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**Abstract** Introduction: Infectious diseases remain public health issues in Indonesia. However, there remains a knowledge gap on whether breastfeeding can prevent infectious diseases in young children. This study examined the relationship between current breastfeeding and child infections in Indonesia. Methods: Data were derived from the 2017 Indonesia Demographic and Health Survey by including 5158 children aged 6–23 months. The dependent variables were diarrhea, fever, and acute respiratory infection (ARI). The main exposure of interest was the current breastfeeding status. Covariates included factors at the child, maternal, household, health care, and community levels.

Results: Around 20%, 38%, and 4% of children experienced diarrhea, fever, and ARI, respectively. Current breastfeeding status was protective against diarrhea (adjusted odds ratio [AOR] = 0.74, 95% confidence [CI] 0.61–0.89) not to (AOR = 0.95, CI = 0.82–1.11) and ARI (AOR = 1.01, 95% CI = 0.70–1.47). Other factors related to diarrhea included female children, older maternal age, maternal higher education, improved drinking water source, and living in Sulawesi. Living in Sumatera and Sulawesi were linked to fever. Higher birth orders and improved toilet facilities were associated with ARI.

Conclusion: findings different of factors child Thus, breastfeeding with hygiene, and sanitation interventions may help prevent infectious diseases in young children.

Keywords: respiratory breastfeeding, diarrhea, fever Breastfeeding Status and Infectious Diseases among Children Aged 6–23 Months in Indonesia Original Article Bunga A.

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Innovation Agency, 2 Department of Faculty Health Sciences, Alma 3 Department Public Alma Graduate of Public Universitas Ata, Indonesia [How to cite this article:](#) Paramashanti BA, Nugraheny Suparmi Afifah Nugraheni Lestyoningrum SD, et al 6–23 months in Indonesia.

Asian [J Soc Health Behav](#) 2024;7:149-56. This an access and are distributed the of Creative Attribution-NonCommercial-ShareAlike License, allows to tweak, build the non-commercially, long appropriate is and the creations licensed the terms. [For reprints contact: WKHLRPMedknow\\_reprints@wolterskluwer.com](#) Introduction Improving child survival remains crucial despite success reducing child mortality in the past decades. The sustainable development goals call for the mortality rate (UFMR) to **25 per 1000 live births** or fewer by 2030. [1] **In 2019, the UFMR was 37.7 deaths per 1000 live births globally and 14.3**

**per 1000 live births in East Asia** the [2] **In Indonesia, the UFMR was 19.8 per 1000 live births in 2021. However, disparities exist across the subnational level, ranging from 12.0 in Jakarta to 49.0 per 1000 live births in Papua.**[3] The international consensus has stipulated that disease, including infection, is one of the leading causes of death. **The immediate cause of child death in most diarrhea cases is due to dehydration, whereas acute respiratory (ARI) not the respiratory tract but also systemic due to inflammation, reduced lung function.**

[4] **However, there are more complex chains in the child death causes. For example, malnutrition could hold a predisposing role to child death caused by infections.** [5] **Around 49.2% of child mortality is due to infections, including lower respiratory infections (13.9%) and diarrhea (9.1%).**[6] **In Indonesia, the diarrhea prevalence under-fives stagnant between 2012 and 2017 (14%), with higher proportions occurring among 6–11 months (19%) and 12–23 months (20%) children. The ARI prevalence was 4% in 2017, slightly lower than in 2012 (5%).**

In addition, the fever prevalence was around 31% between 2012 and 2017, with **children aged 6–23 months** being more susceptible. [7] **Infectious diseases, including diarrhea, fever, and ARI remain public health problems, not only contributing to child deaths but also undernutrition. Infection has been recognized as the immediate cause of child malnutrition.** [8] **There has been an association between infectious diseases** Received: 21 February, 2024. Revised: 25 April, 2024. Accepted: 02 May, 2024. Published: 13 November, 2024. ORCID: Bunga A Paramashanti's <https://orcid.org/0000-0001-6066-2039> Downloaded from <http://journals.lww.com/shbh> by BhDMf5ePHKav1zEoum1tQfN4a+kJLhEZgbsIH04XMi0hCywCX1AWnYQp/IIQrHD3i3D0OdRyi7TvSFI4Cf3VC4/OAVpDDa8KKGKV0Ymy+78= on 12/20/2024

150 Asian Journal of Social Health and Behavior | Volume 7 | Issue 4 | October-December 2024 and stunting, wasting, and underweight, [9,10] suggesting that frequent and persistent infections increase child undernutrition risks. [10] The relationship between infections and nutrition is likely bidirectional.

While infection can affect nutritional the status alter the host's response to infection. [9] Earlier national-level studies found that infectious illnesses, such as diarrhea and ARI were determined by individual (e.g., child's sex and maternal education), household (e.g., water, hygiene, and sanitation [WASH] services), and community (e.g., geographic region) factors. Infant and young child feeding also contributed to the occurrence of infections. [11-14] However, there were inconsistent results across these studies. Efforts have been made to reduce infectious diseases, including improving WASH, immunization, and nutrition.

[12] Regarding nutrition, breastfeeding is particularly important since it has nutritional, immunological, and hygienic advantages that could lower child infections. [9] Early breastfeeding initiation and exclusive breastfeeding were protective against infections, including diarrhea, ARI, pneumonia, and urinary tract infections. [12] However, existing research typically used exclusive breastfeeding as the predictor of infectious diseases during first months life.

[13] While infections typically occur among children aged 6–23 months, [7] there is a lack of evidence on whether breastfeeding can prevent infectious diseases during that period. Therefore, this study aims to determine the relationship between current breastfeeding and infections (diarrhea, fever, and ARI) among Indonesian children aged 6–23 months. Methods Data source and study population We used the most updated national survey in Indonesia, the 2017 Indonesia Demographic and Health Survey. Following a stratified design, survey probability proportional to size to select primary sampling units (PSU).

PSU stratified rural–urban with stratification each by the PSU on category wealth Twenty-five households were then selected systematically from each PSU.[7] Our analysis involved a total of 5158 ever -married women aged 15–49 years whose last-born child was aged 6–23 months. Ethical consideration The 2017 DHS was ethically approved by The Institutional Review Board of ICF International (FWA00000845). We used available with information; thus, ethical approval was exempted. Dependent variables The dependent variables were infections in the past 2 weeks preceding the survey, including (1) diarrhea, (2) fever, and (3) ARI.

These outcomes followed the survey questions to the child's mother regarding diarrhea,

fever, and ARI (a cough accompanied by short, rapid breathing and/or breathing). [7] All measures were binary: yes (if experiencing) or no (if not experiencing). Independent variables The independent variables were current breastfeeding and complementary feeding practices. Current breastfeeding was the state where a child was breastfed during the last 24 h before the survey. Complementary feeding practices were minimum dietary diversity (MDD), minimum meal frequency (MMF), and minimum acceptable diet (MAD) during the last 24 h preceding the survey.

The MDD was consumption at five eight groups: (1) grains, roots, and tubers, (2) legumes and nuts, (3) products, (4) foods, (5) (6) Vitamin A-rich fruits and vegetables, (7) other fruits and vegetables, and (8) breast milk. The MMF for breastfed children was when a child received solid, semi-solid, or soft foods at least twice a day (6–8 months) or at least three times a day (9–23 months), whereas for non-breastfed children as if they received solid, semi-solid, or soft foods at least four times a day (6–23 months). The MAD was when a child met the MDD and MMF.

[7,15] Other potential predictors Our analyses included several potential predictors that were considered confounding variables, as follows: • Child Age in months, sex (male and female), order (1–2, and =4), birth weight (<2500 g =2500 g) • Maternal A ge years (<25, and =35), education (none or incompleted primary, completed primary, completed secondary, and completed higher education), working status (not working and working), weekly access to media, including television, radio, and newspaper (no and yes), weekly Internet access (no and yes), and involvement in healthcare-related decision-making (not involved and involved) • Household P aternal age in years (<25, 25–34, and =35), education (none incompleted primary, completed primary, completed secondary, and completed higher education), household wealth (poorest, poorer, middle, richer, and richest), toilet facility (unimproved and improved), source of drinking water (unimproved and improved), the number of members (<5 =5), the of children (1, and =3). wealth was estimated based on household assets, including ownership of infrastructures and amenities, using principal component analysis. [16] Sources of drinking water were categorized into improved (e.g.,

pipied water, tube well or borehole, and rainwater) and unimproved (e.g., unprotected dug well, unprotected spring, and river). The type of toilet was grouped into

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2024 151 improved (e.g., private facilities and public facilities) and unimproved (e.g.,

river, pond, and yard) [17] • Health-care The number of antenatal care visits (<6, place delivery (nonhealth and health facilities), and the postnatal checkup within 2 months (no and yes) • Community Living residency (rural and urban) and region (Java and Bali, Sumatera, Kalimantan, Sulawesi, and Eastern Indonesia). Statistical analysis We conducted descriptive statistics to describe the study variables. We performed univariate logistic regression to examine the association between each predictor and infection variable measured by crude odds ratios (COR). Variables with  $P < 0.25$  were entered into multiple logistic regression to create a full baseline model.

The P value of was to variables known important that not identified with a traditional P value of [18] We kept breastfeeding complementary practices fixed variables of significance they independent variables of interest. We reported adjusted odds (AORs) the model. analyses done using Stata version 17.0 (StataCorp, College Station, TX, USA), adjusted for the complex survey design using “svy” commands. Results The prevalence of diarrhea, fever, and ARI were 19.8%, 37.8%, and 4.2%. The proportion of current breastfeeding, MDD, MMF, and MAD were 69.8%, 53.2%, 70.9%, and 41.0%, respectively. As shown in Table 1, the mean age of children was  $14.5 \pm 5.1$  months. Most children were male (51.8%) first- or children (68.0%).

Most mothers were aged 25–34 years (52.3%) and completed primary school (46.5%). The majority of households had improved toilet facilities (84.2%) and improved sources of drinking water (91.5%). Table 2 reported COR and AOR of diarrhea, fever, and ARI, respectively. Children who were currently breastfed were 1.35 times less likely to get diarrhea than those not currently breastfed. Girls were 1.25 times less likely to experience diarrhea than boys. Children whose mothers were aged 25–34 years and aged >35 years had 29% and 39% lower odds of getting diarrhea than those whose mothers were aged <25 years.

Mothers who completed higher education had 42% lower odds of having children with diarrhea than those with no formal education. Children who had improved sources of drinking water were 1.39 less likely to have diarrhea than those with unimproved sources of drinking water. Children who lived in Sulawesi had 38% greater odds of diarrhea than in Java and Bali. Residing Sumatera (AOR: 95% interval [CI]: and (AOR: 95% CI: 1.29–2.03) were the only factors associated with fever. Children with birth orders of >4 were 2.28 more likely to get ARI than those with lower birth orders. Children with improved toilet facilities were associated with 1.64 lower odds of experiencing ARI than those with unimproved toilet facilities. Discussion The proportion of children aged 6–23 months experiencing diarrhea and fever in the last 2 weeks was 19.8% and 37.8%, or than under-fives Indonesia which was 14% and 31%, respectively. [7] The ARI prevalence among 6–23-month children was similar to under at 4%.

[7] Current breastfeeding status, female children, maternal age >25 years, higher maternal education, and improved source of drinking water were protective factors against diarrhea, whereas residing in Sulawesi was associated with a higher risk of diarrhea. Living in Sumatera and Sulawesi put the children at a greater risk of fever. Children whose birth order of >4 tend to experience ARI, whereas those with improved toilet facilities were less likely to experience ARI. The findings provide for particularly in Indonesia and Southeast Asian countries that have similar trends in diarrhea and ARI. This study found that current breastfeeding was protective against diarrhea.

Previous studies showed similar results with most breastfeeding outcomes, including current breastfeeding, [11] ever breastfeeding, [19] early initiation of breastfeeding, and exclusive breastfeeding. [13] Earlier research revealed that breastfeeding continuation protected against gastrointestinal illnesses, regardless of whether they received exclusive or nonexclusive breastfeeding. [20] Conversely, early cessation of breastfeeding was linked to diarrhea. [21] Breastfeeding could lower the risk of diarrhea in several ways: (1) eliminating the exposure to diarrheal-causing pathogens through contaminated nonhuman milk or bottle feeding, [16] (2) stimulating passive immunity in the gastrointestinal tract, [16] (3) immunoglobulin A, lactoferrin, and oligosaccharides that particularly preventing enteropathogens, including Campylobacter, , and Escherichia coli , [11,21] (4) preventing diarrhea by enhancing the nutritional status, [16] and (4) determining the microbiome diversity. [21] Early breastfeeding termination could decrease microbiome diversity, which may interfere with early immune development, leading to diarrhea.

[21] Thus, promoting optimal breastfeeding practices throughout the infancy and childhood period is key to controlling diarrhea. Following a previous cohort study, [20] current fever and ARI. Meanwhile, another cohort study showed not upper respiratory tract infection. [22] Breastfeeding Downloaded from <http://journals.lww.com/shbh> by BhDMf5ePHKav1zEoum1tQfN4a+kJLhEZgbsIH04XMi0hCywCX1AW nYQp/IIQrHD3i3D0OdRyi7TvSFI4Cf3VC4/OAVpDDa8KKGKV0Ymy+78= on 12/20/2024 152 **Asian Journal of Social** Health and Behavior | Volume 7 | Issue 4 | October-December 2024 Contd...

Table 1: Characteristics of **children aged 6-23 months in Indonesia**

Variables	n	% or mean+SD
Child factors		
Age (in months)	5158	14.52+5.10
Sex		
Male	2712	51.8
Female	2446	48.2
Birth order		
1-2	3325	68.0
3-4	1490	27.2
>4	343	4.8
Birth weight		
<2500	666	10.2
>2500	4492	89.8
Maternal factors		
Age (in years)		
<25	1188	22.8
25-34	2709	52.3
>=35	1261	24.9
Education		
None or incompleted primary school	353	5.8
Completed primary school	2198	46.5
Completed secondary school	1581	30.6
Completed higher		

education 1026 17.1 Working status Not working 2744 55.9 Working 2407 44.1 Weekly access to media No 851 14.2 Yes 4307 85.8 Weekly access to internet No 2999 56.3 Yes 2152 43.7 Decision making in healthcare Not involved 281 5.2 Involved 4877 94.8

Household factors Father's age (in years) <25 439 8.4 25-34 2403 46.8 >=35 2189 44.8 Father's education None or incompleting primary school 424 6.7 Completed primary school 2017 43.6 Completed secondary school 1784 34.9 Completed higher education 810 14.8 Household wealth Poorest 1396 19.6 Poorer 1048 19.4 Middle 1006 21.7 Richer 872 19.3 Richest 836 20.0 Toilet facility Unimproved facility 968 15.8 Improved facility 4189 84.2 Table 1: Characteristics of children aged 6-23 months in Indonesia Variables n % or mean+SD Drinking water source Unimproved 520 8.5 Improved 4638 91.5 Number of household members <=5 2899 61.0 >5 2259 39.0 Number of children under fives 1 3319 69.1

2 1519 26.4 >=3 320 4.5 Healthcare factors ANC visits <6 1179 18.9 >=6 3847 81.1 Place of delivery Non-health facilities 1158 16.9 Health facilities 3999 83.1 Postnatal checkup within 2 months No 1618 30.2 Yes 3378 69.8 Community factors Living residency Rural 2586 50.8 Urban 2572 49.2 Region Java and Bali 1617 56.5 Sumatera 1351 22.6 Kalimantan 451 5.9 Sulawesi 779 7.1 Eastern Indonesia 960 7.9 gastrointestinal infections. While immunoglobulins from breast milk provide direct and timely protection against microorganisms localized in the gastrointestinal tract, ingested immunoglobulins should be absorbed through the intestinal mucosa and transported to other areas through the bloodstream to protect from infections localized in other sites. [23] parental recall bias. [20,22] breastfeeding in this study might not cover the duration of breastfeeding or whether breastfeeding might have been stopped due to ARI or fever.

Thus, future research and programs should consider all aspects of breastfeeding and infections, including the nature of how breastfeeding may protect against infection, durations, frequencies, or whether there is a change in maternal breastfeeding behavior during child infections. Girls were less likely to experience diarrhea than boys, as shown in Ethiopia [24] and India. [25] risk could be related to cultural and pathophysiological mechanisms. Downloaded from <http://journals.lww.com/shbh> by BhDMf5ePHKav1zEoum1tQfN4a+kJLhEZgbsIH04XMi0hCywCX1AWnYQp/IIQrHD3i3D0OdRyi7TvSFI4Cf3VC4/OAVpDDa8KKGKV0Ymy+78= on 12/20/2024 Asian Journal of Social Health and Behavior | Volume 7 | Issue 4 | October-December 2024 153 Caregivers may allow boys to play outside the house, whereas they are more protective of girls. Consequently, boys have greater exposure to unsanitary surroundings than girls.[24] Boys could be more prone to diarrhea because of pathophysiologic differences disease infectivity, and immunity.

However, the mechanisms remained unknown. [25] There have been limited studies investigating the relationship between the child's sex and infectious diseases. Further research is needed to better understand differences nutritional, health, and environmental exposures and their relationship with infections. Following previous studies, [11,19] older mothers had a lower risk of having children with diarrhea than younger mothers. Older mothers might be more knowledgeable since they were more experienced exposed various from resources.

[19] Older mothers might have more opportunities to more emotionally and stable, [26] contributing to better child care and feeding practices. Table 2: The association of breastfeeding status and with diarrhea, fever, and ARI among children aged 6-23 months in Indonesia

Variables	Diarrhea	Fever	Acute respiratory infection	AOR	95% CI	P
Breastfeeding						
Currently breastfeeding	0.74	0.61-0.89	0.002	0.95	0.82-1.11	0.533
Child factors						
Sex						
Male	Ref	Ref	Ref	Ref	Ref	Ref
Female	0.80	0.67-0.96	0.015	0.96	0.83-1.11	0.572
Birth order						
1-2	Ref	Ref	Ref	Ref	Ref	Ref
3-4	1.15	0.71-1.86	0.573	>4	2.28	1.10-4.76
Maternal factors						
Age (in years)						
<25	Ref	Ref	Ref	Ref	Ref	Ref
25-34	0.71	0.58-0.88	0.002	1.06	0.88-1.27	0.527
>=35	0.61	0.47-0.79	<0.001	0.96	0.78-1.19	0.731
Education						
None or incompleted primary	Ref	Ref	Ref	Ref	Ref	Ref
Completed primary	0.94	0.66-1.35	0.749	0.99	0.73-1.36	0.977
Completed secondary	0.91	0.61-1.34	0.620	0.81	0.59-1.12	0.206
Completed higher education	0.58	0.37-0.89	0.014	0.72	0.51-1.01	0.059
Toilet facility						
Unimproved facility	Ref	Ref	Ref	Ref	Ref	Ref
Improved facility	0.78	0.59-1.02	0.068	0.61	0.40-0.94	0.024
Drinking water source						
Unimproved	Ref	Ref	Ref	Ref	Ref	Ref
Improved	0.72	0.54-0.95	0.020	0.85	0.66-1.11	0.229
Healthcare factors						
Postnatal checkup within 2 months						
No	Ref	Ref	Ref	Ref	Ref	Ref
Yes	1.25	1.07-1.47	0.006			
Community factors						
Region						
Java and Bali	Ref	Ref	Ref	Ref	Ref	Ref
Sumatera	1.17	0.94-1.46	0.164	1.36	1.13-1.63	0.001
Kalimantan	1.25	0.89-1.74	0.195	1.05	0.81-1.34	0.729
Sulawesi	1.38	1.03-1.85	0.032	1.62	1.29-2.03	<0.001
Eastern Indonesia	1.12	0.84-1.50	0.435	1.03	0.81-1.31	0.808

0.66 0.39-1.12 0.120 ARI, Acute Respiratory Infection; COR, crude odds ratio; AOR, adjusted odds ratio; p, P value; CI, confidence intervals; Ref, reference Downloaded from <http://journals.lww.com/shbh> by BhDMf5ePHKav1zEoum1tQfN4a+kJLhEZgbsIH04XMi0hCywCX1AWnYQp/IIQrHD3i3D0OdRyi7TvSFI4Cf3VC4/OAVpDDa8KKGKV0Ymy+78= on 12/20/2024 154 Asian Journal of Social Health and Behavior | Volume 7 | Issue 4 | October-December 2024 As shown in Ethiopia [19] and Nigeria, [27] children whose mothers had higher levels of education were found to have the lowest rates of diarrhea. Maternal education was linked to maternal awareness of child health status.

Highly educated mothers tend to have more knowledge about diarrhea prevention, including good hygiene, appropriate infant and young child feeding, clean environments, and the consequences of unhealthy living. [11,27] They also tend to seek health-care services and practice better personal health behavior. [27] While higher educational levels could explain better knowledge and practices, improving maternal knowledge through community-based health education may help promote child health and care practices, in addition to formal education.

Following a Benin study, [14] this study found that an improved source of drinking water was linked to a reduced risk of diarrhea. Clean and safe drinking water could prevent intestinal infections, including diarrhea, since the water has undergone treatment processes that remove most pathogenic organisms, such as bacteria, viruses, and parasites.[28] Conversely, water contaminated by human or animal waste may contain bacteria and parasites. Thus, improving household access to clean and safe drinking water sources may reduce disease transmission between individuals.

Children living in Sulawesi tend to experience diarrhea and fever than those in Java and Bali. Children who lived in Sumatera were at higher risk of fever than children in Java and Bali. Geographical and environmental variations attributable to air and water quality, where the shortage of safe and adequate water supply and low air quality might increase the pathogen spectrum of infections. [29] Sumatera is prone to haze and This condition puts children at risk due to their rapid breathing and undeveloped immune system. [30] The other risk of childhood illnesses, including traditional beliefs and community practices to access health services.

Thus, in child infectious diseases. Policymakers and public health actors should advance health equity across health-care facilities, skilled health workers, and access to improved WASH services. Following a study in India, [31] higher birth orders were associated with ARI. Children with higher birth orders, particularly those in poor families, are likely to live in overcrowding households. This condition may put them at a greater risk of direct person-to-person disease transmission[32] and being exposed to indoor pollution, such as biomass cooking fuels from the kitchen and tobacco smoke.

[31] Thus, the use of a separate kitchen and liquid petroleum gas cooking is crucial to reduce indoor pollution,[31] approaches that require household economic improvement and government support. Enhancing maternal and family knowledge and awareness on how to minimize ARI transmissions (e.g., covering coughs and sneezes, frequent handwashing) and the risks of being exposed to cigarette smoke may help prevent ARI. In addition, our study supports the importance of family planning in improving child health outcomes. This study showed that improved toilet facilities were linked to a

decreased risk of ARI, as shown in Sub-Saharan Africa.

[33] Several respiratory viruses can come from feces, in which their infection can be spread by splashing water or feces. [34] While handwashing with soap after the toilet can prevent ARI, [35] unimproved toilet facilities may not be accompanied by handwashing stations with clean water and soap nearby. Besides, household living conditions, particularly sanitation, which is essential in determining the spread of ARI. [33] The provision of improved toilet facilities may enhance sanitation situations at the household level.

[33] Therefore, nutrition-sensitive approaches integrating nutrition and WASH or social protection interventions to improve preventing ARI. Limitations We could not draw a causal inference since we used cross-sectional data. We could not conclude whether breastfeeding and other variables caused child infections or vice versa. Besides, this study might have recall bias since breastfeeding, complementary feeding, and infection variables based the 's affecting the results between feeding practices and infections.

Thus, future research should consider using longitudinal or community trial studies to investigate the potential mechanism between infections and their risk factors and to overcome the limitations of maternal recalls. In addition, the duration and frequency of infections should be considered. Conclusion Different influence fever, ARI. study underscores the importance of continued breastfeeding promotions to prevent infections, particularly diarrhea. It is critical to design suitable programs to prevent and control different types of infections based on child characteristics and specific where live.

and health managers should consider integrating a package of interventions combining child health information, education, and communication programs, and the promotions of breastfeeding, complementary feeding, and WASH practices into the existing health system implemented by national and subnational authorities, particularly outside Java and Downloaded from <http://journals.lww.com/shbh> by BhDMf5ePHKav1zEoum1tQfN4a+kJLhEZgbsIH04XMi0hCywCX1AW nYQp/IIQrHD3i3D0OdRyi7TvSFI4Cf3VC4/OAVpDDa8KKGKV0Ymy+78= on 12/20/2024 Asian Journal of Social Health and Behavior | Volume 7 | Issue 4 | October-December 2024 155 Bali where health-care services, health and environmental infrastructures, and education system remain challenging. Authors' contributions Concept and design: Bunga A Paramashanti, Esti Nugraheny. All authors contributed to the development of the concept and design.

Acquisition of data and interpretation of data: Bunga A Paramashanti, Esti Nugraheny.

Drafting and revising the article: all authors. Final approval of the article: all authors. Data availability statement The that the of study available from the corresponding author (Bunga A. Paramashanti) upon reasonable request.

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