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EFFECTIVENESS OF INTRADIALYTIC LOW INTENSITY STRENGTH TRAINING TO INCREASE FUNCTIONAL CAPACITY AMONG PATIENTS UNDERGOING HAEMODIALYSIS

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Abstract: The aim of the study was to assess the effectiveness of Intradialytic, low intensity strength training to increase functional capacity among haemodialysis patient in dialysis unit at selected hospitals of Indore, in year 2011- 2012. Quasi experimental non-equivalent pre-test post-test control group design with experimental approach was used to evaluate effectiveness of low intensity strength training. Dialysis patients n=60 (experimental group=30, control group=30) were included in the study based on purposive sampling technique. A standardized tool 'Short physical performance battery'. & modified 'Physical activity' tool to assess functional capacity and low intensity strength training to improve functional capacity. The study reveals that low intensity strength training in intradialytic was highly effective to increase functional capacity of dialysis patients and there was a significant increase in post test score in experimental group.

Key words: Low intensity strength training, haemodialysis patients; Short physical performance battery; Physical activity

INTRODUCTION

Chronic kidney disease (CKD) is a worldwide public health problem. It is recognized as a common condition that is associated with an increased risk of cardiovascular disease and chronic renal failure (CRF). In the United States, there is a rising incidence and prevalence of kidney failure, with poor outcomes and high cost (S.K. Agarwal, R.K. Srinivas 2009)[19].

The incidence of chronic renal failure has increased by almost 8% per year for the past 5 years. In the United States, more than 2, 80,000 patients with chronic renal failure (65%) are receiving haemodialysis and more than 1, 20, 000 (28%) are undergoing renal transplantation. The incidence of kidney diseases is very high in India. There are almost 1.5 lakh new cases with end stage kidney failure, which require dialysis and transplantations. Chronic kidney disease is a worldwide public health problem, a social calamity and an economic catastrophe. In the year 2000, in the United States alone, about 30 million people were diagnosed with chronic kidney disease (Lacson E *et al.,* 2009)[11].

Thus in extensive review of literature, the investigator came across many studies that reflected fatigue as a debilitating symptom or side effect experienced by many patients on long-term dialysis. So during the clinical practice the investigator had experienced that there is an emergent need to grab this problem and thus aimed to assess the effectiveness of Intradialytic low intensity strength training to increase functional capacity among haemodialysis patients. Literature related to incidence of chronic renal failure patients undergoing haemodialysis, literature related to fatigue among haemodialysis patients and literature related to effectiveness of exercise during dialysis. Conceptual framework is based on modified Orem's self care deficit theory developed by the Dorothea Elizabeth Orem on 1971.

MATERIALS AND METHODS

Research design

Quasi experimental non-equivalent pre-test, post-test, control group design.

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Population

Haemodialysis patient who are receiving haemodialysis.

Sampling technique

Purposive Sampling

Sample size

Sample consisted of 60 men and women (patients) undergoing haemodialysis and who fulfilled the inclusion criteria.

Setting

Choithram Hospital and Research Centre, Indore

Inclusion Criteria

- Haemodialysis patients, who are undergoing haemodialysis in CH&RC, Indore district.
- Haemodialysis patients who are willing to participate in the study.
- Patients who are able to understand and read Hindi and English.

Exclusion Criteria

- Patients with uncontrolled hypertension and B.P ≥ 160/100 mmHg.
- Pregnant ladies undergoing haemodialysis.
- Patients with limbs deformity.

Section I:
Part-1: Socio-demographic variables
Part-2: Multidimensional assessment of fatigue

Section II: Effectiveness of low intensity strength training to reduced fatigue in haemodialysis patients.

Section III: Effectiveness of low intensity strength training to improve functional capacity patients who are undergoing haemodialysis

RESULTS AND DISCUSSION

Section I: Part-1: Socio-demographic variables

Table 1: Frequency and percentage distribution of socio-demographic variables of control group, experimental group.

Socio-demographic Variables	Control group		Experimental group	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Age in years				
• 20-40	13	43.33	13	43.33
• 41-60	14	46.67	14	46.67
• 61-80	3	10	3	10
Gender				
• Male	21	70	27	90
• Female	9	30	3	10
Religion				
• Hindu	25	83.33	24	80
• Muslim	05	16.67	02	6.67
• Christian	00	00	00	00
• Other	00	00	04	13.33
Educational status				
• Illiterate	03	10	04	13.33
• Middle school	04	13.33	06	20
• Higher secondary	09	30	12	40
• Graduate and above	14	46.67	8	26.67
Occupation				
• Govt. job	12	40	8	26.67
• Business	6	20	7	23.33
• Self-employee	9	30	13	43.33
• Unemployed	3	10	2	6.67
Monthly income (in Rs.)				
• <10,000	6	17	3	10
• 10,000-20,000	9	33	11	36.67
• 20,000-30,000	13	43	15	50
• >30,000	2	7	1	3.33

Section I: Part-2: Multidimensional assessment of fatigue

Table 2: Frequency and percentage distribution of Multidimensional assessment of fatigue of control group & experimental group.

Multidimensional assessment of fatigue (MAF)scale	Control group		Experimental group	
	Pre-test Score (%)	Post-test Score (%)	Pre-test Score (%)	Post-test Score (%)
1. Extreme fatigue	0	0	0	0
2. Severe fatigue	0	0	6.67	0
3. Moderate fatigue	76.67	86.67	76.67	0
4. Less fatigue	23.33	13.33	16.16	90
5. Very less fatigue	0	0	0	10

Section II: Effectiveness of low intensity strength training to reduced fatigue in haemodialysis patients. SPPB

Table 3: Mean, mean difference, SD, SE, degree of freedom, t-value of pre-test and post-test of experimental group

Test	Mean	Difference	SD	SE	D_f	"t" value
PRE-TEST	6.4667	3.26667	1.31131	.23941	29	13.645 (S)****
POST-TEST	9.7333					

Section II (CONT….)

Table 4: Mean, difference, SD, SE, degree of freedom, t-value among Control and Experimental group

TEST	MEAN	DIFFERENCE	SD	SE	D_f	"t" value
Experimental Group	9.733	1.80	1.048	.208	58	8.643 (S)***
Control Group	7.933		.449			

Section III: Effectiveness of low intensity strength training to improve functional capacity patients who are undergoing haemodialysis (Physical Activity)

1. In mean difference of ROLE LIMITATION DUE TO PHYSICAL HEALTH 34.94 and pre-test standard deviation value is 83.39 and post-test standard deviation 93.21 in experimental group
2. In mean difference of ROLE LIMITATION DUE TO PHYSICAL HEALTH 151.67 and standard deviation 93.21 (experimental group), 55.60 (control group) in between post –test of experimental group and control group.
3. In mean difference of ROLE LIMITATION DUE EMOTIONAL PROBLEM 203.31 and standard deviation 93.52 (pre-test), 81.93 (post-test) in experimental group.
4. In mean difference of ROLE LIMITATION DUE EMOTIONAL PROBLEM 166.67 and standard deviation 81.93 (experimental group), 71.43 (control group) in between post-test of experimental group and control group.
5. In mean difference of PAIN 125.83 and standard deviation 39.11 (pre-test), 15.54 (post-test) in experimental group.
6. In mean difference of PAIN 121.67 and standard deviation 15.54 (experimental group), 26.86 (control group) in between post-test of experimental and control group.
7. In mean difference of GENERAL HEALTH 98.33 and standard deviation 52 (pre-test), 45.2 (post-test) in experimental group.
8. In mean difference of GENERAL HEALTH 85 and standard deviation 45.2 (experimental group), 51.10 (control group) in between post-test of experimental and control group.
9. In mean difference of SOCIAL FUNCTIONING 43.3 and standard deviation 17.95 (pre-test), 16.54 (post-test) in experimental group.
10. In mean difference of SOCIAL FUNCTIONING 43.33 and standard deviation 16.54 (experimental group), 20.21 (control group) in between post-test of experimental and control group.

Dialysis patients are less active and have reduced functional capacity compared to individuals with normal renal function. Exercise is one of the possible preventive manoeuvres to reduce muscle protein loss and maintain muscle function. Exercise could improve many indicators of physical functioning, improve self-reported physical functioning, and also improve quality of living in ESRD patients.

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