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A QUASI- EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF AEROBIC EXERCISES ON FATIGUE AND ACTIVITIES OF DAILY LIVING AMONG PATIENTS UNDERGOING HEMODIALYSIS IN A SELECTED HOSPITAL AT PANIPAT, HARYANA

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Abstract

A Quasi-Experimental study to assess the effectiveness of aerobic exercises on fatigue and activities of daily living among patients undergoing hemodialysis in selected Hospital at Panipat, Haryana. Kidney is an important organ of our body. The primary function of kidney is to regulate the volume and composition of extracellular fluid (ECF) and excrete waste products from our body. Hemodialysis is a treatment to filter wastes and water from body's blood. Hemodialysis helps to control blood pressure and balance electrolytes, such as potassium, sodium and calcium in blood. The quasi-experimental pre-test post-test design was used in the present study which included 60 Hemodialysis patients from selected hospital of panipat, Haryana and selected by convenient sampling technique. Tool of study consists of Socio-Demographic Variable, Fatigue severity scale, Lawton instrumental activities of daily living (IADLs) and Katz activities of daily living (ADLs) was used for descriptive and inferential statistics. The overall effectiveness of the intervention strategies were established among the subjects who were under experimental group during the post assessment stage. The study finding portrays that the experimental group pre-test mean score of ADL was 0.57±1.04 and the post-test mean score was 5.37±0.61. The mean improvement score was 4.80. In the experimental group and the mean difference score was 4.47 between the experimental and control group. The calculated paired't' value of t = 22.165 was found to be statistically highly significant at p<0.001 level. The study findings revealed that interventional package given to the Hemodialysis patients helps to enhance the quality of life of Hemodialysis patients. This clearly indicates that aerobic exercises administered to patients undergoing hemodialysis was found to be effective and there was significant improvement in their post-test level of ADL in the experimental group whereas in the control group the calculated paired 't' value of t = 1.795 was not found to be statistically significant.

***Keywords**: Aerobic exercises, Fatigue, Activities of Daily living.*

INTRODUCTION

Kidneys are the most important excretory organs within the human body. Healthy kidneys are the sophisticated reprocessing machine that cleans the blood by removing salt and wastes from the body. Chronic kidney disease is based on the presence of kidney damage (i.e., albuminuria) or decreased kidney function (i.e. Glomerular filtration rate [GFR] <60 mL/min per 1·73 m^2) for 3 months or more, irrespective of clinical diagnosis. Findings from experimental and clinical studies have suggested an important role for protein urea in the pathogenesis of disease progression.[1]

When kidney functions goes below 10% to 15%, kidneys are no longer able to filter the blood and produce urine. Kidney dialysis or kidney transplant is the only way to remove the body's waste products. Hemodialysis is a treatment to filter wastes and water from body's blood. Hemodialysis helps to control blood pressure and balance electrolytes, such as potassium, sodium and calcium in blood. Hemodialysis is the most common renal replacement therapy, which is a process that replaces the excretory functions of the kidney through the use of a filter that contains a semi permeable membrane separating by a rinse solution from blood to filter out toxic substances from the blood. Patients receive the treatment during 3 to 5 hours per session. Hemodialysis treatment is administered in hospital, in outpatient department or at home after a training period and adaptation at home.[3] According to WHO (2013) said that approximately 80% of the world's renal replacement therapy (RRT) patients live in Europe, Japan or North America. By contrast, less than 10% of Indian ESRD patients receive RRT, while up to 70% of those starting dialysis die or stop treatment, due to cost, within the first 3 months.[4]

The people who undergo hemodialysis may develop anxiety, fatigue, stress, pain, electrolyte imbalance, infection require the health care professional to do symptoms management strategies which include dietary and nutritional management, exercise, stress reduction techniques to increase quality of life[5] .

The research study was conducted with the following objectives:-

1. To assess the fatigue and activities of daily living among hemodialysis patients in experimental and control group.
2. To correlate between the level of fatigue and activities of daily living among hemodialysis patient in experimental and control group.
3. To determine the effectiveness of aerobic exercises on fatigue and activities of daily living among hemodialysis patients in experimental and control group.
4. To associate the pre-test level of fatigue and activities of daily living with the selected demographic variables in experimental group.

MATERIALS AND METHODS

The research approach adopted in this study was Quantitative Research approach and research design was Quasi-experimental research design (one group pre-test and post-test design). The study conducted at LHDM & Dr. Prem Hospital and Civil Hospital, Panipat among 60 hemodialysis patients with age group of 35 – 65 years and were conveniently sampled. Tools comprised of: **Socio-demographic profile**, consisted of 10 items used to collect information about socio-demographic characteristics which comprised of study participant age, sex, education status, marital status, occupation, area of residence, duration of illness, genetic predisposition, years of hemodialysis and frequency of hemodialysis. The other tool consisted of structured questionnaire includes **Fatigue Severity Scale (FSS), Lawton – Brody Instrumental Activities of Daily Living (IADL) Scale, Katz Index of Independence in Activities of Daily Living (ADL) Scale** was used to assess the level of fatigue and ADLs. In order to measure the validity of tools, the content validity of tools will be obtained from 5 nursing and 2 medical experts and reliability of the tools will be assessed by test retest method and the tool was found to be reliable. The reliability of the tool was by test retest method found (r = 0.88), and the tool was considered as fit for proceeding with pilot study. Formal permission was obtained from the concerned authorities in the hospital and

informed written consent was obtained from the sample enrolled for the study. The pilot study will be conducted on 10% of total population. 6 patients will be selected for pilot study. 3 patients for experimental group and 3 patients for control group. The data collection done procedure done for 4 weeks in selected hospital of Panipat. The actual data collection was done in the month of May 2021. Introduction about investigator given to the samples. Based on inclusion criteria 60 samples will be collected for both experimental and control group. Samples collected through convenient sampling technique. After getting informed consent from each subject Pre-test will be conducted for both experimental and control group and from next day onwards Aerobic exercise explained and performed for two weeks in experimental group and after 15 days Post-test will be conducted by using Fatigue severity scale, Lawton Instrumental activities of daily living (IADLs), Katz Activities of daily living (ADLs) for both experimental and control group.

RESULT

SECTION B: ASSESSMENT OF PRE TEST AND POST TEST LEVEL OF ACTIVITIES OF DAILY LIVING (ADL), INSTRUMENTAL ACTIVITIES OF DAILY LIVING (IADL) AND SEVERITY OF FATIGUE AMONG PATIENTS UNDERGOING HEMODIALYSIS IN THE EXPERIMENTAL AND CONTROL GROUP.

Table 4.2: Frequency and percentage distribution of pre-test and post-test level of Activities of Daily Living (ADL) among the patients undergoing hemodialysis in the experimental and control group.

(n =60)

Group	Activities of Daily Living (ADL)	Fully Dependent (≤2)		Moderately Dependent (3-5)		Fully Independent Functional (6)	
		f.	%	f.	%	f.	%
Experimental Group	Pre test	29	96.67	01	3.33	00	00
	Post test	00	00	17	56.67	13	43.33
Control Group	Pre test	27	90.0	03	10.0	00	00
	Post test	26	86.67	04	13.33	00	00

Table 4.3: Frequency and percentage distribution of pre-test and post-test level of Instrumental Activities of Daily Living (IADL) among patients undergoing hemodialysis in the experimental and control group.

(n =60)

Group	Activities of Daily Living (ADL)	Fully Dependent (≤4)		Moderately Dependent (5-7)		Fully Independent Functional (8)	
		f.	%	f.	%	f.	%
Experimental Group	Pre test	29	96.67	01	3.33	00	00
	Post test	03	10.0	13	43.33	14	46.67
Control Group	Pre test	28	93.33	02	6.67	00	00
	Post test	27	90.0	03	10.0	00	00

Table 4.4: Frequency and percentage distribution of pre-test and post-test level of fatigue among patients undergoing hemodialysis in the experimental and control group.

(n =60)

Group	Fatigue	No Fatigue (<36)		Severe Fatigue (≥36)	
		f.	%	f.	%
Experimental Group	Pre test	00	00	30	100.0
	Post test	26	86.67	04	13.33

Control Group	Pre test	00	00	30	100.0
	Post test	02	6.67	28	93.33

SECTION C: EFFECTIVENESS OF AEROBIC EXERCISES AMONG PATIENTS UNDERGOING HEMODIALYSIS IN THE EXPERIMENTAL AND CONTROL GROUP.

Table 4.5: Comparison of pre-test and post-test level of Activities of Daily Living (ADL) among patients undergoing hemodialysis within the experimental and control group.

(n = 60)

ADL	Pre test		Post test		Mean Improvement Score	Paired 't' Test Value
	Mean	S.D.	Mean	S.D.		
Experimental Group	0.57	1.04	5.37	0.61	4.80	t = 22.165 p = 0.000 S***
Control Group	0.80	1.24	0.90	1.27	0.10	t = 1.795 p = 0.083 N.S

***p<0.001, S – Significant, N.S – Not Significant

Table4.6: Comparison of pre-test and post-test level of Activities of Daily Living (ADL) among patients undergoing hemodialysis between the experimental group and control group.

(n =60)

ADL	Pre test		Post test	
	Mean	S.D.	Mean	S.D.
Experimental Group	0.57	1.04	5.37	0.61
Control Group	0.80	1.24	0.90	1.27
Mean Difference Score	0.23		4.47	
Unpaired 't' Value	t = 0.789 p = 0.434 N.S		t = 17.349 p = 0.000 S***	

***p<0.001, S – Significant, N.S – Not Significant

Table 4.7: Comparison of pre-test and post-test level of Instrumental Activities of Daily Living (IADL) among patients undergoing hemodialysis within the experimental and control group.

(n = 60)

IADL	Pre test		Post test		Mean Improvement Score & %	Paired 't' Test Value
	Mean	S.D.	Mean	S.D.		
Experimental Group	0.97	1.32	6.87	1.52	5.90	t = 14.083 p = 0.000 S***
Control Group	1.07	1.51	1.23	1.63	0.16	t = 1.542 p = 0.134 N.S

***p<0.001, S – Significant, N.S – Not Significant

Table4.8: Comparison of pre-test and post-test level of Instrumental Activities of Daily Living (IADL) among patients undergoing hemodialysis in experimental group.

(n =60)

IADL	Pre test		Post test	
	Mean	S.D.	Mean	S.D.
Experimental Group	0.97	1.32	6.87	1.52
Control Group	1.07	1.51	1.23	1.63
Mean Difference Score & %	0.10		5.63	
Unpaired 't' Value	t = 0.273 p = 0.786 N.S		t = 13.807 p = 0.000 S***	

***p<0.001, S – Significant, N.S – Not Significant

Table4.9: Comparison of pre-test and post-test level of fatigue among patients undergoing hemodialysis within the experimental and control group.

(n = 60)

Fatigue	Pre test		Post test		Mean Improvement Score & %	Paired 't' Test Value
	Mean	S.D.	Mean	S.D.		
Experimental Group	58.03	3.66	15.27	9.50	42.77	t = 21.751 p = 0.000 S***
Control Group	58.47	3.69	57.30	6.72	1.17	t = 1.590 p = 0.123 N.S

***p<0.001, S – Significant, N.S – Not Significant

Table 4.10: Comparison of pre-test and post-test level of fatigue among patients undergoing hemodialysis between the experimental group.

(n =60)

Fatigue	Pre test		Post test	
	Mean	S.D.	Mean	S.D.
Experimental Group	58.03	3.66	15.27	9.50
Control Group	58.47	3.69	57.30	6.72
Mean Difference Score & %	0.44		42.03	
Unpaired 't' Value	t = 0.456 p = 0.650 N.S		t = 19.787 p = 0.000 S***	

***p<0.001, S – Significant, N.S – Not Significant

SECTION D: RELATIONSHIP BETWEEN POST TEST ACTIVITIES OF DAILY LIVING, INSTRUMENTAL ACTIVITIES OF DAILY LIVING AND FATIGUE SCORES AMONG PATIENTS UNDEROGING HEMODIALYSIS IN THE EXPERIMENTAL AND CONTROL GROUP.

Table 4.11: Correlation between post-test activities of daily living, IADL and fatigue scores among patients undergoing hemodialysis in the experimental and control group.

(n= 30)

Group	Variables	Post Test		'r' Value
		Mean	S.D	
Experimental Group	ADL	5.37	0.61	r = 0.501

	Fatigue	15.27	9.50	p = 0.005 S**
	IADL	6.87	1.52	r = 0.686 p = 0.000 S**
	Fatigue	15.27	9.50	
Control Group	ADL	0.90	1.27	r = 0.133 p = 0.483 N.S
	Fatigue	57.30	6.72	
	IADL	1.23	1.63	r = 0.148 p = 0.435 N.S
	Fatigue	57.30	6.72	

****p<0.01, S – Significant, N.S – Not Significant**

DISCUSSION

The main aim of the study was to assess the effectiveness of aerobic exercises on level of fatigue and ADLs among patients undergoing hemodialysis at selected hospitals, Panipat.

MAJOR FINDINGS OF THE STUDY AND DISCUSSION

Majority of the samples were in the age group of 46 – 55 years(40%), male were more affected than females 17(56.67%), in that 23(76.67%) were married, 12(40%) were graduates, 16(60%) were homemakers, 18(60%) were from urban area, 15(50%) were suffering from illness for ±6 month and 1 – 5 years respectively, 23(76.67%) had no family history of CKD, 21(70%) were undergoing hemodialysis for <6 months and 25(83.33%) were undergoing hemodialysis twice in a week.

The analysis of ADLs in the experimental group, 29(96.67%) were fully dependent and only one (3.33%) was moderately dependent in the pre-test, whereas in the post test, 17(56.67%) were moderately dependent and 13(43.33%) were fully independent. In the control group, in the pre-test 27(93.33%) were fully dependent and only 3(6.67%) were moderately dependent whereas in the post test, 26(86.67%) were fully dependent and only 4(13.33%) were moderately dependent.
The analysis of FSS in the experimental group, almost all 30(100%) had fatigue in the pre-test whereas in the post test, 26(86.67%) had no fatigue and only 4(13.33%) had fatigue. In the control group, in the pre-test almost all 30(100%) had fatigue and in the post test, 28(93.33%) had fatigue and only 2(6.67%) had no fatigue.

The study findings clearly indicates that the aerobic exercises on Activities of daily living was found to be effective in improving the level of ADL among patients undergoing hemodialysis in the experimental group than the patients in the control group.

CONCLUSION

The present study assessed the effectiveness of Fatigue and ADLs is one of the most common side effects of Hemodialysis, it adversely affects the course of hemodialysis and the patient's quality of life as well. This study highlighted the effectiveness of aerobic exercises in reducing fatigue and ADLs among hemodialysis patients, and thereby improves the quality of life. As aerobic exercises can be done easily, patient can be effectively of these exercises. Nurses can promote the use of these aerobic exercises, thus promoting the patients quality of the life and prognosis of the disease.

Study finding showed that aerobic exercise is a more effective in reducing the level of fatigue and increases the ADLs among patient undergoing hemodialysis is a non – pharmacological, cost effective and simple approach in preventing fatigue and ADLs.

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