychological distress (depression and anxiety scores) compared to standard care.

Study Design

This research will be conducted in two main phases:

Phase I: Cross-sectional study to assess baseline levels of depression and anxiety using validated tools.

Phase II: Randomized controlled trial (RCT) with two groups:

- Intervention Group: Receives structured, home-based walking exercise program for 6 months.
- Control Group: Receives standard care without exercise intervention.

Post-intervention assessment will be conducted for both groups after 6 months using the same tools.

Study Population

Inclusion Criteria: Adults ≥ 18 years old; Diagnosis of ESRD on hemodialysis for ≥ 3 years; Stable clinical status; No diabetic foot complications; Able to walk without assistance.

Exclusion Criteria: Any acute or chronic condition limiting participation in exercise; Refusal to give informed consent.

Sample Size and Sampling Technique

Using Cochran's formula for finite populations, with a total population of 132, a 95% confidence interval, 5% margin of error, and an estimated prevalence of depression of 73%, the calculated sample size is 54 participants.

Sampling Method: Simple random sampling from the list of eligible patients at Al Suwaiq Renal Dialysis Center.

Intervention

Home-Based Exercise Program: Walking or cycling for 5–10 minutes once or multiple times daily; Gradually increasing duration by 3–5 minutes until reaching 30–60 minutes per session; Exercise 2–3 days per week initially, progressing to 4–7 days per week; Performed on non-dialysis days.

Data Collection Tools and Methods

Depression Assessment: PHQ-9 questionnaire (University of Michigan Depression Center).

Anxiety Assessment: GAD-7 questionnaire (University of Michigan Depression Center).

Data will be collected via face-to-face interviews and patient medical records from the Al Shifa system.

Data Analysis Plan

Data entry and cleaning using SPSS v22; Descriptive statistics for demographics and baseline variables; Baseline comparisons using t-tests or non-parametric equivalents; Paired t-tests for within-group changes; Independent t-tests for between-group differences; Significance set at $p < 0.05$ (two-tailed).

Ethical Considerations

Ethical approval will be obtained from the Institutional Research and Ethics Committee. Informed consent will be taken from all participants. Confidentiality will be maintained, and participants can withdraw anytime without affecting their treatment.

Expected Outcomes

The intervention group is expected to show a statistically significant reduction in depression and anxiety scores compared to the control group, supporting the integration of home-based exercise programs in dialysis care.