



WHO SRQ-20 Outcomes in Mothers of Children 6-23 Months By Fecal Disposal and Drinking Water Source Factors

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Abstrak

Sebagian besar penelitian cenderung berfokus pada hubungan kondisi kesehatan atau perilaku tantrum pada balita dengan kesehatan mental ibu. Penelitian ini bertujuan untuk mengetahui perbedaan skor WHO SRQ-20, dan hubungan luaran WHO SRQ-20 dengan faktor pembuangan tinja dan sumber air minum. Penelitian ini menggunakan data sekunder dari RISKESDAS 2018 yang melibatkan 670 ibu dengan anak usia 6-23 bulan. Kuesioner WHO SRQ-20 digunakan untuk mengukur gangguan kesehatan mental umum. Analisis mann whitney dilakukan untuk mengetahui perbedaan skor, sedangkan *Chi Square* dilakukan untuk mengetahui hubungan luaran WHO SRQ-20 dengan faktor pembuangan tinja balita dan sumber air minum. Semua analisis dilakukan dengan SPSS 22.0 dengan nilai signifikansi <0.05 . Hasil analisis menunjukkan bahwa pembuangan tinja yang tidak sesuai dan sumber air minum yang buruk meningkatkan total skor WHO SRQ-20 ($p=0.003$, & $p=0.041$). Kedua faktor tersebut berkorelasi positif dengan tujuh gejala kesehatan mental umum pada ibu dengan anak usia 6-23 bulan, termasuk tidak nafsu makan, kesulitan berpikir, kesulitan mengambil keputusan, perasaan takut, tangan gemetar, dan gangguan pencernaan, dengan nilai p signifikan ($p<0.05$) untuk setiap gejala. Kualitas lingkungan khususnya pembuangan tinja yang tidak sesuai dan buruknya sumber air minum berkorelasi signifikan dengan peningkatan gejala kesehatan mental pada ibu dengan anak usia 6-23 bulan.

Abstract

Most studies tended to focus on the association of health conditions or tantrum behavior in toddlers with maternal mental health. This study aimed to determine the differences in WHO SRQ-20 scores and the association of WHO SRQ-20 outcomes with fecal disposal factors and drinking water sources. This study used secondary data from RISKESDAS 2018, involving 670 mothers with children aged 6-23 months. The WHO SRQ-20 questionnaire was used to measure general mental health disorders. Mann-Whitney analysis was conducted to determine the difference in scores, while Chi-Square was used to examine the association of WHO SRQ-20 outcomes with toddler feces disposal factors and drinking water sources. All analyses were performed using SPSS 22.0, with a significance value of <0.05 . The analysis showed that inappropriate fecal disposal and poor drinking water sources increased the total WHO SRQ-20 score ($p=0.003$, & $p=0.041$). Both factors were positively correlated with seven common mental health symptoms in mothers with children aged 6-23 months, including no appetite, difficulty thinking, difficulty making decisions, feelings of fear, trembling hands, and indigestion, with significant p -values ($p<0.05$) for each symptom. Environmental quality, especially inappropriate fecal disposal and poor drinking water sources, was significantly correlated with increased mental health symptoms among mothers with children aged 6-23 months.

INTRODUCTION

Maternal mental health is an important issue worldwide, especially in developing countries, where access to sanitation facilities and clean water is limited. Previous research reports show that inadequate environmental conditions, such as poor sanitation and limited sources of safe drinking water, not only impact the physical health of children but indirectly impact the psychological health of mothers. Mothers of young children often face additional pressures that worsen their mental health, especially if their living environment is not supportive (Rahman et al., 2008; Surkan et al., 2011).

Maternal mental health is essential to support child development. Wachs' research in low- and middle-income countries shows that children of depressed mothers experience cognitive and motor delays, as well as malnutrition and stunted growth (Wachs et al., 2009). The far-reaching consequences of mental health disorders emphasize the importance of early detection of symptoms in postpartum mothers, particularly those living in resource-limited settings such as inadequate living environment, access to clean water and poor sanitation behavior (Bartram & Cairncross, 2010; Surkan et al., 2011). This is often the case in developing countries including Indonesia.

Poor sanitation and limited sources of safe drinking water can have a direct impact on children's physical health such as the incidence of diarrhea and malnutrition. Research reports show that mothers of children with malnutrition reached 42% and 64.1%, higher than mothers of children with normal nutrition (Ashaba et al., 2015; Haithar et al., 2018; Husain et al., 2016) Although research on child conditions with

maternal mental health has been widely studied, there are still limited studies that discuss the relationship between environmental conditions and maternal mental health with children aged 6-23 months (Headey & Palloni, 2019; Sommer et al., 2015)

This study seeks to fill this literature gap by exploring the relationship between environmental factors such as inadequate toddler feces disposal and unsafe drinking water sources on maternal mental health in Indonesia. Using secondary data from the 2018 Basic Health Research (RISKESDAS), we will analyze the results of the WHO's Self-Reporting Questionnaire 20-item (SRQ-20), which is an internationally recognized screening tool to detect symptoms of non-psychotic mental disorders, such as depression and anxiety (Beusenbergh et al., 1994; Harpham et al., 2005; Netsereab et al., 2018). The SRQ-20 has been shown to be valid in developing country populations (Do et al., 2023), thus providing a strong foundation for evaluating mental health conditions in groups of mothers with children aged 6-23 months.

This study aims to answer an under-explored question in Indonesia, namely whether there is a significant association between poor sanitation and access to drinking water with increased risk of maternal mental disorders. Under-five feces disposal in septic tank latrines and use of unprotected drinking water sources were identified as environmental factors that may contribute to poorer mental health. The findings are expected to provide new insights for government and policy makers on how to improve access to clean water and sanitation infrastructure to reduce the risk of maternal physical and psychological illness.

METHOD

This study uses secondary data obtained from the results of the Basic Health Research survey (RISKESDAS) of the Ministry of Health in 2018. RISKESDAS is a national scale survey with a cross-sectional and non-intervention design conducted every 5 years. The population includes households in all provinces and districts/cities (34 provinces, 416 districts and 98 cities) in Indonesia. Data collection was done by interview, measurement, and examination. Interviews used 2 instruments namely: Household Instrument and Individual Instrument. Details on sampling techniques, survey design, survey instruments, measurement systems, and quality control have been described in other publications. (Azam et al., 2021; Ganihartono, 1996; Irmansyah et al., 2010; Reuter et al., 2020). This analysis was conducted on 670 women with children aged 6-23 months who had completed the questionnaire. Data on the Mental Health Disorder Status of mothers with children aged 6-23 were determined by the WHO Self-Report Questionnaire-20 (SRQ-20). The SRQ-20 consists of 20 questions regarding the prevalence of somatic, cognitive, and emotional symptoms over the past 30 days: 0 = No and 1 = Yes. Referring to previous studies that validated the SRQ-20 in the Indonesian population (Azam et al., 2021; Ganihartono, 1996; Irmansyah et al., 2010; Reuter et al., 2020). The independent variable in this analysis is toddler feces disposal, which is categorized as appropriate if it uses a latrine or disposes of it in a latrine, while it is not appropriate if the disposal of feces is done other than through septic tanks, such as being planted, disposed of in any place, or cleaned in inappropriate places, because it has the

potential to cause environmental contamination and health problems. Water sources used by households for drinking purposes can be categorized into protected and unprotected. Protected water sources include branded bottled water, refill water, tap water, boreholes, protected dug wells, protected springs, and rainwater harvesting. Meanwhile, unprotected water sources include retail tap water, unprotected dug wells, unprotected springs, and surface water such as rivers or lakes. Protected water sources are safer from the risk of contamination, while unprotected water sources are vulnerable to pollution and health hazards. All operational definitions of the study variables have been adapted to the operational definitions of the 2018 Riskesdas questionnaire.

Mann Whitney test analysis was conducted to determine the difference in WHO-SRQ-20 scores among mothers of children aged 6-23 months for numerical data that were not normally distributed, while Chi Square was conducted to determine the association of WHO SRQ-20 outcomes with the variables of toddler feces disposal and drinking water source among mothers of children aged 6-23 months. All analyses were performed by SPSS 22.0 (IBM Corporation, NY, USA). The Research Ethics Committee of the Health Research and Development Agency (Balitbangkes), Ministry of Health of the Republic of Indonesia, reviewed and approved the survey protocol, design, data, and questionnaires (Number: LB.02.01/2/KE.024/2018). No further ethical clearance was required for the analysis of the secondary data. Researchers were asked to consent and sign the survey data use form.

RESULT AND DISCUSSION

Table 1. Measures of Centering and Spread by Variable (n: 670)

Variable	N	p-value Normality	Mean	Median	SD	Variance
Method of Child Feces Disposal						
Inappropriate	328	<0.000	1.9878	1	2.86599	8.214
Appropriate	342		2.7251	1	3.4506	11.907
Drinking Water Source						
Poor	596	<0.000	2.448	1	3.26874	10.685
Good	74		1.6892	0	2.46024	6.053

Table 1 shows the measures of data centering and dispersion based on the variables of toddler fecal disposal method and drinking water source, with a total sample of 670. On the variable of under-five fecal disposal method, the non-compliant group (N=328) had a mean of 1.9878, median of 1, standard deviation (SD) of 2.86599, and variance of 8,214, while the compliant group (N=342) had a higher mean of 2.7251, median of 1, SD of 3.4506, and variance of 11,907. The normality data

in these two groups showed a p-value <0.000, indicating that the data distribution was not normal. In the drinking water source variable, the unprotected group (N=596) had a mean of 2.448, median of 1, SD of 3.26874, and variance of 10.685, while the protected group (N=74) had a lower mean of 1.6892, median of 0, SD of 2.46024, and variance of 6.053. The p-value of <0.000 in the group with poor drinking water sources indicates a non-normal distribution of the data.

Table 2. Analysis of the Relationship between Variables and Total Score of WHO SRQ-20 (n: 670)

Environmental Characteristics	Mean Rank	Z	p-value
Child Feces Disposal			
Inappropriate	356.77	-3.005	0.003
Appropriate	313.32		
Drinking Water Source			
Poor	340.71		
Good	293.52	-1.083	0.041

Table 2 shows the analysis of the relationship between environmental characteristics and the total WHO SRQ-20 score among 670 respondents. In the variable of toddler feces disposal, the group with inappropriate disposal had a mean rank of 356.77, while the appropriate group had a mean rank of 313.32. The Z statistical test showed a value of -3.005 with a p-value of

0.003, indicating a significant difference between the two groups. For the drinking water source variable, the group with unprotected conditions had a mean rank of 340.71, while the group with protected conditions had a mean rank of 293.52. The Z value of -1.083 with a p-value of 0.041 also showed a significant difference between the condition of the drinking water source and the total WHO SRQ-20 score.

Table 3. Analysis of WHO SRQ-20 Outcomes by Toddler Fecal Disposal and Drinking Water Source (n: 670)

WHO-SRQ	Response	Method of Child Feces Disposal (%)		p-value	Drinking Water Source (%)		p-value
		Inappropriate	Appropriate		Poor	Good	
		Respondent frequently suffers from headaches.	Yes		52.8	47.2	
	No	49.7	50.3		88.2	11.8	
Respondent has no appetite.	Yes	64.3	35.7	0.002	96.5	3.5	0.003*
	No	48.3	51.7		87.4	12.6	
Respondent has trouble sleeping.	Yes	55.7	44.3	0.212	91.1	8.9	0.392
	No	49.6	50.4		88.3	11.7	
Respondent is easily frightened.	Yes	59.5	40.5	0.158	98.6	1.4	0.002*
	No	50.0	50.0		87.8	12.2	
Respondent feels tense, anxious, or worried.	Yes	55.3	44.7	0.347	95.1	4.9	0.024
	No	50.1	49.9		87.6	12.4	
Respondent's hands tremble.	Yes	60.0	40.0	0.242	98.0	2.0	0.032*
	No	50.3	49.7		88.2	11.8	
Respondent has digestive problems or poor digestion.	Yes	62.5	37.5	0.053	97.2	2.8	0.015*
	No	49.7	50.3		88.0	12.0	
Respondent finds it hard to think clearly.	Yes	64.8	35.2	0.049	87.0	13.0	0.808
	No	49.8	50.2		89.1	10.9	
Respondent feels unhappy.	Yes	62.5	37.5	0.134	83.3	16.7	0.293
	No	50.2	49.8		89.4	10.6	
Respondent cries more often.	Yes	62.5	37.5	0.183	87.5	12.5	0.793*
	No	50.3	49.7		89.0	11.0	
Respondent finds it hard to enjoy daily activities.	Yes	58.7	41.3	0.356	91.3	8.7	0.808*
	No	50.5	49.5		88.8	11.2	
Respondent finds it hard to make decisions.	Yes	65.5	34.5	0.037	94.5	5.5	0.258*
	No	49.8	50.2		88.5	11.5	
Respondent's daily work is disturbed.	Yes	56.7	43.3	0.657	83.3	16.7	0.364*
	No	50.8	49.2		89.2	10.8	
Respondent is unable to do useful things in life.	Yes	66.7	33.3	0.217	95.2	4.8	0.719*
	No	50.5	49.5		88.8	11.2	
Respondent has lost interest in various things.	Yes	63.3	36.7	0.234	90.0	10.0	0.572**
	No	50.5	49.5		88.9	11.1	
Respondent feels worthless.	Yes	71.4	28.6	0.044	89.3	10.7	0.626**
	No	50.2	49.8		88.9	11.1	
Respondent has thoughts of ending their life.	Yes	71.4	28.6	0.451*	85.7	14.3	0.561*
	No	50.8	49.2		89.0	11.0	
Respondent feels tired all the time.	Yes	60.4	39.6	0.069	90.1	9.9	0.843
	No	49.6	50.4		88.8	11.2	
Respondent has stomach discomfort.	Yes	61.5	38.5	0.036	90.6	9.4	0.698
	No	49.3	50.7		88.7	11.3	
Respondent gets tired easily.	Yes	56.3	43.7	0.153	93.7	6.3	0.044
	No	49.4	50.6		87.5	12.5	

Chi-Square Tests; * Fisher's Exact Test 2-sided; ** Fisher's Exact Test 1-sided

Table 3 shows the WHO SRQ-20 outcome analysis based on the variables of toddler fecal disposal and drinking water source in 670 mothers of children aged 6-23 months. For the under-five fecal disposal variable, some results showed significant differences. For example, the percentage of mothers with no appetite was higher in the group with non-compliant fecal disposal (64.3) than in the compliant group (35.7), with a p-value of 0.002, indicating a significant difference. Similarly, the variable of respondents having difficulty thinking clearly was higher in the group with inappropriate fecal disposal (64.8) than the compliant group (35.2), with a p-value of 0.049. In addition, the variable of difficulty making decisions also showed a significant difference with a percentage of 65.5 in the non-compliant group and 34.5 in the compliant group (p-value 0.037). In the drinking water source variable, several aspects of mental health showed a significant relationship. Respondents with poor drinking water sources were more likely to have no appetite (96.5) than

respondents with good drinking water sources (3.5), with a p-value of 0.003. Respondents from the group with poor drinking water were also more likely to feel fear (91.6) compared to those with good drinking water sources (8.4), with a p-value of 0.002. In addition, physical symptoms such as trembling hands were also reported more frequently by respondents with poor water sources (98.0) compared to those with good water sources (2.0), with a p-value of 0.032. Analysis of indigestion also showed a significant difference in drinking water source groups, with 97.2 of respondents with poor drinking water reporting the symptom compared to 2.8 of those with good drinking water (p-value 0.015). Overall, this analysis shows that environmental quality, both in terms of fecal disposal and drinking water source, has a significant influence on a number of mental and physical health symptoms measured through the WHO SRQ-20, especially related to eating disorders, fear, and indigestion.

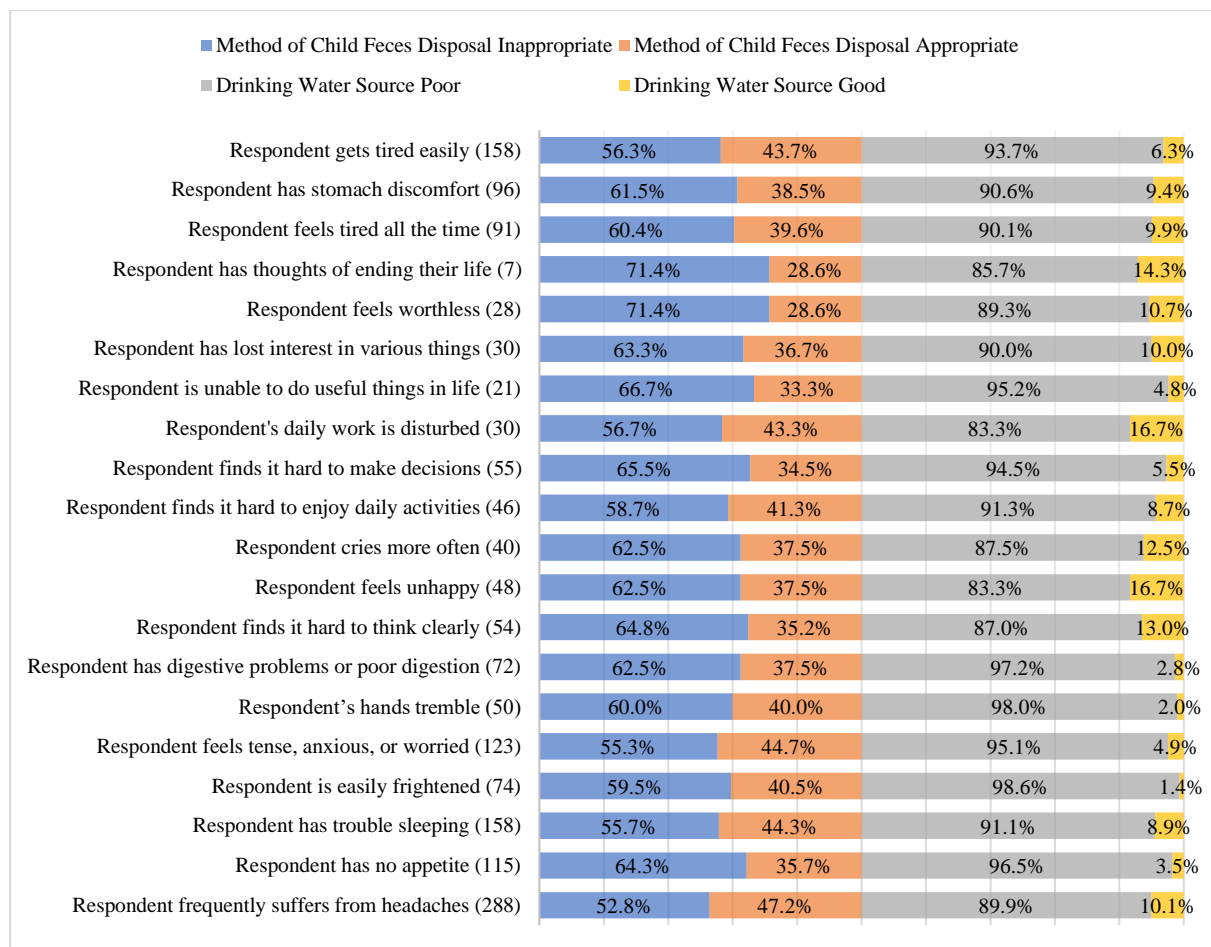


Figure 1. Distribusi Persentase Responden Berdasarkan Skor The Self-Reporting Questionnaire (SRQ-20)

The chart shows that 43.0 mothers suffered from frequent headaches, making it the most commonly reported symptom. A total of 23.6 mothers admitted to having difficulty sleeping and feeling tired easily, indicating that sleep disturbances and fatigue were significant problems. Reduced appetite was reported by 17.2 mothers, while 18.4 felt tense, anxious or worried. Some mothers reported more serious psychological symptoms, such as feeling unhappy (7.2), crying more often (6.0), and finding it difficult to enjoy daily activities (6.9). Although only 1.0 mother reported having thoughts of ending her life, this is still an important finding that requires further attention. Most mothers did not experience symptoms such as shaking

hands (92.5), indigestion (89.3), and feelings of worthlessness (95.8).

The results showed that mothers in the unsuitable fecal disposal group had a higher mean rank (356.77) than those in the suitable fecal disposal group (313.32). This result shows that there is a significant difference in the score of general mental health disorders in mothers with children aged 6-23 months based on toddler fecal sanitation hygiene with a Z value of -3.005 and a p-value of 0.003. This finding is in line with research showing that poor sanitation can worsen mental health. Research by Ejemot-Nwadiaro et al. (2021) found that women exposed to environments with poor sanitation have a higher risk of experiencing anxiety and stress disorders due to the increased burden of disease

arising from improper sanitation practices (Ejemot-Nwadiaro et al., 2021).

The source of drinking water also affected the WHO SRQ-20 score. The group of mothers using unprotected water sources had a higher mean rank score (340.71) than the group with protected water sources (293.52), with a Z-value of -1.083 and a p-value of 0.041. The fact that unsafe drinking water is often associated with increased cases of waterborne diseases adds stress for mothers. Safe and clean drinking water is essential for maintaining public health, especially for preventing waterborne diseases. Mothers who have to rely on polluted water are likely to face additional health problems, such as a higher risk of gastrointestinal infections in their children, ultimately causing greater psychological distress. The study by Bain et al. (2014) supports these findings by showing that access to clean water not only lowers the burden of disease, but also improves mental well-being, especially in low-income communities in developing countries (Bain et al., 2014).

The results of the WHO SRQ-20 outcome analysis based on toddler fecal disposal and drinking water source showed a significant association between the sanitation quality of toddler fecal disposal and drinking water source with maternal mental and physical health conditions measured using the Self-Reporting Questionnaire (SRQ-20). In the under-five fecal disposal variable, it was found that mothers with unsuitable fecal disposal experienced symptoms of no appetite more often (64.3) compared to the group with suitable fecal disposal (35.7), with a significant p value of 0.002. This finding indicates that poor sanitation quality has the potential to increase maternal stress, which in turn can lead to eating disorders. Previous

research also supports that unhealthy environmental conditions affect the psychological well-being and diet of mothers (Bartram & Cairncross, 2010; Clasen et al., 2015).

Symptoms of difficulty thinking clearly were also found to be higher in the group with unsuitable feces disposal (64.8) compared to the group with suitable feces disposal (35.2), with a p value of 0.049. This suggests that exposure to poor sanitation can affect a person's cognitive and mental abilities. This is in line with other studies that emphasize that poor environmental conditions often lead to mental disorders such as confusion and concentration difficulties (Montgomery & Elimelech, 2007). Another symptom related to fecal disposal was difficulty making decisions, with the group with unsuitable disposal (65.5) reporting more problems than the group with suitable disposal (34.5) (p-value 0.037).

On the variable of drinking water source, it was found that mothers with poor access to drinking water were more likely to experience symptoms of no appetite (96.5) compared to those with good drinking water (3.5), with a p-value of 0.003. In addition, fear was also more common in the group with poor water sources (91.6) compared to the group with good drinking water (8.4), with a p value of 0.002. This reinforces the view that poor water quality significantly affects the psychological state of mothers, particularly in relation to eating disorders (Prüss-Üstün et al., 2008).

In addition, the group with poor drinking water sources (98.0) reported shaking symptoms more frequently than the group with good drinking water sources (2.0), with a p value of 0.032. This finding suggests that poor water quality affects both physical and mental health. Poor water

quality also affects physical symptoms such as tremors (UNICEF & WHO, 2019). In the poor drinking water group, 97.2 of people reported symptoms of impaired digestion, compared to only 2.8 of the good drinking water group, with a significant p value of 0.015. Physical symptoms such as digestive problems, anxiety, and fear are caused by poor environmental conditions. International organizations such as WHO and UNICEF say that access to good sanitation and clean drinking water is essential to prevent more serious health problems in vulnerable groups such as mothers and children. This study supports these recommendations (UNICEF & WHO, 2019).

CONCLUSION

The results of this study have the potential to inform policy studies that focus on improving sanitation facilities and access to clean drinking water in vulnerable areas, especially to improve the physical health of children under five and the mental health of mothers. It is evident that improved WASH (Water, Sanitation, and Hygiene) intervention programs can improve people's physical health and psychological well-being, especially for vulnerable groups such as mothers of children under five. Overall, this analysis emphasizes the importance of a clean environment, both in terms of fecal disposal and drinking water quality, to maintain the mental health of mothers with children aged 6-23 months.

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