Research Article

Effectiveness of Structured Teaching Program on Knowledge Regarding Importance of Diet in Management of Tuberculosis among TB Patients

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Abstract

Aim: The objective of the study was to assess the effectiveness of structured teaching program on knowledge regarding importance of diet in management of tuberculosis (TB) among TB patients and to find the association between pre-test knowledge score and baseline variables.

Materials and Methods: Quantitative evaluative approach with one-group pretest-posttest design was adapted in the study. The purposive sampling technique was used to select 60 TB patients. Knowledge level of TB patients was assessed by semi-structured knowledge questionnaire. After collecting data, structured teaching program on importance of diet in the management of TB was administered to the subjects lasting for 45 min. On the 7th day, post-test was conducted using the same semi-structured knowledge questionnaire.

Results: Results show that in pre-test, 63.3% of samples were having moderate knowledge, 36.66% of samples were having inadequate knowledge, whereas in post-test, 61.67% of samples were having adequate knowledge, 38.3% were having moderate knowledge. Finding also shows that mean post-test knowledge level (21.73 ± 3.47) was higher than mean pre-test knowledge level (11.7 ± 4.8) with mean difference 10.3. Paired "*t*"-test was used to compare pre- and post-test score and it was found significant at 0.05 level of significant. Hence, research hypothesis was accepted. Only age in years had significant association with pre-test knowledge score and there was no significant association found between pre-test knowledge score and other baseline variables.

Conclusion: The study findings proved that structured teaching program was effective in improving knowledge of TB patients regarding importance of diet in the management of TB.

Keywords: Effectiveness, structured teaching program, tuberculosis sanatorium, tuberculosis, diet

Introduction

Tuberculosis (TB) is a communicable airborne infection and also called TB caused by mycobacterium TB, an aerobic, acid–fast bacillus. It is generally acquired by inhalation of a particle small enough to reach the alveolus. TB is one of the two most prominent mycobacterial diseases known to human kind.[1] In Asia, in particular India, population growth played a significant role in increasing the number of TB cases. Despite intensive efforts to limit its spread, in 1993, TB was declared a "global emergency."[2]

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Nutritional status is one of the most important determinants of resistance to infection. It is well established that nutritional deficiency is associated with impaired immune functions. It has long been known that there is an association between TB and malnutrition. Malnutrition enhances the development of active TB, and active TB makes malnutrition worse.[3]

Concomitant malnutrition could diminish the pharmacodynamic effectiveness of antimycobacterial drug regimens, which must be taken for several months to cure the patient. Thus, nutritional intervention along with appropriate pharmaceutical therapy could improve the outcome in malnourished TB patients.[4] While giving priority to drugs, we must not forget the importance of a basic, balanced diet in the management of TB. We must keep in mind that we are not only treating the disease, but the person as a whole.[5]

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TB is a major global health problem and is one of the top 10 causes of illness, disability worldwide and is the leading cause of death from a curable infectious disease. Globally, the estimated figures show that 18 lakhs people die of TB, a majority of them in developing countries. The annual incidence of new cases of all forms of TB accounts for about 88 lakhs, 95% of which occur in the developing countries.[6] India has the highest burden of TB in the world, accounting for approximately one-fifth of the global incidence – an estimated 2 million cases annually and more than 40% of population is infected with *Mycobacterium* TB. The annual economic cost of TB to the Indian economy is at least Rs. 130,000 million because of higher prevalence of disease in economically productive age group (15–54 years).[2]

The bidirectional association between undernutrition and TB leads to a high prevalence of undernutrition among people with TB. Proper nutritional care improves nutritional recovery for people who are undernourished and therefore helps reduce future health risks.[4]

Kennedy *et al*. conducted a study on nutritional status and weight gain in patients with pulmonary TB in Tanzani. They assessed nutritional status in 200 adult TB patients with smear-positive pulmonary TB before, during, and after 6 months of TB treatment. One hundred and forty-eight patients (74%) were successfully followed for 12 months. Marked nutritional impairment was present on admission. About 77% of males and 58% of females had a body mass index below 18.5; approximately one-fifth had body mass index (BMI) < 16.0. Most patients lost weight after completing treatment and returning home. At 12 months, 32% of male and 19% of female patients considered cured of TB had BMI < 18.5. It is concluded that patients with TB from this area of Tanzania frequently have evidence of malnutrition before and after treatment for TB. However, the results also demonstrated that nutritional rehabilitation can be successfully achieved even in TB patients and in patients with a suboptimal response to therapy.[7]

Objectives of the study

The objectives of the study are:

(a) To determine the existing knowledge regarding importance of diet in the management of TB among TB patients in TB sanatorium, Moodushedde, Mangalore.
(b) To find out the effectiveness of structured teaching program on knowledge regarding importance of diet in the management of TB among TB patients in TB sanatorium, Moodushedde, Mangalore.
(c) To find out the association between the pre-test knowledge score and selected baseline variables.

Hypothesis

The hypothesis will be tested at 0.05 level of significance.

- $H_1$1: There will be significant difference between mean pre-test and mean post-test knowledge score among TB patients
- $H_1$2: There will be significant association between pre-test knowledge scores and selected baseline variables.

Materials and Methods

Study design and setting

Pre-experimental one-group pre-test, post-test design was used and the study was conducted in TB sanatorium Moodushedde at Mangalore.

Population

TB patients were admitted to TB sanatorium Moodushedde at Mangalore.

Sampling procedure

The sample size for this study was 60 TB patients who were admitted in Moodushedde TB sanatorium and non-probability purposive sampling technique was used to select the samples. Patients who were available during the time of data collection and who can follow the instruction were included in the study.

Data collection tool and technique

Selection and development of the tool

Semi-structured knowledge questionnaire developed and administered to TB patients to assess their knowledge regarding importance of diet in the management of TB. Tool has two sections.

Section A: Baseline pro forma with 10 items
Section B: Knowledge questionnaire with 30 items

To ensure content validity, the tool, and lesson plan on importance of diet in the management of TB along with blueprint, criteria checklist was submitted to 10 expert educators. The final tool was tested for reliability and the reliability of the tool was computed using split half method. The reliability coefficient of knowledge questionnaire is found to be 0.98 which indicated that the tool was reliable.

After obtaining the informed consent from the samples, data were collected using semi-structured knowledge questionnaire and followed by administration of structured teaching program which was carried out for about 60 min. Post-test was conducted after 1 week.

Statistical analysis

The collected data were analyzed using descriptive statistics and inferential statistics. Data were analyzed in terms of frequency, percentage, mean, median, mean percentage, and standard deviation and would be presented in the form of tables and diagrams. The significant difference between mean pre-test and post-test knowledge scores was found out by paired "*t*" test. Association of pre-test knowledge level with selected demographic variables was tested using Chi-square test.

Results

The data were analyzed and presented under following headings:

Section A: Description of baseline variables of the samples

This section deals with the description of the demographic characteristics of TB patients and has been presented in the form of frequency and percentage which is presented in Table 1.

Section B: Description of level of knowledge of TB patient regarding importance of diet in the management of TB

Data in Table 2 show that there was increase of knowledge level in post-test after STP than pre-test.

To compare the pre-test and post-test knowledge score, statistically paired "*t*"-test was used. To test the statistical significance, the following research hypothesis was stated.

$H_1$1: The mean post-test knowledge score will be significantly higher than the mean pre-test knowledge score.

Section C: Effectiveness of structured teaching program on knowledge regarding importance of diet in the management of TB

Data in Table 3 show that post-test knowledge range (11–28) is significantly higher than pre-test knowledge range (2–20).

Table 1: Frequency and percentage distribution of tuberculosis patients according to baseline characteristics *n*=60

Variables	Frequency (f)	Percentage
Age in years		
20–30	5	8.34
31–40	15	25
41–50	25	41.66
51–60	15	25
Gender		
Male	49	81.66
Female	11	18.34
Family income in rupees		
5000 and below	18	30
5001–10,000	36	60
10,001–20,000	5	8.34
20,001 and above	1	1.66
Educational status		
No formal education	18	30
Primary education	26	43.33
Higher secondary	11	18.33
PUC and above	5	8.34
Occupation		
Daily wager	40	66.66
Self-employed	9	15
Private sector	7	11.67
Government	4	6.67
Type of family		
Nuclear	34	56.67
Joint	22	36.67
Extended	4	6.66
Area of residence		
Rural	39	65
Urban	21	35
Type of diet		
Vegetarian	12	20
Non-vegetarian	48	80
History of relapse		
Yes	25	41.66
No	35	58.34
Previous knowledge		
Yes	12	20
No	48	80

Data also depict that mean post-test knowledge score (21.73 ± 3.47) is higher than mean pre-test knowledge score (11.7 ± 4.8). The median value of post-test (21) is higher than median value of pre-test (12). This signifies the effectiveness of structured teaching program.

Data in Table 4 show that mean post-test knowledge level (21.73 ± 3.47) is higher than mean pre-test knowledge level (11.7 ± 4.8) with mean difference 10.3. Pre-test and post-test knowledge score was compared using paired "*t*" test. The calculated "*t*" value was 16.38 greater than table value (2.00) at 0.05 level of significance. Hence, the research hypothesis was accepted.

Section D: Association between pre-test knowledge scores and selected baseline variables

Chi-square test was computed to determine the association of pre-test knowledge score with selected baseline variable. To test the significance, the following research hypotheses stated $H_1$2: There will be significant association between pre-test knowledge scores and selected baseline variables.

Data in Table 5 show that baseline variable age in years had significant association with pre-test knowledge score (calculated value is more than table value at 0.05 level of significance) and there is no significant association found between pre-test knowledge score and gender, income, education status, occupation, type of family, area of residence, type of diet, history of relapse, and previous knowledge. Hence, the null hypothesis was partially rejected and research hypothesis is partially accepted.

Table 2: Pre-test and post-test knowledge level of tuberculosis (TB) patient regarding importance of diet in the management of TB *n*=60

Knowledge level	Score	Pre-test		Post-test	
		F	%	F	%
Inadequate	0–10	22	36.67	0	0
Moderately adequate	11–20	38	63.33	23	38.33
Adequate	21–30	0	0	37	61.67
Total		60	100	60	100

Table 3: Range, mean, median, standard deviation (SD), and mean percentage of pre-test and post-test level of knowledge of tuberculosis (TB) patients regarding importance of diet in the management of TB *n*=60

	Obtained range	Mean	Median	SD	Mean %
Pre-test	2–20	11.7	12	4.8	39
Post-test	11–28	21. 73	21	3.47	72.42

Table 4: Comparison of pre-test and post-test knowledge level of tuberculosis patients *n*=60

	Maximum score	Mean	Standard deviation	Mean difference	"*t*" value
Pre-test	30	11.7	4.8	10.03	16.38
Post-test	30	21.73	3.47		

*At 0.05 level of significance

Table 5: Association between pre-test knowledge score and selected demographic variables $n=60$

Demographic variable	Df	χ^2	Table value	Inference
Age in years	2	15.04*	5.99	S
Gender	1	0.533	3.84	NS
Income (monthly)	1	0.0075	3.84	NS
Educational status	1	0.659	3.84	NS
Occupation	1	0.059	3.84	NS
Type of family	1	0.24	3.84	NS
Area of residence	1	0.20	3.84	NS
Type of diet	1	0.36	3.84	NS
History of relapse	1	0.097	3.84	NS
Previous knowledge	1	0.004	3.84	NS

Discussion

Most (41.66%) of participants were belongs to the age group of 41–50 years. Majority (81.66%) of participants were male, highest percentage (60%) of participant's monthly income was Rs. 5001–Rs. 10,000. About 43.33% of participants were having secondary education. Most (66.66%) of participants were daily wager. Highest percentage (56.6%) of participants belongs to nuclear family. Most (65%) of participants were residing in rural area. Majority (80%) of samples non-vegetarian, more or less (58.33%) of samples had no history of relapse. Majority (80%) of samples had no previous information about TB and its management.

In pre-test, most (63.3%) of samples were having moderately adequate knowledge, 36.66% of samples were having inadequate knowledge, none of the samples having adequate knowledge. In post-test, most (61.67%) of samples were having adequate knowledge, least percentage (38.3%) were having moderately adequate knowledge, and no samples were having inadequate knowledge. After structured teaching program, it was revealed that post-test knowledge range (11–28) was significantly higher than pre-test knowledge range (2–20). Data also depict that mean post-test knowledge score (21.73 ± 3.47) was higher than mean pre-test knowledge score (11.7 ± 4.8). The median value of post-test (21) was higher than median value of pre-test (12). This signifies the effectiveness of structured teaching program. Findings show that post-test knowledge level (21.73 ± 3.47) was higher than mean pre-test knowledge level (11.7 ± 4.8) with mean difference 10.3. Pre-test and post-test knowledge score was compared using paired "*t*" test. The calculated "*t*" value was 16.38 greater than table value (2.00) at 0.05 level of significance.

Above finding was consistent with a cross-sectional study which was carried out among 88 patients suffering from pulmonary TB and receiving treatment from Rural Health Training Centre, Jawan, J N Medical College, UP. Results show that majority of the patient 80.7% were aware of symptoms of TB. As many as, 96.6% of patients were aware that TB could be transmitted from one person to another. As regard the etiology of disease, 47.7% were aware of correct etiology, that is, infective organism, 37% of patients were aware of investigations carried out for TB and 9.1% of patients were aware about Bacillus Calmette-Guérin vaccination as mode of prevention for TB. Majority of the patient 95.5% believed that TB is curable and 6–9 months duration was correctly known to only 32.9% of patient. The cross-sectional study revealed that although knowledge regarding symptoms, mode of transmission, and etiology was satisfactory, there is still a great need to educate general population and illiterate individuals on priority basis. Misconceptions such as food and utensils as mode of transmission need to be removed.[8]

Similar study was conducted to assess the effectiveness of patient Education Program to Improve Adherence Rates with Anti-TB Drug Regimens. The 205 subjects who participated in the study are categorized according to patients with active TB (n = 88) or preventive patients with no evidence of active disease (n = 117). Patients in each of these groups were randomly assigned to a special intervention (SI) group or a usual care (UC) control group and were followed monthly throughout their treatment program. While SI patients with active TB demonstrated higher levels of appointment-keeping behavior and mean percent of medication taken compared to UC patients, no statistically significant differences between the two groups were found. These results demonstrate the positive effects of a structured health education program on the improvement of continuity of care and adherence behavior among patients with TB.[9]

A cross-sectional observational study was conducted among patient suspected or diagnosed with pulmonary TB in a tertiary care hospital using pre-structured questionnaire. A total of 100 samples participated in the study. Out of these, 74% had never suffered TB in the past. Cough was identified as a symptom of TB by 75% participants. The study reveals that there are quite a few misconceptions regarding causes, transmission, and prevention of TB. There is still a way to go to educate the population regarding such common illness.[10]

Conclusion

This study was useful to know the knowledge level of TB patients and to find the effectiveness of teaching program to improve their knowledge. Training to students about health education approaches and motivating to implement those techniques will help to improve knowledge of patient and thereby improve their quality of life. This study can be important illustrative information for the students to understand how the teaching program was important to improve knowledge of patients.

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