EFFECTIVENESS OF INTRADIALYTIC EXERCISE ON FATIGUE AND QUALITY OF LIFE AMONG CHRONIC RENAL FAILURE PATIENTS UNDERGOING HEMODIALYSIS IN A SELECTED HOSPITAL AT MANGALORE

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ABSTRACT
An evaluative approach, with one group pretest post design was used in the study. The study was conducted at K.S. Hegde hospital, Mangalore. The sample size was 40. Purposive sampling technique was used to select the subjects. WHO BREF scale and MAF scale was used to measure QOL and fatigue respectively. Intradialytic exercise was taught to the patients for the period of 30 minutes and after 4 weeks post-test was done. The overall findings of the study have shown that Intradialytic exercise was effective in reducing the fatigue and improving the quality of life among dialysis patients, as calculated t value (12.71 and 24.45) was greater than table value (t39=1.69) at 0.05 level of significance. There was a negative correlation between level of fatigue and quality of life (–0.504) at 0.05 level of significance. Study revealed that there was no significant association between the fatigue, QOL and selected variables. Exercise training in hemodialysis patients improves fitness, physical function, and quality of life. Health professionals should provide appropriate treatment for patients who are experiencing fatigue in order to prevent any other complications that could arise.

KEYWORDS: Fatigue, Quality of life, Dialysis patients, Effectiveness

NEED AND BACKGROUND OF THE STUDY
Kidneys are the most important excretory organs within the human body. The word excretion means the removal of metabolic waste substances from the body. This "metabolic waste" is the large number of chemical reactions that occur in the cells, tissues and organs. Of these substances, some of the by-products and end-products of metabolism are toxic and have to be removed from the body, before they will poison the body tissues. Kidneys play a major role in this task and End Stage Renal Disease is the point in kidney failure where approximately 90% of renal function has been lost, rendering the body incapable of maintaining proper fluid and electrolyte balance, adequate waste removal and normal hormonal function.1 Patients on hemodialysis account for approximately 92% of the overall
dialysis population (USRDS, 2012) and endure a high symptom burden as they may experience troubling symptoms such as fatigue, decreased appetite, trouble concentrating, swelling in their feet and hands, muscle cramps, and, all of which cause daily distress and negatively affects their quality of life.\(^2\)

Exercises can make muscles stronger and joints more flexible, it will be easier for patients to reach, bend, stoop and to do other daily activities. During dialysis exercise increases the blood flow to muscles and opens the capillary surface area which subsequently increases the flux of urea from the tissue to the vascular compartment. It results in an increase in serum urea clearance and improvement in the dialysis efficacy.\(^3\)

Tae-Du Jung and Sun-Hee Park conducted a review aimed to investigate the beneficial effects of exercise during hemodialysis (intradialytic exercise) and also to introduce various intradialytic exercise programs and their advantages. The study concluded that aerobic and resistance exercise are beneficial not only in improving physical functioning, including maximal oxygen uptake and muscle strength, but also in improving anthropometrics, nutritional status, hematological indexes, inflammatory cytokines, depression, and health-related quality of life.\(^4\)

Ronaldo Ribeiro\(^7\), Gustavo L, Coutinho; Anderson Iuraset al conducted a correlational study on the effect of intradialytic resistance exercise in chronic renal patients on hemodialysis. The objective was to study the role of resistance exercise (RE) in the treatment and quality of life in 60 adult patients undergoing chronic hemodialysis. SF-36 questionnaire was used to assess QOL. Result showed that out of the 60 patients studied 46 (76.7%) were men with a mean age of 57.8 years and 14 were women (23.3%) with a mean age of 57.8 years. Significant improvement in the QOL parameters \((p < 0.001)\) with the RE, such as functional capacity, physical aspect, reduction of pain (in general), general health, vitality, social function, emotional state and mental health was observed.\(^5\)

**Objective:**

- Evaluate the effectiveness of intradialytic exercise on level of fatigue and quality of life among chronic renal failure patients undergoing hemodialysis.
- Assess the fatigue and quality of life of chronic renal failure patients undergoing hemodialysis.
- To find out the correlation between the fatigue and quality of life among chronic renal failure patients undergoing hemodialysis.
- To find out the association between level of fatigue and quality of life with selected variables.
MATERIALS AND METHODS

An evaluative approach is adopted for this study. The study design adopted was one group pretest post-test research design. The present study was conducted in the Justice K.S. Hegde Charitable hospital. Samples comprises of the 40 dialysis patients in a selected hospital at Mangalore. Purposive sampling technique was used to collect samples.

DATA COLLECTION INSTRUMENTS

The following tools were used for data collection:
- Demographic Proforma
- WHO QOL BREF scale (standardized tool for assessing QOL).
- Multi-dimensional assessment of fatigue scale (standardized tool for assessing fatigue)

DATA COLLECTION PROCESS

Formal written permission was obtained from the Medical Superintendent and Dept. of Nephrology prior to data collection. Confidentiality was assured to all subjects to get their cooperation and informed consent was taken from the subjects. Subjects were instructed to fill the instruments and after that intradialytic exercises were taught to the patients and they were assisted to perform the exercises during each visit. The data collection period was three weeks and at the fourth week post- test was conducted.

DATA ANALYSIS

Section I- Description of the sample characteristics
- Demographic proforma containing sample characteristics will be analyzed using descriptive statistics.

Section II- The fatigue and quality of life of dialysis subjects by using descriptive statistics.

Section III - Effectiveness of intradialytic exercise on fatigue and quality of life of hemodialysis patients by using Paired t test.

Section IV- Correlation between the fatigue and quality of life of dialysis patients using Karl Pearson coefficient of correlation.

Section V- Association between pretest quality of life scores with selected variables using Chi-square and Fishers Exact test.
PROTECTION OF HUMAN SUBJECTS

- The study proposal was presented to the ethical committee for ethical consideration
- Permission for the study was obtained from the medical superintendence and HOD, Department of Nephrology. An informed consent was also obtained from the respondents after proper explanation about the purpose, usefulness of the study and assurance was given about the confidentiality of their responses.

RESULTS

Section 1:- Description of dialysis patients according to the demographic characteristics
Demographic proforma containing sample characteristics were analyzed by using frequency and percentage.

Section 2:- Level of fatigue of dialysis patients.
Fatigue of the samples was analyzed by descriptive statistics.

Section 3:- Effect of intradialytic exercise on fatigue and quality of life among chronic renal failure patients.
Effectiveness of intradialytic exercise was analyzed by paired ‘t’ test.

Section 4:- Correlation between level of fatigue and quality of life among hemodialysis patients
Correlation between level of fatigue and quality of life will be statistically analyzed by Karl Pearson’s coefficient of correlation.

Section 5:- Association between fatigue and quality of life with selected variables.
The association between fatigue, quality of life and selected variables were analyzed using Chi-square.

Table 1: Fatigue scores of dialysis patients

<table>
<thead>
<tr>
<th>Level of Fatigue</th>
<th>Pretest score</th>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Moderate</td>
<td>40</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>-</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

Above table shows that during pretest all the samples (100%) had moderate level of fatigue.
Table 2: Domain wise quality of life among dialysis patients

<table>
<thead>
<tr>
<th>Domain</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>S.D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical domain</td>
<td>12</td>
<td>25</td>
<td>18.30</td>
<td>2.278</td>
</tr>
<tr>
<td>Psychological domain</td>
<td>11</td>
<td>19</td>
<td>15.40</td>
<td>1.549</td>
</tr>
<tr>
<td>Social domain</td>
<td>5</td>
<td>11</td>
<td>7.30</td>
<td>1.522</td>
</tr>
<tr>
<td>Environmental domain</td>
<td>13</td>
<td>22</td>
<td>18.65</td>
<td>1.861</td>
</tr>
</tbody>
</table>

Above table depicts that the highest mean quality of life score is in the environmental domain (18.65), followed by physical domain with (18.3), psychological domain (15.40) and lowest score (7.30) is in the social domain.

Table 3: Paired ‘t’ test scores of effect of intradialytic exercise on fatigue

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>S.D</th>
<th>t cal value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>70</td>
<td>100</td>
<td>83.75</td>
<td>7.745</td>
<td>12.71</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Posttest</td>
<td>45</td>
<td>76</td>
<td>65.90</td>
<td>8.283</td>
<td>(t39=1.69)</td>
<td>p&lt;0.05= level of significance</td>
</tr>
</tbody>
</table>

From the table it is clear that, Calculated t value (12.71) is greater than table value (t39=1.69) and the p value is <0.05. This means that there is a significant difference between the mean pre-test and post-test fatigue scores at 5% level of significance. Hence intradialytic exercise was effective in reducing the fatigue among dialysis patients.

Table 4: Paired ‘t’ test scores showing effect of intradialytic exercise on quality of life

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>S.D</th>
<th>t cal value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>46</td>
<td>69</td>
<td>61.25</td>
<td>4.111</td>
<td>24.45</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Posttest</td>
<td>67</td>
<td>85</td>
<td>77</td>
<td>4.356</td>
<td>(t39=1.69)</td>
<td>p&lt;0.05= level of significance</td>
</tr>
</tbody>
</table>

Above table shows that, Calculated t value (24.45) is greater than table value (t39=1.69) and the p value is <0.05. Hence research hypothesis is accepted and concluded that there is a significant difference between the mean pre-test and post-test quality of life scores. Thus the intradialytic exercise was effective in improving the quality of life of hemodialysis patients.
Table 5: Correlation between level of fatigue and quality of life among hemodialysis patients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Karl Pearson correlation coefficient r value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue VS quality of life</td>
<td>-.504</td>
<td>.001</td>
</tr>
</tbody>
</table>

p<0.05= level of significance

Since the Karl Pearson correlation coefficient value of quality of life and fatigue is -.504 (p<0.05), it was concluded that there is negative correlation between fatigue and quality of life indicating that as the fatigue increases QOL decreases.

There was no association between the fatigue, quality of life and selected variables.

DISCUSSION

Fatigue and quality of life of dialysis patients.

All the subjects 40 (100%) had experienced moderate level of fatigue and none of the dialysis patients had mild and severe level of fatigue.

 Majority of the dialysis patients 39 (97.5%) experienced moderate quality of life, 1 (2.5%) had good quality of life and none of the dialysis patients had poor quality of life. Whereas a descriptive correlational study to assess the quality of life and health status correlation in hemodialysis patients with end-stage renal Disease conducted in Iran revealed that the majority of cases (53.4%) were rated poor QOL and only 5.5% of the participants earned good scores, and 1.9% rated very good.6

Effectiveness of intradialytic exercise on fatigue and quality of life among chronic renal failure patients.

The intradialytic exercise was effective in reducing fatigue and QOL ($t_{cal}=12.71$ and QOL is 24.45 <0.05). The findings are supported by a correlational study conducted by Ronaldo Ribeiro' Gustavo L,Coutinho; Anderson Iuraset al to find the effect of intradialytic resistance exercise in chronic renal patients on hemodialysis which showed that there was a significant improvement in QOL parameters ($p < 0.001$) with the resistance exercise and thus intradialytic exercise is effective to improve QOL in chronic kidney disease patients.5
LIMITATIONS

- The setting of the study was selected by purposive sampling and imposes limits in larger generalization.
- Fatigue and Quality of life was purely based on the verbal reports of the dialysis patients and not through observation.
- The sample was minimal (40) and hence, it cannot be generalized.
- The present study was on all age group ,it can be focused on younger adults

RECOMMENDATIONS:

- Replication of the study could be done with a larger sample to validate and generalize the findings.
- A comparative study can be conducted to find the effectiveness of intradialytic exercises verses home exercises to reduce fatigue among hemodialysis patients.
- A survey of factors that influence fatigue and QOL of dialysis patients can be undertaken.

REFERENCES