



# Nutrition literacy mediates the relationship between self-efficacy and eating behavior in young tuberculosis patients: A cross-sectional study

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## ABSTRACT

**Objective:** To assess the associations between self-efficacy, nutrition literacy and eating behavior, and to examine if nutrition literacy mediates the relationship between self-efficacy and eating behavior in young tuberculosis patients.

**Methods:** This cross-sectional study used a convenience sampling strategy to select 230 young tuberculosis patients at the Second Hospital of Nanjing (Public Health Medical Center of Nanjing), China, from June 2022 to August 2022. The data were collected using a demographic data form, the Eating Behavior Scale, the Food and Nutrition Literacy Questionnaire and the Tuberculosis Self-Efficacy Scale. Descriptive statistics, Pearson bivariate correlation analysis, Pearson partial correlation analysis, hierarchical multiple regression, and mediation analysis were conducted in the study.

**Results:** The mean self-efficacy score for young tuberculosis patients was 92.56 (SD = 9.89, range = 21 ~ 105). The average nutrition literacy score for young tuberculosis patients was 68.24 (SD = 6.75, range = 0 ~ 100). The bivariate correlation analysis and partial correlation analysis found that self-efficacy was positively correlated with nutrition literacy ( $P < 0.01$ ). The regression analysis showed that self-efficacy ( $F = 5.186$ ,  $\beta = 0.233$ ,  $P < 0.001$ ) and nutrition literacy ( $F = 7.749$ ,  $\beta = 0.545$ ,  $P < 0.001$ ) significantly predicted eating behavior. The three dimensions of nutrition literacy including nutritional knowledge (mediation effect ratio = 13.1%, 95% CI = -0.089; -0.005), preparing food (mediation effect ratio = 17.4%, 95% CI = 0.011; 0.077) and eating (mediation effect ratio = 54.7%, 95% CI = 0.070; 0.192) mediated the relationship between self-efficacy and eating behavior in young tuberculosis patients.

**Conclusion:** Nutrition literacy mediated the relationship between self-efficacy and eating behavior. To promote healthy eating behavior among young tuberculosis patients, interventions aimed at improving self-efficacy and nutrition literacy should be conducted.

## 1. Introduction

Tuberculosis (TB) remains one of the main infectious killers in the world (World Health Organization, 2022). In 2022, Chinese TB morbidity accounted for 7.4% of the global incidence (World Health Organization, 2022). In 2018, the global burden of TB for young people was estimated for the first time (Snow et al., 2018). It was estimated that 1.8 million young people suffered from TB in 2018, accounting for 17% of all new TB cases in the world (Snow et al., 2018). Young people are at a higher risk of developing TB than children (Marais et al., 2004). Several studies have shown that malnutrition can increase the risk of TB

(Sinha et al., 2021; Martin and Sabina, 2019). Malnutrition is significantly affected by age, socioeconomic status, diseases, and eating behavior (Norman et al., 2021; Besora-Moreno et al., 2020; Ji et al., 2022). Healthy eating behavior can improve TB patients' nutritional status to improve their immune system, which increases their cure rates (Guideline: Nutritional Care and Support for Patients with Tuberculosis. Geneva: World Health Organization, 2013).

Several studies found that healthy eating behavior was associated with self-efficacy (Rodríguez-Oliveros et al., 2022; Dorling et al., 2019; Guntzwiller et al., 2017). According to Bandura's social cognitive theory, self-efficacy is essential for healthy behavior (Bandura, 1998). Self-

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efficacy refers to an individual's confidence in their ability to effectively complete a task, and is a major cognitive factor that encourages an individual to continue engaging in healthy behavior (Houlihan et al., 2009). It has been demonstrated that self-efficacy plays a significant role in eating behavior, particularly dietary self-efficacy (Anderson et al., 2007). Previous research has shown that self-efficacy can predict healthy eating behavior (Bektas et al., 2021). Thus, it is critical to recognize the importance of self-efficacy in promoting healthy eating behavior.

Additionally, nutrition literacy (NL) is associated with healthy eating behavior (Taylor et al., 2019), and increasing NL levels is also considered an effective strategy to improve healthy behavior and nutritional status (Cullen et al., 2015). NL is a special type of health literacy, which refers to the ability of an individual to acquire, process, and understand basic nutritional information (Weiss et al., 2005; Krause et al., 2018; Doustmohammadian et al., 2017; Silk et al., 2008). There is a significant positive correlation between health literacy and nutritional behavior (KHARAZI et al., 2022), and improving health literacy levels can promote healthy eating behavior (KEIKHA, Farnaz, 2021). Numerous studies reported that self-efficacy was positively related to health literacy (Bektas et al., 2021; Ceylan et al., 2022), and improving self-efficacy could enhance health literacy. Previous studies have demonstrated that self-efficacy is strongly related to health literacy (Bektas et al., 2021; Ceylan et al., 2022). As NL is derived from health literacy (Weiss et al., 2005), we hypothesized that self-efficacy may be related to NL.

In summary, the relationship between self-efficacy, health literacy, and eating behavior, as well as the relationship between NL and eating behavior were respectively examined and found to be significant. However, previous studies have been several limitations. Firstly, the relationship between self-efficacy and NL in young TB patients has not been demonstrated. In addition, no study has yet used mediation analysis to assess the association between self-efficacy, NL, and eating behavior in young TB patients, which can determine the indirect effect by which self-efficacy is associated with eating behavior.

The purpose of the study was to assess the associations between self-efficacy, NL and eating behavior, and to examine if NL mediates the relationship between self-efficacy and eating behavior in young TB patients. On the basis of previous studies, two hypotheses were stated: (a) self-efficacy is positively related to NL; (b) NL mediates the relationship between self-efficacy and eating behavior.

## 2. Methods and materials

### 2.1. Design and participants

This cross-sectional study was conducted at the Second Hospital of Nanjing (Public Health Medical Center of Nanjing), China, between June 2022 and August 2022. The samples consisted of 230 TB patients from five TB wards at the Second Hospital of Nanjing, China. According to the inclusion criteria, patients were selected using a convenience sampling strategy. Inclusion criteria for patients included the following: (1) patients diagnosed with TB; (2) patients whose age ranged from 18 to 44 years old (Ahmad OB et al., 2020); (3) patients with clear consciousness, clear communication, and the ability to understand the contents of the questionnaire; (4) patients who agreed to participate in this study and signed the written informed consent. Exclusion criteria for patients included the following: (1) patients with cognitive impairments or mental disorders; (2) patients with memory impairments; (3) unwillingness of patients to continue participating in the study.

The sample size in this study was calculated using an online application named Monte Carlo Power Analysis for Indirect Effects (Donnelly et al., 2022) ([https://schoemanna.shinyapps.io/mc\\_power\\_med/](https://schoemanna.shinyapps.io/mc_power_med/)). The application performs power analysis for indirect effects to calculate the sample size of mediation models, and helps researchers test moderated mediation models (Donnelly et al., 2022). Based on 80% power and 95% confidence level, the minimum sample size was determined to be 200

patients. Before conducting the study, the researchers informed the patients of the study information, and obtained written informed consent from patients. A total of 240 patients agreed to participate in this study. Ten patients were excluded due to incomplete answers. Thus, 230 patients were recruited in this study (effective response rate 95.83%).

### 2.2. Ethics statement

The study was approved by the Ethics Review Committee of the Second Hospital of Nanjing, China (ethical approval number: 2022-LS-ky004). Researchers informed patients about the purpose of the study and obtained written informed consent from patients.

### 2.3. Instruments

The study instruments included a demographic data form, the Eating Behavior Scale, the Food and Nutrition Literacy Questionnaire for Chinese adults, and the Tuberculosis Self-Efficacy Scale.

### 2.4. Demographic data form

The demographic data form was used to collect information regarding the socio-demographic characteristics of young TB patients, such as gender, age, marital status, education level, occupation, personal monthly income, medical insurance, etc.

### 2.5. Eating behavior scale (HUEBS)

The scale was developed by Professor Luc Pellerier at the University of Ottawa, Canada (Guertin et al., 2020). This tool is used to measure adult eating behavior. This scale consists of two dimensions: healthy eating behavior (11 items) and unhealthy eating behavior (11 items). The Likert 5-point scale is used: 1 point means "never", 2 points mean "sometimes", 3 points mean "most of the time", 4 points mean "often", and 5 points mean "always". The total score can range from 22 to 110, with higher scores indicating healthier eating behavior. The scale was adapted into Chinese by Lihua Di (Di, 2021). The study found that the Chinese version of the Eating Behavior Scale had good reliability and validity. The Cronbach's  $\alpha$  for the whole scale was 0.89, and the average content validity index (CVI) was 0.92.

### 2.6. Food and Nutrition Literacy Questionnaire for Chinese adults (FNLQ)

The questionnaire was developed by Zhang Y (Zhang et al., 2022). This tool is used to assess the level of NL in Chinese adults. This questionnaire consists of four dimensions: nutritional knowledge (5 items), selecting food (15 items), preparing food (11 items), and eating (19 items). The total score can range from 0 to 100, with higher scores reflecting a higher level of NL. This study indicated that the questionnaire had good reliability and validity. The Cronbach's  $\alpha$  for the whole questionnaire was 0.89. Furthermore, the content validity of the questionnaire was good, with a mean correlation coefficient above 0.60 between each dimension and the total questionnaire.

### 2.7. Tuberculosis Self-Efficacy scale (TBSSES)

The scale was designed by Cao (Cao et al., 2019). This tool is used to measure the self-efficacy of TB patients. The scale consists of four dimensions: medical care management (9 items), support seeking (6 items), psychological adjustment (4 items), and transmission management (2 items). The Likert 5-point scale is used: 1 point means "not at all confident", 2 points mean "20%~30% confidence", 3 points mean "50%~60% confidence", 4 points mean "70%~80% confidence", and 5 points mean "completely confident". The total score can range from 21 to 105, with higher scores indicating a higher level of self-efficacy. This study

indicated that the scale had good reliability and validity. The Cronbach’s  $\alpha$  for the whole scale was 0.92, and the average content validity index (CVI) was above 0.80.

### 2.8. Statistical analysis

The statistical analysis of this study was conducted using SPSS 26.0. The characteristics of the patients were analyzed using descriptive statistics. Pearson bivariate correlation analysis was used to assess the association between self-efficacy and NL. Pearson partial correlation analysis was used to retest the association between self-efficacy and NL when controlling for potential confounding factors (such as age, gender, educational level, and other socio-demographic factors). Predictive effects of self-efficacy and NL on eating behavior were examined with hierarchical multiple regression analysis. Mediation analysis was conducted to examine if NL mediates the relationship between self-efficacy and eating behavior in young TB patients. We used the Bootstrap method to determine the significance of the indirect effect. Based on 5000 repeated samples, bias-corrected confidence intervals (CI) were estimated for the indirect effect. If the 95% CI does not exceed 0, then the indirect effect is significant (Shrout and Bolger, 2002). After that, the mediation effect ratio was calculated (indirect effect/total effect%). The significance level was set at 0.05.

## 3. Results

### 3.1. Participant characteristics

A total of 230 patients were recruited for this study, including 113 males (49.1%) and 117 females (50.9%). The age of the patients ranged from 18 to 44 years, and the mean age was 30.82 years (SD = 8.30). In this study, only 2.2% of the patients had medical-related work experience, while 5.7% received nutrition guidance or treatment related to TB. Additional demographic details are shown in Table 1.

### 3.2. Self-efficacy, nutrition literacy and eating behavior

The mean self-efficacy score for young TB patients was 92.56 (SD = 9.89, range = 21 ~ 105). The average NL score for young TB patients was 68.24 (SD = 6.75, range = 0 ~ 100). The average score for eating behavior was 78.77 (SD = 8.42, range = 22 ~ 110), whereas the mean score for healthy eating behavior was 36.85 (SD = 5.81). Table 2 shows the detailed scores of young TB patients on self-efficacy, nutrition literacy, and eating behavior.

### 3.3. Correlation analysis of self-efficacy and nutrition literacy

Pearson bivariate correlation analysis showed that self-efficacy and its subscales were positively correlated with the total score of NL ( $P < 0.01$ ). When controlling confounding factors (such as age, gender, educational level, and other socio-demographic factors), Pearson partial correlation analysis showed that the medical care management subscale ( $r = 0.373, P < 0.01$ ), the support seeking subscale ( $r = 0.289, P < 0.01$ ), the psychological adjustment subscale ( $r = 0.344, P < 0.01$ ), and the transmission management subscale ( $r = 0.247, P < 0.01$ ) were still significantly positively correlated with NL. Details are shown in Table 3.

Partial correlation analysis: Fully controlling for confounding factors (such as age, gender, educational level, and other socio-demographic factors).

### 3.4. Predictive effects of self-efficacy and nutrition literacy on eating behavior

In this research, eating behavior was used as the dependent variable, self-efficacy and NL as independent variables. Model 1 included socio-demographic variables (such as gender, age, and education level and

**Table 1**  
Demographic characteristics of young TB patients (n = 230).

characteristics	N (%)
Gender	
Male	113 (49.1%)
Female	117 (50.9%)
Permanent residence	
Urban	156 (67.8%)
Rural	74 (32.2%)
Education	
Junior high school or lower	46 (20%)
Senior High School	52 (22.6%)
College/university diploma or higher	132 (57.4%)
Marital status	
Single	104 (45.2%)
Married	123 (53.5%)
Divorced	3 (1.3%)
Occupation	
Agriculture	3 (1.3%)
Business / institution staff	83 (36.1%)
Service staff	6 (2.6%)
Student	31 (13.5%)
Laid-off worker	18 (7.8%)
Others	89 (38.7%)
Healthcare-related work experience	
Yes	5 (2.2%)
No	225 (97.8%)
Personal monthly income (RMB yuan)	
<5000	80 (34.8%)
5000–8000	61 (26.5%)
8000–13000	48 (20.9%)
13000–17000	29 (12.6%)
> 17000	12 (5.2%)
Health insurance	
Urban and rural residents’ health insurance	152 (66.0%)
Self-financed	11 (4.8%)
Employee health insurance	51 (22.2%)
Others	16 (7.0%)
Time of illness	
<1 year	195 (84.8%)
1–5 years	34 (14.8%)
> 5years	1 (0.4%)
Type of treatment	
Primary treatment	192 (83.5%)
Rehabilitation	38 (16.5%)
Chronic diseases	
Yes	23 (10.0%)
No	207 (90.0%)
Nutritional treatment/guidance	
Yes	13 (5.7%)
No	217 (94.3%)

Note: Chronic diseases refer to dyslipidemia, diabetes or elevated blood sugar, hypertension, heart disease, stroke, etc.

**Table 2**  
Self-efficacy, nutrition literacy and eating behavior scores of young TB patients.

Item	Item score (X ± SD)
<b>Self-efficacy</b>	21 92.56 ± 9.89
Medical care management	9 42.31 ± 4.14
Support seeking	6 25.17 ± 4.76
Psychological adjustment	4 16.38 ± 3.31
Transmission management	2 8.70 ± 1.41
<b>Nutrition literacy</b>	50 68.24 ± 6.75
Nutritional knowledge	5 8.08 ± 1.41
Selecting food	15 17.32 ± 3.07
Preparing food	11 15.88 ± 2.24
Eating	19 26.97 ± 3.26
<b>Eating behavior</b>	22 78.77 ± 8.42
Healthy eating behavior	11 36.85 ± 5.81
Unhealthy eating behavior	11 41.92 ± 5.57

other variables) as control variables, model 2 included self-efficacy, and model 3 included NL. Hierarchical multiple regression was then conducted. As shown in model 2, self-efficacy explained 25.2% of the

**Table 3**  
Correlation analysis of self-efficacy, nutrition literacy, and eating behavior in young TB patients (n = 230).

Variables	Nutrition literacy			
	Bivariate correlation analysis		Partial correlation analysis	
	r	P	r	P
Self-efficacy	0.446	< 0.01	0.441	< 0.01
Medical care management	0.342	< 0.01	0.373	< 0.01
Support seeking	0.334	< 0.01	0.289	< 0.01
Psychological adjustment	0.298	< 0.01	0.344	< 0.01
Transmission management	0.292	< 0.01	0.247	< 0.01

variance in eating behavior and significantly predicted eating behavior ( $F = 5.186, \beta = 0.233, P < 0.001$ ). The results of model 3 indicated that NL significantly predicted eating behavior ( $F = 7.749, \beta = 0.545, P < 0.001$ ), which explained 33.5% of the variance in eating behavior. Table 4 shows the detailed statistics of the three models.

### 3.5. The mediating effect of nutrition literacy

The study used mediation analysis to determine if NL and its dimensions (nutritional knowledge, selecting food, preparing food and eating) mediate the relationship between self-efficacy and eating behavior in young TB patients. The results showed that NL was a partial mediator of the relationship between self-efficacy and eating behavior. In addition, the study showed that the nutritional knowledge, preparing food and eating mediated the relationship between self-efficacy and eating behavior, respectively. As a result, the mediation effect ratios (indirect effect/total effect) of nutritional knowledge, preparing food, and eating dimensions were 13.1%, 17.4%, and 54.7%, respectively. And the indirect effect was significant as well. Details of the mediation analysis are presented in Fig. 1 and Table 5.

## 4. Discussion

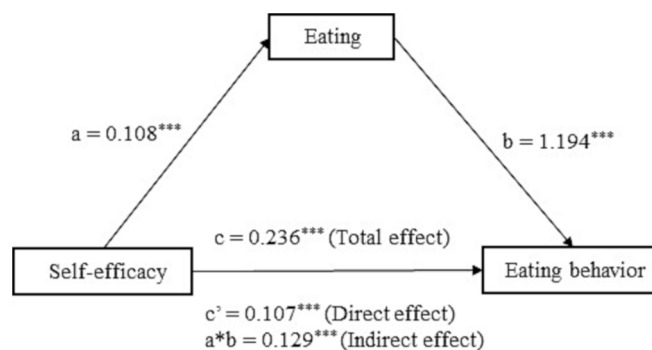
The purpose of this study was to assess the associations between self-efficacy, NL and eating behavior, and to examine if NL mediates the relationship between self-efficacy and eating behavior in young TB patients.

NL refers to an individual's ability to acquire, process, and understand basic nutrition information (Weiss et al., 2005; Krause et al., 2018; Doustmohammadian et al., 2017; Silk et al., 2008), and it is associated with healthy eating behavior (Cullen et al., 2015). According to our

**Table 4**  
Predictive effects of self-efficacy and nutrition literacy on eating behavior (n = 230).

Variables	Model 1		Model 2		Model 3	
	$\beta$	t	$\beta$	t	$\beta$	t
Age	0.108	1.139	0.118	1.296	0.075	0.871
Gender	0.762	0.698	0.872	0.832	0.145	0.146
Permanent residence	0.429	0.318	0.504	0.39	1.248	1.019
Education	-0.128	-0.254	-0.231	-0.476	-0.77	-1.653
Marital status	2.04	1.416	1.726	1.248	2.166	1.663
Occupation	0.111	0.572	0.134	0.715	-0.049	-0.273
Healthcare-related work experience	-6.809	-1.769	-6.438	-1.743	-5.467	-1.568
Personal monthly income (RMB yuan)	0.59	1.248	0.332	0.727	0.059	0.136
Health insurance	0.66	1.666	0.403	1.05	0.615	1.717
Time of illness	0.918	0.58	1.592	1.043	1.875	1.304
Type of treatment	0.804	0.5	-0.017	-0.011	0.04	0.028
Chronic diseases	-7.724***	-4.048	-7.69***	-4.202	-6.474***	-3.733
Nutritional treatment/guidance	-0.933	-0.393	-0.611	-0.268	2.067	0.944
Self-efficacy	-	-	0.233***	4.454	-	-
Nutrition literacy	-	-	-	-	0.545***	7.01
R <sup>2</sup>	0.183		0.252		0.335	
$\Delta R^2$	0.134		0.204		0.292	
F	3.733**		5.186***		7.749***	

Note: Predictor variables were added as follows: Model 1: Control variables; Model 2: Self-efficacy; Model 3: Nutrition literacy. \*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$ .



**Fig. 1.** A graphical example of the mediating effect of the dimensions of NL, (\*\*\*)  $P < 0.001$ .

knowledge, this study is one of the first to examine the association between self-efficacy and NL in young TB patients. The results of this study revealed that self-efficacy and its subscales (medical care management, support seeking, psychological adjustment, and transmission management) were significantly positively associated with NL. The findings suggested that patients with high levels of self-efficacy could enhance NL. The positive relationship between self-efficacy and NL was expected. Because self-efficacy alone is inadequate for promoting healthy eating behavior, an individual must also possess the behavioral abilities (knowledge and/or skills) to engage in healthy behavior (Bandura, 2001). And NL can provide specific knowledge and skills (Weiss et al., 2005; Krause et al., 2018; Doustmohammadian et al., 2017; Silk et al., 2008). Additionally, this study indicated that young TB patients had a high level of self-efficacy, but they were lacking in NL and healthy eating behavior. This showed that young TB patients had a low NL level, indicating that they lacked the ability to acquire, process, and comprehend basic nutritional knowledge. The results of this study fully explained that individuals had a high level of self-efficacy, but lack of corresponding nutritional knowledge and skills would inhibit developing healthy eating behavior (Bandura, 2001; Worsley, 2002). Consequently, interventions aimed at improving NL should focus on strengthening patients' abilities to acquire, process, and understand nutrition information and knowledge, thereby promoting healthy eating behavior.

This study found that self-efficacy and NL played a significant role in predicting eating behavior in young TB patients. This result was in line with Bektas' findings, suggesting that increasing self-efficacy levels could increase to develop healthy eating behavior (Bektas et al., 2021).

**Table 5**  
Summary of the mediating effects of nutrition literacy.

Effect	Independent variable Self-efficacy			Dependent Variable Eating behavior			BC 95% CI			Mediation Effect%		
	a			c'			c			Indirect Effect	Indirect Effect/Total Effect	
	$\beta$	R <sup>2</sup>	F	$\beta$	R <sup>2</sup>	F	$\beta$	R <sup>2</sup>	F			
Mediator: Nutritional knowledge	0.032***	0.049	11.853***	-0.205***	0.012	12.897***	-0.236***	0.076	18.868***	-0.031 †	-0.089 ~ - 0.005	13.1%
Mediator: Selecting food	0.113***	0.132	34.543***	0.210***	0.822	10.162***	0.235***	0.764	18.868***	0.025	-0.024 ~ 0.078	-
Mediator: Preparing food	0.052***	0.053	12.789***	0.194***	0.119	15.320***	0.235***	0.076	18.868***	0.041 †	0.011~ 0.077	17.4%
Mediator: Eating	0.108***	0.107	27.170***	0.107*	0.268	41.467***	0.236***	0.764	18.868***	0.129 †	0.070~ 0.192	54.7%

Note: a =  $\beta$  coefficient for the association between self-efficacy and nutrition literacy; b =  $\beta$  coefficient for the association between nutrition literacy and eating behavior; c' =  $\beta$  coefficient for the association between self-efficacy and eating behavior, when nutritional literacy is the mediator variable in the model; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; † Significant by 5000 Bootstrap samples, biased corrected methods: 95% CI of standardized coefficient.

Previous studies showed that healthy eating behavior was influenced by self-efficacy (Rodríguez-Oliveros et al., 2022; Dorling et al., 2019; Guntzwiller et al., 2017), and a high level of self-efficacy could prevent unhealthy eating behavior (Chari et al., 2014). Meanwhile, NL has been reported to be a predictor of healthy eating behavior (Lai et al., 2021). High levels of NL can improve adherence to healthy eating behavior (Taylor et al., 2019), and improve eating behavior (Kaur et al., 2020). To promote healthy eating behavior among young TB patients, interventions aimed at improving self-efficacy and NL should be conducted.

The present study showed that NL and its three dimensions (nutritional knowledge, preparing food and eating) mediated the relationship between self-efficacy and eating behavior, and the mediation effect ratios (indirect effect/total effect) were 13.1%, 17.4%, and 54.7%, respectively. This suggests that NL can explain and influence the effect of self-efficacy on eating behavior. The highest proportion of the eating dimension mediating effect was 54.7%. The results indicated that patients with higher self-efficacy had a greater food intake to support healthy eating behavior. Several studies have found that individuals with higher self-efficacy have greater health awareness and behavioral control to enrich food intake, which can improve their eating behavior (Anderson et al., 2007; Ayres and Pontes, 2018). Compared to the eating dimension, the proportion of the mediating effect of preparing food and nutritional knowledge was relatively low. However, several studies reported that the ability to prepare food was associated with healthy eating behavior (Reicks et al., 2014; Bernardo et al., 2017). An individual with high self-efficacy is confident in preparing food to promote healthy eating behavior (Knol et al., 2019). The research indicated that self-efficacy was positively related to nutritional knowledge, and that increasing self-efficacy and nutritional knowledge could improve eating behavior and nutritional status (Sharma et al., 2019).

4.1. The strengths of the study

Firstly, this study is the first to assess the relationship between self-efficacy, NL, and eating behavior in young TB patients. In addition, the study provides evidence that NL mediates the relationship between self-efficacy and eating behavior. Young TB patients with high self-efficacy could enhance the levels of NL to improve eating behavior. Therefore, improving the self-efficacy and NL of young TB patients is an

important task. The findings of this study suggest that interventions should focus on improving patients' self-efficacy and NL to encourage healthy eating behavior in the future. And healthy eating behavior can improve the nutritional status of TB patients, thereby reducing the risk of treatment failure (Xiong et al., 2020).

4.2. The limitations of the study

Firstly, this study only selected young TB patients from the Second Hospital of Nanjing (Nanjing Public Health Medical Center). Moreover, a convenience sampling strategy was used, and the sample size was relatively small. Therefore, the results cannot be generalized to all young TB patients in China. In addition, it is a cross-sectional study, and causal relationships between self-efficacy, NL, and eating behavior have not been demonstrated. In the future, longitudinal data can be used to investigate the mechanisms of each variable.

5. Conclusions

According to this study, self-efficacy was positively related to NL among young TB patients. Furthermore, NL mediated the relationship between self-efficacy and eating behavior. Based on these findings, self-efficacy and NL play an important role in improving eating behavior. As a result, interventions aimed at improving self-efficacy and NL should be conducted to improve eating behavior and the nutritional status of young TB patients in the future.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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