

Effect of Personalized Education on the Awareness Rate of Protective Knowledge Among Inpatients with Newly Diagnosed Pulmonary Tuberculosis

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Abstract: *Objective:* This study aims to explore the impact of personalized education on the awareness rate of protective knowledge among inpatients newly treated for pulmonary tuberculosis. *Methods:* 325 initial pulmonary tuberculosis inpatients admitted to our hospital between January 2018 and December 2022 were selected as the research subjects. Using the randomized controlled trial method, they were divided into an experimental group of 163 cases and a control group of 162 cases. The experimental group received personalized education, including personalized guidance on patients' disease awareness, treatment compliance, and preventive measures. The control group received routine health education. After the experiment, the awareness rate of protective knowledge of the two groups of patients was evaluated. *Results:* The total awareness rate of the experimental group was 76.07%, which was significantly higher than that of the control group, which was 55.63%, and the difference was statistically significant at $P < 0.05$. The transmission route, suspicious symptoms, medical institutions, preferential policies, whether it can be cured, and the full awareness rate of the experimental group were all higher than those of the control group, and the difference was statistically significant at $P < 0.05$. *Conclusion:* Personalized education positively impacts the awareness rate of protective knowledge among inpatients newly treated for pulmonary tuberculosis. Therefore, when hospitals provide medical services for newly diagnosed pulmonary tuberculosis patients, they should strengthen personalized education, improve patients' awareness of the disease and self-protection ability, and reduce the risk of infection.

Keywords: Personalized education; Tuberculosis; Awareness rate

Online publication: September 22, 2023

1. Introduction

Tuberculosis is a chronic infectious disease caused by *Mycobacterium tuberculosis*. It is mainly transmitted through the respiratory tract. Common symptoms include cough, sputum production, fever, night sweats,

and loss of appetite. Tuberculosis has a severe impact on the life and work of patients and may lead to death in severe cases. Tuberculosis is a common chronic infectious disease that poses high risks to patients and healthcare workers. Due to insufficient awareness of the disease, newly diagnosed pulmonary tuberculosis patients often have the risk of infection during hospitalization. Therefore, it is significant to increase the awareness rate of protective knowledge among newly diagnosed pulmonary tuberculosis inpatients to reduce the risk of infection. As a targeted education method, personalized education can provide personalized guidance according to the different situations of patients, and help to improve the learning effect of patients.

2. Materials and methods

2.1. Survey object

325 initial pulmonary tuberculosis inpatients admitted to our hospital between January 2018 and December 2022 were selected as the research subjects, including 196 males and 129 females aged 15–86 years old, with an average age of 44.7 ± 8.0 . For the educational level, 33 were illiterate, 132 were in primary school and junior high school, 105 were in high school and technical secondary school, and 55 were in college and above. For residence area, 139 were in urban areas and 186 were in rural areas. The randomized controlled trial method was used to randomly divide the patients into an experimental group of 163 cases and a control group of 162 cases.

2.2. Methods

The experimental group received personalized education, including personalized guidance on patients' disease awareness, treatment compliance, and preventive measures. The control group received routine health education.

After the experiment, the awareness rate of protective knowledge of the two groups of patients was evaluated. The evaluation form in this study was a questionnaire and it was based on clinical and literature data. The main contents of the questionnaire are as follows: general situation of the survey object, gender, age, marriage, education level, place of residence, and family income. There were 5 pieces of core information on tuberculosis prevention and control: Article 1 was the main transmission routes of tuberculosis, Article 2 was suspicious symptoms of tuberculosis, Article 3 was professional institutions for examination and treatment of tuberculosis, Article 4 was content of tuberculosis reduction and exemption policy, and Article 5 was whether tuberculosis can be cured. The outpatient doctor asked the patient for quality control and filled it out on-site.

2.3. Observation indicators

Total awareness rate of core information was calculated: Total awareness rate = [total number of correct answers for each piece of core information / (number of people surveyed \times 5)] \times 100%.

Full awareness rate of core information was calculated: Full awareness rate = (number of people who answered all information correctly / number of people surveyed) \times 100%.

Awareness rate of a single core information was calculated: Awareness rate of a single piece of information = (number of people who correctly answer a single piece of core information / number of people surveyed) \times 100%.

2.4. Statistical methods

The data were processed with SPSS software, and the obtained data were analyzed statistically. Counting data were compared using the χ^2 test, and $P < 0.05$ was considered statistically significant.

3. Results

3.1. Survey on the total awareness rate of core tuberculosis information

The total awareness rate of 76.07% in the experimental group was significantly higher than 55.63% in the control group, and the difference was statistically significant at $P < 0.05$, as shown in **Table 1**.

Table 1. Survey on total awareness rate of tuberculosis core information [n (%)]

Group	Number of cases	Total awareness rate
Control group	162	89 (55.63)
Experimental group	163	124 (76.07)
χ^2	-	16.0697
P	-	0.0001

3.2. Survey on the full awareness rate of core tuberculosis information

The transmission route, suspicious symptoms, medical treatment institutions, preferential policies, whether it can be cured, and all awareness rates of the experimental group were higher than those of the control group, and the difference was statistically significant at $P < 0.05$, as shown in **Table 2**.

Table 2. Survey on the full awareness rate of tuberculosis core information [n (%)]

Group	Control group (n = 162)	Experimental group (n = 163)	χ^2	P
Transmission route	87 (83.70)	121 (74.23)	-	-
Suspicious symptoms	89 (54.94)	124 (76.07)	-	-
Medical institutions	88 (54.32)	114 (69.94)	-	-
Preferential policies	90 (55.56)	136 (83.44)	-	-
Whether it can be cured	91 (56.17)	119 (73.01)	-	-
All awareness rates	86 (53.09)	112 (68.71)	8.3324	0.0039

4. Discussion

Tuberculosis is mainly spread through the respiratory tract. The bacteria released by patients when they cough, sneeze, and talk will spread to others through the air. In addition, sputum saliva may also carry the bacteria [1-4]. Common symptoms of pulmonary tuberculosis include coughing, sputum production, fever, night sweats, and weight loss. Some patients may have symptoms such as dyspnea and chest pain. In addition, fatigue and loss of appetite are also common signs. Pulmonary tuberculosis tests include sputum examination, lung imaging examination, and tuberculin test. Based on the examination results and the patient's clinical symptoms, the doctor will comprehensively judge whether the diagnosis of tuberculosis is confirmed. If tuberculosis is not treated in time, the condition may further worsen with severe damage to the lungs and may even be life-threatening, but as long as timely diagnosis and standard treatment are received, most of the cases can be cured. The condition of some tuberculosis patients can be effectively controlled with good prognosis. Taking medication regularly according to the doctor's recommendations is the key to treating tuberculosis. Patients should not stop taking the medication or change the dosage at will to avoid affecting the treatment effect. The treatment plan may include multiple courses of treatment, there are specific drugs and treatment plans in each course of treatment, which should be strictly followed by the patients. If they have any discomfort or questions, they should consult a doctor. During treatment, the drug should not be stopped or reduced at will, or it will lead

to the recurrence of the condition and may even promote the development of drug resistance. Regular follow-up should be conducted to adjust the medication promptly during treatment. The doctor will adjust the treatment plan according to the patient's condition and drug response.

Preventive measures against tuberculosis^[5-11] include vaccinating newborns with the bacille Calmette-Guerin (BCG) vaccine as soon as possible after birth, which is an important measure to prevent tuberculosis. The BCG vaccine can enhance the body's resistance to *Mycobacterium tuberculosis* and reduce the risk of infection. Regular exercise can strengthen the body's physical function and improve resistance. Proper exercise can promote blood circulation, accelerate metabolism, and help to prevent diseases. Moreover, indoor air circulation can help to reduce the growth of bacteria, and regular window ventilation can keep the air fresh, reduce the density of germs, and prevent the spread of diseases. Adequate intake of protein helps to improve the body's immunity. Eating more high-protein foods such as fish, meat, and beans can enhance the body's resistance to diseases. Plus, covering the mouth and nose with a tissue or elbow when coughing or sneezing can prevent droplets from spreading germs. Washing the hands immediately after sneezing can avoid infecting others, and washing hands frequently can reduce the growth of bacteria and prevent the spread of diseases. Regular disinfection of public areas and commonly used items can reduce the spread of germs. Additionally, keeping a certain distance from tuberculosis patients and avoiding close contact can prevent disease transmission. Tuberculosis patients should receive treatment in designated hospitals to avoid infecting others, while for confirmed tuberculosis patients, appropriate isolation measures can reduce the spread of the disease. Improving the awareness rate of protection knowledge among tuberculosis patients so that patients understand the importance of isolation and cooperate actively is significant for controlling the spread of the disease.

Treatment methods for tuberculosis^[12-17] are as follows:

- (1) Anti-tuberculosis drugs are the core of tuberculosis treatment and the key to cure tuberculosis and prevent recurrence. Anti-tuberculosis drugs mainly include isoniazid, rifampicin, pyrazinamide, and ethambutol. These drugs can kill or inhibit the growth and reproduction of *Mycobacterium tuberculosis*, thereby controlling the disease progression and achieving the treatment purpose. Anti-tuberculosis drug treatment generally adopts a short-term intensive treatment plan, which usually requires continuous medication for 6–8 months. During the treatment process, patients need to take medication regularly under the guidance of a doctor to ensure the accuracy of drug dosage and medication time to achieve the best therapeutic effect.
- (2) Combination therapy is the simultaneous use of two or more anti-tuberculosis drugs to treat pulmonary tuberculosis. This treatment method can increase the therapeutic effect, reduce drug side effects, and reduce the development of drug resistance of *Mycobacterium tuberculosis*. The specific combination therapy plan must be formulated based on the patient's condition and drug sensitivity. Commonly used combination treatment regimens include isoniazid + rifampicin, isoniazid + rifampicin + pyrazinamide, isoniazid + rifampicin + ethambutol.
- (3) Surgical treatment may be required for some pulmonary tuberculosis patients with severe illness or poor response to drug treatment. The primary purpose of surgical treatment is to remove diseased tissue, reduce the reproduction of *Mycobacterium tuberculosis*, and thus control the development of the disease. Before surgical treatment, comprehensive examination and evaluation are required to ensure that patients have surgical indications. After surgery, nursing care and nutritional supplements are required to promote the body's recovery.
- (4) Supportive treatment refers to using some adjuvant treatment methods to enhance the therapeutic effect based on anti-tuberculosis drug treatment. These methods include diet conditioning,

psychological support, and exercise. Through appropriate diet and nutritional supplements, the patient's immunity can be improved, and sufficient energy and nutrients can promote the body's recovery. At the same time, appropriate psychological support and exercise can help patients to relieve anxiety and stress, enhance the body's resistance, and improve the therapeutic effect.

- (5) Regular review is an important measure to ensure the effectiveness of tuberculosis treatment and prevent recurrence. Regular reexamination can detect changes and recurrences of the condition in time, and the treatment plan can be adjusted promptly to avoid deterioration. In general, tuberculosis patients must be re-examined once a month during treatment. For a period of time after completing the treatment, regular follow-up observations are also required to ensure the stability of the condition and the recovery of the body.

The results of this study showed that the total awareness rate of 76.07% in the experimental group was significantly higher than the 55.63% in the control group. Personalized education can effectively improve the awareness rate of protective knowledge among hospitalized patients with newly diagnosed pulmonary tuberculosis because it can provide personalized guidance according to the specific situation of patients, making it easier for patients to understand and remember relevant protection knowledge. At the same time, interaction and communication with patients can help patients to establish correct disease cognition and treatment attitudes, thereby improving patients' treatment compliance and self-protection ability.

5. Conclusion

To sum up, personalized education positively impacts the awareness rate of protective knowledge among inpatients with newly diagnosed pulmonary tuberculosis. Therefore, when hospitals provide medical services for newly diagnosed pulmonary tuberculosis patients, they should strengthen personalized education, improve patients' awareness of the disease and self-protection ability, and reduce the risk of infection.

Disclosure statement

The authors declare no conflict of interest.

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