

*Full Length Research Paper*

# Nutritional Status of School Age children in Elementary School Hamadi Jayapura City, Papua Indonesia

\*Fransisca B. Batticaca, Imma Wardhani

Lecturer of Community Public Health Nursing, Faculty of Medicine, Nursing Department, Cenderawasih University, Sentani Street New City Abepura, Jayapura City

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One of the other programs of Community Public Health Center Hamadi was screening the nutritional status of school age children. Grade one students of the National Elementary School of Hamadi need to be screened to develop the nutritional program of the school. This study was a descriptive quantitative research with a *cross sectional approach*. A total sample of 79 students was included in this and the study was conducted from June 2016 to August 2017. Statistical analysis found students' nutritional status wasted 4.1%, underweight 20.3%, normal 65.8%, and overweight 8.9%. The *Chi square test* found out that there was significant correlation between students' grade and nutritional status ( $p=.088$ ;  $\alpha < 0.05$ ; CI 95%, .080 - .075); there were no correlation between age, sex and nutritional status. There were double burden malnutrition of school age children at the first grade National Elementary School of Hamadi. Thus, we suggest conducting the research about the risk factors of double burden malnutrition of the students age range between 7 years to 12 years.

**Keywords:** School, Student, Nutrition, Education, Hamadi.

## INTRODUCTION

The school age are undergoing periods of rapid growth and development and consequently have high nutritional needs. Diet should include a proper balance of carbohydrate, protein, and fat, with sufficient intake of vitamin and minerals. Identifying nutritional problems, counseling, and making appropriate referral are important in this school setting (Nies and McEwen, 2007). Quality of human resources was influenced by nutrition. School age child need of energy, protein, mineral, vitamin, and water (Waryono, 2010). Lack of nutrition has a negative effect on physical development, intelligence, and children's productivity. They easily get functional organ disturbances such as gastrointestinal tract, pancreas, liver, kidney, respiratory tract, wound healing, and can cause death prematurely (Adisasmito, 2007; Gibney et al., 2009). If the nutritional requirement is less than children's needs, infections and malnutrition occurs. Growth and development disturbances occur, if

an infection and malnutrition occurs together (Anderson and McFarlane, 2004). Hence, All children have the right to adequate nutrition, which is essential for attainment of the highest standard of health (WHO, 2004).

Malnutrition is any condition caused by excess or deficient food energy or intake or by an imbalance of nutrients (Whitney and Rolfes, 2011). Under nutrition is the underlying cause of death. The World Health Organization (WHO) estimate that nearly 20 million children worldwide are severely malnourished, increasing their risk of acquiring infectious and reducing their ability to resist such infections (WHO, 2008 cit Anderson and McFarlane, 2011), because malnutrition impairs the immune system. It is important to note that well nourished children brought up in a healthy, nurturing environment, grow stronger, taller and become adults that are more productive, maintaining high levels of functionality and produce healthy offspring in the future (WHO (2004). Chesire et al. (2008) found a total of 4.5% that were wasted, 14.9% underweight and 30.2% stunted among school age children in a Nairobi Peri-Urban Slum. The children who were over nine years of

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\*Corresponding Author Email: [sis\\_ppnu@yahoo.com](mailto:sis_ppnu@yahoo.com)

age were more underweight (72.4%,  $p=0.000$ ) and stunted (77.2%,  $p=0.000$ ) than those below eight years. The girls were more wasted (29.1%,  $p=0.013$ ) than the boys (18.2%), whereas the boys were more stunted (65.7%,  $p=0.003$ ) than the girls (50.7%). The other variables found to have had significant association with the nutritional status of the children were: monthly household income ( $p=0.008$ ), food prices ( $p=0.012$ ), morbidity trends ( $p=0.045$ ), mode of treatment ( $p=0.036$ ) and school attendance ( $p=0.044$ ).

Papua has the highest prevalence of wasting 34.5% measuring weight for age (WAZ) age of 5-12 children in Indonesia higher than national level 30.7%, and underweight 7.2% measuring body mass index age  $\text{kg/m}^2$  (BMIAZ). Papua is the 6 level of 16 provinces that is underweight (Ministry of Health Indonesia Republic, 2013). Another study found 5.7% of students in BUCEND II Entrop Elementary School under nutrition, Weight for Age (Mapandin, 2013). Other research found 88.5% of children is under nutrition at Sion Elementary (Batticaca, 2013).

Research purposes were to identify the nutritional status of first grade students at Government Elementary School of Hamad Jayapura City being an area where not much research has been done, while one of the other program of Community Public Health Center Hamadi was screening nutritional status of school age children. The first grade students of National Elementary School Hamadi need to be screened to develop a nutritional program of this school.

Anthropometric measurements were taken to assess the nutritional status of the school age children with cut-off points at  $-2\text{SD}$  as recommended by World Health Organisation (WHO, 1983). An observation checklist and a key informant interview guide were used to get more information on the target population and socio-economic status of the household. Data were analysed using descriptive statistics; Pearson's Chi-square tests were used to determine associations. The level of significance was fixed at 0.05 ( $p=0.05$ ).

## MATERIALS AND METHODS

Descriptive study with a cross sectional approach was used to identify the nutritional status of school age children. The population of the study was students of first grade A, B, and C at Government Elementary School Hamadi Jayapura City Papua. There were 79 students of Grade I A and B, and C using a total sample of students who were active learning. The research was conducted from June 2016 to August 2017.

To protect participant human rights, the study was approved by the leader school permit. The leader and teachers of the school were given an information sheet explaining the study's purpose procedure and benefits. The school leader and teachers who their students took part in the study indicated their consent by signing a

consent form about the details of the study. The students who had problems were referred to community health center (Ministry of Health Indonesia Republic, 2010).

The research's instrument of nutritional status was a product of the Ministry of Health Department Indonesia Republic (2011). Total sample of students were active learning during the period of the conducted research. Based line data were collected from teachers of grade 1 A, B, and C using questionnaire of student's characteristics. The second section was the nutritional status of the students using anthropometry measurement, to measured height the meter was used and weight the *body scale was used*.

The study was analyzed statistically by using the SPSS program to describe children's characteristics and nutritional status. Chi-square - test were used to analyses the correlation between the Nutritional status and students Characterize (Hastono, 2007)

## RESULT

Table 1 showed most of the student's age 7 years old 57% higher than 8 years old 43%, mean of ages 7 year and 43 months, SD 0.49, SE 0.056. For gender female 53.2% higher than male 46.8%. While for Grade C 31.6% lower than Grade A and B 34%.

Table 2 showed most of the students' nutritional status in normal range. For normal 65.8% higher than underweight 20.3%. While overweight was less higher 8.9% than waste 5.1%.

Table 3 showed most of the children nutritional status according to sex, measuring body mass index age  $\text{kg/m}^2$  (BMIAZ), female normal 69% less higher than male 62.2%. While female underweight was higher 24.3% than female 16.7%.

Table 4 showed most of the students nutritional status according to age, 7 years of age in normal range. For 7 years of age normal range 71.1% higher than waste 2.2%, underweight 17.8%, and overweight 8.9%, while 8 years of age 58.8% higher than waste 8.8%, underweight 23.5% and overweight 17.8%.

Table 5 showed most children nutritional status according to grade measuring body mass index age  $\text{kg m}^{-2}$  (BMIAZ) in normal range. For grade 1A normal 55.6% higher than waste 7.4%, underweight 22.2% and overweight 14.8%. For grade 1B normal 63% higher than waste 3.7%, underweight 33.3% and overweight 0%. While for grade 1C normal 80% higher than 4.0%, underweight 4.4% and overweight 12%.

Table 6 showed most of the students nutritional status in normal range. For 7 years old normal higher 71.1% than 8 years old 20%. For 8 years old underweight higher 24.3% than 7 years old 17.8%, over weight 9.5% less higher than male 8.1%, but only 2.2% waste for 7. For male 62.2% in normal range higher than female 27.6%. While for grade C normal range higher 80% than A 55.6%, and B 63%, overweight higher in A

**Table 1.** Students characteristics distribution

<b>Categorize</b>	<b>Total (n)</b>	<b>Proportion (%)</b>	<b>Mean</b>	<b>Median</b>	<b>SD</b>	<b>SE</b>
<b>Age of year</b>						
7	45	57.0	7.43	7.00	0.49	.056
8	34	43.0				
<b>Sex</b>						
Male	37	46.8	-	-	-	-
Female	42	53.2				
<b>Grade</b>						
I A	27	34.2	-	-	-	-
I B	27	34.2				
I C	25	31.6				

**Table 2.** Nutritional status distribution

<b>Categorize</b>	<b>Total (n)</b>	<b>Proportion (%)</b>
Waste	4	5.1
Underweight	16	20.3
Normal	52	65.8
Over weight	7	8.9

**Table 3.** Nutritional status of the children by sex

<b>Sex</b>	<b>Nutritional status</b>	<b>Number (n)</b>	<b>Proportion (%)</b>
Male	Waste	2	5.4
	Underweight	9	24.3
	Normal	23	62.2
	Over weight	3	8.1
Female	Waste	2	4.8
	Underweight	7	16.7
	Normal	29	69
	Over weight	4	9.5

**Table 4.** Nutritional status of the children by age

<b>Age of year</b>	<b>Nutritional status</b>	<b>Number (n)</b>	<b>Proportion (%)</b>
7	Waste	1	2.2
	Underweight	8	17.8
	Normal	32	71.1
	Over weight	4	8.9
8	Waste	3	8.8
	Underweight	8	23.5
	Normal	20	58.8
	Over weight	3	8.8

**Table 5.** Nutritional status of the children by grade

Grade of children	Nutritional status	Number (n)	Proportion (%)
1A	Waste	1	7.4
	Underweight	6	22.2
	Normal	15	55.6
	Overweight	4	14.8
1B	Waste	1	3.7
	Underweight	9	33.3
	Normal	17	63
	Overweight	0	0
1C	Waste	1	4.0
	Underweight	1	4.0
	Normal	20	80
	Oveweight	3	12

**Table 6.** Correlation between Nutritional Status and Student's Characterize

Characterize	Nutritional Status										p-value	X <sup>2</sup> -test	CI 95%	
	Waste		Underweight		Normal		Overweight		n	%			Lower	Upper
	n	%	n	%	n	%	n	%						
<b>Age of year</b>														
7	1	2.2	8	17.8	32	71.1	4	8.9	45	100	.856	2.42	.529	.549
8	3	8.8	8	23.5	20	58.8	3	8.8	34	100				
<b>Gender</b>														
Male	2	5.4	9	24.3	23	62.2	3	8.1	37	100	.856	.77	.900	.915
Female	2	4.8	7	16.7	29	69.0	4	9.5	42	100				
<b>Grade</b>														
1 A	2	7.4	6	22.2	15	55.6	4	14.8	27	100	.088	11.02	.080	.075
1 B	1	3.7	9	33.3	17	63.0	0	0	27	100				
1 C	1	4.0	1	4.0	20	80	3	12	25	100				

24.8% than C, but there was nor found in Grade B. Chi square test found no correlation between students' age, students' sex, and students' grade and nutritional status  $\alpha > 0.05$ ; CI 95% .080 - .075); there were no correlation between age, sex and nutritional status.

## DISCUSSION

The research purpose was to identify the nutritional status of first grade students at Government Elementary School of Hamad Jayapura City. The research found most students age to be 7 years old, female. A school age years is a span of time between a child entrance into kindergarten and the beginning of adolescence, a range from 5 to 12 years. During this time period observable difference in growth, development, and cognitive ability are prominent (Edelman and Mandel, 2010).

The school age needs balance diet around 2.400 Kcal each day. They eat 3 times a day and one or two

times snack. They need food reach in protein for breakfast to meet physical and mental need at school day. Children who do not have breakfast and did not sleep at night have difficult to solve problems, and also a risk for under nutrition. Under nutrition students become weak, and risk for infections as result. Although they have dinner with families, have lunch at school, the risk for under nutrition caused are usually meal candies, or unhealthy food (Kozier and Erb's, 2012).

Poor nutritional status is closely associated with poverty. School Breakfast Programs and National School Lunch Programmed were initiated to ensure that all children have access to these meals during the school day (Nies and McEwen, 2007).

Nutritional status of students in the normal range, overweight, waste and under nutrition at both ages 7 and 8 years old students found waste, underweight, and overweight, as well as sex to be both male and female nutritional status consisted of waste, underweight, normal and overweight. This study showed there were double burden malnutrition of school age children at

National Elementary School Hamadi Jayapura City. A similar study was conducted in Nairobi Peri-Urban Kenya, 2008 which showed 4.5% were wasted, 14.9% were underweight and 30.2% were stunted (Cheshire et al., 2008).

Children who are malnourished, their behavior and academic performance are affected. The Child with any of several nutrient deficiencies may be irritable, aggressive, and disagreeable, or sad and withdrawn. Such a child may be labeled "hyperactive", "depressed", or "unlikeable". Children who are malnourished are vulnerable to lead poisoning. They absorb more lead if their stomachs are empty; If they have low intakes of calcium, zinc, vitamin C or Vitamin D; and, of greatest concern it is so common, if they have an iron deficiency. Iron deficiency weakens the body's defense against lead absorption, and lead poisoning can cause iron deficiency.

The number of overweight children has increased dramatically over the past three decades and severe obesity in children is becoming more prevalent. Many of these children have multiple risk factors for cardiovascular diseases and a high risk of severe obesity in adulthood. The problem of obesity in children is especially troubling, because overweight children have the potential of becoming obese adults with the social, economic, and medical ramifications that often accompany obesity. They have an additional problem, too, arising from differences in their growth, physical health, and psychological development (Whitney and Rolfes, 2012).

There were no correlation between students' age, students' gender, students' grade and nutritional status. This finding were differences from the study that was conducted by Cheshire et al. 2008 were a strong significant association ( $\chi^2=27.999$ ,  $P = 0.000$ ) was found in height for age also for children above nine years old, being more (77.2%) stunted than the other age group; The sex of the children and their nutritional status (height for age) were significantly associated ( $p=0.013$ ), with the girl child being more wasted (29.1%) than the boy child (18.2%).

It is therefore recommended that the Ministry of Education and Ministry of Health ought to conduct health and nutrition education program aimed at improving the health and nutritional status of these children. We also recommend that awareness be created among the school age children, parents and teachers, on the dietary requirements of both boys and girls.

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