Insights in Public Health Journal

https://doi.org/10.20884/1.iphj.2024.5.1.11909

Original Article

Analysis of Quality of Life in Children with Tuberculosis (8-14 Years) in Banyumas Regency 2023

Febianti Rahayu[1*], Sri Nurlaela[2], Dwi Sarwani Sri Rejeki[2]

[1]Banyumas District Health Official, Central Java, Indonesia.

[2] Public Health Department, Faculty of Health Science, Jenderal Soedirman University, Central Java, Indonesia.

Corresponding author : Febianti Rahayu, Banyumas, Central Java, Indonesia, Telephone: +62-85803456739; email: febianti.r17@gmail.com

ABSTRACT

Background. Tuberculosis (TB) of school-age children (5-14 years) increases significantly every year in Banyumas Regency. Children with TB infection can be a source of TB disease can reduce the quality of human resources and quality of life in the future. It takes information on the quality of life of children TB systematically and more in-depth. **Methods.** This study aims to determine the quality of life of children with TB based on 7 aspects and characteristics with descriptive quantitative method of case study design. The population of all TB patients aged 8-14 years has treatment status in Banyumas Regency in 2022-March 2023. Research samples were 72 with Total sampling method. Data collection with questionnaire interviews and The TNO AZL children's Quality of Life Questionnaire Children Form (TACQOL CF) instruments that have been translated and tested for reliability validity and univariate data analysis. **Results.** Characteristics of TB patients aged 8-14 years in Banyumas Regency, the average age is 10 years old, male (68.1%), and educated in elementary school (80.6%). Most are in Sumbang District (15.3%), confirmed in February 2023 (25%). Clinical characteristics were BCG immunization (97.2%), normal nutritional status (56.3%), type of pulmonary TB (93.1%), advanced stage (75%), type of scoring diagnosis (83.3%), no OAT side effects (73.6%), no comorbidities (66.7%), and family history of TB (52.8%). The quality of life of the study subjects was moderate (51.4%), with the most aspects of the good category on positive emotions (25%) and the less good category on motor function (23.6%) and daily habits (23.6%). **Conclusion.** The total quality of life of the study subjects was good at best on the aspects of positive emotions and poor quality of life only on the aspects of daily habits. Any difficulties and disorders symptoms are experienced most when the condition is sick and mild pain.

Keywords: Characteristics, Quality of Life, Childhood Tuberculosis.

INTRODUCTION

Tuberculosis (TB) children is a chronic infection caused by bacterial infection Mycobacterium tuberculosis (M.tb) in children less than 15 years of age[1]. Bacteria M.tb can attack the lungs and other organs. The high burden of childhood TB is known from 1.2 million (11%) children with less than 15 years of age suffering from TB globally in 2021. Children'S TB cases from 2018 to 2022 there were 3.5 million children of people suffering from TB and 115,000 children included in TB-RO[2]. Data from the World Health Organization (WHO) states that the largest contributor to child TB cases comes from Southeast Asia.

Indonesia is the country with the second heaviest TB burden in the world after India[3]. The proportion of child TB cases in Indonesia among all TB cases notified in 2021 was 9.5% increased compared to 2020 (8.5%). It is known that 12/10, 000 children aged 5-14 suffer from TB in 2021. The

proportion of children'S TB cases in 2022 as of October again experienced an increase in cases of 11.9%. TB problems nationally in Indonesia are most prevalent in West Java province, then Central Java is in the second highest order[4].

Child TB is still a high burden in Central Java. In 2020, the number of children'S TB cases in Central Java amounted to 12.3% of all TB cases[5]. Banyumas Regency became the region with the highest contributor of TB cases in Central Java after Semarang City. Children'S TB cases in Banyumas have increased every year. The number of pediatric TB cases among total TB cases in 2021 (11.58%) decreased from 2020 (12.66%). However, children'S TB cases in 2022 there were 880 cases (21.56%), which means that there was an increase in cases more than 2 times compared to 2021[6].

The burden of childhood TB in the community remains unknown. This is because the control of childhood TB in Indonesia is still not a priority because of the assumption that childhood TB is not contagious[4]. TB control in children is still experiencing difficulties in diagnosis, availability of funds and most of TB in children are children in low economic families with difficulty accessing health services[7]. Of the global efforts that have been made in "End TB" or elimination of TB, almost none have focused on measuring or improving the quality of care provided to children with TB[8]. Whereas TB disease in children will affect their growth and development[9]. The influence of childhood TB is included in the child's growth and development process, both in infancy and childhood and the risk of transmitting and contracting it again in the future. This can reduce the quality of Human Resources (HR) of the younger generation in the future[10]. In addition, children with chronic diseases will be hampered in achieving growth and development, because children have a critical period that will affect the quality of life[11]. TB patients who undergo treatment either obey or disobey can experience a decrease in various functions, namely physical, social, psychological, and environmental functions that will have an impact on reducing the quality of life[12].

Systematic evaluation of quality of life is needed in certain groups, including children with TB. Until now there is no specific instrument that has been validated to measure the health status of TB patients and use the raw instrument of chronic disease[13]. There are several instruments used to measure the quality of children with chronic diseases that have been proven valid and reliable, including TNO AZL children's Quality of Life (TACQOL)[14]. TACQOL consists of 7 (seven) domains, namely physical function, motor function, daily freedom function, cognitive function, social function, and negative and positive emotions[15].

Research on the quality of life of children with TB has not been widely conducted in Indonesia compared to the quality of life of adult TB. Previous research Pratmawati (2019), in Jember on the correlation of parental happiness with treatment and quality of life of children'S TB[16]. The research of Nkereuwem et al. (2022), using PedsQL instruments only explained that the quality of life was significantly lower in post-pulmonary TB children. More information is needed to research TB disease in school-age children[17].

This is because in mid-childhood there is an increase in the child's capacity for decision-making, reasoning, self-awareness, social understanding and emotion management. In addition, in school-age children, namely the range of 5-18 years, many abilities and characteristics of children develop. Health problems in children are not only related to physical problems, but also psychological problems related to growth and development, and can affect the quality of life of children[18].

Information on the quality of life is systematically needed in the group of children with TB[19]. The importance of knowing the quality of life of children with TB so that this study aims to analyze and describe how the condition of 7 (seven) aspects of quality of life (physical function, motor function, daily freedom function, cognitive function, social function, positive and negative emotions), as well as knowing the descriptive characteristics of children with TB. This study can be a guideline for parents and health workers in providing

treatment and healing support to children with TB viewed from various aspects, and improve aspects of the quality of life of children with poor TB. Based on this background, researchers are interested in conducting research on the quality of life of children with tuberculosis (8-14 years) in Banyumas Regency in 2023.

METHODS

Study design

This research is a non-experimental research with a descriptive quantitative method and case study design. The subjects were TB patients aged 8-14 years and using the standard instrument of child quality of life questionnaire TACQOL CF (Children Form) Research Vogels & Verrips (1998), proved TACQOL instrument valid and reliable[20]. In Indonesia research Vionalita & Kusumaningtiar (2017), using Indonesian TACQOL instrument to measure the quality of life and cognitive quality of children[21].

Study setting

The implementation of the study was carried out in March – May 2023 in 22 sub-districts of Banyumas Regency, which are included in 31 Puskesmas working areas. Banyumas Regency is the area with the highest TB cases in Central Java. With cases of TB in children increasing every year[6].

Population, sample size and sampling methods

The study population was all TB patients aged 8-14 years who had treatment period status in Banyumas Regency from 2022 to March 2023 totaling 83 with certain inclusion and exclusion criteria that supported this study. Sampling technique in this study using Total Sampling, by taking all research subjects who meet the criteria of the research population obtained a sample of 72 research subjects who meet the criteria.

Data collection

Data collection is done in primary and secondary. Primary Data were obtained directly by questionnaire interviews for age, sex, BCG immunization status, OAT side effects, comorbidities, and family history, quality of life questionnaire interviews, and measurement of body weight (BB) and height (TB) to see nutritional status. Secondary Data obtained from SITB the data include the characteristics of confirmed place and time, stage of treatment, type of TB, and type of diagnosis.

Research instruments use questionnaires to obtain information relevant to the purpose of the study. Questionnaires on respondents ' parents / guardians for BCG immunization history variables, OAT side effects, and family history, as well as quality of life questionnaires on research subjects with TACQOL-CF instruments consisted of 7 functions, namely physical function, motor function, daily habit function, cognitive function, social function with parents and peers, and events during negative and positive emotions. Vogels & Verrips' (1998) research explains that the 7 functions of quality of life can be asked directly to children aged 8-15 using the TACQOL Children Form questionnaire.

Statistical analysis

Data analysis was carried out by univariate analysis to get an idea of the frequency distribution of research subjects and to obtain an overview of each variable. Describe all variables in the form of descriptions, tables, and graphs. As well as the frequency test for categorization in measuring the quality of life of children with TB using SPSS 26 software. The categorization of quality of life variables is based on the results of the normality test. The results of the normality test show that the data is not normal so the categories based on Quartile (Q) from the total score become three categories, namely the good category > Q3, the moderate category Q1 ≤ Score ≤ Q3, and the poor category < Q1.

Ethical considerations

This study has obtained ethical permission from the ethics commission of the Faculty of Health Sciences, Jenderal Soedirman University with Permit Number: 1044/EC/KEPK/III/2023. Where there is Informed Consent, namely a consent form from the respondent's parents/guardians regarding the research subjects and Informed Assent, namely the consent of the research subjects. In addition, this study uses confidentiality research ethics, namely the principle used to maintain the confidentiality of all information obtained. This study was carried out after obtaining permission from the Kesbangpol of Banyumas Regency with Permit Number: 070.1/169/OL/III/2023 which includes permission from the Head of the Banyumas Regency Health Office to be forwarded to the head of the relevant health center.

RESULTS

The implementation of the study was carried out in March – May 2023 in 22 sub-districts of Banyumas Regency, which are included in 31 Puskesmas working areas. Primary Data was conducted by going directly to the field to visit the homes of pediatric TB patients and secondary data were obtained from SITB. The results of the distribution of research variables in Table 1. showed the characteristics of the study subjects showed an average age of 10 years, the youngest 8 years and the oldest 14 years, male-dominated (68.1%), and educated in elementary school (80.6%). Based on the place of residence, the subjects were in 22 sub-districts in Banyumas Regency with the most being in Sumbang District (15.3%). The least number in the districts of Ajibarang, Jatilawang, Kemranjen, Somagede and Tambak that there is only 1 research subject respondents (1.4%). The most confirmed time was found in February 2023 (25.0%).

Tabel 1. Frequency Distribution of Descriptive Characteristics of Research Subjects

Variable	Mean	Min	Max
Age	10	8	14
Variable		**(n)**	**(%)**
Gender			
Male		49	68,1
Female		23	31,9
Total		**76**	**100,0**
Education			
SD		58	80,6
SMP		14	19,4
Total		**72**	**100,0**

Results of variable frequency distribution in Table 2. showed that the nutritional status is normal (65.3%). Only 3 subjects (4.2%) who have more nutritional status are in families with good economic status and are able to eat nutritious food.

Tabel 2. Frequency Distribution of Clinical Characteristics of Research Subjects

Variable	Frekuency (n)	Presentase (%)
Vaccine BCG		
No	2	2,8
Yes	70	97,2
Total	**72**	**100,0**
Nutritional Status		
Low Nutrition	21	29,2
Normal Nutrition	47	65,3
Excess Nutrition	3	4,2
Obesity	1	1,4
Total	**72**	**100,0**
Types of TB		
Pulmonary TB	67	93,1
Extrapulmonary TB	5	6,9
Total	**72**	**100,0**
Treatment		
Intensive stage	18	25,0
Advanced stage	54	75,0
Total	**72**	**100,0**
Types of Diagnosis		
TCM	12	16,7
Score	60	83,3
Total	**72**	**100,0**
Effects of the OAT		
Yes	19	26,4
No	53	73,6
Total	**72**	**100,0**
Comorbid Diseases		
Yes	24	33,3
No	48	66,7

Variable	Frekuency (n)	Presentase (%)
Total	**72**	**100,0**
Family History		
Yes	34	47,2
No	38	52,8
Total	**72**	**100,0**

The results of the distribution of comorbidities had no comorbidities (66.7%) when diagnosed with tuberculosis. There were 24 subjects (33.3%) had comorbidities, namely asthma (32%), ulcer (20%), allergy (16%), tonsillitis (12%), Heart (8%), anemia (4%), bronchitis (4%), and hyperthyroidism (4%). Based on family history, there are more families suffering from TB (52.8%) where there is close contact (65.8%) living in the same house, but the status of treatment has long been completed (42.1%).

The results of the frequency distribution of quality of life of subjects with TB in children 8-14 years in Banyumas Regency in Table 3. showed that the total quality of life score of children with TB 8-14 years had more moderate quality of life (51.4%) based on the quartile value of the total quality of life score. Based on 7 aspects of function, it is known that the aspects of quality of life with the most positive emotions (25%), while the score category is less on motor function (23.6%) and daily habit function (23.6%). The minimum value for each aspect is 0 and the maximum value for the fifth function of the function is 32, while for the emotion aspect the maximum value is 16 points. The results of the frequency distribution of respondents ' quality of life based on clinical characteristics are found in Table 4. showed that the quality of life was good at most in the condition of study subjects with normal nutrition (37.5%), type of pulmonary tuberculosis (47.2%), advanced treatment stage (37.5%), no OAT side effects (37%), and no comorbidities (40.3%).

Table 3. Quality of life of children with TB 8-14 years based on 7 aspects of function

Quality of Life Aspects	Quality of Life (%)			Quality of Life Score		
	Good	Moderat	Less	Minimum	Maximum	Median
Physical Aspect	0	79,2	55,6	11	32	26,00
Motor Aspect	0	76,4	55,6	1	32	32,00
Aspect of Daily Habits	0	76,4	47,7	4	32	31,00
Cognitive Aspect	0	83,3	59,7	18	32	31,00
Social Aspect	18,1	62,5	58,3	12	32	30,00
Positive Emotional Aspect	25,0	52,8	69,4	6	16	12,00
Negative Emotional Aspect	19,4	55,6	58,3	1	16	10,00
Total Quality of Life Score	**23,6**	**51,4**	**51,4**	**61**	**192**	**171,00**

DISCUSSION

Quality of Life Based on Functional Aspects

The quality of life of the study subjects with TB children 8-14 years based on Table 1.3 overall had more moderate quality of life (51.4%). The best aspects of quality of life are aspects of positive emotions (25.0%), while the aspects with less good are the most on motor function (23.6%) and the function of daily habits (23.6%). Research on the quality of life of pediatric TB patients in Yogyakarta using PedsQL Generic Core Scales instrument version 4.0 more quality of life of moderate pediatric TB patients (73.17%). Different aspects of the function of the highest score is the social function (27.32%) and the lowest on the emotional function (24.39%)[22]. Aspects of quality of life can be different because they are influenced by the condition of different respondents. It is certain that people with TB have a reduced quality of life and the likelihood of an abnormal increase in lung function is three times that of children who have never had TB17. Here is the quality of life based on the other seven aspects.

Aspects of physical function related to energy levels and symptoms affect the health of the child's activity[23]. Aspects of physical function in the study were moderate (79.2%), but it was known that the components of physical function aspects were most disturbed by mild pain conditions with other symptoms and fatigue. Bacteria M.tb causes decreased lung function which will cause several symptoms that can interfere with physical condition9. The components of physical function that most interfere with other symptoms are cough, flu and shortness of breath. Immunity of children with chronic pain may decrease due to exposure to bacteria, making it susceptible to other diseases such as cough and influenza[24]. In addition to physical function, it is known if aspects of motor function are moderate (76.4%). Motor function is related to the functioning of the limbs to carry out organized and systematic body movements[25]. 23.6% had poor motor function. Complaints that are experienced are complaints when mild pain or when sick conditions, such as complaints when walking for a long time, playing, running, and standing. Chronic pain in children leads to a decrease in the effectiveness of respiratory function leading to impaired motor function of the child[26]. Research in West Jakarta shows the lowest aspect is motor function because disturbances in the respiratory process cause children to not be able to perform heavy motor activities[27].

The same thing in the daily habit function is the aspect with the most unfavorable category (23.6%) and most moderate (76.4%) as in the motor function. Daily habits are activities that a child usually does every day. The most common difficulties that occur when the condition is sick are difficulty exercising and difficulty going to school. Another difficulty experienced even in conditions that have improved is the difficulty of cycling and doing hobbies. Then the difficulty of bathing alone and difficulty going to the toilet is not only affected by TB pain suffered, but children who have mobility difficulties are also affected by other comorbidities. Mobility difficulties in TB children occur due to the manifestation of symptoms and the impact of bacteria in the body (Saleh, 2009). Most children with TB during initial treatment and when sick conditions will do a complete break so as not to move as usual, including to school. Medical treatment and medication often make children with chronic diseases impaired in the process of independence and education[28].

Not attending school is an educational problem that is often faced by children with chronic diseases[18]. However, the results of this study showed that the cognitive function of most of the study subjects was moderate (83.3%). Cognitive functions include how the child's education in school and in the learning process. Most cognitive difficulties only Arithmetic difficulties (52.2%), but in good condition/not sick. In general, school-age children are in the period of concrete operations and formal operations. This shows the growing level of lessons to be faced[29]. It is not uncommon to find difficulties depending on the intellectual level of each child.

More attention for children with TB in the aspect of social relations should also be considered. This study showed that the social function of TB patients aged 8-14 years was mostly moderate (62.5%) and there were 18.2% of research subjects well. Almost all social aspects are carried out when the research subjects are in a state of improvement. The social aspect with the highest value is happy to play (86.2%). Basically, children have a primary need to play and get along with peers and the surrounding environment[30]. Another thing on the negative social aspects showed a great influence on his relationship with parents. Children with chronic pain can cause disturbances in interpersonal relationships, one of them with family and span get problems in relationships with their peers because of feelings of feeling alienated and rejected by their environment[31].

In general, the child's reaction to chronic disease depends on the age of the child, the child's personality, the surrounding social environment, relationships with parents, and

treatment[32]. Therefore, the aspects of positive emotions (52.8%) and negative emotions (55.6%) in this study are mostly moderate. Positive emotions are the aspect with the highest good score among the other seven aspects (25%). The feeling that is most often felt is feeling calm, happy, and cheerful, while rarely is self-confidence. Children with severe symptoms some of the weight also dropped dramatically so tend to close themselves from their peers because they feel different. According to Shaleh (2009), school-age children can already give conclusions something good and wrong, so as to make self-evaluation that tends to make school-age children less confident and more critical of themselves.

On negative emotions the most common feeling is irritability (44.4%). Even so, it needs to be seen from the emotional development of school-age children basically tend to express their emotions freely and openly so that it is normal for the possibility of often feeling angry. Especially to get attention from parents[33]. Not all of the irritable condition of the study subjects was caused by TB disease. However, chronically ill children can experience unstable psychological conditions, a sense of anger, and turmoil that may be vented to those around them[34]. In dealing with children who are sick with TB in addition to medical treatment with regular medication must also be considered psychological aspects. Evaluation of mental health is important for the quality of life of every child[30].

Quality of Life Based on Clinical Conditions

The quality of life of good study subjects was more with normal nutritional status (37.5%). Research at Puri Asih Salatiga hospital in hospitalized patients shows that nutritional status affects the quality of life of respondents[35]. Therefore, TB treatment in India focuses not only on treatment but also on the condition of the nutritional status of its people[36]. Malnutrition will affect the body's resistance so that it becomes vulnerable to infectious diseases such as tuberculosis[37]. Then the variable type of pulmonary TB is most common in research subjects (93.1%), so the quality of life is also the most common in patients with pulmonary TB (47.2%). In general, different types of TB do not distinguish the condition of the quality of life of the sufferer because of the same chronic disease. According to the American Academy of Pediatrics, in Sekartini (2014), chronic disease is a disease that is suffered in the long term and requires more attention in the field of Health and special care compared to normal children his age[34]. The quality of life of TB patients depends on the manifestations of TB that cause different degrees of severity and treatment starts from 6-12 months[37].

Quality of life improves as TB treatment progresses. The results of this study showed better quality of life at the advanced stage of treatment (37.5%) than at the initial treatment (9.7%). In general, TB symptoms will get better as the TB treatment stage progresses[38]. Patient weight can be used as a parameter to assess clinical improvement in TB patients[39]. The quality of life was better in the study subjects who had no side effects (37.5%). Research Abrori & Ahmad (2018), in resistant TB patients in Banyumas States the presence of severe or mild side effects have a worse quality of life than those who do not. Side effects can provoke the occurrence of physical and mental disorders[40].

Based on comorbidities, it is known that some of the subjects with no comorbidities had a good quality of life (40.3%). Research Athiutama et al. (2022), in the pulmonary Specialty Hospital of South Sumatra province, most do not have chronic companions (67%) and the quality of life of respondents is also good (95%). In this study, children who have severe comorbidities such as heart disease and acute asthma have more severe health problems have a lower level of quality of life. The presence of other chronic diseases is one of the things that causes the severity of children'S TB to get heavier[9]. Any TB patient who has concomitant diseases can affect the quality of life. The quality of life of TB patients depends on the severity of the accompanying disease[40].

CONCLUSION

The total quality of life of subjects with TB in children 8-14 years was moderate (51.4%). All aspects of functioning were mostly in the moderate category, but the quality of life based on seven aspects of functioning the highest score of the good category was in positive emotions (25%), and the highest score in the poor category in motor function (23.6%) and daily habits (23.6%). Quality of life based on 7 functions of physical function more impaired physical function in mild pain conditions with the most symptoms of abdominal pain, headache, and nausea. Motor function, the most complaints in the condition of mild pain and pain, in the form of complaints when walking/running for a long time. Function of daily habits, the most difficulty with sick conditions is difficulty exercising and difficulty going to school. Cognitive function, when the sick condition is difficulty concentrating. Social function, almost all performed on the subjects of the study improved state and the highest is happy to play. Positive emotions, feelings that are most often felt are feeling calm and happy while rarely feeling confident. Negative emotions, the most frequent feeling is anger, but more feelings that are never felt are envy and anxiety.

Quality of life on clinical characteristics in good quality of life of subjects showed more normal nutrition (37.5%), type of pulmonary tuberculosis (47.2%), at the stage of advanced treatment (41.7%), no side effects OAT (37.5%), and no comorbidities (40.3%). Clinical characteristics of the study subjects most of whom had received BCG immunization (97.2%), normal nutritional status (65.3%), type of pulmonary TB (93.1%), were in the advanced phase (75%), type of diagnosis using a scoring system (83.3%), did not have OAT side effects (73.6%), did not have comorbidities (66.7%), and more respondents when diagnosed with tuberculosis had a family history of TB (52.8%).

Acknowledgement

I extend my gratitude to my my lecturers for their input and corrections so that this research can be completed smoothly. I would also like to thank the TB program Manager of Banyumas District Health Office for the ease of obtaining secondary data and colleagues who have supported in the preparation of my research.

REFERENCE

1. Migliori, G. B., Bothamley, G., Duarte, R., & Rendon, A. (2018). Tuberculosis. European Respiratory Society. https://books.google.co.id/books?hl=id&lr=&id=t5l9DwAAQBAJ&oi=fnd&pg=PA234&dq=childhood+tuberculosis+%2B+quality+of+life&ots=Q940BhPecC&sig=jjX5eGWqu6X0JHsSUTWxq9oh0mU&redir_esc=y#v=onepage&q&f=falseAlfiyah. 2010. Sebab-sebab Pernikahan Dini. Jakarta: EGC.
2. WHO. (2021). Global Tuberculosis Report.
3. WHO. (2022). WHO Consolidated Guidelines On Tuberculosis Module 5: Management of tuberculosis in children and adolescents.
4. TBC Indonesia. (2022). Dashboard Tuberkulosis. https://tbindonesia.or.id/pustaka-tbc/dashboard-tb/
5. Diskominfo Jateng. (2020). Kasus TBC Tinggi, Warga pinta Tak Abaikan APD. https://jatengprov.go.id/beritaopd/kasus-tbc-tinggi-warga-diminta-tak-abaikan-apd/
6. Dinkes Banyumas. (2021). Profil Kesehatan Tahun 2021 Kabupaten Banyumas.
7. Kemenkes RI. (2016). Petunjuk Teknis Manajemen dan Tatalaksana TB Anak.
8. Zumla, A., & Petersen, E. (2018). The historic and unprecedented United Nations General Assembly High Level Meeting on Tuberculosis (UNGA-HLM-TB)—'United to End TB: An Urgent Global Response to a Global Epidemic.' International Journal of Infectious Diseases, 75, 118–120. https://doi.org/10.1016/j.ijid.2018.09.017
9. Ramadani, M., & Fitri, D. (2023). Tuberkulosis Pada Anak: Pencegahan & Penanggulangan (B. N. (ed.); 1st ed.). CV. SULUAH KATO KHATULISTIWA.
10. Widiawati, S., & Puspita, M. (2020). Pencegahan TBC pada Anak di Tatanan Keluarga (U. D. Raharjo (ed.)). Zahir Publishing. https://www.google.co.id/books/edition/Pencegahan_TBC_pada_Anak_di_Tatanan_Kelu/J7eAEAAAQBAJ?hl=id&gbpv=0
11. Siringoringo, N. S., Matongka, Y. H., Agustina, A. N., Silalahi, H., Nova, F., Purnamawati, I. D., Rahayu, H. S., Silaban, C., Tendean, A. F., Annisa, F., Arofi, T. M., Ernawati, E., Rukmi, D. K., Juairiah, J., Damanik, S. M., & Meinarisa, M. (2022). Asuhan Keperawatan Anak dengan Penyakit Infeksi (M. J. F. Sirait (ed.)). Yayasan Kita

Menulis. https://www.google.co.id/books/edition/Asuhan_Keperawatan_Anak_dengan_Penyakit/W6yYEAAAQBAJ?hl=id&gbpv=1&dq=tuberkulosis+anak&pg=PR13&printsec=frontcover
12. Laxmeshwar, C., Stewart, A. G., Dalal, A., Kumar, A. M. V., Kalaiselvi, S., Das, M., Gawde, N., Thi, S. S., & Isaakidis, P. (2019). Beyond 'cure' and 'treatment success': Quality of life of patients with multidrug-resistant tuberculosis. International Journal of Tuberculosis and Lung Disease, 23(1), 73–81. https://doi.org/10.5588/ijtld.18.0149
13. Oo MM, Boonathapat N, Aung HKK, Pungrassami P, Liabsuetrakul T. Changes in health-related quality of life and the associated factors among Myanmar migrants with tuberculosis: a cohort study. BMC Infect Dis. 2021 Apr 21;21(1):377. doi: 10.1186/s12879-021-06070-2. PMID: 33882855; PMCID: PMC8061011.
14. Germain N, Aballéa S, Toumi M. Measuring the health-related quality of life in young children: how far have we come? J Mark Access Health Policy. 2019 May 22;7(1):1618661. doi: 10.1080/20016689.2019.1618661. Erratum in: J Mark Access Health Policy. 2019 Jun 11;7(1):1626572. doi: 10.1080/20016689.2019.1626572. PMID: 31156762; PMCID: PMC6534256.
15. van Muilekom MM, Luijten MAJ, van Oers HA, Conijn T, Maurice-Stam H, van Goudoever JB, Grootenhuis MA, Haverman L; KLIK collaborator group. Paediatric patients report lower health-related quality of life in daily clinical practice compared to new normative PedsQLTM data. Acta Paediatr. 2021 Jul;110(7):2267-2279. doi: 10.1111/apa.15872. Epub 2021 May 6. PMID: 33838052; PMCID: PMC8360011.
16. Pratmawati, I. K. (2019). Korelasi Indeks Kebahagiaan Orang Tua dengan Kelengkapan Pengobatan dan Kualitas Hidup Anak Yang Terinfeksi TB di Kabupaten Jember Tahun 2019.
17. Nkereuwem, E., Agbla, S., Sallahdeen, A., Owolabi, O., Sillah, A. K., Genekah, M., Tunkara, A., Kandeh, S., Jawara, M., Saidy, L., Bush, A., Togun, T., & Kampmann, B. (2023). Reduced lung function and health- - related quality of life after treatment for pulmonary tuberculosis in Gambian children: a cross- - sectional comparative study. 281–287. https://doi.org/10.1136/thoraxjnl-2022-219085
18. Shaleh, A. Q. (2009). Panduan Lengkap Mendeteksi, Memahami, dan Mengatsi Masalah-Masalah Kesehatan Anak Secara Medis dan Psikologis. DIVA Press.
19. Aggarwal, A. N. (2019). Quality of Life with Tuberculosis. Journal of Clinical Tuberculosis and Other Mycobacterial Diseases, 100121. https://doi.org/10.1016/j.jctube.2019.100121
20. Abraham S, Edginton E, Cottrell D, Tubeuf S. Measuring health-related quality of life measures in children: lessons from a pilot study. Res Psychother. 2022 May 9;25(1):581. doi: 10.4081/ripppo.2022.581. PMID: 35532026; PMCID: PMC9153752.
21. Febriawan, N. R., Khasanah, U., & Yusuf, A. (2024). The Relationship between Clean and Healthy Living Behavior and Risk of Diarrhea in Toddler. Journal of Maternal and Child Health, 9(2), 228–238. https://doi.org/10.26911/thejmch.2024.09.02.09.
22. Lusmilasari, L., Rahayu, R. D., Rahmawati, J., Khartika, A., & Rukmana, S. (2017). Relationship Of Adherence, Self Efficacy, Social Support, Quality Of Health Care, And Psychological Response Of Parens Towards Quality Of Life Of Children With Tuberculosis In Yogyakarta, Indonesia. Belitung Nursing Journal, 3(1), 41–51.
23. Anthony, M. G., Hoddinott, G., Van Niekerk, M., Mtshabe, A., Pienaar, A., Dewandel, I., Mckenzie, C., Goussard, P., Hesseling, A. C., & van der Zalm, M. M. (2022). Caregivers' perspectives on health-related quality of life in young children with TB and respiratory illnesses. Public Health Action, 12(4), 201–205. https://doi.org/10.5588/pha.22.0038
24. Debulpaep, S., Dreesman, A., Dirix, V., Toppet, V., Wanlin, M., Geysens, L., Arrazola de Oñate, W., Fauville, M., Mascart, F., Levy, J., & Mouchet, F. (2020). Tuberculosis Transmission in a Primary School and a Private Language School. An Estimation of Infectivity. Frontiers in Pediatrics, 8(February), 1–9. https://doi.org/10.3389/fped.2020.00010
25. Fatmawati, F. A. (2020). Pengembangan Fisik Motorik Anak Usia Dini. Ceremedia.
26. Nataprawira HM, Gafar F, Risan NA, Wulandari DA, Sudarwati S, Marais BJ, Stevens J, Alffenaar JC, Ruslami R. Treatment Outcomes of Childhood Tuberculous Meningitis in a Real-World Retrospective Cohort, Bandung, Indonesia. Emerg Infect Dis. 2022 Mar;28(3):660-671. doi: 10.3201/eid2803.212230. PMID: 35202524; PMCID: PMC8888221.
27. Oktavia, T. (2016). Analisis Kualitas Hidup Anak Pada Pasien Asma Di Rsab Harapan Kita Jakarta Barat [Universitas Esa Unggul]. https://digilib.esaunggul.ac.id/analisis-kualitas-hidup-anak-pada-pasien-asma-di-rsab-harapan-kita-jakarta-barat-7549.html
28. Berkelbach van der Sprenkel EE, Nijhof SL, Dalmeijer GW, Onland-Moret NC, de Roos SA, Lesscher HMB, van de Putte EM, van der Ent CK, Finkenauer C, Stevens GWJM. Psychosocial functioning in adolescents growing up with chronic disease: The Dutch HBSC study. Eur J Pediatr. 2022 Feb;181(2):763-773. doi: 10.1007/s00431-021-04268-9. Epub 2021 Sep 30. PMID: 34595612; PMCID: PMC8821406.
29. Uce, L. (2017). The Golden Age: Masa Efektif Merancang Kualitas Anak. Jurnal Pendidikan Anak, 1(2), 77–92. https://doi.org/10.1177/002070200906400118
30. Maurice-Stam H, Nijhof SL, Monninkhof AS, Heymans HSA, Grootenhuis MA. Review about the impact of growing up with a chronic disease showed delays achieving psychosocial milestones. Acta Paediatr. 2019 Dec;108(12):2157-2169. doi: 10.1111/apa.14918. Epub

2019 Aug 1. PMID: 31250466.
31. Athiutama, A., Saputra, D. N., & Trulianty, A. (2022). Kualitas Hidup Domain Mental Pasien Tuberkulosis Paru. Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal, 4 Okt 2022(Oktober), 1–2.
32. Wise, P. (2024). Chronic illness in childhood. In Nelson textbook of pediatrics (22th ed., pp. 187–191).
33. Mu'riah, S., & Wardan, K. (2020). Psikologi Perkembangan Anak dan Remaja. Literasi Nusantara.
34. Garcia Rodrigues M, Rodrigues JD, Pereira AT, Azevedo LF, Pereira Rodrigues P, Areias JC, Areias ME. Impact in the quality of life of parents of children with chronic diseases using psychoeducational interventions - A systematic review with meta-analysis. Patient Educ Couns. 2022 Apr;105(4):869-880. doi: 10.1016/j.pec.2021.07.048. Epub 2021 Jul 29. PMID: 34389225.
35. Raharjanti, D. (2021). Pengaruh Karakteristik Pasien Dan Status Gizi Awal Terhadap Kualitas Hidup Pasien Rawat Inap Di Bangsal Penyakit Dalam Rsu Puri Asih Salatiga. Poltekkes Kemenkes Yogyakarta.
36. Shaji, B., Arun Thomas, E. T., & Sasidharan, P. K. (2019). Tuberculosis Control in India: India: Refocus on Nutrition. Indian Journal of Tuberculosis, 66(1), 26–29. https://doi.org/10.1016/j.ijtb.2018.10.001
37. Kemenkes RI. (2020a). Pedoman Nasional Pelayanan Kedokteran Tata Laksana Tuberkulosis.
38. Kemenkes RI. (2021). Pedoman Sekolah Peduli Tuberkulosis Dalam Rangka Gerakan Bersama (Geber) Melawan Tuberkulosis Di Satuan Pendidikan.
39. Fatriany, E., & Herlina, N. (2020). Hubungan antara Status Gizi dengan Kejadian Tuberkulosis Paru di Puskesmas : Literature Review. Borneo Student Research, 2(1), 158–165.
40. Abrori, I., & Ahmad, R. A. (2018). Kualitas hidup penderita tuberkulosis resisten obat di kabupaten Banyumas Quality of life among patients with multi-drug resistant tuberculosis in the district of Banyumas. Berita Kedokteran Masyarakat, 34(2), 56–61.