Effect of Pulmonary Rehabilitation Program (PRP) to improve the quality of life among adults with Chronic Respiratory Diseases (CRDs) residing in Urban regions, Maharashtra

Ms. Shalaka Ramesh Gadhave[1], Prof. Prabhudas A. Raiborde[2]

[1]*MSC Nursing II year, Dr. Panjabrao Deshmukh Nursing Institute, Shivaji Nagar, Amravati, Maharashtra*

[2]*Prof. cum vice Principal, Dr. Panjabrao Deshmukh Nursing Institute, Shivaji Nagar, Amravati, Maharashtra*

Abstract: Background of the study: Chronic Respiratory Diseases (CRDs) are chronic, recurring, and persistent disorders that affect the airways and lungs, and are among the most common causes of morbidity and mortality worldwide.[1] PR is a proactive approach to reducing Chronic obstructive pulmonary diseases (COPD) symptoms, enhancing health-related quality of life, and promoting physical and emotional engagement in daily activities. The promotion of Pulmonary rehabilitation (PR) needs a multifactorial approach that includes physician and patient education, increased program accessibility, and mechanisms to encourage enrollment and adherence.[2] Therefore; it is decided to do this research study for creating awareness regarding PR program to improve the quality of life among CRDs patients. **Objective:** The objective of the study was assessing the effect of PRP to improve the quality of life among adults with CRDs. An experimental research approach and one group pre-test post-test research design was used to collect data before and after an administration of PRP to improve the quality of life among adults with CRDs. The adults with CRDs were the samples selected by a purposive sampling technique and data was collected by using Standardized Chronic Respiratory Questionnaire with structured interview schedule. The analysis was done by using descriptive and inferential statistics. **Results:** The majority of 57.7% were male patients where as 42.3 % were females. The patient's ≥49 yrs. were 47.7% where as 4.6% of the patients had 18-28 yrs years of age. The majority of 29.2% patients had Higher Secondary education status and 15.4% were Graduate and above. The Majority of 43.8% patients had other occupation whereas only 6.9% were mine workers. The majority of 52.3% patients were married whereas 3.1% were separated. The majority of 59.2% patients had nuclear families whereas 5.4% had extended families. The majority of 49.2 % patients were vegetarian and 8.5% were on special diet. The family income of patients more in between 10001-20000 Rs were 39.2% whereas ≥30001 had 6.2%. The 94.62 % patients had poor quality of life in pretest where in posttest 86.2% had average quality of life. There was a significant difference between pretest quality of life score 42.13% and posttest quality of life score 93.72% of patients with CRDs regarding pulmonary rehabilitation program as t-value was 145.78 and p value 0.0001 where p<0.05. It reveals that the pulmonary rehabilitation program was effective in improving the quality of life of patients with CRDs. It is found that there were no significant association between the quality-of-life scores and demographic variables such as age, gender, educational status, occupation, marital status, type of family whereas type of diet, monthly family income was significantly associated. **Conclusion:** Analysis of data showed that there is significant difference between pretest and posttest quality of life score. Hence, Pulmonary Rehabilitation Program has significantly brought out their improvement in the quality-of-life score.

Keywords: Pulmonary Rehabilitation Program, Chronic Respiratory Questionnaire, patients with chronic respiratory diseases, Structured Interview Schedule.

INTRODUCTION

Chronic Respiratory Diseases are chronic, recurring, and persistent disorders that affect the airways and lungs, and are among the most common causes of morbidity and mortality worldwide.[1] PR is a proactive approach to reducing COPD symptoms, enhancing health-related quality of life, and promoting physical

and emotional engagement in daily activities. The promotion of PR needs a multifactorial approach that includes physician and patient education, increased program accessibility, and mechanisms to encourage enrolment and adherence.[2] Therefore; it is decided to do this research study for creating awareness regarding PRP to improve the quality of life among CRDs patients. Pulmonary rehabilitation (PR) is a program of education and exercise designed to increase awareness about lungs and diseases.[3] Pulmonary rehabilitation increases exercise endurance, lowers tiredness and dyspnea, and improves several aspects of health-related quality of life (HRQOL) when compared to typical community care.[4] The Global burden of Diseases reported that CRDs contribute to 32% of total Disability Adjusted Life Years.[5] In 2019, CRDs were the third greatest cause of death, accounting for 4.0 million deaths and 454.6 million cases worldwide. Because of the size and diversity of the Indian population, exact figures of the present prevalence of CRDs in India are difficult to obtain; however, data suggest that prevalence could range from 3% to 8%.[6] Disabling chronic respiratory conditions are alarmingly increasing in developing countries leading to increased morbidity, repeated hospital admissions, and reduced health-related quality of life (HRQoL). CRDs are not completely curable but the morbidity arising from it can be controlled and improved by holistic management like PR.[5]

OBJECTIVES

The objectives of the study are:
1. To assess the effect of PRP to improve the quality of life among adults with chronic respiratory diseases before intervention.
2. To find out the effect of PRP to improve the quality of life among adults with chronic respiratory diseases after intervention.
3. To find out the association between post intervention to improve the quality of life of adults and their selected demographic variables.

MATERIALS AND METHODS

An experimental research approach was adopted and one group pre-test posttest pre- experimental design was used for this study. The study was carried out in the selected community health centers, out patients'

departments at urban regions of Maharashtra. The period of data collection was two weeks. The permission was obtained from concern authority of respective centers, at Maharashtra state. The purposive sampling technique was used to select 130 CRDs patients from different settings of the health Centre's. Written consent was obtained from the samples and pretest has been assessed for all the 130 patients using demographic and chronic respiratory questionnaire for assessing quality of life. Then the pulmonary rehabilitation program was carried out for all patients to whom the pre-test was conducted. After two weeks, the post-test was taken and the data was analyzed.

STATISTICAL ANALYSIS

The data was analyzed by descriptive and inferential statistics. Demographic data was analyzed using frequency and percentage, data from the chronic respiratory questionnaire before and after pulmonary rehabilitation program administered was also analyzed using frequency, percentage and student paired 't' test. The association between quality-of-life findings and demographic variables was analyzed by using t test and chi square test.

RESULT

Table 1: Percentage wise distribution of Adults with CRDs according to their demographic characteristics.

Demographic Variables	No. of Adults	Percentage (%)
Age(yrs)		
18-28 yrs	6	4.6
29-38 yrs	15	11.5
39-48 yrs	47	36.2
≥49 yrs	62	47.7
Gender		
Male	75	57.7
Female	55	42.3
Educational Status		
Illiterate	25	19.2
Primary	21	16.2
Secondary	26	20.0
Higher Secondary	38	29.2
Graduate and above	20	15.4
Occupation		
Industrial Worker	23	17.7
Factory Worker	16	12.3
Farmer	25	19.2
Mines Worker	9	6.9
Other	57	43.8
Marital Status		
Married	68	52.3
Widow	16	12.3

Widower	17	13.1
Divorced	10	7.7
Separated	4	3.1
Unmarried	15	11.5
Type of family		
Nuclear	77	59.2
Joint	46	35.4
Extended	7	5.4
Type of diet		

Vegetarian	64	49.2
Non-Vegetarian	55	42.3
Special Diet	11	8.5
Family Income (Rs)		
<10000 Rs	50	38.5
10001-20000 Rs	51	39.2
20001-30000 Rs	21	16.2
≥30001 Rs	8	6.2

Table 2: Significance of difference between quality-of-life score in pre and post-test of Adults with CRDs

Overall	Mean	SD	Mean Difference	t-value	p-value
Pre Test	42.13	8.04	51.58±4.03	145.78	0.0001 S,p<0.05
Post Test	93.72	7.79			

This table shows the comparison of pretest and posttest quality of life scores of adults with CRDs from selected urban area. Mean, standard deviation and mean difference values are compared and student's paired 't' test is applied at 5% level of significance. The tabulated value for n=130-1 i.e. 129 degrees of freedom was 1.98. The calculated 't' value i.e. 145.78 are much higher than the tabulated value at 5% level of significance for overall quality of life score of the adults with CRDs which is statistically acceptable level of significance. Hence it is statistically interpreted that Pulmonary Rehabilitation Program to improve the quality of life among adults with CRDs from selected urban area was effective. Thus, the H_1 is accepted.

Table 3: Association of post-test quality of life score in adults with CRDs in relation to demographic variables.

Age in year	No of Adults	Poor quality of life	Average quality of life	Good quality of life	x2- value	p-value
18-28 yrs	6	0	5	1		0.26
29-38 yrs	15	0	13	2		
39-48 yrs	47	0	37	10	3.95	NS,p>0.05
≥49 yrs	62	0	57	5		
Gender	No of Adults	Poor quality of life	Average quality of life	Good quality of life	x2-value	p-value
Male	75	0	67	8		0.22
Female	55	0	45	10	1.50	NS,p>0.05
Educational Status	No of Adults	Poor quality of life	Average Quality of life	Good Quality of life	x2- value	p-value
Illiterate	25	0	24	1		
Primary	21	0	18	3		0.58
Secondary	26	0	22	4	2.84	NS,p>0.05
Higher Secondary	38	0	32	6		
Graduate and above	20	0	16	4		
Occupation	No of Adults	Poor quality of life	Average quality of life	Good quality of life	x2- value	p-value
Industrial Worker	23	0	19	4		
Factory Worker	16	0	12	4		
Farmer	25	0	24	1	5.57	0.23 NS,p>0.05
Mines Worker	9	0	9	0		
Other	57	0	48	9		

Marital Status	No of Adults	Poor quality of life	Average Quality of life	Good quality of life	$x2$- value	p-value
Married	68	0	60	8		
Widow	16	0	15	1		0.68
Widower	17	0	13	4	3.09	
Divorced	10	0	8	2		
Separated	4	0	3	1		NS,p>0.05
Unmarried	15	0	13	2		
Type of family	No of Adults	Poor quality of life	Average quality of life	Good quality of life	$x2$- value	p-value
Nuclear	77	0	67	10		0.43
Joint	46	0	38	8	1.65	
Extended	7	0	7	0		NS,p>0.05
Type of diet	No of Adults	Poor quality of life	Average quality of life	Good quality of life	$x2$- value	p-value
Vegetarian	64	0	50	14		0.032
Non Vegetarian	55	0	52	3	6.91	
Special Diet	11	0	10	1		S,p<0.05
Monthly family income (Rs)	No of Adults	Poor quality of life	Average quality of life	Good quality of life	$x2$- value	p-value
<10000 Rs	50	0	45	5		
10001-20000 Rs	51	0	42	9		0.74
20001-30000 Rs	21	0	18	3	1.25	
≥30001 Rs	8	0	7	1		S,p<0.05

The above table shows that no association of posttest quality of life score in relation to demographic variables like age in (yrs), gender, educational status, Occupation, marital status, type of family and shows significant association in type of diet, monthly family income among patients with CRDs. The association was computed using chi square test. The results of majority demographic variables revealed in the present study that there is no significant association between posttest quality of life scores of CRDs patients with their selected demographic variables.

DISCUSSION

The present study was undertaken to assess the effectiveness of pulmonary rehabilitation program on quality-of-life score among patients with CRDs in selected urban regions at Maharashtra. The study concluded that in pretest 123 (94.62%) had poor quality of life, 7 (5.38%) had average quality of life and 0 (00%) had good quality of life whereas in post test qualiy life score 0 (0.00%) had poor quality of life, 112 (86.2%) average quality of life, 18 (13.8%) had good quality of life. It reveals that the posttest mean score percentage of quality-of-life score after pulmonary rehabilitation among the patients with CRDs (93.72%) was higher than the pretest mean score percentage (42.13%). This difference was found

to be significant. (t= 145.78***, p<0.05). Thus, it is considered that the pulmonary rehabilitation program was effective to improve the quality-of-life scores among patients with CRDs. The study also concluded that there were no significant associations of quality-of-life score and selected demographic variables such as age, gender, educational status, Occupation, marital status, type of family because p value is >0.05. Whereas no significant association with type of diet and monthly family income because p value is <0.05.

CONCLUSION

After the detailed analysis, this study leads to the following conclusion. The patients with CRDs does not have 100% quality of life score. There was a significant increase in the quality-of-life score after the interventions of pulmonary rehabilitation program. Thus, it was concluded that pulmonary rehabilitation program to improve quality of life was found effective. Demographic variables did not show a major role in influencing the pretest and posttest quality of life score among patients with CRDs. Hence based on the above cited findings, it was concluded undoubtedly that the diligently implementing the program of pulmonary rehabilitation by the investigator helped the patients to improve their quality of life.

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