



## Education on the Effect of Malnutrition on Prenatal Factors for Children with Special Needs

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### ABSTRACT

The purpose of this study is to educate the public regarding nutritional deficiencies that can affect health, including a mother's pregnancy. The method used in this research is the experimental method by giving a pre-test to the respondents as many as 20 people as a sample. Then action is given in the form of education related to malnutrition which is a factor causing children with special needs and then a post-test is given to respondents. The results showed that the average N-gain was 0.62 (62%) which means that education about malnutrition using the PowerPoint method in educating citizens can be said to be quite effective. The comparison between the average pre-test results is 61.5 with the average post-test results, which is 86.3 there is an increase. Then the results show that the understanding of respondents has increased from before after being given education related to malnutrition on the prenatal causes of children with special needs. This research can increase the understanding of the Karyawangi of the village about malnutrition on the prenatal causes of children with special needs. Thus, malnutrition in someone who can be a prenatal factor causing children with special needs can be overcome early on.

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## 1. INTRODUCTION

The phenomenon of malnutrition in today's society is a problem that has not been resolved until now. This problem must be faced in the development of a nation to make a healthy, intelligent, and productive nation (Ernawati, 2017). Therefore, malnutrition is one of the main focuses of the government in developing a nation's health (Ernawati, 2017).

Malnutrition is a condition where there is a lack of calorie intake and essential substances needed by the body to make a person healthy and stay healthy (Arifin, 2016). This nutritional deficiency can be experienced by anyone, including children, adolescents, and adults including pregnant women (Inten & Permatasari, 2019).

Pregnant women can cause the birth of children with special needs. Children with special needs are children who need to be given special attention to be able to carry out all their daily activities well (Nisa *et al.*, 2018). In addition, the causes of the birth of children with special needs can vary but are still related to a lack of nutritional intakes, such as due to extreme climate change (Rylander, 2013) then it could be due to low economic factors.

Mothers experience depression and mental disorders because they cannot meet the nutritional needs of the fetus (Stein, 2014; Delisle, 2008). then it could be due to the mother's habit of smoking (Nyaradi, 2013) and hunger (Neelsen, 2011). As a result, various kinds of them can cause a thin body and low weight and can be a factor causing the birth of an abnormal fetus. The birth of a child with special needs in a mother's pregnancy (Ekayanthi, 2019).

Then have an impact on the risk of schizophrenia (He, 2018), then the risk of stunting in children born (Teferi, 2016; Reinhardt, 2014). Therefore, it is necessary to have good knowledge and understanding between mothers and toddlers who are still small or when they are young. still in the womb, then during birth and after birth about the factors that can be at risk of harming the fetus in the womb (Puji, 2013).

There have been many studies conducted on the effect of malnutrition on human health, one of which is the pregnancy of the mother and the child being born. As discussed by Nancy & Arifin (2005) related to "malnutrition in pregnant women: a threat to the fetus". the result of his research is that it takes a long time to reduce the poverty level of the people to reduce malnutrition, therefore nutrition improvement programs must continue without having to wait for the people to prosper first. Nutrition programs and poverty suppression go hand in hand.

The research that has been done by Nancy & Arifin (2005) related to "malnutrition and the threat of a lost generation". The results of his research indicate that there is a need to improve services and health stocks at the Integrated Healthcare Center as a preventive measure to overcome malnutrition. The research conducted by Barker (2013) related to depression symptoms of prenatal mothers and the nutrition, and cognitive function of children. The results of his research concluded that during pregnancy apart from poverty factors, mothers with low education, adolescent mothers, and symptoms of depression can reduce the level of nutrition in children. It interferes with cognitive function in children during the prenatal and postnatal periods (Barker, 2013).

In addition, there is one study conducted by Stein (2014) which discusses the symptoms of prenatal maternal depression and nutrition, and children's cognitive function. The results of his research are to explain that poverty, adolescent mothers, mothers with low education, parity, birth complications, drug use, lifestyle crimes, and partner cruelty to mothers are various prenatal and postnatal potentials in a mother's pregnancy. Based on these studies, it

is necessary to conduct a study on knowledge related to malnutrition in the community, especially among mothers and prospective mothers.

The risk of malnutrition that can have an impact on the fetus such as the risk of having children with special needs can be minimized. Therefore, the purpose of this study is to educate the public regarding nutritional deficiencies that can affect health, including a mother's pregnancy. The Novelty of this research is discussed in depth related to the effect of malnutrition, balanced nutritional intake, and the impact that can be a risk on the birth of children with special needs.

## 2. METHODS

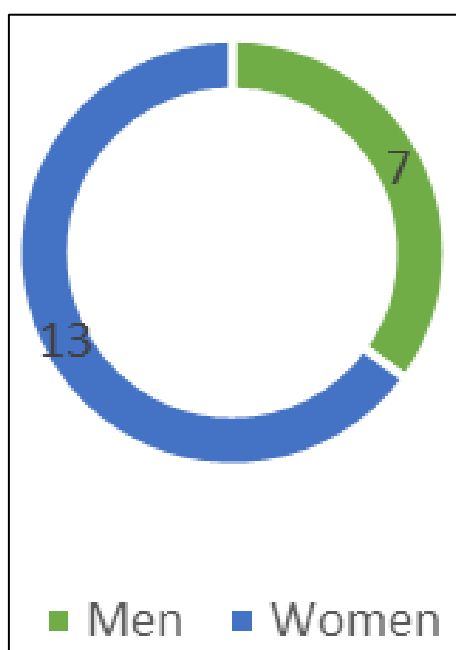
The research method used in this study used a quantitative approach, including narrow questions collecting measurable data from participants, and analyzing numbers with statistics. Then, the type of research used in this study was an experimental research type by analyzing the results of the pre-test and post-test. The participants used in this study were people from Karyawangi, Parongpong, Indonesia.

The population in this study were mothers and fathers as well as adolescent mothers as well as teenage fathers in Karyawangi, Indonesia. However, we did not take all of them but only took a sample of 20 respondents. The instrument used was a non-test instrument in the form of a questionnaire as a data collection tool. This questionnaire was a closed system, containing 20 questions (Setyanto, 2013).

### 2.1. Research subject

The research subjects selected were from Karyawangi, Parongpong, Indonesia. We took a sample of 20 respondents. The age group of respondents was around 20-30 years old. Respondents consisted of 7 men and 13 women.

The average occupation of the respondents consists of 8 housewives, 2 farmers, 2 private employees, 3 teachers, and 5 students. **Figure 1** and **Table 1** show the data on the age and occupation of respondents.



**Figure 1.** Presentation of respondents by gender.

**Table 1.** Data on age and occupation of respondents.

Name	Age (Years)	Work
A	P	Housewife
B	L	Farmer
C	L	student
D	L	Teacher
E	L	Farmer
F	L	Student
G	L	Teacher
H	L	Student
I	P	Student
J	P	Student
K	P	Housewife
L	P	Teacher
M	P	Housewife
N	P	Housewife
O	P	Housewife
P	P	Private sector employee
Q	P	Private sector employee
R	P	Housewife
S	P	Housewife
T	P	Housewife

## 2.2. Research Design Analysis

The data collection technique was carried out by distributing a questionnaire that had been made in the form of a questionnaire paper containing 20 questions to the Karyawangi. The questionnaire was made into 2 kinds, namely the pre-test questionnaire and the post-test questionnaire which consisted of the same 20 questions. The question material is more aimed at education related to malnutrition and the causes of children with special needs. Types of questions in the form of answers "Yes" and "No".

As well as for giving score for the correct answer was given a score of 1 and for the wrong answer was given a score of 0. The stages of data collection were carried out through three stages, namely (i) distribution of the Pre-test questionnaire; (ii) Dissemination or providing education related to the material through PowerPoint media; and (iii) distribution of post-test questionnaires. The quantitative approach is used to process the data. **Table 2** shows the pre-test and post-test questions. 20 questions with answer options "true" or "wrong".

### 2.2.1. N-Gain nilai value analysis

The analysis of the N-gain value is intended to measure the effectiveness of the method used in the one-group pre-test post-test design research. In determining the conclusion of the final result, the gain of N-Gain can be categorized by referring to **Table 3** (Prastiwi & Nurita, 2018).

**Table 2.** Pre-test and post-test questions.

No	Question	Answer	
		True	Wrong
1	Do you know about nutrition?		
2	Do you know about malnutrition?		
3	Is nutrition an absorption word from Arabic, namely Giza?		
4	Does protein function as an energy substance for the body?		
5	Are carbohydrates a regulatory substance for the body?		
6	Is rice one of the criteria for 4 healthy 5 perfect food?		
7	Can the bad impact on malnourished children affect their physical and mental?		
8	Are obesity, sluggishness, and fatigue a bad effect of excess nutrition?		
9	Does anemia arise as a result of malnutrition?		
10	Do you know about children with special needs?		
11	Is one of the factors that cause children with special needs before birth genetic disorders?		
12	Is one of the factors causing children with special needs during the birth process too long pregnancy?		
13	Is one of the factors that cause children with special needs at the time after birth premature birth?		
14	Blind is a type of crew with visual impairment.		
15	Deafness is a type of hearing loss?		
16	Physical disability is a type of child with special needs with physical disorders.		
17	Tuna Grahita (mentally retarded children) is a type of child with special needs with mental retardation disorder.		
18	Can a proper diet cause a pregnant woman to be malnourished?		
19	Is anemia a result of malnutrition in pregnant women?		
20	Can pregnant women who have excess nutrition cause underdevelopment of some organs?		

**Table 3.** Distribution of n-gain scores.

N-Gain Value	Category
$g > 0.70$	Tall
$0.30 < g < 0.70$	Currently
$g < 0.30$	Lace

### 3. RESULTS AND DISCUSSION

According to [Serevina et al. \(2018\)](#), the purpose of calculating the N-gain value is to show an increase in the quality of skills and understanding of each respondent after being given an action. Based on **Tables 4** and **5**, the average N-gain is 0.62(62%), the minimum value of N-Gain is -0.25(-25) and the maximum value of N-Gain is 0.90 (90). Then if we look at the N-Gain obtained by 0.62 (61.84), the method used through power point media in educating citizens can be said to be quite effective. Because based on the category in **Table 3** for the interpretation of the effectiveness of N-Gain, the average value obtained falls into the 56-75 group (quite effective). **Tables 4** and **5** show the analysis of pre-test and post-test gain values.

**Table 4.** Analysis of Pre-Test and Post-Test Gain Values.

No	Name	Score		N-Gain	Category
		Pre-Test	Post-Test		
1	A	40	75	0.58	Currently
2	B	45	80	0.64	Currently
3	C	75	90	0.60	Currently
4	D	55	85	0.67	Currently
5	E	80	75	-0.25	Low
6	F	40	75	0.58	Currently
7	G	50	85	0.70	Currently
8	H	45	75	0.55	Currently
9	I	70	90	0.67	Currently
10	J	50	95	0.90	Tall
11	K	65	90	0.71	Tall
12	L	65	90	0.71	Tall
13	M	75	95	0.80	Tall
14	N	60	90	0.75	Tall
15	O	65	90	0.71	Tall
16	P	65	95	0.86	Tall
17	Q	80	90	0.50	Currently
18	R	65	85	0.57	Currently
19	S	75	85	0.40	Currently
20	T	65	90	0.71	Tall
<b>Average</b>		<b>61.5</b>	<b>86.3</b>	<b>0.62</b>	
<b>Min</b>		<b>40</b>	<b>75</b>	<b>-0.25</b>	
<b>Max</b>		<b>80</b>	<b>95</b>	<b>0.90</b>	

**Table 5.** Value of N-Gain

Statistics		
Gain Percent		
N	Valid	20.00
	Missing	0.00
	mean	61.84
	Minimum	-25.00
	Maximum	90.00

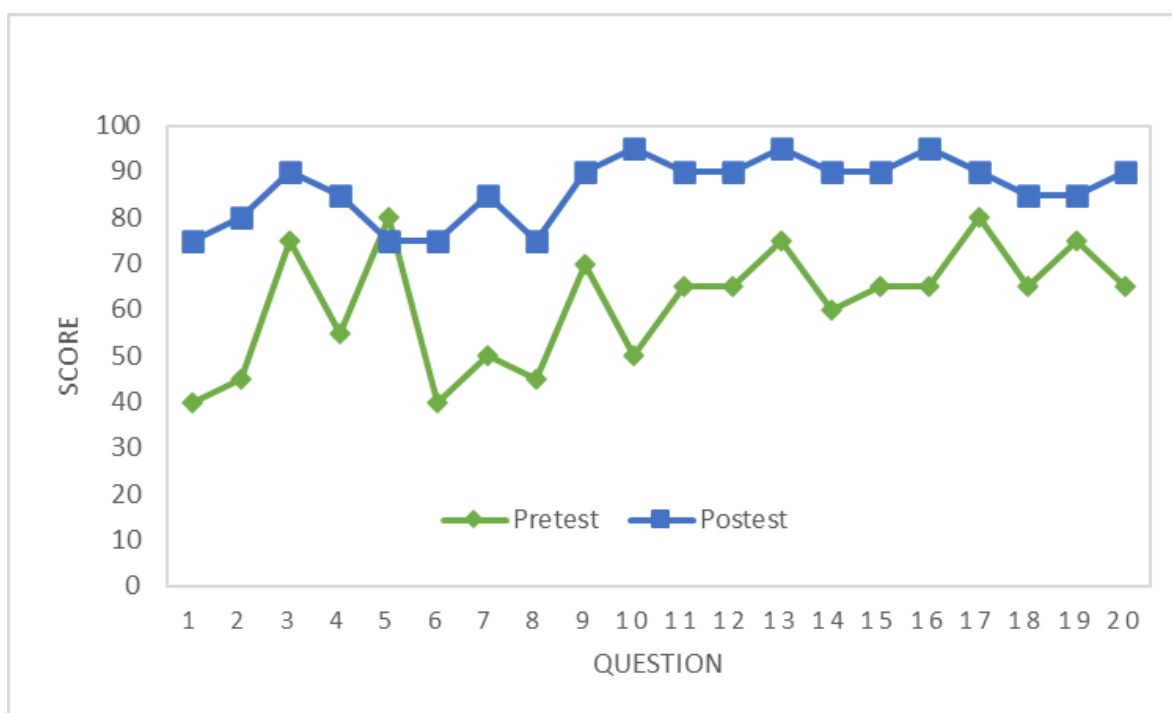
In determining the interpretation of the effectiveness of N-Gain, N-Gain gain can be categorized by referring to the following **Table 6**. **Table 6** shows that if the effectiveness of N gain is less than 40, it shows ineffective results, then if the effectiveness of N gain is in the range of 40-55, it shows fewer effective results. then if the effectiveness of N Gain is in the range of 56-75, it shows quite effective results. then if the effectiveness of N Gain > 76 then it shows effective results.

Based on **Figure 2**, we can get the difference between the initial score on the pre-test question and the post-test score after education. The difference dominantly shows an increase in each question indicator. The PowerPoint media is still quite effective and has a positive impact to be used in conducting education related to malnutrition on prenatal factors with special needs. Because it is proven to be able to increase the understanding of the

residents of the Karyawangi regarding malnutrition which is a prenatal factor for children with special needs.

**Table 6.** Categories of interpretation of N-Gain effectiveness

Percentage	Interpretation
<40	Ineffective
40-55	Less effective
56-75	Effective enough
>76	effective



**Figure 2.** Pre-test and post-test results.

**Table 7** shows the results of the relationship between the pretest value and the posttest value which shows a significance value of 0.031. As the basis for decision-making in the correlation test, if the significance value is < 0.05 then there is a correlation between the 2 variables, while if the significance value is > 0.05 then there is no relationship between the 2 variables.

Therefore, because the significance value obtained in **Table 7** is 0.031, from 0.05, there is a relationship between the pretest value and the posttest value (Ansori, 2022). Then in **Table 8**. The significance value is 0.000 < 0.05, there is a significant difference between the pretest and post-test results related to nutritional deficiencies (Ansori, 2022).

**Table 7.** Paired samples correlations

	N	Correlation	Sig.
Pairs 1 Adolescent Pretest Score & Adolescent Posttest Score	20	0.484	0.031

**Table 8.** Paired Samples Test

	mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Pairs 1 Adolescent pretest scores - Adolescent Posttest scores	-24.75	11.295	2.526	-30.036	19.464	-9.800	19	0.000

From each data analysis that has been carried out, education related to malnutrition material has a positive impact on increasing the understanding of the Karyawangi, Parongpong, Indonesia. Then if you look at the media used, namely PowerPoint, it is considered quite effective to use based on the N-Gain value.

#### 4. CONCLUSION

This study aims to educate related on malnutrition which is a prenatal factor causing children with special needs. then after doing research and socialization related to malnutrition the results show that the N-Gain obtained is 0.62 (61.84), the method used through power point media in educating citizens can be said to be quite effective. Because based on the category table for the interpretation of the effectiveness of N-Gain, the average value obtained falls into the 56-75 group (quite effective). Then the difference between the initial score on the pre-test and post-test scores after education. The difference dominantly shows an increase in each question indicator.

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#### 6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.



## 7. REFERENCES

- Arifin, Z. (2016). Overview of eating patterns for children 3-5 years old with malnutrition at the Tri Sakti Balong Tani Maternity Boarding School, Jabon–Sidoarjo District. *Journal of Midwifery Midwifery*, 1(1), 16-29.
- Barker, E. D., Kirkham, N., Ng, J., and Jensen, S. K. (2013). Prenatal maternal depression symptoms and nutrition, and child cognitive function. *The British Journal of Psychiatry*, 203(6), 417-421.
- BM, M. D. U. (2014). Analysis of students' errors in solving math story problems with fraction counting operations. *MATHEdunesa*, 3(3), 131-134.
- Delisle, H. F. (2008). Poverty: the double burden of malnutrition in mothers and the intergenerational impact. *Annals of the New York Academy of Sciences*, 1136(1), 172-184.
- Ekayanthi, N. W. (2019). Edukasi gizi pada ibu hamil mencegah stunting pada kelas ibu hamil. *Jurnal Kesehatan*, 10(3), 312-319.
- Ernawati, A. (2017). Nutritional problems in pregnant women. *Journal of research and development: research, development and science and technology information media*, 13(1), 60–69.
- He, P. C. (2018). Long-term effect of prenatal exposure to malnutrition on risk of schizophrenia in adulthood: evidence from the Chinese famine of 1959–1961. *European Psychiatry*, 51, 42-47.
- Inten, D. N., and Permatasari, A. N. (2019). Health literacy in early childhood through eating clean activities. *Journal of Obsession: Journal of Early Childhood Education*, 3(2), 366-376.
- Neelsen, S. (2011). Effects of prenatal and early life malnutrition: Evidence from the Greek famine. *Journal of Health Economics*, 30(3), 479-488.
- Nency, Y., and Arifin, M. T. (2005). Malnutrition, the threat of a missing generation. *Innovation*, 5(17), 18–21.
- Nisa, K., Mambela, S., and Badiah, L. I. (2018). Characteristics and needs of children with special needs. *Adi Buana Abadimas Journal*, 2(1), 33-40.
- Nyaradi, A. L. (2013). The role of nutrition in children's neurocognitive development, from pregnancy through childhood. *Frontiers in Human Neuroscience*, 7, 97.
- Prastiwi, M. D., and Nurita, T. (2018). Problem solving ability in grade VII SMP students. *Pensa E-Journal: Science Education*, 6(02), 98-103.
- Reinhardt, K. (2014). Addressing chronic malnutrition through multi-sectoral, sustainable approaches: a review of the causes and consequences. *Frontiers in Nutrition*, 1, 13.
- Rylander, C. Ø. (2013). Climate change and the potential effects on maternal and pregnancy outcomes: an assessment of the most vulnerable—the mother, fetus, and newborn child. *Global Health Action*, 6(1), 19538.

- Serevina, V., Astra, I., and Sari, IJ (2018). Development of e-module based on problem based learning (PBL) on heat and temperature to improve student's science process skills. *Turkish Online Journal of Educational Technology-TOJET*, 17(3), 26-36
- Setyanto, A. E. (2013). Reintroducing experimental methods in communication studies. *Journal of Communication Studies*, 3(1), 37–48.
- Stein, A. P. (2014). Effects of perinatal mental disorders on the fetus and child. *The Lancet*, 384(9956), 1800-1819.
- Teferi, M. B. (2016). Prevalence of stunting and associated factors among children aged 06–59 months in Southwest Ethiopia: a cross-sectional study. *Journal of Nutritional Health and Food Science*, 4(3), 1-6.