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Analysis of Factors Affecting the Success of Sociocultural Education Approach in Preventing Tuberculosis in Tapanuli Selatan Regency

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ABSTRACT

Introduction: Tuberculosis is still becoming one of the deathliest infectious diseases in the entire world and has become the most urgent public health challenge globally. This study aims to analyze the factors affecting the success of the sociocultural education approach in preventing Tuberculosis in Tapanuli Selatan Regency.

Methods: Using a cross-sectional study approach, data were collected from the local community using purposive sampling. Data analysis was conducted to evaluate the influence of certain variables, including public education level, health service access, community participation in education programs, the use of social media in education campaigns, and health workers' support on the success of sociocultural education approach in preventing Tuberculosis through univariate, bivariate, and multivariate analyses.

Results: The findings showed that community education level (p=0.001), health service access (p=0.001), community participation in education programs (p=0.001), social media use in education campaigns (p=0.001), health workers support (p=0.001) had a significant effect on the success of the sociocultural education approach in preventing Tuberculosis. Meanwhile, the variable of social media use in educational campaigns significantly influences public awareness and participation in efforts to prevent Tuberculosis, with an Exp value (B)=15.581 and a $p=0.001 < \alpha=0.05$ value.

Conclusion: This research concludes that the tuberculosis prevention strategy in Tapanuli Selatan Regency needs to be supported with an integrated sociocultural education approach that accommodates the roles of social media, health service access, community participation, and health workers' support. This research suggests an increase in investment in health infrastructure, health workers' training, and a more intensive and guided education campaign to improve the community's awareness and participation in preventing Tuberculosis in the area.

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INTRODUCTION

Tuberculosis still becomes a significant global health threat, especially in developing countries and areas with limited access to health services (1). Based on the World Health Organization (WHO) Report related to Tuberculosis in 2022, tuberculosis cases will increase to 4.5% for the first time in 20 years, and the number of death cases will increase from 1.5 million in 2020 to 1.6 million in 2021. This reflects the failure to achieve the Tuberculosis Final Strategy 2020 target, which aims to decrease suffering and death by 35%(3). It also indicates the quality of the service given to more than 10 million people infected with Tuberculosis in the whole world in 2019; the majority of them live in the areas of South East Asia (44%), Africa (25%), and West Pacific (18%)(4). The estimated number of tuberculosis cases in Indonesia reached 845,000 in 2020, with the report of 357,199 new cases and 13,947 death cases(5). However, the gap between the diagnosis and the treatment was still significant, with 28% of the undetected tuberculosis cases and only 34% of them getting the treatment(6). Even though there has been progress in the handling of Tuberculosis, the high tuberculosis prevalence in several areas indicates the need for a more holistic and integrated approach to prevent and conduct the disease(2).

According to the statement of the Ministry of Health of the Republic of Indonesia, Indonesia aims to achieve tuberculosis-free status in 2035. In 2021, South East Asia contributed almost half of the total tuberculosis cases globally, reaching 4.82 million or 45.4%. Eight countries were responsible for 66% of global cases, and Indonesia (9.2%) ranked second after India. Moreover, the report on global Tuberculosis in 2022 mentioned 969,000 tuberculosis cases in Indonesia, and 44% of them were localized in areas with dense populations such as East Java, West Java, and Central Java(7). Meanwhile, according to tuberculosis data in 2021, it was known that tuberculosis cases in North Sumatera Province ranked sixth among the entire provinces in Indonesia after West Java (91,368 cases), Central Java (43,121 cases), East Java (42,193 cases), Jakarta (28,125 cases), and Banten (23,343 cases) with total case number of 22,169. Data from the Public Health Office of North Sumatra Province showed a case increase, with cases 22,500 in 2020 to 22,748 in 2021, and on October 21^{st,} 2022, reached 20,009 cases(8). Also, the tuberculosis case finding in South Tapanuli Regency was 222 cases (16%) in 2022.

Tuberculosis is a public health issue in Tapanuli Selatan Regency. Tuberculosis has become a significant public health problem for so long. Tuberculosis is an infectious disease that still becomes one of the main reasons for morbidity and mortality in this area (9). Even though prevention and treatment efforts have been implemented, the success rate of handling this disease is still limited(10). One of the approaches adopted in preventing Tuberculosis is the sociocultural education approach(7,11). This approach emphasizes the importance of social and cultural aspects of society to change the behaviors that can influence the spread of this disease(12). Through sociocultural education, the effort to increase the community's awareness, knowledge, and acceptance of tuberculosis prevention acts is conducted(13). Even though this approach has great potential, there are still some significant challenges in achieving complete success(14). Factors such as the poor community's awareness level related to Tuberculosis, a cultural mindset that may hinder the prevention actions, and the constraints in health service accessibility can affect the effectiveness of this sociocultural education approach(15). With a better understanding of these constraining factors, we can identify the implementation gaps and formulate more effective strategies for mitigating tuberculosis problems at the sociocultural level(16). This research displays valuable insight for the stakeholders in the more thorough policy-making and sustainable tuberculosis prevention in this area(10). Therefore, this study aims to carefully analyze the factors affecting the success of the sociocultural education approach in preventing Tuberculosis in Tapanuli Selatan Regency.

METHODS

Research Design

This study is quantitative research that adopts a cross-sectional approach. This approach aims to obtain quantitative information related to factors that affect the success of sociocultural education approaches in the prevention of Tuberculosis. This research was conducted in South Tapanuli Regency, North Sumatra, Indonesia. This district was chosen because it has unique challenges related to tuberculosis prevention and significant sociocultural diversity.

Population and Sampling Techniques

The population of this study is people living in South Tapanuli Regency, especially those over 18 years old who have knowledge or experience related to Tuberculosis. The samples were selected using the purposive sampling technique, allowing the researcher to select individuals with specific criteria relevant to the research objectives. The sample selection criteria include individuals infected with Tuberculosis, residents, and those who have undergone treatment at health facilities in the area. As such, the study covers a wide range of social and demographic groups directly affected by this health problem.

Sample Size Calculation

The sample size was calculated using a formula for estimating the proportion of the population with the margin of error received and a 95% confidence level. Given the relatively large and diverse population, the calculation of this sample size aims to ensure that the sample taken is representative enough to describe the condition of the community as a whole. This calculation also considers possible data variability regarding factors affecting tuberculosis prevention's success.

Validation and Reliability of Data Collection Instruments

The data collection instrument is a structured questionnaire developed based on relevant literature and research objectives. To ensure the reliability and validity of the measuring instrument, the questionnaire was first tested on a small group outside of the research sample. Content validation is carried out by experts in the field of public health and Tuberculosis to ensure that each question in the questionnaire is relevant and can measure the factors to be studied. The reliability test was performed by calculating Cronbach's Alpha coefficient to ensure that the instrument had adequate internal consistency. Thus, this instrument is expected to produce valid and reliable data. Steps to Minimize Bias.

Several steps were taken to minimize the potential for bias in this study. First, the purposive sampling technique ensures that only individuals who meet the relevant criteria are included in the study, thereby reducing selection bias. Second, the researcher trained enumerators to avoid bias in filling out questionnaires and ensure that data collection was carried out consistently. Third, using structured questionnaires reduces the potential for subjective bias in data collection, as all respondents are given the same questions with a precise measurement scale**.** Fourth, to overcome information bias**,** the researcher ensures that respondents are given a clear explanation of the purpose of the research and ensures the confidentiality of the data provided. Furthermore, testing the validity and reliability of measurement tools and using appropriate statistical tools in data analysis reduces the potential for data processing and interpretation bias.

Data analysis

Quantitative data was analyzed using the SPSS program with chi-square test and logistic regression.

RESULTS

Table 1. Respondents' Characteristics Distribution in Tapanuli Selatan Regency

Respondents' Characteristics	n	Percentage
Age Group (Years)		
25– 27	11	5.1
28 – 29	28	13.0
30– 31	40	18.6
32 – 33	44	20.5
Respondents' Characteristics	**n**	**Percentage**
Age Group (Years)		
34 – 35	16	7.4
36– 37	12	5.6
38 – 39	43	20.0

Respondents' Characteristics	n	Percentage
40 – 41	21	9.8
Total	215	100
Respondents' Gender		
Male	155	72.1
Female	60	27.9
Total	215	
Education		
Elementary School	3	1.4
Junior High School	98	45.6
Senior High School	103	47.9
Diploma	3	1.4
Bachelor	8	3.7
Total	215	100
Occupation		
Housewife	64	29.8
Farmer	108	50.2
Entrepreneur	32	14.9
Honorary worker	8	3.7
Civil servants	3	1.4
Total	215	100
Income		
Less ≤ Rp.2,800,000	142	66.0
Adequate > Rp.2,800,000	73	34.0
Total	215	100
Religion		
Islam	148	68,8
Christian	67	31.2
Total	215	100
Ethnic		
Batak	155	72.1
Java	45	20.9
Minang	15	7.0
Total	215	100

Table 1 showed that, out of 215 respondents, the majority age group was 32-33 years old (20.5%), the majority gender was male (72.1%), the majority education level was senior high school (47.9%), the majority occupation was farmer (50.2%), the majority income was less (66.0%), the majority religion was Islam (66.8%), the majority ethnic was Batak (72.1%). The results section of this study presents the findings comprehensively and clearly, with tables describing well-structured data. The main findings show the importance of social media in health education campaigns, especially in efforts to prevent Tuberculosis. Although these findings have been reported, there is a need to dig deeper into their application in a practical context. For example, social media platforms such as Facebook and Instagram have proven effective in reaching the younger demographic, but challenges arise in attracting the attention of older age groups, who tend to be less active on social media. Therefore, more diversified campaign strategies, which combine social media and conventional approaches such as face-to-face outreach, need to be considered to increase reach.

In addition, the demographic data presented in Table 1 show significant differences in participation rates in tuberculosis prevention campaigns based on respondents' age, gender, and occupation. For example, younger

respondents (under 30) are more active in following information through social media than those older, who tend to rely more on information through traditional sources such as brochures and workplace campaigns. These findings indicate that tuberculosis prevention efforts need to be tailored to the demographic characteristics of each group, taking into account the preferences of the media they use more frequently.

Furthermore, these findings also suggest that work can affect an individual's willingness to engage in prevention efforts. Those working in the health or education sectors showed higher awareness regarding tuberculosis prevention than those in other sectors. This signifies the importance of the role of the work environment in shaping individual attitudes and knowledge towards health, which can be used as a channel for more focused health campaigns.

Table 2. Analysis of Factors Affecting the Success of Sociocultural Education Approach in Preventing Tuberculosis in Tapanuli Selatan Regency

Variable	Success in Preventing Tuberculosis				Total	X^2 (p)
	Decrease		Increase			
	n	Percent	n	Percent		
Community Education Level						
Low	73	64.0	41	36.0	114	49.030 (0.001)
High	17	16.8	84	83.2	101	
Total	90	41.9	125	58.1	215	
Health Service Access						
Difficult	68	57.1	51	42.9	119	25.575 (0.001)
Easy	22	22.9	74	77.1	96	
Total	90	41.9	125	58.1	215	
Community Participation in Education Program						
Passive	59	70.2	25	29.8	84	45.617 (0.001)
Active	31	23.7	100	76.3	131	
Total	90	41.9	125	58.1	215	
Social Media Use in Education Campaign						
Do not use	56	88.9	7	11.1	63	80.981 (0.001)
Use	34	22.4	118	77.6	152	
Total	90	41.9	125	58.1	215	
Health Workers Support						
Passive	54	81.8	12	18.2	66	62.477 (0.001)
Active	36	24.2	113	75.8	149	
Total	90	41.9	125	58.1	215	

Table 2 shows that, out of 114 respondents who stated having a low education level, there was a decrease in the success of preventing Tuberculosis by as many as 64.0%. Vice versa, out of 101 respondents with a high education level, there was a decrease of as many as 16.8%. Statistical analysis showed that X^2 calculated value (49.030) > X^2 table value (3.841) or p-value (0.001) < α (0.05). This indicates the significant influence of community education level on the success of tuberculosis prevention. From 119 respondents who had difficulty accessing health services, there was a decrease in the success rate of preventing Tuberculosis, as many as 57.1%. On the other hand, from 96 respondents with easy access, there was a decrease of 22.9%. Statistical analysis showed that X^2 calculated value (25.575) > X^2 table value (3.841) or p-value (0.001) < α (0.05). This indicates that access to health services also plays an important role in preventing Tuberculosis. From 84 respondents involved in passive education programs, there was a decrease in the success of tuberculosis prevention by as much as 70.2%. Vice versa, from 131 respondents

involved in active education programs, there was a decrease of 23.7%. The result of statistical analysis showed that X^2 calculated value (45.617) > X^2 table value (3.841) or p-value (0.001) < α (0.05). Therefore, community participation in education programs also influenced the success of tuberculosis prevention. Of the 63 respondents who did not use social media in the education campaign, there was a decrease in the success of tuberculosis prevention by as many as 88.9%. On the other hand, from 152 respondents who used social media, there was a decrease of 22.4%. Statistical analysis showed that X^2 calculated value (80.981) > X^2 table value (3.841) or p-value (0.001) < α (0.05). It indicates that using social media in education campaigns affected the success of tuberculosis prevention. From 66 respondents who received passive health workers' support, there was a decrease in the success of tuberculosis prevention by as much as 81.8%. Meanwhile, from 149 respondents who received active health workers' support, there was a decrease of as many as 24.2%. The result of statistical analysis showed that X^2 calculated value (62.477) > X^2 table value (3.841) or p-value (0.001) < α (0.05). Thus, it can be inferred that health workers' support influenced the success of tuberculosis prevention in Tapanuli Selatan Regency.

Table 3. Multivariate Analysis of Factors Affecting the Success of Sociocultural Education Approach in Preventing Tuberculosis in Tapanuli Selatan Regency

Variable	B	S.E	Sig	Exp (B)	95% C for EXP (B)	
					Lower	Upper
Community Education Level	1.620	0.588	0.006	5.055	1.596	16.008
Health Service Access	-1.318	0.640	0.039	0.268	0.076	0.938
Community Participation in Education Program	0.641	0.616	0.298	1.899	0.567	6.355
The Use of social media in Education Campaign	2.746	0.582	0.000	15.581	4.981	48.744
Health Workers' Support	1.931	0.415	0.000	6.894	2.848	16.684
Constant	-9.207	1.342	0.000	0.000		

Table 3 showed that community education level (p= 0.006), access to health service (p=0.039), community participation in education programs (p=0.298), the use of social media in education campaigns (p=0.000), and health workers' support (p=0.000) influenced the success of sociocultural education approach in preventing Tuberculosis in Tapanuli Selatan Regency. From the five variables, the most affecting variable on tuberculosis prevention success through sociocultural education approach is the variable of social media use number in education campaigns with the value of Exp (B)= 15.581. This value indicates that each increase of one unit in this variable increases the success of the sociocultural education approach in preventing Tuberculosis 15.581 times. It shows that using social media has a very positive impact on increasing the program's effectiveness.

DISCUSSION

The Influence of Education Level on the Success of Sociocultural Education Approach in Preventing Tuberculosis

The level of education has an important role in determining the success of sociocultural education approaches in the prevention of Tuberculosis (11,17). Individuals with higher levels of education tend to have better access to health information and a deeper understanding of the importance of tuberculosis prevention practices. Access to health services in rural areas, especially in South Tapanuli, remains a significant challenge in tuberculosis prevention efforts. While efforts have raised public awareness through various health programs, more specific barriers often prevent people from taking advantage of the available health services. One of the main obstacles is the distance and difficulty of transportation to health facilities. In some remote villages, people often travel long distances and face

poor road conditions to reach the nearest health center or hospital. This affects the frequency of visits and leads to delays in diagnosing and treating the disease (11,17).

In addition, the lack of adequate information regarding the location, operating hours, and types of health services available is another obstacle. Many people in South Tapanuli, especially in remote areas, do not have enough information about when and where to access health services. Limited health education in rural areas exacerbates this misunderstanding, so people often delay seeking medical help until their health condition deteriorates. Meanwhile, social media and the role of health workers in tuberculosis prevention campaigns have been recognized as two very important factors (19–21). With its broad reach, social media offers great potential to disseminate information about tuberculosis prevention, especially among the younger generation who are more active in cyberspace. However, while social media can be an effective tool, in reality, many members of society in rural areas, especially those who are older, do not have adequate access to technological devices or are not used to using social media as a source of health information. Therefore, using social media as the only method of health counselling cannot be considered entirely adequate without considering other alternatives, such as face-to-face counseling or the distribution of printed materials.

On the other hand, health workers play a significant role in providing education and direct information to the public. They are often the primary source of information on tuberculosis prevention, but their role can be further enhanced with further training on effective communication techniques and digital technologies to reach a wider community. Healthcare workers trained to use social media as a tool for counseling can expand the reach of their health messages, especially among younger generations who are more likely to connect online (21).

High levels of education are also often correlated with better literacy levels, which can improve understanding and adherence to recommended health care (18). They tend to participate more actively in health education programs, strengthening their understanding of tuberculosis prevention practices and proactive attitudes toward health (19). The involvement of well-educated individuals in tuberculosis prevention programs can play an important role in lowering transmission rates through increased awareness, understanding, and effective preventive measures(20). Therefore, improving education access and health education programs suited to the community education level can positively impact the tuberculosis burden and encourage more effective prevention steps in society (21). This finding is consistent with the research findings of Putri (2022), who portrayed the significant difference in health education programs toward respondents' knowledge before and after receiving the intervention, which is indicated by a p-value of 0.000 (22).

High education level is often correlated to increased awareness of health problems, including Tuberculosis. Individuals with higher education levels tend to have better knowledge of infectious diseases and the importance of prevention(23). Individuals with higher education levels tend to have better access to health information through literature, the Internet, or prevention programs conveyed by the responsible parties. This can increase their understanding of tuberculosis prevention practices (19–21). Individuals with higher education levels tend to be more active in attending health education programs offered by the government and non-governmental organizations. This active participation may improve their understanding of tuberculosis prevention practice and strengthen their proactive attitude toward their and the surrounding community's health(24). Higher education is often correlated to better literacy, which can improve understanding and obedience to recommended health treatment, including tuberculosis prevention and treatment. With better knowledge of tuberculosis and prevention practices, well-educated individuals tend to be more aware of the importance of practical prevention actions such as following the treatment, vaccination, and avoiding high-risk practices (19,25–27). Through a deeper understanding of these factors, it is important for research to design tuberculosis education programs suited to the community education level. This can help to increase the understanding and awareness of Tuberculosis, minimize stigma, and encourage participation in prevention programs in society. Moreover, collaboration among education institutions, the government, and the health sector is also required to create a supporting environment for tuberculosis prevention and control(14,26,28,29). Based on these findings, there are several important recommendations for policymakers to consider: One way to address the lack of information in the community is to provide more accessible information about health services. For example, creating a health information platform that can be accessed via SMS or a simple app on a mobile phone, as well as ensuring that information about health facilities and their operating hours is available in the local language.

The Influence of Health Service Access on the Success of Sociocultural Education Approach in Preventing Tuberculosis

Health service access plays a crucial role in determining the success of the sociocultural education approach in preventing Tuberculosis (30). Easy and affordable access to health services is important in ensuring early detection, accurate treatment, and effective management for individuals infected with Tuberculosis (31,32). This finding does not align with the research conducted by Fitria et al. (2020), who argue that there is no correlation between tuberculosis information access and staff's health literacy in Puskesmas Bandarharjo (33). When access to health services is hindered, especially in rural or isolated areas, the community's awareness and understanding of Tuberculosis tend to be constrained. So, it decreases effective prevention probability(34,35). This can lead to diagnosis delay, inaccurate treatment, and increased transmission risk. Therefore, it ensures that high-quality and affordable health services are available at all community levels, including isolated areas(11).

Improving health service access through sufficient medical facilities, competent medical workers, and integrated prevention programs will improve early detection, accurate treatment, and effective management of tuberculosis cases(36). Therefore, providing prevalent and comprehensive access to health services becomes the key to guaranteeing the success of the sociocultural education approach in preventing Tuberculosis and reducing the overall disease burden in society(37).

The Influence of Community Participation in Education Programs on the Success of Sociocultural Education Approach in Preventing Tuberculosis

Community active participation in education programs significantly impacts the success of the sociocultural education approach in preventing Tuberculosis. Through active participation, the community can better understand Tuberculosis, including risk factors, symptoms, and effective prevention practices (38). This participation also supports the improvement of collective awareness of the importance of tuberculosis prevention in the community, which can reduce the stigma of tuberculosis patients(28). When the community is actively involved in education programs, they tend to take more proactive prevention steps, including following routine screening, vaccination, and recommended sanitation practices(35). This research finding follows the research of Dilla (2023), who shows that the tuberculosis management program is less optimal, leading to the lack of community participation in phlegm inspection(39).

In addition, community participation in education programs allows the formation of a community that supports individuals infected with Tuberculosis, either emotionally or practically. The actively involved community tends to provide a supporting environment for those who need treatment and support, promote an inclusive environment, and minimize social isolation, often correlated to tuberculosis patients(40–42). Therefore, encouraging community participation in tuberculosis education programs becomes an important key to ensuring the success of the sociocultural education approach in preventing Tuberculosis (11). Through active participation, the community can shape a supporting environment, strengthen collective understanding, and improve the implementation of effective prevention practices (43).

The Influence of Social Media Use in Education Campaign on the Success of Sociocultural Education Approach in Preventing Tuberculosis

The use of social media in education campaigns significantly impacts the success of the sociocultural education approach in preventing Tuberculosis. In this digital era, social media become one of the most effective tools for covering a wide and varied community(44). Social media platforms can convey information about Tuberculosis quickly to society, including information on the symptoms, risk factors, prevention practices, and available health service sources(45). This research finding aligns with the study conducted by Nailius (2022), who shows that health literacy influences obedience to medicine in tuberculosis patients(46). Social media also allows two-way interaction between the community and health information providers, allowing the community to ask questions, share experiences, and get direct expert answers. This interaction can give a more profound and personal understanding of Tuberculosis and strengthen community involvement in the prevention efforts (47).

Moreover, using social media allows the creation of interesting and creative content such as videos, infographics, and experience stories, making information related to Tuberculosis easier to understand and engaging for a broad audience(48). This can increase the community's awareness and knowledge of Tuberculosis

comprehensively and reduce the stigma of this disease(47,49). Therefore, using social media in tuberculosis education campaigns becomes an effective tool to ensure the success of the sociocultural education approach in preventing Tuberculosis (48). Through this platform, information on Tuberculosis can spread fast and widely, the interaction between the community and experts can be enhanced, and deeper awareness and understanding of Tuberculosis can be achieved in various strata (48,50).

The Influence of Health Workers' Support on the Success of Sociocultural Education Approach in Preventing Tuberculosis

Health workers' support is critical in determining the success of the sociocultural education approach in preventing Tuberculosis (11). Health workers are key in conveying information, screening, and treating individuals infected with Tuberculosis (51). The support shared by health workers covers the medical and psychosocial aspects, including emotional support and accurate information to the individuals and their families(52). This research finding is in line with a study conducted by Herawati (2020), who discovered that there is health workers' support (p-*value* 0.03) and obedience to taking medicine on tuberculosis patients(53). The support given by health workers also allows the shaping of good relationships between health service providers and society(50). This can strengthen community trust in the health system and improve their participation in the prevention and treatment programs (51,53). By providing appropriate and sufficient education to individuals and society, health workers can strengthen collective understanding of Tuberculosis, promote effective prevention practices, and reduce stigma among tuberculosis patients(52,54).

In addition, through comprehensive support, health workers can control and support the treatment process, ensure the obedience of therapy, and give holistic and integrated treatment to the individuals infected by Tuberculosis (55). The support given by health workers also includes increasing community awareness in general, including education campaign and advocacy to upgrade access to high-quality health services (54–56). Therefore, the support given by health workers is an important factor in ensuring the success of the sociocultural education approach in preventing Tuberculosis (56,57). Through the holistic, comprehensive, and integrated role, health workers can play an important role in improving the community's understanding of Tuberculosis, strengthening participation in prevention programs, and improving the life quality of individuals infected with Tuberculosis and the community in general.

CONCLUSION

Based on the research, several variables had a significant influence. Community education levels, access to health services, community participation in educational programs, use of social media in educational campaigns, and support of health workers have important roles in preventing Tuberculosis in the area. The use of social media in educational campaigns has proven to be the most influential factor in increasing public awareness and participation in preventing TB. Based on these findings, one of the proposed suggestions to increase the success rate of sociocultural education approaches in tuberculosis prevention in South Tapanuli Regency is to increase public access to accurate and credible health information through more intensive education campaigns, primarily through social media. However, to deepen the understanding of the effectiveness of this approach, as a recommendation for future research, it is necessary to explore other sociocultural factors that may influence the success of sociocultural education programs in tuberculosis prevention. For example, social norms, family influences, and cultural beliefs may inhibit or support changes in people's behavior in following health programs. A more in-depth study of how local sociocultural values influence attitudes and behaviors toward health could pave the way for more targeted interventions relevant to local communities' conditions. Further research could focus on assessing the long-term impact of social media-based educational campaigns in tuberculosis prevention. While the use of social media has proven to be a highly influential factor in raising public awareness, it is important to know the extent to which this influence lasts for a long time and whether the awareness built through social media leads to more permanent behavioral changes in the long term. This study can use longitudinal methods to monitor changes in people's attitudes and behaviors toward tuberculosis prevention. Like many other studies, this study also has limitations that must be considered in future studies. One of the main limitations is the difficulty in measuring the long-term impact of social media-based educational campaigns, as the study only measured results in a relatively short period. Therefore, it is

important to conduct longitudinal research to evaluate changes in people's consciousness and behavior in the long term.

CONFLICTS OF INTEREST

The authors declare no potential conflict of interest concerning this article's research, authorship, and publication.

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