

# Efficacy of Intradialytic Stretching Exercise on Health-related Quality of Life among Patients Undergoing Haemodialysis

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## ABSTRACT

**Introduction:** Patients suffering from End Stage Renal Disease (ESRD) are physically less active typically when compared to healthy individuals. Performing regular exercise could improve many attributes indicating the physical functioning of such patients and thus improving their quality of life. Haemodialysis patients can be safely guided to participate in a range of exercise programs to improve their health-related quality of life while restricting adverse effects to a minimum.

**Aim:** To evaluate the efficacy of intradialytic stretching exercise on quality of life among patients undergoing haemodialysis and to find the association between quality of life with selected variables in the experimental and control group.

**Materials and Methods:** A quasi-experimental pre-test and post-test design with a control group was used to assess the effectiveness of intradialytic stretching exercise on Health-Related Quality of Life (HRQOL) among haemodialysis patients. Two hundred patients were selected through purposive sampling technique. The inclusion criteria considered were chronic kidney

patients undergoing haemodialysis for a period of one year, whose vital signs were within safe limits for exercise therapy. Patients with femoral catheter and lower limb pathology were excluded from the study.

**Results:** There was no significant difference between experimental and control groups before the intervention in terms of HRQOL. Six months after the intervention, the post-test findings revealed that out of 100 participants in experimental group, 65 (65%) were having good HRQOL, 35 (35%) were having average HRQOL and no one had poor HRQOL. Whereas, in control group, out of 100 participants, pre-test scores were very similar to those of post-test. The pre-test scores showed 83 (83%) were having poor HRQOL, 17 (17%) were having average HRQOL and no one had good HRQOL. Post-test scores showed 84 (84%) were having poor HRQOL, 16 (16%) were having average HRQOL and none had good HRQOL.

**Conclusion:** The study concluded that regular intradialytic stretching exercises among haemodialysis patients help in improving HRQOL.

**Keywords:** End stage renal disease, Haemodialysis patients, Healthy individuals

## INTRODUCTION

End Stage Renal Disease (ESRD) is considered as one of the major epidemics in developing countries [1,2] because the main pillar of treatment for ESRD is dialysis and it poses many challenges and financial burden to patients and families [3,4]. In recent times HRQOL assessment is used as a major indicator for predicting renal health among dialysis patients [5,6]. HRQOL monitoring helps to measure the total wellbeing of a patient [7].

In general; dialysis patients lack self-motivation to do exercise because of their limited physical strength and associated symptoms. It is always wise to consider the individual needs of the patients while prescribing exercises [8]. Many studies and programs highlight and promote the importance of exercise among dialysis population [9,10]. Performing regular intradialytic exercises during dialysis have benefitted the patients functionally and physiologically [11-13]. Intradialytic exercises have also helped in improving blood circulation and elevating mental health in patients [14]. However, very few dialysis centres are practising intradialytic exercises as a part of daily routine care. Hence, it is the need of the hour to consider implementing exercise as a mandatory practice in dialysis unit [8]. With this point keeping in mind the present study was conducted with an aim to evaluate the efficacy of intradialytic stretching exercise on quality of life among patients undergoing haemodialysis and to find the association between quality of life with selected variables in the experimental and control group.

## MATERIALS AND METHODS

A quasi-experimental design was adopted to conduct the study. The main purpose of the study was to assess the effect of intradialytic

stretching exercise on HRQOL among haemodialysis patients. The sample size estimation was done by using the formula

$$n = \frac{[P_1(100 - P_1) + P_2(100 - P_2)](Z_\alpha + Z_\beta)^2}{(P_1 - P_2)^2}$$

and it was found to be 100 for control and experimental group. General demographic variables and an investigator-developed five-point rating scale were used as the tool to gather the data through interview method. The scale consisted of thirty items and the final score was categorised as  $\leq 50$ , 51-100 and 101-150, which is interpreted as poor, average and good HRQOL respectively. The scores were determined after reviewing the related literature and discussion with subject matter experts. The tool was validated by 15 experts and the reliability was 0.765. The intervention (intradialytic stretching exercise) was initiated after the completion of one hour of haemodialysis for 10 minutes with an interval of half hour for three times for three dialyses. Data collection was done from 1<sup>st</sup> January 2017 to 30<sup>th</sup> July 2017. After obtaining ethical clearance from the institution (Ref: SCN/198/2014-15) and informed consent from the participants, samples were selected using purposive sampling. The following hypotheses were formulated for the study.

- H<sub>1</sub>: There is a significant difference between the HRQOL of control and experimental group among patients undergoing haemodialysis.
- H<sub>2</sub>: There is a significant association between the post-test score of HRQOL and selected demographic variables among patients undergoing haemodialysis in control and experimental group.

## STATISTICAL ANALYSIS

**Descriptive statistics:** Frequency and percentage distribution were used to analyse the socio-demographic data, mean and standard deviation were used to analyse the HRQOL.

**Interferential statistics:** Paired and independent t-tests were used to compare the data within and between the groups respectively. Chi-square test was used to find the association between HRQOL and demographic variables.

## RESULTS

Out of 100 participants in each group; majority 89 (89%) in control group belonged to the age group of 41-50 years and 56 (56%) in experimental group were in the age group of 51-60 years. There were 95 (95%) males in control group and 91 (91%) in experimental group. Educational qualifications revealed that 93 (93%) participants had higher secondary education in control group compared to 82 (82%) in experimental group. Participants' occupation status showed that 86 (86%) in control group and 84 (84%) in experimental group were employed in private firms. Marital status showed that 93 (93%) in control group and 97 (97%) in experimental group were married. Fifty-four (54%) in control group and 53 (53%) in experimental group were earning a monthly income of <INR 5000.

In control group, 98 (98%) of the participants and 89 (89%) from experimental group belonged to the category of 1-3 years since participants were diagnosed with renal failure. One-hundred (100%) in control group and 50 (50%) in experimental group were undergoing dialysis for 3-4 years category. One-hundred (100%) participants in control group replied yes to not having family history of renal failure, whereas 96 (96%) replied the same in experimental group.

Out of 100 in each group, 82 (82%) participants in the control group and 84 (84%) in the experimental group were not performing any exercises.

### Effectiveness of Intradialytic Stretching Exercise on HRQOL

Out of 100 participants in the control group, 83 (83%) were having poor HRQOL, 17 (17%) were having average HRQOL and no one had good HRQOL in pre-test scores. In post-test, out of 100 participants, 84 (84%) were having poor HRQOL, 16 (16%) were having average HRQOL and none had good HRQOL.

Out of 100 participants in the experimental group, 84 (84%) were having poor HRQOL, 16 (16%) were having average HRQOL and no one had good HRQOL in pre-test scores. In post-test, out of 100 participants, no one had poor HRQOL, 35 (35%) were having average HRQOL and 65 (65%) had good HRQOL.

The [Table/Fig-1] depicts the overall pre-test and post-test response of HRQOL among control group. The mean and standard deviation values during pre-test and post-test were found to be almost equal. Hence, there is no significant difference in this regard.

Test	Mean	Mean (%)	SD	t-value	p-value
Pre-test	35.56	23.71%	11.343	0.965	0.337
Post-test	35.04	23.36%	10.927		

**[Table/Fig-1]:** Overall mean and standard deviation HRQOL scores of participants undergoing haemodialysis in control group.

The [Table/Fig-2] describes the overall pre-test and post-test comparison of HRQOL scores in experimental group. The results showed a high significant difference in the mean pre-test and post-test scores.

Test	Mean	Mean (%)	SD	t-value	p-value
Pre-test	35.1	23.40%	10.982	-28.59	0.001**
Post-test	97.21	64.80%	18.69		

**[Table/Fig-2]:** Overall mean and standard deviation HRQOL scores of participants undergoing haemodialysis in study group.

\*\*Significant at 0.001 level

The [Table/Fig-3] indicates the overall HRQOL pre-test scores of haemodialysis patients among experimental and control group. The finding revealed that there was no significant difference between the groups and the p-value was not significant at 0.05 level.

Group	Mean	SD	t-value	p-value
Control	35.56	11.343	0.291	0.771
Experimental	35.1	10.981		

**[Table/Fig-3]:** Overall pre-test mean scores on HRQOL among experimental and control group.

The [Table/Fig-4] reveals the overall HRQOL post-test mean scores of patients undergoing haemodialysis among experimental and control group. The results revealed significant difference before and after the intervention and the derived p-value was highly significant at 0.001 level.

Group	Mean	SD	t-value	p-value
Control	35.04	10.927	-28.716	0.001**
Experimental	97.21	18.69		

**[Table/Fig-4]:** Overall post-test mean scores on HRQOL among experimental and control group.

\*\*Significant at 0.001 level

**Association between post-test HRQOL with selected demographic variables in study group:** From the [Table/Fig-5] it is evident that the chi-square values computed for age and income are statistically significant at 0.05 level, whereas the variable length of duration of dialysis was statistically significant at 0.001 level. Furthermore, the chi-square value computed for gender, religion, educational qualification, occupation, marital status, are you following any exercises, duration since diagnosis of renal failure and family history of renal failure were statistically non-significant at 0.05 level. This indicates that there was no association between the above-said variables and the levels of HRQOL scores of the experimental group at the post-test level.

## DISCUSSION

The findings presented in [Table/Fig-4] reveal that there is a significant difference in the mean post-test score of control and experimental group. This reveals that the hypothesis  $H_1$  is accepted.

The findings in [Table/Fig-4] are also supported with a randomised study that was conducted regarding the effects of intradialytic exercise on HRQOL among haemodialysis patients. There were 33 participants, out of which 19 were enrolled in experimental group and they were administrated with intradialytic training programme for a period of 10 months. The control group consisted of 14 participants and no intervention was conducted. A formal psychosocial assessment, lab test and clinical examination were performed at the start and end of the study for both groups. The results revealed that the mean score for quality of life index in experimental group improved from 6.5 to 9.0 after the intervention. In control group the value remained at 6.3 before and after the intervention [15]. Other studies have revealed that a carefully planned and customised moderate to high intensity exercise training has proved to enhance the HRQOL of hemodialysis patients [16,17].

It is evident from [Table/Fig-5] that the chi-square values computed for age and length of duration of dialysis are statistically significant at 0.001 level and income is significant at 0.05 level. This indicates that the research hypothesis,  $H_2$  is accepted for the experimental group for the above-said variables and it is rejected for rest of the variables.

The findings are also consistent with a descriptive study that was conducted regarding factors affecting quality of life among haemodialysis patients in a tertiary care hospital in India. The 50 participants for the study were selected through convenient sampling and the data was collected through interview method. The results

Demographic variables	Class	No. of clients in		Chi-square value	df	p-value
		Average HRQOL	Good HRQOL			
Age (in years)	31-40 years	1	0	12.780	2	0.001**
	41-50 years	7	36			
	51-60 years	27	29			
Gender	Male	34	57	2.481	1	0.115
	Female	1	8			
Religion	Hindu	32	54	1.423	2	0.491
	Christian	1	5			
	Muslim	2	6			
Educational qualification	Primary level	0	2	3.529	3	0.317
	Higher secondary	31	51			
	Graduate	4	8			
	Postgraduate and above	0	4			
Occupation	Unemployed	0	2	7.804	3	0.05
	Private	30	54			
	Government employee	4	1			
	Self-employed	1	8			
Income per month	<INR 5000	22	31	6.372	2	0.041*
	INR 5000-10000	13	24			
	>INR 10000	0	10			
Marital status	Married	35	62	1.665	2	0.435
	Unmarried	0	2			
	Divorced	0	1			
Are you following any exercise?	Yes	3	13	2.211	1	0.137
	No	32	52			
Duration since diagnosis of chronic renal failure	1-3 years	32	57	0.324	1	0.569
	4-6 years	3	8			
Since how long you are on dialysis	1-2 years	28	20	22.256	2	0.001**
	3-4 years	7	43			
	5-6 years	0	2			
Family history of renal failure	Yes	1	3	0.183	1	0.669
	No	34	62			

**[Table/Fig-5]:** Chi-square test for testing the significance of association between the demographic variables and the levels of HRQOL scores of experimental group at the post-test level.

\*Significant at 0.05 level; \*\*Significant at 0.001 level n=100

revealed that there was an association between monthly income of the family and psychological factors [18]. Similarly, other studies also have shown that factors like age and income had significant association with HRQOL of hemodialysis patients [19,20].

## LIMITATION AND RECOMMENDATION

The investigators could assess the effect of intervention only once during the period of data collection. A comparative study can be undertaken regarding the effectiveness of intradialytic stretching exercise between haemodialysis and peritoneal dialysis patients. Implementing intradialytic stretching exercise during haemodialysis should be made as a mandatory practice after considering the physical fitness of the patients.

## CONCLUSION

The physical capabilities of haemodialysis patient are significantly less when compared to healthy individuals. The findings of the study revealed that physical activity aids haemodialysis patients to improve their HRQOL in all dimensions of health. Regular exercise may promote rehabilitation and prevent further complications in dialysis patients. The study concluded that a well-planned and supervised intradialytic exercise programme, tailored to individual needs is safe as well as efficient in providing the immense potential to improve HRQOL.

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