



Short Communication

The relationship between environmental sanitation of family and stunting among under-five children: A cross-sectional study in the public health center of Jember, Indonesia

Fitri Nur Ainy¹, Tantut Susanto^{2*}, Latifa Aini Susumaningrum²

¹Faculty of Nursing, Universitas Jember, Jember, Indonesia

²Department of Community, Family and Geriatric Nursing, Faculty of Nursing, Universitas Jember, Jember, Indonesia

ARTICLE INFO

Received 21 January 2021
Accepted 23 February 2021

Available online at:
<http://npt.tums.ac.ir>

Key words:
environment;
sanitation;
family;
stunting;
under-five children

***Corresponding Author:**
Tantut Susanto, Department of
Community, Family and Geriatric
Nursing, Faculty of Nursing,
Universitas Jember, Jember,
Indonesia.
E-mail: tantut_s.psik@unej.ac.id

DOI:
10.18502/npt.v8i3.5932

ABSTRACT

Background & Aim: Unhealthy environmental sanitation contributes to stunting among under-five children that correlated several factors, such as the house components, sanitation facilities, and behavior of poor food sanitation hygiene. This study aims to identify the relationship between family and stunting's environmental sanitation among under-five children in the Public Health Center in Indonesia.

Methods & Materials: A cross-sectional study was conducted among 393 families with under-five children in the public health center of Panti of Jember district, East Java of Indonesia, using consecutive sampling from December 2019 to January 2020. A self-administered questionnaire was used to measure participants' characteristics and environmental sanitation. A Chi-square test was used to analyze the data.

Results: Among 67.2% of families were unhealthy environmental sanitation. Meanwhile, children who suffer from stunting were 56.2%. There was a significant correlation between environmental sanitation of family and stunting among under-five children ($\chi^2=38,440$; $p < 0,001$), The environmental sanitation of family had 0.254 times for a chance of stunting among under-five children (OR= 0.254; 95% CI= 0.163-0.397).

Conclusion: The family's unhealthy environmental sanitation of family is a relationship with stunting among under-five children. Improving healthy environmental sanitation should be maintained by involving the family to fulfill under-five children's nutrition requirement based on height for age.

Introduction

Nutrition problems are the difficulties experienced by every country, especially in under-five children. According to the United Nations Children's Fund (UNICEF) and World Health Organization (WHO), stunting is one of the most critical malnutrition problems in the world (1,2). More than 2 million deaths in under-five children worldwide are caused by stunting (3). Stunting is a chronic nutritional problem characterized by height conditions that are not appropriate for their age (4). Stunting is caused by bad parenting, infectious diseases, and environmental sanitation (2,5-8). The current low of family access to sanitation facilities,

environmental-based conditions contribute to more than 80% of illnesses suffered by under-five children, such as infectious diseases, appetite disorders, digestive tract disorders, and so on, as well as being the leading causes of death in under-five children in Indonesia (9). The environment is one indicator of the human health degree assessment. The home environment condition is also an essential part of family health, including the most crucial evaluation source to support optimal health for individual families and family units (9,10).

The home environment sanitation is one of the family setting's fundamental aspects (11). Poor sanitation can invite infectious diseases in under-five children, such as diarrhea and

Please cite this article as: Ainy F.N, Susanto T, Susumaningrum L.A. The relationship between environmental sanitation of family and stunting among under-five children: A cross-sectional study in public health center of Jember, Indonesia. *Nursing Practice Today*. 2021; 8(3):173-178



intestinal worms that can interfere with the digestion process in absorbing the nutrients, which causes a baby's weight loss. If this condition occurs for a long time, it will cause children's growth and development (9). One of the family functions is health care. The family's task in maintaining health is to modify the family environment to ensure the health and maintain a favorable home atmosphere for health (11,12,13).

Ideal environmental sanitation includes criteria for a healthy home, access to improve sanitation facilities (clean water facilities, restrooms, wastewater disposal facilities, and waste bin facilities), and residents' hygiene behavior (14). Based on data from the Central Statistics Agency in 2019, access to proper sanitation throughout Indonesia was recorded at 69.27%, while East Java was recorded at 68.84% (15). Based on the Indonesian Ministry of Health research, only 32% of residents have implemented clean and healthy living behavior (16). Inadequate home environmental sanitation conditions are also associated with stunting in under-five children (5,17,18). Adequate sanitation of the home environment indicates the right socioeconomic family, mother's nutritional knowledge, maternal dietary behavior and good hygiene, and healthy behavior in the family setting (9,13,19).

Globally, the prevalence of under-five children stunting reaches 22.9% (154.8 million people) in 2016, and more than half of the world's stunting in under-five children come from the Asian continent (55%) (2,9). According to the Indonesian Under-Five Children Nutrition Status Survey in 2019, the stunting prevalence in Indonesia was recorded at 27.67% (20). Based on the results of recording Public Health Center of Panti until September 2019, stunting cases in under-five children were recorded as many as 699 stunting among under-five children. The incidence of stunting in Jember District is 39.2%, higher than Sumenep (32.5%) and Bangkalan (32.1%) (21). That means under-five children stunting in Jember district, especially in the Panti sub-district, is still relatively high.

Furthermore, unhealthy environmental sanitation conditions risk the incidence of stunting in under-five children. Achieving adequate access to sanitation and environmental hygiene is the international target of achievement number two and output in one of the health sectors of the Sustainable Development Goals (SDGs) in 2030 in reducing stunting (1,22). In contrast, there is a high prevalence of stunting among under-five children in Indonesia. On the other hand, the families responsible for taking care of children have terrible environmental sanitation conditions and healthy living behavior in Indonesia. Therefore, the study aimed to identify the correlation between family and stunting's environmental sanitation among under-five children in the Public health center of Panti, Jember district, East Java province of Indonesia.

Methods

A cross-sectional study was conducted from December 2019 to January 2020 in Panti Public health center in Jember District. This study's population was families with under-five children in Panti Public health center (PHCs) (N = 4,607). The sample size was determined using the consecutive sampling techniques with the following inclusion criteria: 1) Families with under-five children; 2) Families who live together in a home with under-five children. The exclusion criteria were: 1) Families that had met the inclusion criteria but refused to be respondents; 2) families didn't communicate well; 3) Respondents who were not at home when measuring data; 3) Under-five children were sick and hospitalized; 4) Under-five children with lower limb disorders or other congenital abnormalities influence measuring height; 5) Families and under-five children had moved residence; 6) Under-five were not registered at Integrated Healthcare Center of PHCs. Finally, about 393 participants participated in the study.

A self-administered questionnaire was used to measure family and under-five children's sociodemographic data. Sociodemographic information collected

includes age, gender, educational history, and income level. Then the environmental sanitation questionnaire was used to measure the condition of environmental sanitation of the family. This questionnaire had several indicators, including housing components, sanitation facilities, and occupant behavior. Under-five children's height was measured using the length board or microtoise tool and then converted to a z-score with the WHO-2018 AnthroPlus software. Furthermore, the z-score is classified according to standards from the Ministry of Health of the Republic of Indonesia into two categories: normal and very short.

The data collection, firstly, the researcher asked the family's availability to become respondents and then explained the study's purpose. If the respondent had agreed, they signed the informed consent form to be participants. Then, researchers measured under-five children's height. Next, the researcher explains to families how to fill in the questionnaire. This study was approved by the Health Research Ethics Committee of the Faculty of Dentistry, the University of Jember, with No. 729/UN25.8/KEPK/DL/2019.

Finally, the data analyzed using the Chi-square test to examine the relationship between family environmental sanitation and stunting among under-five children.

Results

The demographic and characteristic respondents were shown in Table 1. This table shows that the participant's characteristics of families in this study were the median age of 28 years and most female sex (92.9%). Most participants were junior high school education (40.2%), and most respondents have income of 500,000-1,000,000 IDR (39.7%). Most of the under-five respondents were male respondents. There were 202 children (51.4%) with an average age of 33.3 months, and the average length or height of children 84.071 cm (48-133 cm).

Most respondents in Panti Public health center in Jember District have an unhealthy environment equal to 67%. Meanwhile, the prevalence of stunting in Panti Public health center in Jember District was higher than 221 children (56.2%) compared to not stunting or normal.

Regarding the analysis results using the Chi-square test in Table 2, there was a relationship between family's environmental sanitation and the prevalence of stunting in under-five children ($\chi^2=38.440$; $p\text{-value}<0.001$). The family's environmental sanitation had 0.254 times a chance of stunting (OR=0.254; 95% CI=0.163-0.397).

Table 1. Demographic and characteristic respondent (n=393)

Characteristic respondent		Families N (%)	Under-five children N (%)
Age (Year)	Md±(P ₂₅ -P ₇₅)	28±(18-69)	33.3±(23-45)
Under-five children height (cm)	Mean±(P ₂₅ -P ₇₅)		84.071±48-133
Gender	Male	28 (7.1)	202 (51.4)
	Female	365 (92.9)	191 (48.6)
Education history	Not Attending School	7 (1.8)	
	Elementary School	121 (30.8)	
	Junior High School	158 (40.2)	
	Senior High School	100 (25.4)	
	Bachelor	7 (1.8)	
Family income (USD)	Less than 34.80	41 (10.4)	
	34.80 – 69.60	156 (39.7)	
	69.60 – 104.40	112 (28.5)	
	104.40 – 139.19	70 (17.8)	
	More than 139.19	14 (3.6)	

Md=Median; (P₂₅ - P₇₅) =Percentile 25–75
USD= US Dollars

Table 2. The relationship between environmental sanitation of family and stunting among under-five children

Environmental sanitation of family	The incidence of stunting		χ^2 p-value	OR	95% CI
	Stunting (N%)	Not stunting (N%)			Min - Max
Healthy environment	44 (34.1)	85 (65.9)	38.440	0.254	0.163-0.397
Unhealthy environment	177 (67.0)	87 (33.0)	(<0.001)		

OR = Odds Ratio; χ^2 = Likelihood Ratio; 95% CI = 95 Confidence Interval

Discussion

The Sustainable Development Goals (SDGs) target will end all malnutrition forms in 2030 (1). Indonesia's nutritional status is still relatively severe because of many factors: family environmental sanitation. The results showed a very high prevalence of unhealthy family environmental sanitation of 67%. This finding is probably due to several things concerning the home environment's overall sanitation that still do not meet health standards. According to Basic Health Research of Indonesia (2013), healthy environmental sanitation is seen based on the components of the house (roof, walls, floors, bedroom windows, living room windows, ventilation, kitchen smoke holes, and lighting), sanitation facilities (clean water facilities, restrooms, wastewater disposal facilities, and waste bin facilities), and occupant behavior (opening the bedroom window, opening the living room window, cleaning the house and yard, throwing childrens' feces into the toilet, and taking out the trash in its place) (23).

The study's final results indicate a significant relationship between environmental sanitation of family and stunting in under-five children. This result is almost the same as Rahayu and Darmawan (2019) that healthy environmental sanitation positively affects children's nutritional status under five and vice versa (24). The analysis also shows that the relationship of family environmental sanitation has a 0.254 times greater chance of stunting in under-five children. This finding is also reinforced by Apriluana and Fikawati's (2018) research that poor sanitation has a significant effect on stunting in under-five children and has a risk of stunting up to 5 times greater (25,26).

Therefore, unhealthy sanitation is the dominant factor in stunting risk.

The study has several limitations. This study was only conducted at one Public health center, although it involved a representative sample size from 7 areas. Therefore, a large research area is needed to describe family sanitation and the incidence of stunting in the future. Design research Cross-sectional study can describe the temporary relationship of the two variables. Multivariate analysis involving environmental factors, family, and children can be further analyzed in the future.

Conclusion

Environmental sanitation of family is a relationship with stunting among under-five children. Based on the results obtained, the researchers revealed that to meet under-five children's optimal nutritional needs, it can apply a healthy home's requirements and improve environmental sanitation facilities and practice clean and healthy living behavior in the family environment. Parents and families' role in fulfilling the nutritional intake of under-five children can help health workers provide interventions for under-five children who experience nutritional status problems, especially stunting.

Acknowledgments

We would like to thank you for the Research Group "Family Health Care Studies" to facilitate research activities. Faculty of Nursing, Universitas Jember for supporting research.

Conflict of interest

There is no conflict of interest for this study.

References

1. UNICEF. UNICEF Annual Report 2015. July 2016. 2015. Available from http://www.unicef.at/fileadmin/media/Infos_und_Medien/Info-Material/Jahresberichte/UNICEF_Annual_Report_2015_En.pdf. Accessed on 19 December 2020.
2. WHO. Reducing Stunting in Children: Equity Considerations for Achieving Global Nutrition Target 2025. 2018. 1-40 p. Available on <https://www.who.int/publications/i/item/9789241513647>. Accessed on 10 December 2020.
3. SDG. Laporan Baseline SDG tentang Anak-anak di Indonesia (SDG Baseline Report on Children in Indonesia). 2017. Available on <https://www.unicef.org/indonesia/media/1471/file/SDG%20Baseline%20report%20Indonesian.pdf>. Accessed on 9 December 2020.
4. Kementerian Kesehatan Republik Indonesia. Buku Saku Pemantauan Status Gizi Tahun 2017. Kemenkes RI. 2017. p. 140. Available on <https://sehatnegeriku.kemkes.go.id/baca/umum/20180125/3424539/buku-saku-hasil-pemantauan-status-gizi-psg-tahun-2017/>. Accessed on 9 December 2020.
5. Torlesse H, Cronin AA, Sebayang SK, Nandy R. Determinants of stunting in Indonesian children: Evidence from a cross-sectional survey indicate a prominent role for the water, sanitation and hygiene sector in stunting reduction. *BMC Public Health*. 2016;16(1):1–12.
6. Desyanti C, Nindya TS. Hubungan riwayat penyakit diare dan praktik higiene dengan kejadian stunting pada balita usia 24-59 bulan di wilayah kerja Puskesmas Simolawang, Surabaya. *Amerta Nutrition*. 2017 Oct 23;1(3):243-51.
7. Lestari W, Kristiana L, Paramita A. Stunting: Studi Konstruksi Sosial Masyarakat Perdesaan Dan Perkotaan Terkait Gizi Dan Pola. *J Masal Sos*. 2018;9(1):17–33.
8. Susanto T, Yunanto RA, Rasny H, Susumaningrum LA, Nur KRM. Promoting children growth and development: A community- based cluster randomized controlled trial in rural areas of Indonesia. *Public Heal Nurs*. 2019;36(4):514–24.
9. Purnama SG. Diktat Dasar-Dasar Kesehatan Lingkungan. 2017;161. Available on https://simdos.unud.ac.id/uploads/file_pendidikan_dir/6090e73ad19c5f043c64bdf9f26b3919.pdf. Accessed on 19 December 2020.
10. Wiyono S, Burhani A, Harjatmo TP, Astuti T, Zulfianto NA, Putri MS. The role sanitation to stunting children age 6-35 months, Purwojati subdistrict, Banyumas district, Central Java, Indonesia. 2019;6(1):82–8.
11. Pusdatin. Situasi Balita Pendek (Stunting) di Indonesia. *Pus Data dan Inf Kesehat*. 2018. Available on https://pusdatin.kemkes.go.id/resources/download/pusdatin/profil-kesehatan-indonesia/PROFIL_KESEHATAN_2018_1.pdf. Accessed on 9 December 2020.
12. Susanto T. Buku Ajar Keperawatan Keluarga: Aplikasi Teori pada Praktik Asuhan Keperawatan Keluarga. 2st ed. Jakarta: Trans Info Media; 2021. 1–200 p.
13. Kementerian Kesehatan RI. Perilaku Hidup Bersih dan Sehat. Direktorat Promosi Kesehatan dan Pemberdayaan Masyarakat. 2016. Available on <https://promkes.kemkes.go.id/download/dtcr/files62013LAPTAH%202018.pdf>. Accessed on 9 December 2020.
14. Hammer J, Spears D. Village sanitation and child health : Effects and external validity in a randomized field experiment in rural India. *J Health Econ*. 2016;48:135–48.
15. Badan Pusat Statistik. Presentase Rumah Tangga Menurut Provinsi dan Memiliki Akses Terhadap Sanitasi Layak. BPS Jawa Timur; 2019. Available on <https://www.bps.go.id/indicator/23/1558/1/persentase-rumah-tangga-yang-memiliki-akses-terhadap-layanan-sanitasi-layak-dan-berkelanjutan-40-bawah-menurut-provinsi.html>. Accessed on 19 December 2020.
16. Susanto T, Sulistyorini L, Wuryaningsih EW, Bahtiar S. School health promotion: A cross-sectional study on Clean and Healthy Living Program Behavior (CHLB) among Islamic Boarding Schools in Indonesia. *Int J Nurs Sci*. 2016; (3): 291-298.
17. Fregonese F, Siekmans K, Kouanda S, Druetz T, Ly A, Diabaté S, et al. Impact of contaminated household environment on stunting in children aged 12-59 months in Burkina Faso. *J Epidemiol Community Health*. 2017;71(4):356–63.

18. Rahman N, Napirah MR, Nadila D. Research Article Determinants of Stunting among Children in Urban Families in Palu, Indonesia. *Pakistan J Nutr.* 2017;16(10):750–6.
19. Aridiyah RO, Rohmawati N, Ririanty M. Faktor-faktor yang Mempengaruhi Kejadian Stunting pada Anak Balita di Wilayah Pedesaan dan Perkotaan. *e-Jurnal Pustaka Kesehat.* 2015;3(1):163–70.
20. SSGBI. Menkes Lakukan Soft Launching Hasil Survei Status Gizi Balita Indonesia 2019. Sehat Negeriku. 2019. Available on <https://www.gatra.com/detail/news/451750/kesehatan/prevalensi-stunting-di-indonesia-tahun-2019-turun-jadi-2767>. Accessed on 9 December 2020.
21. Sekwapres. 100 Kabupaten/Kota Prioritas untuk Intervensi Anak Kerdil (Stunting). Vol. 111, Tim Nasional Percepatan Penanggulangan Kemiskinan. 2017. 1-42 p. Available on http://www.tnp2k.go.id/images/uploads/downloads/Binder_Volume1.pdf. Accessed on 9 December 2020.
22. Sarana Multi Infrastruktur. Sanitasi. PT Sarana Multi Infrastruktur (Persero); 2019. Available on https://ptsmi.co.id/id/post_media/smi-insight-2019-sanitasi/ Accessed on 9 December 2020.
23. Kementerian Kesehatan RI. Laporan Hasil Riset Riset Kesehatan Dasar (RISKESDAS) Tahun 2013. In Jakarta: Kementerian Kesehatan Republik Indonesia; 2013. Available on <https://www.litbang.kemkes.go.id/laporan-riset-kesehatan-dasar-riskesdas/> Accessed on 19 December 2020.
24. Rahayu B, Darmawan S. Hubungan Karakteristik Balita, Orang Tua, Higiene dan Sanitasi Lingkungan terhadap Stunting pada Balita. *Binawan Student J.* 2019;1(April):22–7.
25. Apriluana G, Fikawati S. Analisis Faktor-Faktor Risiko terhadap Kejadian Stunting pada Balita (0-59 Bulan) di Negara Berkembang dan Asia Tenggara. *Media Penelit dan Pengemb Kesehat.* 2018;28(4):247–56.
26. Syahrul, Kimura R, Tsuda A, Susanto T, Saito R, Akhmad F. Prevalence of underweight and overweight among school-aged children and it's association with children's sociodemographic and lifestyle in Indonesia. *Int J Nurs Sci.* 2016;3(2):169–77.