


**AUTHOR QUERY FORM**

 <b>ELSEVIER</b>	<b>Journal:</b> ENFCLI	<b>Please e-mail your responses and any corrections to:</b>
	<b>Article Number:</b> 1365	<b>E-mail:</b>

Dear Author,

Please check your proof carefully and mark all corrections at the appropriate place in the proof (e.g., by using on-screen annotation in the PDF file) or compile them in a separate list. Note: if you opt to annotate the file with software other than Adobe Reader then please also highlight the appropriate place in the PDF file. To ensure fast publication of your paper please return your corrections within 48 hours.

For correction or revision of any artwork, please consult <http://www.elsevier.com/artworkinstructions>.

Any queries or remarks that have arisen during the processing of your manuscript are listed below and highlighted by flags in the proof. Click on the 'Q' link to go to the location in the proof.

<b>Location in article</b>	<b>Query / Remark: <a href="#">click on the Q link to go</a> Please insert your reply or correction at the corresponding line in the proof</b>
<b>Q1</b>	Please check the short title that has been created, or suggest an alternative of fewer than 80 characters including spaces.
<b>Q2</b>	Please confirm that given name and surname are correctly identified. The different colors indicate whether tagged as first or last name. Please note that proper identification is key for correct indexing of the article.
<b>Q3</b>	Correctly acknowledging the primary funders and grant IDs of your research is important to ensure compliance with funder policies. We could not find any acknowledgment of funding sources in your text. Is this correct?
	<div style="border: 1px solid black; padding: 10px; margin-top: 20px;">           Please check this box or indicate your approval if you have no corrections to make to the PDF file           <input style="float: right; margin-left: 20px;" type="checkbox"/> </div>

Thank you for your assistance.



## Elsevier - Author Forms

Saya & Saya

7 Feb 13:01

1 lampiran



# ELSEVIER

Dear Dr. Purba,

Thank you for completing the Rights and Access Form for your article **FACTORS ASSOCIATED WITH NUTRITIONAL STATUS OF CHILDREN UNDER THE AGE OF 5 YEARS IN THE WORKING AREA OF SADABUAN PUBLIC HEALTH CENTER**. Please find attached a copy of the "Journal Publishing (License) Agreement" which you completed online on February 07, 2020.



If you have any questions, please do not hesitate to contact us. To help us assist you, please quote our article reference ENFCLI1365 in all correspondence.

Now that your article has been accepted, you will want to maximize the impact of your work. Elsevier facilitates and encourages authors to share their article responsibly. To learn about the many ways in which you can share your article whilst respecting copyright, visit: [www.elsevier.com/sharing-articles](http://www.elsevier.com/sharing-articles).

We are committed to publishing your article as quickly as possible.

Elsevier Logo

### Publishing Agreement

Elsevier España, S.L.U.

**FACTORS ASSOCIATED WITH NUTRITIONAL STATUS OF CHILDREN UNDER THE AGE OF 5 YEARS IN THE WORKING AREA OF SADABUAN PUBLIC HEALTH CENTER**

Corresponding author	Dr. Agnes Purba
E-mail address	agnespurba24@yahoo.co.id
Journal	Enfermería Clínica
Our reference	ENFCLI1365
PII	S1130-0721(20)00070-0

#### Your Status

- I am one author signing on behalf of all co-authors of the manuscript
- I am signing on behalf of the corresponding author
  - Name/Job Title/Company: Dr. Juan Elizabeth Purba
  - E-mail address: agnespurba24@yahoo.co.id

#### Assignment of Copyright

I hereby assign to Elsevier España, S.L.U. the copyright in the manuscript identified above (where Crown Copyright is asserted, authors agree to grant an exclusive publishing and distribution license) and any tables, illustrations or other material submitted for publication as part of the manuscript (the "Article"). This assignment of rights means that I have granted to Elsevier España, S.L.U., the exclusive right to publish and reproduce the Article, or any part of the Article, in print, electronic and all other media (whether now known or later developed), in any form, in all languages, throughout the world, for the full term of copyright, and the right to license others to do the same, effective when the Article is accepted for publication. This includes the right to enforce the rights granted hereunder against third parties.

#### Supplemental Materials

"Supplemental Materials" shall mean materials published as a supplemental part of the Article, including but not limited to: graphical, illustrative, video and audio material.

With respect to any Supplemental Materials that I submit, Elsevier España, S.L.U. shall have a perpetual worldwide, non-exclusive right and license to publish, extract, reformat, adapt, build upon, index, redistribute, link to and otherwise use all or any part of the Supplemental Materials in all forms and media (whether now known or later developed), and to permit others to do so.

#### Research Data

"Research Data" shall mean the result of observations or experimentation that validate research findings and that are published separately to the Article, which can include but are not limited to raw data, processed data, software, algorithms, protocols, and methods.

With respect to any Research Data that I wish to make accessible on a site or through a service of Elsevier España, S.L.U., Elsevier España, S.L.U. shall have a perpetual worldwide, non-exclusive right and license to publish, extract, reformat, adapt, build upon, index, redistribute, link to and otherwise use all or any part of the Research Data in all forms and media (whether now known or later developed), and to permit others to do so. Where I have selected a specific end user license under which the Research Data is to be made available on a site or through a service, the publisher shall apply that end user license to the Research Data on that site or service.

#### Reversion of rights

Articles may sometimes be accepted for publication but later rejected in the publication process, even in some cases after publication in "Articles in Press" form, or which case all rights will revert to the author (see <https://www.elsevier.com/about/our-business/policies/article-withdrawal>).

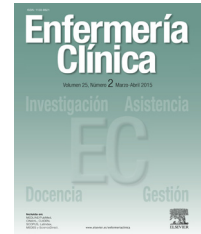
#### Revisions and Addenda

I understand that no revisions, additional terms or addenda to this Journal Publishing Agreement can be accepted without Elsevier España, S.L.U.'s express written consent. I understand that this Journal Publishing Agreement supersedes any previous agreements I have entered into with Elsevier España, S.L.U. in relation to the Article from the date hereof.



# Enfermería Clínica

[www.elsevier.es/enfermeriaclinica](http://www.elsevier.es/enfermeriaclinica)



## 3 Factors associated with nutritional status of children 4 under the age of 5 years in the working area of 5 Sadabuan Public Health Center

6 Q2 Agnes Purba<sup>a,\*</sup>, Ivan Elisabeth Purba<sup>b</sup>, Rinawati Sembiring<sup>a</sup>

7 <sup>a</sup> Professional Program in Midwifery of Sari Mutiara Indonesia University, Medan, Indonesia

8 <sup>b</sup> Postgraduate Program Study of Sari Mutiara Indonesia University, Medan, Indonesia

9 Received 25 September 2019; accepted 11 November 2019

### 10 KEYWORDS

11 Knowledge;  
12 Perception;  
13 Exclusive  
14 breastfeeding;  
15 Nutritional status

### Abstract

*Objective:* The objective of this research is to identify the relationship of knowledge, perception and exclusive breastfeeding with the nutritional status of children under five in the Working Area of Sadabuan Public Health Center.

*Method:* A cross-sectional approach was employed with the total number of population was 240 and 71 people of which were selected to be the research samples through purposive sampling technique. The variables studied were mothers' knowledge, perceptions, exclusive breastfeeding and nutritional status. Chi square test was carried out to identify the correlation between the variables.

*Result:* The nutritional status of children under 5 years in the study was dominantly good (73.24%) and it could still be seen that there were children suffering from malnutrition (1.41%). It was obtained that mothers' knowledge about children's nutrition was associated with children's nutritional status ( $p=0.034$ ), mother's perceptions about nutrition fulfillment was associated with nutritional status of children under 5 years of age ( $p=0.008$ ), and exclusive breastfeeding was also associated with children's nutritional status ( $p=0.005$ ).

*Conclusions:* Mothers' knowledge and perception about nutritional status as well as exclusive breastfeeding are associated with the nutritional status of children under 5 years of age. Therefore, the role of health practitioners is needed in order to give health education, particularly about nutritional status and kinds of food that contain carbohydrate, protein, vitamin, and mineral needed in children's growth and development.

© 2020 Elsevier España, S.L.U. All rights reserved.

Peer-review under responsibility of the scientific committee of the 3rd International Conference on Healthcare and Allied Sciences (2019). Full-text and the content of it is under responsibility of authors of the article.

\* Corresponding author.

E-mail address: [agnespurba24@yahoo.co.id](mailto:agnespurba24@yahoo.co.id) (A. Purba).

<https://doi.org/10.1016/j.enfcli.2019.11.040>

1130-8621/© 2020 Elsevier España, S.L.U. All rights reserved.

Please cite this article in press as: Purba A, et al. Factors associated with nutritional status of children under the age of 5 years in the working area of Sadabuan Public Health Center. *Enferm Clin.* 2020. <https://doi.org/10.1016/j.enfcli.2019.11.040>

## Introduction

Data from Basic Health Research<sup>1</sup> (2018) reported in Indonesia in 2013, children under 5 years suffering from malnutrition and under nutrition with body weight/age as the indicator reached the percentage of 17.7% and the percentage increased by 19.6% in 2018. On the other hand, the percentages of children with nutritional status of very short and short with body height/age as the indicator were 37.2% in 2013 and 30.8% in 2018.

Furthermore, Basic Health Research<sup>1</sup> (2018) also reported that children under 5 years suffering from under nutrition and malnutrition were still found in North Sumatera Province. Data from the last two years showed that there was an increase of percentage of under nutrition cases among children under 5 years (3.1% in 2016 and 5.2% in 2017), while the cases of malnutrition were 10.1% in 2016 and 13% in 2017. It was also found that Padangsidempuan Regency was the regency with the highest percentage of under nutrition and malnutrition cases, i.e. 16.3%. Sadabuan is one of the villages in Padangsidempuan where under nutrition and malnutrition cases are still found. Data from Sadabuan Public Health Center showed that there were 4 cases of under nutrition and 2 cases of malnutrition in the health center. Moreover, it was also found that the nutritional status of 1.4% of children under five years at the Integrated Services Post was below red line (Medical Record, Sadabuan Public Health Center, 2018).<sup>2</sup>

An interview with several mothers at the integrated services post suggests that the reason of the mothers do not bring their children to the health post is because they think their children do not have health or appetite issues. Besides, they also perceive that their children are healthy because they are notably active despite their thin body. The preliminary result from the observation shows that Sadabuan villagers do not give their children fish or eggs because they believe their children will have intestinal worms or boils if they consume such food. This misconception from the family or mothers contributes to any disorders of children's growth. Based on the facts above, the aim of this study is to identify the relationship of knowledge, perception and exclusive breastfeeding with the nutritional status of children under five.<sup>3</sup>

## Method

A cross-sectional approach with epidemiological study design was carried out. A total of 71 people was selected as samples through purposive sampling technique. The

parameters in measuring the nutritional status of children under five are body weight/age, body height/age, and body weight/body height. In order to measure knowledge, perception and exclusive breastfeeding, a set of questionnaires of which the validity had been tested was administered as the instrument.

After the data collection, the variable of knowledge was categorized into 'good' and 'less', perception was categorized into 'positive' and 'negative', and exclusive breastfeeding was categorized into 'given' and 'not given', while the variable of nutritional status was categorized as over-nutrition, normal, under-nutrition, malnutrition.

Then, data analyses using chi-square calculation was carried out to analyze the relationship between knowledge, perception and exclusive breastfeeding with the nutritional status of children under five.<sup>4</sup>

## Result

Data in Table 1 illustrates the relationship between mothers' knowledge and nutritional status of children under 5 years taken from 71 respondents. The knowledge of mothers about children' nutrient needs fulfillment is dominantly categorized 'good' (80.28%) and the nutritional status of children under 5 years in the study is dominantly normal (73.24%). However, it can still be seen that there are children suffering from malnutrition (1.41%). The result of statistical analysis test as shown in Table 1 shows that there is a significant relationship between mothers' knowledge and nutritional status of children under 5 ( $p$  value = 0.034).

Data in Table 2 shows that most of the mothers in the study have a positive perception about children's nutrition needs fulfillment (66.20%). However, it is found that there are respondents who have a negative perception with normal nutritional status children is 73.91%. The data shows that there is a significant relationship between mothers' perception about children's nutrition needs fulfillment and nutritional status of children under 5 years of age ( $p$  value = 0.008).

The data in Table 3 shows that the majority of the mothers of children under 5 years in the present study give exclusive breastfeeding to their children (70.42%) and the nutritional status of the children is also majorly normal (86%). However, children with malnutrition are still found (1.41%). The result from the statistical analysis suggests that there is a significant relationship between exclusive breastfeeding and nutritional status ( $p$  value = 0.005).<sup>5</sup>

**Table 1** The relationship between mother's knowledge and nutritional status.

Knowledge	Nutritional status										$p$
	Over nutrition		Normal		Thin		Malnutrition		Total		
	$n$	%	$n$	%	$n$	%	$n$	%	$n$	$f$	
Good	3	5.26	46	80.70	7	12.28	1	1.75	57	80.28	0.034
Less	6	42.86	6	42.86	2	14.29	-	-	14	19.72	
Total	9	12.68	52	73.24	9	12.68	1	1.41	71	100	

**Table 2** The relationship between mothers' perception and nutritional status.

Perception	Status Gizi										p
	Over nutritional		Normal		Thin		Malnutrition		Total		
	n	%	n	%	n	%	n	%	n	%	
Positive	4	8.51	38	68.75	5	10.64	-	-	47	66.20	0.008
Negative	5	20.83	14	73.91	4	16.67	1	4.17	24	33.80	
Total	9	12.68	52	73.24	9	12.68	1	1.41	71	100	

**Table 3** The relationship between exclusive breastfeeding and nutritional status.

Exclusive breastfeeding	Nutritional status										p
	Over nutrition		Normal		Thin		Malnutrition		Total		
	n	%	n	%	n	%	n	%	n	f	
Given	4	8	43	86	3	6	-	-	50	70.42	0.005
Not given	5	23.81	9	42.86	6	28.57	1	4.76	21	29.58	
Total	9	12.68	52	73.24	9	12.68	1	1.41	71	100	

## Discussion

Knowledge about nutrient needs fulfillment can be defined as all things about nutritious food that should be known and provided by mothers in order to support their children growth and development.<sup>6</sup> In average, mothers of children under 5 years have a good knowledge about nutritious food for their children (80.28%). When mothers know that nutritious food brings good impacts to their children's growth and development, it is likely that mothers will provide their children food which adequate to their children's needs, in terms of quantity and quality. It can be seen from the data showing that the mothers who have good knowledge also have children with good nutritional status (73.24%).

It is obtained that there is a significant relationship between mothers' knowledge and nutritional status of children under 5 years ( $p = 0.034$ ). This finding is in line with that of Astuti<sup>7</sup> where mothers of children under 5 years of age have good knowledge about food processing and food as the source of nutrients. This knowledge significantly affects children's nutritional status which is majorly good (73.24%). This finding is also supported by Oktavia et al.<sup>8</sup> who suggests that there is a relationship between mothers' knowledge about nutrients and the rate of energy and protein adequacy which contributes to children's growth. Similarly, Weya et al.<sup>9</sup> also suggest that nutritional status of children under 5 years at Puncak Jaya Regency is predominantly affected by knowledge and dietary culture. Labada<sup>10</sup> states that knowledge is a factor associated with nutritional status of children under the age of 5 years for knowledge is a reference in selecting and providing nutritional food to children.

However, this study still finds a child with poor nutritional status. On the other hand, belief affects the provision of foods in the way that there are certain kinds of food that are believed should not be given to their children that eventually affect their children's growth. Besides, the parents believe that as long as their children can do physical activities

actively, the children do not have health issues. They also believe that there are some kinds of food that are generally prohibited to be given to the children, such as beans and fish. It is because they believe beans can cause their children to have digestion problems, while fish, because they believe it can lead their children to have intestinal worms. Perception is individual's judgment on something. Mothers need to have a positive perception about children nutritional status in order to provide adequate nutrients to their children. The perception from parents, particularly mothers, as well as knowledge and stimulus from the environment will encourage mothers to monitor their children's growth and development. When they notice any kind of disorder in their children's growth, mothers' with positive perceptions know that they need to provide better nutrients to their children as the solution.<sup>11</sup> Almoosawi et al.<sup>12</sup> proposes there is misconception perception in mothers which eventually negatively affects their children dietary. Similar finding is also proposed by Tompkins et al.<sup>13</sup> suggesting that the misconception that parents tend to have bring them to provide their children with wrong dietary pattern when they intend to increase their children's weight.

Parents' perception, particularly mothers, is strongly correlated with nutritional status of children under 5 years. In a study conducted by Almoosawi et al.,<sup>12</sup> it is found that parents tend to have a wrong definition of children's body weight status. They believe that if their children have bigger body size than their peers, it indicates that they children are healthy, so that they let their children consume soft drink, even in an excessive amount. On the other hand, even though they find that their children are relatively thin, as long as they do not fall sick, they are inclined to neglect it. Through a brief interview with the mothers at Mengkudu Integrated Services Post, a number of reasons for not giving their babies exclusive breast milk are found, such as poor breast milk production, limited amount of breast milk that is not enough to make babies full and

eventually cry, misperception of giving formulated milk to accelerate children's growth, and limited time of working mothers to provide breast milk to their babies.

Among the mothers who give exclusive breast milk to their children, it is found that majorly, their children have good nutritional status (86%). Meanwhile, among their counterparts, it is found that 28.57% of the children suffering from under nutrition, and 4.76% of the children suffering from malnutrition. Based on the statistical analysis, it is obtained that there is a significant correlation between exclusive breastfeeding and nutritional status of children under 5 years of age ( $p=0.005$ ). This finding is in line with that of Ujung et al.<sup>14</sup> suggesting that there is a significant correlation between the length of exclusive of breastfeeding and nutritional status of children under the age of 5 years, where babies who received more exclusive breast milk tend to have better nutritional status. Susanti et al.,<sup>15</sup> in a study found that among 50 babies who did not receive exclusive breast milk, 76.7% of which suffering from malnutrition with several symptoms, such as lack of energy, iron and vitamin A.

Sugito<sup>16</sup> also found similar finding, showing that giving babies breast milk in the first 24h of their lives as well as supplementary food in the age of 0-23 months are strongly correlated with the incident of underweight in children under 5 years. Basically, giving babies exclusive breast milk is sufficient to fulfill nutrient needs. Similar suggestion is also proposed by Singh et al.<sup>17</sup> that the optimal practice of breastfeeding contributes to babies' nutritional status it was found that exclusive breastfeeding contributed to babies' growth (0-5 months) in the intervention group; the height increased by 0.45 cm and the weight increased by 0.06 kg more than those of the control group. Giugliano et al.,<sup>18</sup> through an interview and meta-analysis study, found that, mostly, mothers do not have sufficient knowledge about the benefit of exclusive breast milk on improving babies' immune and will not cause diarrhea to babies. Generally, mothers believe that exclusive breast milk is not enough if it is only given to babies until they are in 6 months of age. This leads to babies' body mass index decline.

## Conflict of interests

The authors declare no conflict of interest.

## Acknowledgements

To the head of Sadabuan Primary Health Care for granting permission to conduct the research and all mothers serving as respondents in this study.

## References

1. Ministry of Health. Indonesia Health Profile. Jakarta: Kementerian Kesehatan Republik Indonesia; 2018.
2. Riskesdas. Riset Kesehatan Dasar. Kementerian Kesehatan Badan Penelitian dan Pengembangan Kesehatan; 2018.
3. Susanty M, Kartika M, Alharini S. The correlation between the pattern of breastfeeding and supplementary foods and malnutrition status among babies of 6-24 months of age in Panmampu Neighborhood in Makassar. *J Media Gizi Masyarakat Indonesia*. 2012;1:97-103.
4. Giugliani E, Horta B, Mola CL, Lisboa B, Victoria CG. Effect of breastfeeding promotion interventions on child growth: a systematic review and met-analysis. *Acta Paediatr*. 2015;110:20-9.
5. Kramer MS, Guo T, Platt RW, Shapiro S, Collet JP, Chalmers B, et al. Breastfeeding and infant growth: biology or bias? *Pediatrics*. 2002;110:343-7.
6. Naidu BM, Mahmud SZ, Ambak R, Sallehuddin SM, Mutalip HA, Saari R, et al. Overweight among primary school-age children in Malaysia. *Asia Pac J Clin Nutr*. 2013;22:408-15.
7. Astuti EP. Nutritional status of children under 5 years at Melati Integrated Services Post in Sendengadi Melati village, Sleman Yogyakarta. *J Permata Indonesia*. 2017;8.
8. Oktavia S, Widajanti L, Aruben R. Factors associated with poor nutritional status among children under 5 years in Semarang City in the year of 2017. *J Kesehatan Masyarakat*. 2017;5. Available at: <http://ejournal-s1.undip.ac.id/index.php/jkm>
9. Weya A, Rantetampang AL, Tingginehe R, Mallongi A. Factors affecting nutrient status of children under five years at Puncak Jaya District Sub Province Papuan. *Int J Sci Healthc Res*. 2018;3. Available at: [www.ijshr.com](http://www.ijshr.com)
10. Labada A. The correlation between the characteristics of mothers visiting Bahu Manado Public Health Center and nutritional status of children under 5 years. *eJournal Keperawatan (eKp)*. 2016;4.
11. Potter PA, Perry AG. Conception to adolescence: fundamentals of nursing, vol. 160, 7th ed. Elsevier Publications; 2008.
12. Almoosawi S, Jones A, Parkinson K, Pearce M, Collins H, Adamson A. Parental perception of weight status: influence on children's diet in the gateshead millenium study. *PLoS ONE*. 2015;11.
13. Tompkins C, Seablom M, Brock D. Parental perception of child's body weight: a systematic review. *J Child Family Stud*. 2014:1-8.
14. Ujung RM, Sudaryati E, Aritonang EY. The correlation between breast feeding and nutritional status based on babies' weight/age among babies age range in 6-11 months in the working area of Siborong-borong Public Health Center. *Maternal Neonatal J*. 2017;12:44-53.
15. Susanti D. Rekoningsih. Helena. Studi fenomenologi pengalaman keluargadalam merawat pasien paska pasung di Pekalongan Jawa Tengah. Tesis. Depok:Universitas Indonesia.Tidak dipublikasikan; 2012.
16. Sugito MW, Wardoyo AS, Mahmudiono T. The relationship of exclusive breastfeeding and underweight in East Java in 2016. *Medicine*. 2017:180-8.
17. Singh V, Ahmed S, Dreyfuss M, Kiran U, Chaudhery D, Srivastava V, et al. An integrated nutrition and health program package on IYCN improve breastfeeding but not complementary feeding and nutritional status in rural northern India: a quasi-experimental randomized longitudinal study. Impact of CARE-India's INHP II on Infant Feeding Practice and Growth. *PLoS ONE*. 2017;12.
18. Giugliano LG, Bessler HC, de Oliveira IR. Human milk glycoproteins inhibit the adherence of *Salmonella typhimurium* to HeLa cells. *Microbiol Immunol*. 2006;50:877-82.