UNDERWEIGHT AND MORBIDITY STATUS AMONG UNDER FIVE YEARS CHILDREN IN SURABAYA

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INTRODUCTION

Under five years old children is one of the group that vulnerable to under nutrition, moreover this age group also susceptible to infectious disease due to their immunity and their activity related to exposure of infectious disease. To achieve optimal growth, a children must obtain adequate dietary intake, optimal care practice that include appropriate feeding practices and less frequent of infectious disease (Black et al, 2008). Inadequate food intake to Undernutrition among under five children become important issue since it can affect short term and also long term that go beyond child hood (Neufeld and Osendarp, 2014). Indonesia Basic Health Survey revealed there was fluctuation of underweight prevalence from 18.4% in 2007, decreased to 17.9% in 2010 and increased to 19.6% in 2013 (Indonesia Basic Health Survey, 2013). There is a strong evidence that undernutrition that occurred during the first two years of life contribute to the increasing risk of non communicable disease in the later life (Victora et al, 2008). Communicable disease is one of the factors that contribute to nutritional status, particularly underweight in children since underweight is the indicator that reflect an acute disturbance of nutritional status. Communicable diseases that often occur in children are diarrhea and upper respiratory infecti on. In developing countries, diarrhea contributes to the childhood morbidity and mortality, as it estimated that 1.5 million child die to diarrhea per year (Roy et al, 2011). There is a bidirectional relationship of diarrhea and malnutrition in children with the mechanism of diarrhea episodes lead to anorexia, absorptive function impairment, the damage of mucosal and the increase need of nutrients (Brown, 2003). Malnutrition also increase the incidence and severity of acute respiratory infection through mechanism of immunity impairment, particularly in cellular immunity (Bhutta et al, 1998). This study aimed to analyze the association of underweight and morbidity of diarrhea and acute respiratory infection in under five years old children.

METHODS INTRODUCTION

Study design

A community based cross-sectional study was conducted in Surabaya District. The study was conducted from from June – November 2014.

Study setting

The study was conducted in five area of Surabaya (west, east, central, south, north) District. In each area was chosen one Primary Health Center with the high prevalence of malnutrition problems. Surabaya district is urban area with the urban population is involved in private sectors, government employment, informal sectors and factory workers.

Study participants

The study participants of this study included all 12–60 months old children (paired with their mothers) who settled in the district. The study population were the randomly selected 12–60 months old children (paired with their mothers) who lived at least for six months in the district.

Sampling technique

A sample size was calculated based on the formula of stratified sampling formula, thus the final sample was 467 children. A multistage stratified sampling technique was used to identify study subjects in area of Kelurahan Mulyorejo, Kelurahan Dr. Soetomo, Kelurahan Asem Rowo, Kelurahan Pegirian dan Kelurahan Kebonsari. Stage one was conducted with cluster random sampling, as cluster was the neighbourhood area (RT/Rukun Tetangga). Stage two was done with simple random sampling in each selected RT. One child was selected by lottery method when more than one child was present in selected households.

Measurements

The main outcome variable in this study was nutrition status measured as underweight. Independent variables include: socio-demographic variables(child sex, family type, income,); childhood illness. Anthropometric data were collected through measurement of weight of all children. Weight was measured with minimum clothing and no shoes using SECA weighing scale to the 0.1 kg. WHO Anthro version 3.2.2 software was used to convert the anthropometric measures; weight and age values

into Z-scores of the indices; Weight-for-Age(WAZ) taking sex into consideration using WHO 2006 standards. To assess the childhood illness, the mothers were asked whether their children had been affected by diarrheaand acute respiratory infections today and in the past two weeks. Diarrhea is defined as having three or more loose or watery stool in a 24-hour's period the two weeks period prior to the survey. Acute respiratory infection was define by the symptom of cough and running nose. Data were collected using structured questionnaire via face to face interview and anthropometric measurements.

Analysis

Descriptive statistics like frequencies or proportions were first done and presented by tables. Then bivariate analysis was done by Chi-square analysis. Statistical association

was declared significant if p-value was less than 0.05.

Ethical consideration

The ethical clearance was obtained from Faculty of Public Health Universitas Airlangga Ethical Review Board. Written informed consent was also obtained from each respondent. Participants with diarrhea, respiratory tract infections and undernutrition were referred to primary health care.

RESULTS

Children Characteristics

Table 1. Children Characteristics

Characteristics	n	%
Sex		
Male	198	42.3
Female	270	57.7
Prematurity		
Prematur	30	6,4
Normal	432	92,3
Did not know	6	1,3
	(Min-Max)	Mean	SD
Age (months)	12-60	31,87	12,183
Birth weight (g)	1800 - 4700	3093,40	458,188
Birth length(cm)	30 - 59	48,01	4,321

The majority of children were female, not premature, toddler, birh weight and birth length were normal.

Socioeconomic Status (SES)

Table 2. Socioeconomic Status

SES	N	%
Type of family		
Nuclear	335	71,6
Extended	133	28,4
House owned		
Privately own	139	29,7
Family owned	186	39,7
Yearly rented	93	19,9
Monthly rented	50	10,7
Income		
≥ minimum income	278	59,4
< minimum income	189	40,4
	Min-Maks in 000)	Mean	SD
Family income	400 – 19,500	3072.98	2307.093
Food expend	242.5– 4425	1282.05	595.4
Family member	2 -13	4.24	1.39

The majority of family were nuclear family, lived in family oowned house, with the income was higher that regionally minimum income that regulated by Surabaya District.

Nutritional Status

Table 3. Nutritional Status

Nutritional Status	n	%
Underweight	75	16.1
Non underweight	392	83.0

The prevalence of underweight among children were 16.1%.

Morbidity Status

Tabel 4. Morbidity Status

Disease	Yes		No	
	n	%	n	%
Diarrhea today	17	3.6	451	96.4
ARI today	156	33.3	312	66.7
Diarrhea last two weeks	59	12.6	409	87.4
ARI last two weeks	277	59.2	191	40.8

Acute respiratory infection (ARI) was the common in the children compare to diarrhea. The incidence of diarrhea was 3.6%, whereas ARI was 33.35%.

The Relationship of Nutritional Status and Morbidity Status

Tabel 5. The Relationship of Nutritional Status and Morbidity Status

Disease		Non Underweight		Under weight		Sig
		n	%	n	%	
Diarrhea Today	Yes	13	76.5	4	23.5	ns (0.395)
	No	379	84.2	71	15.8	
ARI Today	Yes	126	81.3	29	18.7	ns (0.272)
	No	266	85.3	46	14.7	
Diarrhea Last 2wk	Yes	45	76.3	14	23.7	ns (0.086)
	No	347	85.0	61	15.0	
ARI Last 2wk	Yes	233	84.1	44	15.9	ns (0.901)
	No	159	83.7	31	16.3	

The statistical analysis showed that underweight was not significantly associated r to diarrhea and acute respiratory infection.

DISCUSSION

The finding suggests that the prevalence of underweight is closely to the national prevalence from basic health survey in 2013. Although the prevalence is not yet considered as the public health problems, however the importance of children should be optimally growth should be considered. The prevalence of acute respiratory infection during the last two weeks is also high. More than half of the children had ARI symptoms. This study is different to the findings in India indicated that relative risk of morbidity due to infection in relation to malnutrition that assessed by WAZ, HAZ, BMI for age showed that the prevalence of morbidity due to infection (on e or more episodes in the last two weeks) was higher in children who were underweight, wasted, stunted and haad low BMI in which BMI for age was found to be more consistent associated to undernutrition ((Ramacandran and Gopalan, 2009). The limitation of our study is morbidity recorded by the mother information that could be biased because of the memory. Therefore it need to measure marker of inflammation to indicate the occurrence of infection in children.

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