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The effects of self-care education on knowledge regarding prevention of recurrent super infection among the patients with pulmonary tuberculosis

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Abstract: *The major cause of TB in humans, Mycobacterium tuberculosis (MTB), is latent in around 25% of the world's population. The aim of the study was to assess the effects of self-care education on knowledge regarding prevention of recurrent super infection among the patients with Pulmonary Tuberculosis (PTB) attending pulmonary Out Patient Department (OPD) of the Aarupadai Veedu Medical College & Hospital, Puducherry. A quasi-experimental research design was selected for this study. A total of 50 pulmonary TB patients were selected using a convenience sampling technique and divided into the control group (n=25) and the experimental group (n=25). The data were collected using a structured interview schedule. The pretest levels of knowledge regarding pulmonary tuberculosis were assessed by using a structured interview questionnaire followed by a self-care education given to the experimental group (EG) regarding prevention of recurrent super infection of PTB. The collected data were computerized and analyzed using a SPSS version 25. In the pre-test of EG, 23(92%) had inadequate and 2(8%) had moderately adequate whereas in the post test, 15(60%) had adequate and 10(40%) had moderately adequate knowledge. Whereas in the pre-test of control group, 24(96%) had inadequate and 1(4%) had moderately adequate knowledge and in the post test, 23(92%) had inadequate and 2(8%) had moderately adequate knowledge regarding prevention of recurrent super infection. Comparison of post-test level of knowledge the EG and control group, the calculated student independent 't' test value of t=17.034 was found to be statistically significant at p < 0.001 level. The self-care education was found to be effective in increasing the level of knowledge on prevention of recurrent super infection among patients with PTB.*

Key Words: *Pulmonary Tuberculosis, Recurrent Super Infection, Knowledge, Self-Care Education, Puducherry*

1. INTRODUCTION:

The primary cause of TB in humans, Mycobacterium tuberculosis (MTB), is present in about 25% of the world's population [(1)]. According to the WHO's 2020 report, TB claimed the lives of 1.5 million people overall. In the year 2020, around 10 million people developed tuberculosis (TB), including 5.6 million men, 3.3 million women, and 1.1 million children. In 2019, 1.4 million people died from TB globally, and there were an estimated 10 million new cases of the disease [(2).] In the Kashmir Valley of India's North Indian Subcontinent, the prevalence of TB was 316/100,000 people in 2022 [(3)].

Physical impairment, cor pulmonale, and opportunistic infections are all conditions that lower patients' quality of life and are all caused by the TB lesions that persist in the lungs [(4)]. In addition to malnutrition, military tuberculosis, pleural effusion, pneumonia, empyema, fibrosis, and hemoptysis, the most frequent complications of pulmonary tuberculosis are lung abscess, chronic obstructive pulmonary disease, infection spread to other organs, respiratory failure, and bronchitis [(5)]. For individuals suffering from TB, it is crucial to address issues including high treatment expenses, emotional distress, family dysfunction, and disabilities while also fostering recovery and optimum health [(6)].

The spread of Multi Drug Restriction -TB may be significantly influenced by social determinants of health such poverty, low literacy, gender inequality, and underfunded health services. Inadequate health personnel and the high cost of treatment are other obstacles to effective TB control. Male gender and HIV infection have been identified as risk factors [(7)]. The recommended course of treatment includes isoniazid, rifampicin, ethambutol, and pyrazinamide in combination, followed by isoniazid and rifampicin in combination. Due to this therapy, about 2.4% of patients experienced liver damage [(8).]

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In order to effectively treat TB patients, we must also put an emphasis on empowering patients to take an active role in their own care. Self-care education is one effort that can be made. The goal of self-care education is to improve a person's ability to manage pulmonary TB disease by increasing knowledge and self-efficacy about tuberculosis. It consists of methods, recommendations, counselling, and behavioural interventions. In pulmonary TB patients, self-care education can enhance quality of life, medication adherence, behaviour toward seeking medical help, and self-efficacy [(9)]. It is anticipated that patients will be able to overcome disease-related challenges and anticipate utilising tuberculosis prevention measures if they are knowledgeable.

2. MATERIALS & METHODS:

Design: A quasi experimental research design-pre-test and post-test control group was adapted for the present study.
Sample Size: A sample of 50 patients in that 25 were in an experimental group and 25 were in control group with PTB who were attending pulmonary OPD of AVMC&H, Puducherry.
Sampling Technique: Convenience sampling technique was used to select the sample.
Data collection Procedure: The formal permission obtained from the concerned authorities. Ethics approval was obtained from the Institute Ethical Committee (IEC). The purpose of the study was explained to patients. The data were gathered using tools-demographic variables, health profile variables and structured knowledge questionnaire. In experimental group, self – care education program intervention was administered and in control group received the routine nursing care. After 15th day, the post test was assessed the effects of self-care education on knowledge regarding prevention of recurrent super infection among the patients with pulmonary tuberculosis.

3. RESULTS:

Out of the 50 patients with PTB with 25 experimental group (EG) and 25 control group (CG) who were interviewed, the demographic variables of majority in the EG, 9(36%) were aged between 51 and 60 years, 13(52%) were males, 23(92%) were married, 18(72%) were Hindus, 10(40%) had primary school education, 9(36%) were private employees, 17(68%) belonged to nuclear family, 7(28%) had a family income of Rs.4810 – 8009 and 14(56%) were getting health information through friends and relatives whereas in the CG, 6(24%) were aged between 20 and 30 years and 41 and 50 years, 15(60%) were males, 20(80%) were married, 18(72%) were Hindus, 9(36%) had primary school education, 7(28%) were private employees 18(72%) belonged to nuclear family, 6(24%) had a family income of Rs.12020 – 16019 and Rs.4810 – 8009 respectively and 15(60%) were getting health information through friends and relatives.

Health profile of majority in the EG, 25(100%) had onset of disease after 20 years, 10(40%) had TB infection confirmed two months ago, 17(68%) had pulmonary tuberculosis for the duration of 1 – 6 months, 21(84%) had none in their family having TB, 22(88%) had taken regular treatment for pulmonary tuberculosis, 10(40%) had started their course of treatment 1 month before, 18(72%) had no comorbidity, 21(84%) had not smoked, 16(64%) had not consumed alcohol and 24(96%) were not following any habit. Regard to the CG, 25(100%) had onset of disease after 20 years, 8(32%) had TB infection confirmed two months ago and three months ago respectively, 14(56%) had pulmonary tuberculosis for the duration of 1 – 6 months, 18(72%) had none in their family having TB, 20(80%) had taken regular treatment for pulmonary tuberculosis, 8(32%) had started their course of treatment 1 month before and 2 months before respectively, 16(64%) had no comorbidity, 18(72%) had not smoked, 13(52%) had consumed alcohol and 24(96%) were not following any harmful habit.

In the pre-test of EG, 23(92%) had inadequate knowledge and 2(8%) had moderately adequate whereas in the post test, 15(60%) had adequate knowledge and 10(40%) had moderately adequate knowledge. Whereas in the pre-test of CG, 24(96%) had inadequate knowledge and 1(4%) had moderately adequate knowledge and in the post test, 23(92%) had inadequate knowledge and 2(8%) had moderately adequate knowledge regarding prevention of recurrent super infection. **(Figure 1)**

In the EG, the pretest mean score was 5.64±3.16 and the posttest mean score was 19.76±1.92. The mean difference (MD) score was 14.12. The calculated paired 't' test value of $t = 20.795$ was found to be statistically significant at $p<0.001$ level which clearly infers that self – care education on knowledge regarding prevention of recurrent super infection administered to patients with PTB was found to be effective in improving the level of knowledge in the post test. **(Table 1)** In the CG, the pre-test mean score was 6.36±3.15 and the post-test mean score was 6.72±3.31. The MD score was 0.36. The calculated paired't' test value of $t = 1.984$ was not found to be statistically significant. **(Table 2)**

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Figure1: Percentage distribution of pre-test and post-test level of knowledge on prevention of recurrent super infection among patients with PTB in the EG and CG

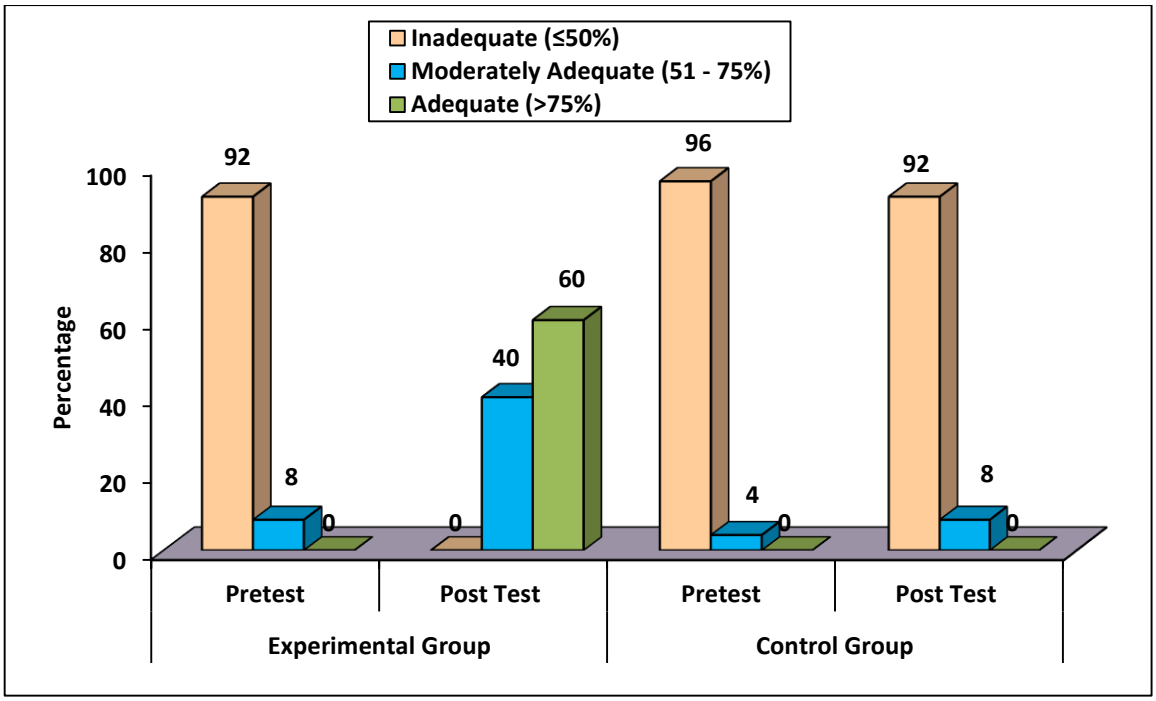

Table1: Comparison of pretest and posttest levels of knowledge regarding prevention of recurrent super infection among patients with PTB in the EG

Tests	Mean	S.D	Mean Difference	Paired 't' Test Value
Pretest	5.64	3.16	14.12	**t = 20.795 p=0.0001, S*** **
Posttest	19.76	1.92		

***p<0.001, S – Significant

Table2: Comparison of pretest and posttest levels of knowledge regarding prevention of recurrent super infection among patients with PTB in the CG

Tests	Mean	S.D	Mean Difference	Paired 't' Test Value
Pretest	6.36	3.15	0.36	t = 1.984 p=0.059, N.S
Post test	6.72	3.31		

N.S – Non Significant

Comparison of post-test level of knowledge the EG and CG, The calculated student independent't' test value of t=17.034 was found to be statistically significant at p<0.001 level.

In experimental group, the demographic variable of religion (χ^2=13.678, p=0.001) and the health profile variables When was your TB infection confirmed? (χ^2=8.696, p=0.034) had shown statistically significant association with pretest level of knowledge regarding prevention of recurrent super infection among patients with PTB at p<0.05 level.

In control group, the demographic variable of marital status (χ^2=7.639, p=0.022) and the health profile variable of When was your TB infection confirmed? (χ^2=25.0, p=0.001), Are you taking regular treatment for PTB (χ^2=7.639, p=0.006), Do you smoke? (χ^2=5.469, p=0.019) had shown statistically significant association with pretest level of knowledge regarding prevention of recurrent super infection among patients with PTB at p<0.05 level.

4. DISCUSSION:

Quasi experimental research design-pre-test and post-test control group was used to select the sample; Total 50 patients with 25 experimental group and 25 control group with PTB were selected by convenience sampling technique. The aim of the study was to the effects of self-care education on knowledge regarding prevention of recurrent super infection among the patients with pulmonary tuberculosis.

The first objective of the present study was to assess the levels of knowledge regarding prevention of PTB among patients with PTB. In the pretest of EG, 92% had inadequate and 8% had moderately adequate knowledge whereas in the pretest of CG, 96% had inadequate and 4% had moderately adequate knowledge. Similar results noted in a study done by Huddart S et al (2018) showed In the category of personal protective equipment, 74.1% of participants properly replied, making up 58.5% of the participants with strong knowledge. The patients' lack of awareness was discovered to be one of the reasons for non-compliance [(10)]. The supported study was conducted by Nautiyal RG et al (2019) shows 13.5% of PTB patients understood that a vaccination is available, 48.6% recognised that TB is not a hereditary disease, and 68.5% knew to cover their mouth and nose when coughing and sneezing to avoid the spread of the disease [(11)].

The second objective of the study was to evaluate the effects of self-care education on knowledge regarding prevention of recurrent super infection of PTB among the patients with PTB attending pulmonary OPD in the EG and CG. The pretest of EG, 92% had inadequate and 8% had moderately adequate knowledge whereas in the posttest 60% had adequate and 40% had moderately adequate knowledge whereas in the pretest of CG, 96% had inadequate and 4% had moderately adequate knowledge and in the post test, 92% had inadequate and 8% had moderately adequate knowledge. The supported study was conducted by Siregar PA et al (2021) revealed that the booklet might raise the value of 10 knowledge from the pretest to 11.03 (p 0.001). The pretest knowledge value can rise from 8.7 to 11.97 to the poster calendar (p 0.001) [(5)]. Consistent results noted in a study done by Amin MA et al (2020) shows after the intervention, the use of brainstorming and booklets had a substantial impact on client knowledge (p=0.000) [(12)]. Hence, the stated research hypothesis (H_1) was accepted.

The third objective of the study was to find an association between pre-test levels of knowledge regarding prevention of recurrent super infection among patients with PTB and their selected demographic variables. In experimental group, religion (χ^2=13.678, p=0.001) and When was your TB infection confirmed?" (χ^2=8.696, p=0.034) had shown statistically significant association with pretest level of knowledge regarding prevention of recurrent super infection among patients with PTB at p<0.05 level. In control group, marital status (χ^2=7.639, p=0.022), When was your TB infection confirmed?" (χ^2=25.0, p=0.001), Are you taking regular treatment for PTB? (χ^2=7.639, p=0.006) and Do you smoke? (χ^2=5.469, p=0.019) had shown statistically significant association with pretest level of knowledge regarding prevention of recurrent super infection among patients with PTB at p<0.001 level. Consistent results noted in a study done by Huddart S et al (2018) shows the patient knowledge was significantly associated with higher at the end of treatment than at the beginning [(10)]. Hence, the stated research hypothesis (H_2) was accepted.

5. CONCLUSION:

The study concluded that self-care education was found to be effective in increasing the level of knowledge on prevention of recurrent super infection among patients with Pulmonary Tuberculosis. This supplementary method is simple, economical, non-invasive, non-pharmacologist. Based on the results, we advise using self-care education to prevent repeated infections and to improve quality of life in community settings and health care facilities, raising awareness of the need to prevent recurring infections to improve quality of life for PTB patients.

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