

# **The Effect of Social Media-Based Pokemon Education on Adolescent Knowledge about Tuberculosis Prevention**

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## **Abstract**

Indonesia is in the second rank of the highest cases (TB) in the world. Therefore, tuberculosis prevention strategies are needed, especially for children. This survey study aims to examine the effect of education using Pokemon based on social media such as Instagram and WhatsApp on students' knowledge about preventing of TB transmission. The Pokemon Education develop by first author and validated by second author. The design of this study was a pre-experimental design with One group pre-posttest design. A total of 113 students were selected as sample of this study, but only 104 students attend and complete the questioner during data collection schedule. The research instrument used a Google Form Questionnaire. Data analysis found that age mean of 104 respondents' student was 13,42, meaning that the average age of the respondents was 13-14 years. Data analysis also found that the pre-test mean value of knowledge about TB Prevention was 74,42 and mean value of the post-test was 84,81. Paired Sample t test results indicate that there is a significant difference knowledge about TB prevention before and after education ( $p$  value = 0,0001). Thus, it can be concluded that education using social media-based Pokemon is effectively to increasing adolescents' knowledge about preventing TB transmission.

**Keywords:** *Students, tuberculosis, social media, knowledge, and prevention*

## **Introduction**

Tuberculosis (TB) is an infectious disease that is a leading cause of ill health, one of the top 10 causes of death in the world and the leading cause of death from a single infectious agent (ranked above HIV/AIDS). It is caused by the bacillus *Mycobacterium tuberculosis*, which spread when a person with TB expels the bacteria into the air; e.g. coughing. It usually affects the lungs (pulmonary TB) but can also affect other organs (extrapulmonary TB). About a quarter of the world's population is infected with *Mycobacterium tuberculosis* and thus is at risk of developing TB disease (WHO, 2019). It is estimated that 20 million children are exposed to tuberculosis (TB) every year, making TB a global disease. Children bear the substantial burden of global tuberculosis, with more than one million (aged <15 years) becoming ill each year. Most children who require evaluation for TB disease are not identified by health services, 90% of the 205.000 children estimated to die of TB each year are never diagnosed or treated. TB prevention in this vulnerable population is also neglected and is a global health emergency (Reuter, Seddon, Marais, & Furin, 2020). TB is still a global concern, where Indonesia is the second country with the highest TB cases in the world after India in 2019 (WHO, 2020). Data from Global there are 10 million people in the world who suffer from tuberculosis (TB) and 1,2 million people die every year. Indonesia is one of the countries with the highest TB burden in the world with an estimated number of people falling ill due to TB reaching 845.000 with a death rate of 98.000 or equivalent to 11 deaths/hour (WHO, 2020).

Tuberculosis CNR in DKI Jakarta in 2020 was 222 per 100,000 population, a decrease compared to 2019 which was 379 per 100,000 population. This decline could be due to the focus of health services on handling the COVID-19 pandemic and the disconnected surveillance system. The case detection rate per 100,000 population calculated in 2020 is 49.8%, similar to 2019 (49%), but still far from the standard set by WHO, which is 70%. New TB cases in the population of children aged 5- 14 years in DKI Jakarta Province in 2020. From a total of 2235 TB cases in children, the highest cases were reported in East Jakarta and South Jakarta. This figure decreased dramatically compared to 2019 which was a total of 5,331 TB cases in children. There were 419 cases of TB in children in the Central Jakarta area in 2020. (Health Department) DKI Jakarta Province, 2020). Data from the Senen Subdistrict Health Center in the Central Jakarta Region in 2020 obtained 87 cases, with TB in children there were 34 cases, while in 2021 there were 94 cases of adult TB and 16 cases of Child TB. SMP Muhammadiyah 3 Jakarta is located in the Central Jakarta area, Jl. Kramat Raya No. 49. The condition of SMP Muhammadiyah 3 Jakarta is located in a dense location, with an environment that is at risk for exposure to mycobacterium tuberculosis bacteria. Data on TB of children in the Kramat area was found to be less than 5% of children's TB achievement. This is due to the Pandemic condition so that people are afraid to go to the Puskesmas for treatment. So far, before the Pandemic there were activities carried out from the Kramat Health Center, namely measuring weight, height, measuring nutritional status, and giving blood tablets. According to the principal's statement, there were students who were malnourished. No one has provided knowledge about Tuberculosis to students so far, according to the principal.

Adolescence is a transitional phase from childhood to adulthood. This stage of adolescent development is a very important phase of human development in laying the foundation for the

importance of maintaining health (WHO, 2021 in Kristina Lisum, Wilhelmus Harry Susilo, 2021). China has the third highest number of TB cases in the world, and in recent years TB outbreaks often occur in China, namely in schools, the results are obtained, where classmates increase the risk of TB with RR = 3,48, 95% CI 1,64-7,40) (Pan et al., 2019). Research result (Ernirita et al, 2020) showed p-value 0,029 and OR = 1,33 with 95% CI (0,95–1,639), meaning that children who have a history of household contact have a 1,33 times greater risk of contracting TB compared to children who have a history of close contact. Contact history is an important indicator in the occurrence of tuberculosis transmission. School age is the age at which children take education, and are actively familiar with their surroundings. At that age, children interact a lot with friends, teachers, and people in the school environment. TB transmission can occur when children interact with other people in the school environment. Therefore, schools as a place for children to gather and interact with other people play an important role in preventing TB transmission. Understanding of TB disease, signs, and symptoms of TB in general in children, TB prevention, how to detect TB, and TB treatment. TB disease can be eradicated early so as to create a strong school in dealing with TB.

Pokemon is an abbreviation that the author made which stands for: *Pengobatan TB dengan tepat dan cepat, kenali tanda dan gejala TB pada anak, monitoring, pengobatan TB sampai sembuh* (Proper and quick TB treatment, recognizing the signs and symptoms of TB in children, monitoring, TB treatment to cured). The author's Pokemon material is made in the form of animations, videos, and posters and delivered through social media, namely **Instagram** and **WhatsApp** groups. *In the current learning process, there is a tendency for children to learn better if the child's learning environment is created naturally. Children's learning outcomes will be more meaningful when children experience what they learn. The game method can help students feel comfortable when learning and feel happy then it becomes easier to invite them to learn. As stated by Komariyah & Soeparno (2010) in (Sri Wuryani & Budi, 2016) that lessons with play nuances are received in a pleasant manner, have an entertaining and uplifting nature. The Pokemon that the researcher is referring to is not a Pokemon (Pocket Monter) but is an extension associated with TB treatment, so that children are motivated by displaying a legendary feel. Therefore, one of the appropriate educational strategies for material on life organization systems in class VII SMP Mumamadiyah 3 Jakarta is using yellow media such as Pokemon which is displayed in the form of Posters, Animations, and Videos. So that it can help increase the activeness of students' cognitive learning outcomes.*

Health education is a major aspect of nursing practice and an important part of the nurse's role and function as a nursing educator. Through Pokemon Education based on social media, it can increase students' knowledge. The provision of social media-based health education by nurses is an effort that can be used in a pandemic situation that is in accordance with technological developments and adolescent growth and development. This media can be used as a preventive effort in increasing adolescents' knowledge about preventing TB transmission. Providing health education using audio-visual media, can be used as informative media in increasing knowledge about preventing TB transmission, especially at the age of teenagers (Fadilah, Syakurah, & Fikri, 2019). Study (Kristina Lisum, Wilhelmus Harry Susilo, 2021), there was a significant increase in knowledge before and after **Youtube**-based health education was carried out with a p value of

0.000 < (0,05). One of the learning media that can be used in health education is audio-visual media, which is a tool that can be used through hearing and through sight which is a combination of both types of media that can stimulate thoughts, feelings, attention, creativity and innovation, and provide direct experience to participants, Rusman, et al, 2011, in (Sicily Bili et al, 2019).

In providing health education, media is needed to convey information. Social media is a concise and attractive medium that makes it easier to convey the knowledge that will be given, includes various ideas, ideas and content in virtual communities, and is able to present and translate new ways of communication with technology that is completely different from traditional media (Yaumi, 2018, in(Dewi, Susila, & Arisudhana, 2021). **Line** is one of the social media that is widely used especially by teenagers. Currently, there are 220 million users who are members of line applications worldwide and in Indonesia alone there are 90 million users who are active users (Experts, 2018). Social media is one of the developments of the internet. Having a high-quality camera on a smartphone makes many people have fun with new activities. Types of social media commonly used include **Facebook, Twitter, Path, and Instagram** (Prihatiningsih, 2017).

The results of interviews with the principal of SMP Muhammadiyah 3 Jakarta, where students have online activities during this pandemic condition, with online learning via cellphones or laptops, students feel bored. Hopefully, the education provided will increase students' insight, especially regarding Tuberculosis. It is interesting and important to examine how social media-based Pokemon education affects knowledge about tuberculosis prevention in junior high school students.

## **Methodology**

This study is a quantitative study with a pre-experimental design and a One group pre-post test design without a case control. The purposive sampling used for total 113 from 7th grade students of SMP 3 Muhammadiyah Jakarta, who were present at the time of the study as many as 104 people. with total sampling technique. In data collection, the researchers conducted a survey with research instruments using a questionnaire in the google form which was carried out on August 20 and August 30, 2021. Subjects in this study with criteria under 15 years old, male and female. The instrument consists of 15 questions, related to TB control in children and knowledge of the use of social media. The questionnaire has been tested for validity and reliability to 20 respondents, using the Pearson Product Moment correlation to analysis between items with a total score in one variable, and measurements obtained a significance level ( $\alpha$ ) = 0.05. The data analysis used SPSS 22.0 software. Based on the results of the reliability test, the value was 0.972. The results are declared reliable because > 0.6. The steps in conducting the intervention are; Educational media that have been prepared in the form of *posters, videos and animations* with *Pokemon* background nuances. *Pokemon* Educational media develop by first author and was validate by second author. Before they are being given information education, students are evaluated by pre-test using google form, after that education is given **via Instagram, WhatsApp,** with questions that arise from students. After 10 days of re-evaluation with the post test, the results of this study were analyzed using the Paired Sample t-test.

## Results and Discussion

Based on the results of the study, the data on the characteristics of the respondents were found in table 1

Table 1  
Distribution of Average Age of Students at SMP Muhammadiyah 3 Jakarta

Variable	Mean Median	SD	Minimum-Maximum
Age	13,42 13	0,972	12 – 16 years

The average age of students is 13 years - 14 years, the youngest age is 12 years and the oldest is 16 years. The most dominant age range is 12 years to 13 years

Table 2  
Average Knowledge of Middle School Students Before and After Pokemon Education

Category	Mean	SD	SE	P value	N
Pre-test	74,42	13,059	1,28	0,0001	104
Post-test	84,81	13,509	1,33		

The average knowledge of students before Pokemon education activities based on social media was 74,42 and the average knowledge after Pokemon education activities was 84,81. There was a significant difference in the average knowledge of students before and after Pokemon education was conducted ( $p$  value = 0,0001). The ability of participants in Pokemon education was done by providing posters, animations, and videos on social media, namely Instagram and Whatsapp groups. For 10 days, Pokemon education was given to the students, then an evaluation was carried out.

Table 2 shows the  $p$  value, which is 0,0001, it can be concluded that the  $p$  value is  $0,000 < (0.05)$ , so there is an effect of the level of knowledge after giving Pokemon educational media to knowledge about tuberculosis prevention based on social media in junior high school students. Age is one of the factors that can describe a person's maturity, both physical, psychological, and social maturity. Age will affect a person's mindset, so that as a person age, the more experience and information he has, so that later it will affect a person's attitudes and behavior. At the adolescent stage there is a cognitive development, the development of advanced reasoning skills, and the ability to think logically. Where the ability of adolescents is able to think abstractly and has the ability to think metacognitively to allow a person to think about his feelings, and develop a thought so that he can be accepted by other individuals.(Chulani & Gordon, 2014). In line with

research results (Kristina Lisum, Wilhelmus hary Susilo, 2021), showed that the frequency of respondents based on age is mostly 15-16 years old by 163 people (98,8%). The increase in a person's age will affect the way a person processes information into knowledge. Teenagers try to develop a high curiosity about information, so that they can form their own knowledge. Adolescents also develop a risky behavior such as smoking. Whereas according to PMK RI No. 67 (2016) regarding TB control, smoking behavior is twice as risky for TB (Menteri Kesehatan, 2017). The results showed that the majority of the sexes were women, generally women were more concerned about health than men. This research is in line with research (Kristina Lisum, Wilhelmus hary Susilo, 2021), the number of female respondents was 105 people (63,6%), while the male respondents were 60 people (36,4%).

Adolescents are an important subpopulation with relatively high notification rates, requiring specialized youth-friendly interventions to reduce stigma, discrimination, and risk behaviors, to diagnose and manage HIV coinfection, and to meet educational needs. Prevalence of smoking among those who aged 15 years. Smoking is a strong risk factor for TB disease at the individual level (WHO, 2021). The results of this study showed the effect of Pokemon education after 10 days of intervention with audiovisual media, namely animation, posters, and videos based on social media on students' knowledge. This study is in accordance with the theory that health education conducted individually or in groups is very important, because TB is related to knowledge as well as attitudes and behavior, so that with health education awareness, tuberculosis transmission can be prevented.

The effect of knowledge level after giving Pokemon educational media to prevention of tuberculosis based on social media in junior high school students in Jakarta. The level of knowledge is one of the risk factors for TB and a factor influencing TB prevention. Knowledge is the basis for taking action to prevent and treat tuberculosis. Ignorance of adolescents will hinder attitudes and actions towards the prevention and eradication of pulmonary TB disease (Mutia et al., 2013) in (Kristina Lisum, Wilhelmus Hary Susilo, 2021). Adolescents who have knowledge of TB prevention will maintain a clean and healthy lifestyle. Because the TB problem is still high related to knowledge and behavior, therefore, it is important to carry out health education with the aim of increasing awareness, willingness, and role in TB control. There are several educational media that can be given as one of TB prevention efforts such as online media.

In this study, the authors used Instagram and WhatsApp group. Online media are types of internet-based media that are popularly used, because online media are informational technology that are able to connect throughout the world, thus allowing information from various types and forms of information to be used together, especially in the current pandemic situation. This can help students to get various information.

Researchers argue that the presence of one of the risk factors that cause TB, namely lack of knowledge, makes the spread of TB increase, so there needs to be an effective effort to prevent TB, one of which is through online media such as Instagram and WhatsApp group. WhatsApp (WA) is most dominantly used at this time. WA has been used by community leaders to communicate in conveying messages to their targets, so currently, although they are still

communicating face to face or directly (Face to face). The notification or information conveyed in the message is more effective and is a satisfaction in itself because using WA makes the target receives the information faster.

Social media are online platforms to communicate and interact remotely without being limited by space and time. One of the social media used by everyone is Instagram.

Pokemon education in the form of animated videos, posters, and discussions on social media via Instagram and Whatsapp groups. Instagram activities are named *Pokemonfortb* accounts, with 11 posts. The response was very positive in educational activities and was able to open up insight into the problem of tuberculosis, through questions submitted by students. Audiovisual is an interesting media which stimulates the senses of hearing and sight and can be played over and over again.

In line with research (Agianto, Setiawati, & Firmansyah, 2020) showed that Instagram users among teenagers have influences on their lifestyle and ethics. There are changes that lead to a better direction and some that lead to a bad direction. These changes occur because of an urge from oneself to do something as a result of seeing a post on Instagram.

This study confirm that Pokemon education based on social media, namely Instagram, can increase students' knowledge, especially TB prevention. It's because the appropriate and interesting educational strategies in life organization system material to the student with posters, videos and animations with Pokemon nuances so that it can help increase the activeness of cognitive learning outcomes. These social media such as Instagram are sources of learning for teenagers on the internet, and will be one step ahead when starting learning in the classroom, and Instagram is a learning medium that is interesting and not boring like reading books, thereby increasing students' interest and motivation to learn. Result of this study related to the study conducted by Erma Novitasari et al, (2013) in (Sri Wuryani & Budi, 2016) that the use of media is interesting and in accordance with student characteristics so that it can motivate students to learn. This is because the world of children is a world of play full of spontaneity and fun,

The results of this study also in line with behavioral theory in general that individuals are more likely to intend to follow a health action if they believe that the behavior will lead to certain outcomes that they value, and if they feel that they have the resources and opportunities necessary to perform the behavior. (Norman & Conner, 2016). In this study, improving health status through Pokemon education is carried out by schools and is relevant to the opinion of Burkert, Raml, Beier, and Freidl (2015) that the use of a positive health concept allows the achievement of better health status differentiation by obtaining the right steps as part of health promotion. health promotion in the workplace.

The importance of the use of social media in health promotion has long been recognized by many parties, especially when referring to the data in 2020 alone there are about 6.1 billion smartphone users and is a potential in the development of digital epidemiological methods and strategies to support the monitoring and surveillance of infectious diseases or even can be used. in understanding attitudes and concerns about infectious diseases. The concept of

digital epidemiology generally consists of the idea that the health of a population can be assessed through a digital footprint. One example is that many people suffer from flu every year and many of them search for relevant information on the internet, and share their health problems with others online (Denecke & Atique, 2016). Based on this, the development of Pokemon Education, meaning *TB Treatment Correctly and Quickly*, which means that by obediently taking medication for the period recommended by the doctor, is a TB prevention education platform that can increase knowledge and awareness, especially the younger generation about TB disease. Therefore, education using Pokemon has the potential for monitoring TB treatment activities according to the principles of TB education in Indonesia, namely Find TB and Treat until Healed, provide moral support by inviting TB sufferers to seek treatment until they are completely healed, not discriminate against TB patients, and implement behavior clean and healthy living so that TB-free Indonesia 2050 can be achieved. Thus the use of Pokemon-based social media in this study can also increase the ability of various parties to communicate risks and crises due to a disease in several ways: (1) collaboratively and participatory, and thereby increase awareness of the situation, (2) decentralization, information can delivered quickly, and (3) can be traced geographically and even enables crisis monitoring. This is also in line with the results of a study by Denecke and Atique (2016) that there is no special system needed in social media-based health crisis communication and the use of existing social media tools such as social networks (ex.Facebook) or microblogging systems is sufficient for crisis communication. This study also in line with study conducted by Sarkar, Le GM, Lyles, Ramo, Linos, Bibbins-Domingo (2018) found that social media more effective to target cancer prevention in young adult. Even Gamification can also be used in health education, and even when used in groups of people with face-to-face interactions can encourage the intrinsic human need to compete (Bamidis et al., 2016) and the results of many studies show that games and gamification have an effect on health and well-being. should be considered as an important component of health education.

## **Conclusion**

Based on result of this study, there is a significant difference in the average value of students' knowledge regarding TB prevention before and after Pokemon education. There is an effect of the level of knowledge after giving Pokemon educational media to the prevention of tuberculosis based on social media in junior high school students in Jakarta. The use of animated audiovisual media as a health promotion media is an approach of health promotion by combining images, text, animation, and video. Therefore, it can modify a series of still images into a moving animation that is much more attractive. Pokemon education using social media was effective increase the student knowledge, but this research has limitation. This research is exploratory study, also Pokemon content not yet evaluate by professional, amount population and sample, and scope of this study focus only one junior high school. Further study by other researcher needs to develop in advance and explanation several variables related knowledge about TB prevention and treatment.



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