# Efficacy of Deep Breathing Exercise and Range of Motion Exercise on Depression, Anxiety and Stress in patients with Chronic Kidney Disease undergoing Hemodialysis.

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**KEYWORDS**

Deep Breathing Exercise, Range of Motion Exercise, Depression, Anxiety and Stress and Hemodialysis.

**ABSTRACT**

**Introduction:** Kidney failure is a significant health issue due to its serious health consequences, High mortality and morbidity rates, along with the ongoing requirement for intensive and frequent medical care, can be a heavy burden for patients and their families.

**Material and Methods:** Pre-test-post-test Control group design conducted on 116 samples and randomly allotted into two equal groups: the intervention group and the control group. Samples were selected based on the study's inclusion criteria. DASS-21 was utilised to assess Depression, Anxiety and Stress in samples from both groups. The pre-dialysis session interventional group received diaphragmatic breathing exercises three times per week for ten minutes each, for a total of six weeks. During dialysis treatments, range-of-motion exercises were performed three times a week for ten minutes each.

**Results:** Pre-test level of Depression, Anxiety and Stress mean and SD was 12.05±3.39 in intervention group and in control group mean and SD was 12.97±3.51. The t test value was 1.424 and p value was 0.1571 found no significant difference before intervention. In post-test Depression, Anxiety and Stress mean and SD was 10.39±3.91 in intervention group and in control group post-test mean was 13.62±3.24 and t test value was 4.833 found difference after intervention at the level of $p \leq 0.05$.

**Conclusion:** The research findings indicate that a regular deep breathing and range of motion exercise program significantly decrease the level of Depression, Anxiety and Stress in patients with CKD undergoing HD.

## Introduction

Kidney failure is a significant health issue due to its serious health consequences, High mortality and morbidity rates, along with the ongoing requirement for intensive and frequent medical care, can be a heavy burden for patients and their families. [1] The Global Burden of Disease (GBD) Chronic Kidney Disease (CKD) Collaboration reported that 9.1% of the world's population had CKD in 2017. Of those, 697.5 million were in China and India, accounting for one-third of the total. (132.3 million and 115.1 million, respectively) [2]

According to an Indian study, Depression was the most common mental health condition among CKD patients. [3] Major depressive disorder has been identified to Common most psychiatric problems in kidney failure patients getting Hemodialysis (HD). [4] Depression and anxiety are recognised as the most common end-stage renal disease-related psychological issues, with higher prevalence and incidence rates in this population than in the entire

population. [5] In India, 71% of CKD patients suffer anxiety, 69% have depression, and 86.5% have insomnia and linked with unemployment, low income, low education, urban residence, and the prevalence of co-morbidities. [6] Furthermore, multiple research demonstrated that sadness and anxiety are robust markers of suicidal thoughts. [7]

The HD patients rarely refer to treat their depression and other psychological illnesses, and health care personnel in therapeutic systems pay little attention to this issue. [8] Stress is widespread among CKD patients and the detrimental impacts of stress can put strain on people and have physical, behavioral, and psychological consequences such as anxiety, concern, mood changes, and medical ailments. Therefore, awareness of stress and its components is vital [9] Blumenthal et al. (2012) feel that workouts can be one of the techniques of treating depression in a different set of individuals. [10]

Regular practice of physical exercise promotes physical and mental health and increases the quality of life. [11] The application of exercise as a part of clinical care is extremely low. Hence, the present study was done to give further evidence for the benefit of Range of motion and breathing Exercise on depression, anxiety and stress of patients on HD.

**Material and Methods**

Patients with CKD undergoing HD therapy took part in a pre-test-post-test randomised trial design. The investigation was conducted at Krishna Hospital and Medical Research Centre in Karad, in their dialysis unit. A total of 116 adult samples were taken and randomly allotted into two groups: the intervention group and the control group. There are 58 samples in each group. After being briefed about the process, each sample provided consent. The institutional ethical committee approved the study. Samples were selected based on the study's inclusion criteria, which included receiving regular HD three times a week and understanding Hindi, Marathi, and English. Patients with hepatitis B, C, and HIV, as well as those with a history of uncontrolled hypertension, heart failure, heart block, cardiac arrhythmias, third degree AV heart block, suspected aneurysm, significant changes in resting ECG, major psychiatric problems, moderate or severe anaemia, musculoskeletal issues/limitations, heart rate of ≥ 100 beats/minute, hearing and communication problems, and severe uncontrolled diabetes, were not included in the study.

Socio-demographic data was collected, and the DASS-21 was utilised to assess Depression, Anxiety and Stress in samples from both groups. The pre-dialysis session diaphragmatic breathing exercises administered on interventional group for three times per week for ten minutes each, for a total of six weeks. During dialysis treatments, range-of-motion exercises were administered three times in week for ten minutes each. Routine hospital care received by control group.

**Results:**

**Description of Socio-demographic characteristics**

Data presented in table no.1 shows age wise distribution of samples majority 42(72.41%) were in interventional group and 46(79.31%) of the control group were within the age group of 41 – 65 years. Gender distribution of sample reveals that about 39(67.24%) of the interventional group and 38(65.52%) of the control group were male. As regards to Occupation 24 (41.38%) of the interventional group and 17(29.31%) of control group were unemployed

Majority of samples 52(89.66%) of interventional group and 48(82.76%) of Control group were married. In relation residence, it shows that the most 43(74.14%) in the interventional and 35(60.34%) in control group were belongs to the Rural area. Majority of samples 37(63.79%) in intervention group and 44(75.86) in control group had duration of HD 3 years and above.

**Table No. 1: Frequency and percentage distribution of samples according to their socio-demographic variables.**

**N=116**

| Sr.No. | Demographic Variables | | Intervention Group(58) | | Control Group (58) | |
|---|---|---|---|---|---|---|
| | | | F | % | F | % |
| 1 | Age(Years) | 18-40 years | 16 | 27.59 | 12 | 20.69 |
| | | 41-65 years | 42 | 72.41 | 46 | 79.31 |
| 2 | Gender | Male | 39 | 67.24 | 38 | 65.52 |
| | | Female | 19 | 32.76 | 20 | 34.48 |
| 4 | Occupation | Home maker | 18 | 31.03 | 18 | 31.03 |
| | | Employed | 13 | 22.41 | 19 | 32.76 |
| | | Unemployed | 24 | 41.38 | 17 | 29.31 |
| | | Retired | 3 | 5.17 | 4 | 6.90 |
| 5 | Marital Status | Married | 52 | 89.66 | 48 | 82.76 |
| | | Unmarried | 4 | 6.90 | 6 | 10.34 |
| | | Widow/Widower | 2 | 3.45 | 4 | 6.90 |
| | | Divorced | 0 | 0.00 | 0 | 0.00 |
| 6 | Residence | Urban | 15 | 25.86 | 23 | 39.66 |
| | | Rural | 43 | 74.14 | 35 | 60.34 |
| 7 | Duration Of Hemodialysis | Below 3 years | 21 | 36.21 | 14 | 24.14 |
| | | 3 years and above | 37 | 63.79 | 44 | 75.86 |

**Table No.2: Comparison of Pre-test and Post-test level of Depression, Anxiety and Stress in Interventional Group and Control Group**

**N=116**

| Sr. No. | DASS-21 Level | Intervention Group(58) | | Control Group(58) | |
|---|---|---|---|---|---|
| | | Pre-test | Post-test | Pre-test | Post-test |
| | | F (%) | F (%) | F (%) | F (%) |
| 1. | **Depression** | | | | |
| | Normal | 15(25.86) | 33(56.90) | 12(20.69) | 10(17.24) |
| | Mild | 32(55.17) | 17(29.31) | 26(44.83) | 25(43.10) |
| | Moderate | 10(17.24) | 8(13.79) | 19(32.76) | 22(37.93) |
| | Severe | 1(1.72) | 0(0.00) | 1(1.72) | 1(1.72) |
| 2. | **Anxiety** | | | | |
| | Normal | 7(12.07) | 15(25.86) | 4(6.90) | 0(0.00) |
| | Mild | 8(13.79) | 18(31.03) | 8(13.79) | 10(17.24) |
| | Moderate | 35(60.34) | 19(32.76) | 35(60.34) | 27(46.55) |
| | Severe | 6(10.34) | 6(10.34) | 10(17.24) | 13(22.41) |
| | Extremely Severe | 2(3.45) | 0(0.00) | 1(1.72) | 0(0.00) |
| 3. | **Stress** | | | | |
| | Normal | 50(86.21) | 52(89.66) | 47(81.03) | 42(72.41) |
| | Mild | 6(10.34) | 6(10.34) | 6(10.34) | 11(18.97) |
| | Moderate | 2(3.45) | 0(0.00) | 5(8.62) | 5(8.62) |

Data shows in table no.2 majority 32(55.17%) samples had mild depression, 35(60.34%) samples were having moderate anxiety level and 50(86.21%) samples were having normal level of stress in Interventional group. In post-test majority 33(56.90%) samples were having normal

level of depression, 19(32.76%) samples were having moderate anxiety level which is reduced in post-test and 52(89.66%) samples were having normal level of stress in Interventional group. In Control group table no.2 shows that in pre-test majority 26(44.83%) samples had mild depression, 35(60.34%) samples were having moderate anxiety level and 47(81.03%) has normal level of stress in Interventional group. In post-test majority 25(43.10%) samples has mild depression, 27(46.55%) samples has moderate anxiety level and 42(72.41%) samples has normal level of stress.

**Table No.3: Efficacy of Deep Breathing Exercise and Range of Motion Exercise on Depression, Anxiety and Stress**
**N=116**

| **Phases** | **Intervention Group** | | **Control Group** | | **Mean Difference** | **Unpaired t test value** | **p value** |
|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | | |
| Before Intervention | 12.05 | 3.39 | 12.97 | 3.51 | 0.91 | 1.424 | 0.1571 |
| After Intervention | 10.39 | 3.91 | 13.62 | 3.24 | 3.22 | 4.833 | <0.0001 |

Data shows in table no.3 pre-test level of Depression, Anxiety and Stress mean and SD was 12.05±3.39 in intervention group and in control group mean and SD was 12.97±3.51. The unpaired t test value was 1.424 and p value was 0.1571 found no significant difference in level of Depression, Anxiety and Stress between intervention group and control group before intervention. Whereas the post-test Depression, Anxiety and Stress mean and SD was 10.39±3.91 in intervention group and in control group post-test mean was 13.62±3.24 and unpaired t test value was 4.833 which found statistical significant difference in level of Depression, Anxiety and Stress between intervention group and control group after intervention at the level of $p < 0.05$.

**Discussion**

CKD patients have been observed to have higher levels of depression. Depression and anxiety worsen quality of life and raise morbidity and mortality rates. Non-pharmacological strategies that helps lower stress and anxiety and prevent depression is physical activity. Therefore study aimed to find efficacy of Deep Breathing and Range of Motion Exercise on Depression, Anxiety and Stress.

Current study results indicate that the majority of patients undergoing HD experienced mild depression in both the interventional and control groups. Additionally, both groups exhibited moderate levels of anxiety. Furthermore, both groups had normal stress levels.

Nagar K et al, reported in study that 50% had moderate symptoms of depression, anxiety, and stress, 30% had mild symptoms, and only 20% had severe symptoms of depression, anxiety, and stress, which were measured by the DASS self-rating scale.[12]

In another study of Suparti Set al[144] reported that that 29 (62.8%) respondents suffered from anxiety; mild (32.6%), moderate (25.6%), and severe category (4.7%). Furthermore, 16 respondents (37.2%) experience depression; mild (20.9%), moderate (40.0.6%), and severe (2.3%) categories. [13]

Present study results shows statistical significant difference in level of Depression, Anxiety and Stress between intervention group and control group after intervention. Therefore, Deep

Breathing Exercise and Range of Motion Exercise found effective to reduce the level of Depression, Anxiety and Stress in CKD patients undergoing HD.

Rezaei J et al study revealed that depression rates in the case and control groups were similar at the start of the investigation, there was a significant difference (P = 0.016) following the intervention. The case group's depression mean and SD at the start of the trial was 23.8 ± 9.29, but by the end, it had dropped to 11.07 ± 12.64 (P < 0.001). [14]

Santhi A el al conducted study on Effectiveness of physical activity on depression, anxiety, stress of patients on HD. Depression, anxiety and stress and improved quality of life in HD patients by regular exercise. Hence, study suggested performing more qualitative and quantitative studies in this area to support adoption of physical exercise in the routine care of HD patients. [15]

**Conclusion:**

The research findings indicate that a regular deep breathing and range of motion exercise program significantly decrease the level of Depression, Anxiety and Stress CKD patients undergoing HD. Addressing and evaluating Depression, Anxiety and Stress in HD patients is vital role of Nurses. Routine clinical assessments and early identification problems of Depression, Anxiety and Stress should be essential to the dialysis staff's responsibilities. Deep breathing and range of motion exercise has positive impact on decrease the level of Depression, Anxiety and Stress in HD patients.

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