UNIVERSITAS INDONESIA

NUTRITIONAL STATUS AND FEEDING PRACTICES OF CHILDREN AGED 0-59 MONTHS LIVING IN ORPHANAGE IN JAKARTA

THESIS

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STUDY PROGRAM IN NUTRITION

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In partial fulfillment of the requirements for degree of

Master of Science in Community Nutrition

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PREFACE

Nutrition is very important especially for under five children to support their growth and development. Malnutrition due to nutrient deficiency may affect their condition in the future. Since under five is very depend on other to fulfilled their requirement, feeding practice received by them is important to be known.

In orphanage, children live together under one roof with some caregiver's. Their live may very different with cildren living in household environment. Some study in abroad found that, children living in the orphanage were more vulnerable. However, in Indonesia the study about under five living in orphanage is still limited. In Jakarta, which is the population is very high, it is possible that are many abandoned children, which mostly live in orphanage. That means, there are many children have high risk of undernutrition

This report is divided into six chapter, i.e Introduction (Chapter 1), Literature review (Chapter 2), Method (Chapter 3), Result (Chapter 4), Discussion (Chapter 5), and Conclussion and recommendation (Chapter 6). One manuscript to be submitted to the Public health and nutrition Journal is also included in the appendix

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Kartika Wandini

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ABSTRACT

Name : Kartika Wandini

Study Program : Community Nutrition

Title : Nutritional status and Feeding Practice of Children Aged 0-59 Months living in orphanage in Jakarta

In general, this cross sectional study aims to explore nutritional status and feeding practice received by orphanage children aged 0-59 months in Jakarta. This study was conducted in three orphanages that are specifically accomodate under five children. Totally, 144 under five children in the orphanages were included in this study.

This study found, 21.9% of children were underweight, 35.2% were stunting, and 6.5% were wasting. Almost 90% children had adequate protein and vitamin A, but more than 90% of them had zinc inadequacy. In fact, nutrient content in the food served by orphanage was also not fulfilled child's requirement for zinc. This study found inappropriate feeding practice received by children, i.e in appropriate food type, inappropriate respond from caregiver during feeding and improper feeding during illness and recovery. 71.5% of children were suffered from ARI, 22.2% suffered from diarrhea and 18.8% children suffered from ARI and diarrhea. This study found some inappropriate practice of food handling such as the use of bottle feeding, hand-washing which was not practiced by children or caregivers when serve food or feeding children, as well as some other things that could allow cross-contamination, or facilitate the spread of infectious diseases.

Keywords: Orphanage, nutritional status, feeding practice, dietary intake, health status

ABSTRAK

Nama : Kartika Wandini

Program Studi : Ilmu Gizi

Judul Thesis : Status Gizi dan Kesehatan Anak-Anak Panti Asuhan Usia 0-59 Bulan di Jakarta

Secara umum studi *cross sectional* ini bertujuan untuk mengetahui status gizi dan praktik pemberian makan yang diterima oleh anak usia 0-59 bulan yang tinggal di panti asuhan di Jakarta. Penelitian dilakukan di tiga panti asuhan yang dikhususkan untuk menampung anak usia balita. Sebanyak 144 anak usia balita di panti dilibatkan dalam penelitian ini.

Berdasarkan hasil studi, sebesar 21.9% anak termasuk dalam kategori gizi kurang, 35.2% pendek, dan 6,5% kurus. Hampir 90% anak yang kebutuhan protein dan vitamin A nya terpenuhi, namun lebih dari 90% anak yang kebutuhan zinc nya tidak terpenuhi. Pada kenyataannya, kandungan gizi pada makanan yang disajikan oleh panti pun tidak memenuhi kebutuhan anak untuk zinc. Penelitian ini menemukan beberapa praktik pemberian makan yang tidak tepat seperti, tipe makanan dan respond pengasuh yang tidak tepat, juga praktik pemberian makan saat anak sakit dan dalam masa pemulihan. 71,5% anak menderita ISPA dan 22,2% menderita diare, sementara 18.8% anak menderita ISPA dan diare. Penelitian ini menemukan beberapa praktik yang tidak tepat seperti dalam hal penanganan makanan, penggunaan botol makanan (*bottle feeding*), tidak praktik cuci tangan yang tidak dilakukan oleh anak maupun pengasuh ketika menyajikan makanan atau menyuapi anak, serta beberapa hal lain yang dapat memungkinkan terjadinya kontaminasi silang ataupun memudahkan terjadinya penyebaran penyakit menular.

Kata kunci: Panti asuhan, status gizi, praktik pemberian makan, status kesehatan, konsumsi makanan.

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LIST OF ABBREVIATIONS

BKKKS	*Badan Koordinasi Kegiatan Kesejahteraan Sosial*
DDS	Dietary Diversity Score
DNIKS	*Dewan Nasional Indonesia untuk Kesejahteraan Sosial*
EAR	Estimated Average Requirements
FAO	Food Agricultural Organization
HAZ	Height per Age Z-Score
IZA	International Zinc Association
KAJ	*Keuskupan Agung Jakarta*
KMS	*Kartu Menuju Sehat*
KPAI	*Komisi Perlindungan Anak Indonesia*
NHMRC	National Health and Medical Research Council of Australia
PVJ	*Perhimpunan Vincentius Jakarta*
RDA	Recommended Dietary Allowances
RISKESDAS	*Riset Kesehatan Dasar*
RSCM	*Rumah Sakit Cipto Mangunkusumo*
SD	Standard Deviation
UNICEF	United Nations Children's Fund
USAID	United State Agency for International Development
USDA	United State Department of Agriculture
WAZ	Weight per Age Z-Score
WHZ	Weight per Height Z-Score
WHO	World Health Organization

Operational Definition

Orphanages

Specific orphanage for underfive which registered to the Social Ministry and Social Department of Jakarta Province

Caregivers

Person who take care under five children living in orphanage

Meals

The main food served by orphanage and received by the children at mealtime

Snack

A small portion of food or drink (except milk) or a light meal, especially one eaten or drunk between regular meals.

Soft food

Semi solid food that was blended and served for children aged 6-12 months, or even until 18 months

Children

Children aged 0-59 months who live in orphanage include orphan, neglected children, or children coming from poor family

Food handler

Person who work in orphanage and directly handle or deal with food handling and preparation for the children in orphanage

Dietary diversity

Number of individual foods or food groups consumed over a reference period (Hadinot., J and Yosehac., Y., 2002). In this study it is measured by Dietary Diversity Score (DDS)

Estimated Average Requirement (EAR)

The amount of a nutrient that is estimated to meet the average needs of the population (Smolin, L.A & Mary, B. G, 2005)

CHAPTER I
INTRODUCTION

1.1 Background

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full human potential. That period is very critical for the promotion of optimal growth, health, and development (WHO, 2005). When nutrition is inadequate it can lead to undernutrition. In 2010, about 20 million children worldwide were estimated to suffer from severe acute malnutrition, leaving them more vulnerable to serious illness and early death (WHO, 2012).

In Indonesia, eventhough general improvement in health and social services have been given to improve nutritional status of children, under nutrition is still prevalent and remains the most devastating problems facing the majority of the Indonesian, especially the poor. According to Indonesian baseline health research (Riskesdas, 2010), the prevalence of underweight, stunting, and wasting among under five children in Indonesia were 17.9%, 35.6%, and 13.3% respectively.

Referring to UNICEF conceptual framework (1997), food intake is one of immediate factors which determine nutritional status of children. While, the actual amount of food ingested by the children is determined by feeding practices (Ramakrishnan, U., 1995). Although it is acknowledged as a major component of child caring practices and thus having important role in growth pattern of children, somehow feeding practice often becomes one of the most neglected determinants of young child malnutrition (Engle, P. L. et al., 1997). Whereas, over two-thirds of deaths caused by malnutrition are often associated with inappropriate feeding practices and it particularly occurs during the first year of life (WHO, 2003).

Besides food intake, another immediate factor of nutritional status among under five children is presence of disease. Diarrhea and ARI are the common diseases among under five years. Diarrhea leads to decreased nutrient absorption, further weakening the immune system and increasing susceptibility to disease. This vicious cycle is often repeated, eventually resulting in severe malnutrition or

even death (Gross, R. et.al., 1997; Ribeira, R., et.al 2009). In Indonesia, the prevalence of diarrhea and ARI among under five children is more than 35% for each (Riskesdas, 2007). Those conditions could be prevented through appropriate health service, health environment, and appropriate care.

Quality of care received by the orphanage children is obviously different from what is gained by children living with family. They are likely to receive less attention, less concern and lack of attachment (Panpanich, R. et.al., 1999; Jayasekara, C.R. 2006). Living together under one roof, they are likely susceptible to disease. A study in Ghana found that fever and diarrhea are the disease that is often the case in the orphanage (Ribeira, R., et.al 2009). Moreover, as they do not receive breast milk, the orphanage children would suffer nutritionally. As a result, they are likely to be malnourished (Panpanich, R. et.al., 1999). Therefore, they are considered as the most vulnerable and disadvantaged members of the community.

Referring to Indonesian state law number 23 in 2002 about child protection, it is mentioned that basically every children has an equal right to be guaranteed, protected and fulfilled their needs by parents, families, communities, governments and countries. Thus, for the orphanage children, countries and communities are required to work together to protect and nurture them in accordance with the concept of child care in Indonesia.

Unfortunately, research and accurate data regarding the situation of orphanages children in Indonesia, particularly underfive children, is still limited. Lack of practical knowledge about the situation of children is inhibiting the ability of governments in formulating policies that are based on the understanding of the situation of children (Social Ministry, 2007).

Therefore, this study is conducted to support information about children in orphanage particularly in nutritional sector. Moreover, it might be used as reference of another study or nutrition program which will be conducted in orphanage as well as to support the government in formulating policies.

1.2. Problem statement and rationale of the study

1.2.1. Problem statement

1. A previous study showed that 'care' in the orphanage was very lacking since one caregiver has to be responsible for some children. Meanwhile, care is one of the most important determinants of nutritional status of under five. Children living in the orphanage are also considered as non-breastfed children and they live in situation in which food available in the orphanage were not optimally fit their needs (quantity, quality, and food variety was very limited). In side of sanitary, the condition in a number of orphanages is not adequate, including a lack of concern for sewage and waste disposal (Social Ministry, 2007). Thus, the children are considered more vulnerable to be undernutrition, and have lower growth and development than the attainments of children living in household environment (Panpanich, R. et.al., 1999; Jayasekara, C.R., 2006).
2. Most of the supervision conducted by the government was limited to initial registration of organization running in orphanage and financial report of orphanage having direct financial assistance. Limited information about the actual condition in the orphanages is inhibiting the governments in formulating policies that are based on an understanding of the actual situation (Social Ministry, 2007).

1.2.2. Rationale of the study

1. Most of the orphanage children are abandoned children (Social Ministry, 2007). Their number increased sharply year to year. Recent data showed, there were 17 million abandon and almost abandon children living in major cities in Indonesia, including Jakarta (KPAI 2010). The increasing number of abandon children lead to increasing number of children living in the orphanage who are considered having the high risk of undernutrition.
2. The actual condition of the children and situation in orphanages are necessary to provide information to the government in formulating policies or developing guideline specifically in nutrition-related services for orphanages and also to the other stakeholder to give contribution especially in nurition-related sectors.

1.3. Research question

How is nutritional status of children and feeding practice receive by the children aged 0-59 months living in the orphanages in Jakarta?

1.4. Objective of the study

1.4.1 General objective

To explore nutritional status of children and feeding practice receive by the children aged 0-59 months living in the orphanages in Jakarta.

1.4.2. Specific objective

1. To assess nutritional status of the children.
2. To describe food available in the orphanage
3. To assess nutrient intake of the children.
4. To describe feeding practice received by the children.
5. To assess morbidity of the children.
6. To describe health service and health environment in the orphanage.

1.5. Conceptual framework

Growth failure observed in institutionalized children did not necessarily reflect an insufficient quantity and quality of available food. It's rather too few caregivers to ensure that the available food was fed to those too young children to feed themselves, a lack of tactical stimulation and care during the planning of meals for infants and children (Frank and Lucas 1996 as cited by Sadik, A., 2010). However, food intake and health status as immediate factors are important to determine of nutritional status of under five. Figure 1 shows the conceptual framework of nutritional status in which feeding practice represent caring practice which is the most possible to be measured in orphanage situation.

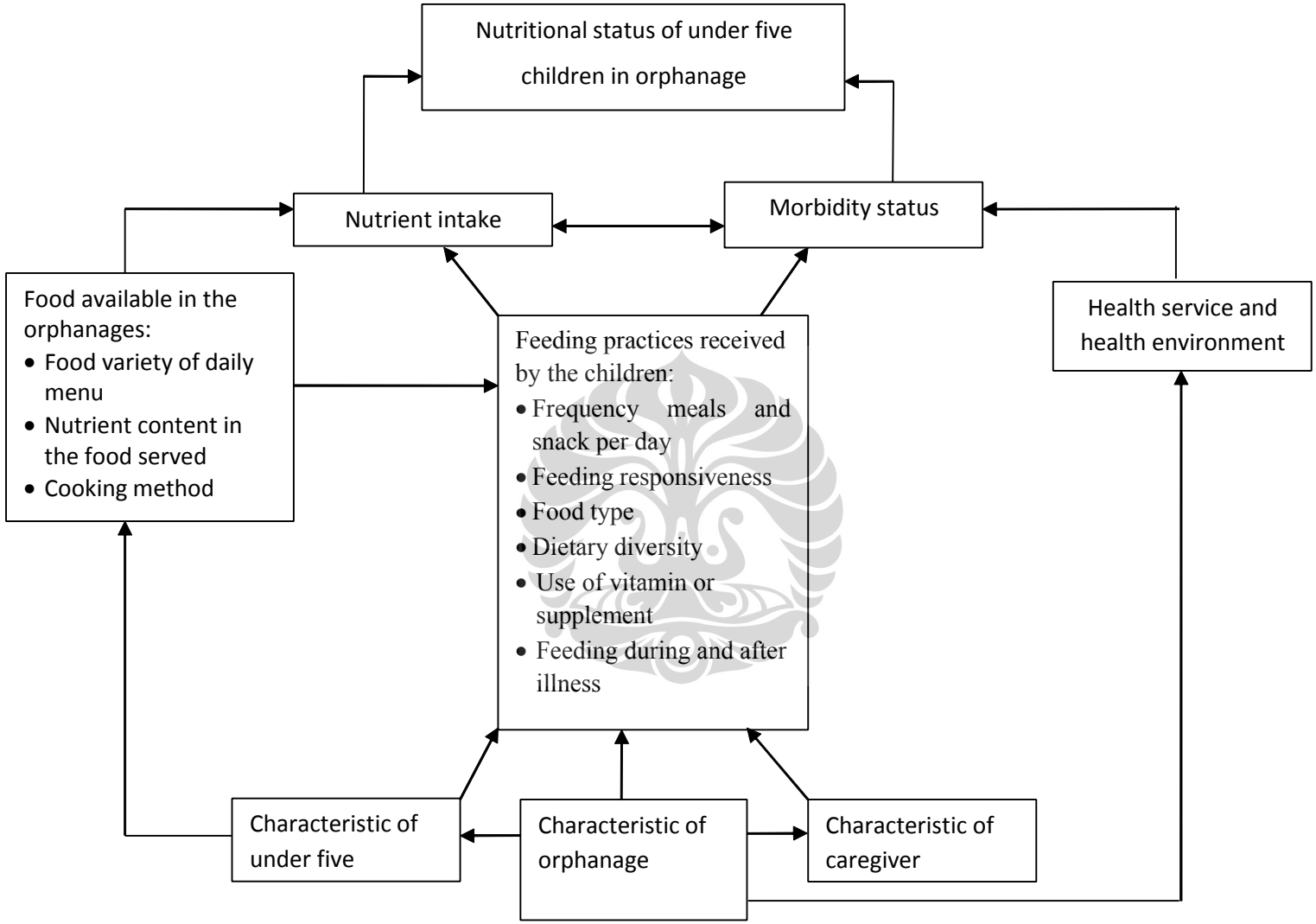


Figure 1.5. Conceptual framework

CHAPTER 2
Literature Review

2.1 Orphanage's description

The number of orphaned children has increased rapidly during the past decade. Some of them and waifs live in institution -orphanage- because of some reasons. Mothers rejecting the children in maternity homes, social and financial destitution, serious illness of parents, inappropriate living condition for children, and morbidity of the children could be the reason why they live in orphanage (Groark, C.J., 2005).

Orphanages in Indonesia have the important role in social service to children and family needing help. Initially, the existence of orphanage is aimed as replacement parent, but nowadays becomes the main place to give service for children and family in community level. Social Service Orientation of Waif in 2002 and General Reference Social Service of Children 2004 in orphanage identify some function of orphanage, i.e. the institution of social welfare of children, resource of data, information, and consultation of children welfare, the referral agencies, and community servant area in children welfare sector (Social Ministry, 2007).

Approximately 7000 orphanages exist in Indonesia taking care of more than 500.000 children. This number could be more, in view of the fact that existing data from government is limited. So far, the government's supervision is limited to initial registration of organization running orphanage and financial report of orphanage having direct financial assistance. In addition, the main attention of these supervision are to be sure whether the orphanage fulfill the standard in documenting all of activity and their legal formality than real supervision of kind and quality of caring to orphanage children (Social Ministry, 2007). Meanwhile, care is one of the most subjectively palpable deficiencies of orphanage (Jayasekara, C.R., 2006).

Basically, children living with their biological parents receive more attention and more concern than orphans living with guardians (Panpanich, R. et.al., 1999). Those living in orphanage may receive even less attention. In Russia

children living in the orphanage experience approximately 60 to 100 caregivers during the first two years of their life (Muhamedrahimov, R.J et.al., 2004).

Cruezinger, describes conditions in an orphanage in Russia that each caregiver was responsible for 20 children under three years of age and worked for 24 hours at a time. The caregivers felt overwhelmed by the work and the children's needs. They believed that they had to train the children to be able to survive in the institution, and had to make the children "tough." Also, caregivers and administrators felt that orphans or abandoned children were "different emotionally," since they came from a poor heritage. Children were rarely held, for fear that they would demand more than the caregivers could provide. If children cried from a fall, they were told to shut up and stop crying. They were continually hurried to the next activity of the day. As a result, the children soon became silent and non-verbal, and they grew up totally unprepared for life beyond the institution (Creuzinger, CK., 1997 as cited by Engle, L.P and Lida L., 1999).

Thus, the analysis of the orphanage structure and system shows that there is no stability and consistency of the infants' primary social–emotional environment (Muhamedrahimov, R.J et.al., 2004). However, orphanages are needed for young children who have no extended families to care for them (Panpanich, R. et.al., 1999).

2.2 Nutritional status of orphanage children

Nutritional status of under five is measured based on age, weight, and height of children, then converted into standardize value (Z-score) using standard anthropometry WHO 2006. Furthermore, nutritional value of underfive is determined based on each indicator. There are three indicators: weight per age (WAZ) for underweight, height per age (HAZ) for stunting, and weight per height (WHZ) for wasting.

Nutritional status indicators

WAZ. The indicator of WAZ gives a picture about general nutritional status, but not specific. High or low prevalence of severe or moderate malnutrition does not quite indicate whether a child under five is proportional to size, and WAZ does not indicate whether undernutrition is critical or acute nutritional problem. Meanwhile, National prevalence of malnutrition was 17.9%. When

compared with a target of achievement for nutrition improvement goals (RPJM) in 2015 by 20% and Indonesia's MDG target for 18.5%, the national targets have been exceeded (Riskesdas, 2010).

HAZ. The indicator HAZ describes the nutritional status of chronic nature, meaning that arise as a result of a longstanding state such as poverty, parenting behaviors are not appropriate, and often suffer from recurrent disease because of poor hygiene and sanitation. Stunting among children under five nationally is a serious nutritional problem with an average national prevalence of around 35.6% (Riskesdas, 2010).

WHZ. The indicator WHZ is generally describe acute nutritional status as a result of circumstances that take place within a short time, such as decreased appetite due to illness or because of suffering from diarrhea. In such circumstances the child's weight will quickly go down so that no longer proportional to the child's height and the body mass of the child decreases. Nationally, wasting prevalence of children under five is 13,3% (Riskesdas, 2010).

Wasting is considered as a significant public health problem when the wasting prevalence > 5%. When the wasting prevalence is between 10-15% it becomes serious public health problem, and become emergency situation when the prevalence is above 15% (UNHCR).

Direct factors affecting nutritional status

Based on UNICEF conceptual framework, malnutrition is determined by immediate (food intake and health status), underlying (household food security, social care environment, and health service and health environment), and basic determinants (e.g. political, social, cultural and economical context).

Due to underfive dependence to caregiver and their critical early years, underfive is considered to be among the high risk group of malnutrition. Moreover, in orphanage underfive are most vulnerable and disadvantaged. Many mothers who leave their babies or deliver the child to an orphanage in desperation often have nutrition problems during pregnancy, such as hunger or malnutrition (Rygaard, N.P., 2008). Moreover, it perpetuates the problem from generation to the next, as malnourished women are more likely to have low birth weight babies (World Bank, 2003).

Studies on orphanage

There were several studies on orphanage abroad, but in Indonesia the study is still limited, particularly on orphanage children aged 0-59 months as subject. In 2007, Social Ministry cooperates with UNICEF conducted study on six provinces in Indonesia (excluding Jakarta), but did not touch nutrition sector. There was a study on orphanage conducted by M. Rachmat and Ratna Djuwita in 1999 about association of food intake and nutritional status, but the subject was children aged 6-18 years. Some studies on orphanage in abroad are shown in table below:

Table 2.1 Summary of studies on orphanage children

Authors and years	Title and country	Study population	Main findings
Sadik A. 2010	Orphanage Children in Ghana: Are their dietary needs met?	Orphanage children aged 2-18 years and orphanage workers (administrative staff and caregivers)	1) 85% (n=34) of the children have a normal WAZ, 10% were underweight, and 5% above +2 Z-score 2) 77,5% have a normal HAZ, 10% were severely stunted, 5% were nourished 3) 80% have normal WHZ, 15% were severely wasted, and 5% were at risk of overweight 4) The dietary intake of children aged 1-3 years was deficient for all nutrients except for protein and magnesium, 5) The dietary intake of children aged 7-10 years was deficient for all nutrients except for protein when compared to RDA's 6) The dietary intake of children aged 11-14 years intake of all the other nutrient were below the RDA's except

			protein, iron, and magnesium 7) The dietary intake of children aged 15-18 years except protein and zinc, however the protein intake of females show an intake below the RDA
Panpanich, R. Bernard B. Andrew G. and Stephen G. 1999	Are Orphans at Increased Risk of Malnutrition in Malawi?	Village orphans, non-orphans, and orphanage children	1) For the group of children under five the prevalence of undernutrition in orphanage children was 54.8% compared with 33.3% and 30% of village orphans and non orphans respectively. 2) 64 of young orphanage children were stunted compared with 50% of village orphans and 46.4% of non-orphans 3) The mean (SD) Z-score of height/age of orphanage group was significantly lower than village orphans and non-orphans group 4) Young orphanage children are more likely to be undernourished and more stunted than village children
Jayasekara C.R. 2006	Nutritional Status of Children Under Five in Three State Foster Care Institution in Sri Lanka.	Children aged 3-60 months	The prevalence of PEM, was 51.9% stunting, 63.5% underweight, and 25.0% wasting and considerably higher than the national prevalence (13.5%, 29.4%, and 14.0% respectively)

2.3 Energy, protein, and micronutrients

Nutrient requirement.

Adequate nutrition during infancy and early childhood is fundamental of each child potential development. As for nutritional needed by underfive children based on RDA 2004 as follows:

Age group	Recommended Dietary Allowance					
	Energy (kcal)	Protein (g)	Calcium (mg)	Zinc (mg)	Iron (mg)	Vitamin A (RE)
0-6 mos	550	10	200	1.3	0.5	375
7-12 mos	650	16	400	7.5	7	400
1-3 year	1000	25	500	8.2	8	400
4-6 year	1550	39	500	9.7	9	450

Source: RDA 2004

Energy. Children have very high energy and nutrient needs for normal body growth and activity (Gross, R., 1997). Foods provide the body with the energy to stay alive, move and grow. Adequate energy is essential for growth and brain development, and required for basic metabolic function. Energy keeps hurt pumping, lungs inhaling, and the body warm. Energy also used to keep stomach churning and muscles working (Smolin, L.A. and Grosvenor, M.B, 2005).

Protein. Protein is needed for growth, maintenance, and repair of body structures and for synthesis for regulatory molecules. It can also be broken down to produce energy (Smolin, L.A. and Grosvenor, M.B, 2005). In addition, protein has an integral role in every living cell and plays important role in immune system (Insel *et.al*, 2006).

Vitamin A. Vitamin A is important to a healthy immune system, vision, and reproduction. This vitamin is found naturally in meat, breast milk, dairy products, eggs, and some fruits and vegetables (USAID, 2009). By increasing and sustaining vitamin A together with zinc intake it could reduce under-five mortality (Micronutrient Initiative, 2007).

Iron. Iron is important in blood cell formation and functioning. Iron is found in red meat and breast milk, and, in a less easily absorbed form, in grains, legumes, and vegetables. Together with vitamin A, iron has been shown to profoundly affect child survival, adult productivity, and overall resistance to

illness (USAID, 2009). Increased and sustained intake of iron also could improving the cognitive development of and educational outcomes among children (Micronutrient Initiative, 2007).

Calcium. Calcium is important for many other body functions, such as muscle contraction and exocytose. Calcium is also essential for nerve conduction, the regulation of enzyme activity and the formation of cell membranes. Approximately, 99% of the calcium currently in the body is stored in teeth and bones. Milk, yogurt, broccoli, kelp, almonds, quinoa, okra, blackstrap molasses and sardines are good sources of calcium. By adding these calcium-rich foods to the diet, it can help improve the levels of calcium in the body (McDowell, Patrick 2008).

Zinc. Zinc is an essential nutrient for human health and every human needs zinc to survive. Ensuring adequate level of zinc intake is a key component in efforts to reduce child illness, enhance physical growth and decrease mortality in developing countries (IZA, 2011)

Malnutrition problem

For developing countries, the highest nutritional priority is related to deficit food intake that affected nutritional deficiencies such as protein energy malnutrition, calcium deficiency, vitamin A deficiency, and anemia (Atmarita, 2005). People may have enough to eat, but still not consume enough micronutrients because only certain foods contain significant amounts of micronutrients. Doing so, it depends on the availability and accessibility of nutrient-rich foods and the dietary practices related to their preparation and consumption (USAID, 2009).

Nutrient	Problem
Energy - Protein	A pure protein deficiency can occur when protein needs are high and food choices are very low in protein. Protein energy malnutrition (PEM) is use to refer to the continuum of conditions ranging from pure protein deficiency (kwashiorkor) to energy deficiency (marasmus). Kwashiorkor symptoms including reduces growth, increase susceptibility to infection, changes in hair colour, dry

	flaking skin, and bloated bellies. While the energy causes growth to slow or stop, body fat store to be depleted, and muscle to shrink, making the body appear emaciated. It is the form of malnutrition that occurs with eating disorder (Smolin, L.A. and Grosvenor, M.B, 2005).
Vitamin A	Hard, bumpy, and scaly skin is an early symptoms of vitamin A deficiency. Vitamin A deficiency interacts with other nutrient deficiencies and with infection, worsening respiratory infection or diarrhea and causing countless death (Insel, *et al.,* 2006). In Indonesia, although vitamin A intervention program has successfully reduced, the clinical prevalence of VAD (xerophthalmia) to 0.33% in 1992, a level in which VAD was no longer considered as a public health problem, but at the sub-clinical level, 50% of the children under five still had low serum retinol (Atmarita, 2005).
Iron	IDA impairs the cognitive development of young children is the most prevalent nutrient deficiency in the world (ADB, 2010). Based on the National Health and Household Survey (NHHS) 1995 and 2001, the prevalence of IDA in Indonesia increased for under five from 40% (1995) to 48% (2001), particularly it is very high (>55%) in the younger children (<24 months) (Atmarita, 2005)
Calcium	When the body is deficient in calcium, bones and teeth will begin to slowly deteriorate. This occurs because the body is pulling calcium from bones in order to perform other essential functions. Being deficient in calcium for a long period of time can cause health problems such as rickets, as well as poor blood clotting (McDowell, Patrick 2008).

Zinc	The body needs zinc to use vitamin A efficiently. Inadequate zinc intake can cause vitamin A deficiency symptoms. Although Indonesia has no large scale data on zinc deficiency but a small-scale study (1997-1999) in West Java, Central Java, and Lombok showed the prevalence of Zinc deficiency among infants was from 6-39% (Satoto, 1999 as cited by Atmarita, 2005).

2.4 Feeding practice

Feeding practice, one of the most neglected determinants of young child malnutrition, constitute a major component of child caring practices and have important role in growth pattern of children (Engle, P. L. et al., 1997). Over two-thirds of deaths causing by malnutrition are often associated with inappropriate feeding practices, particularly occur during the first year of life (WHO, 2003).

Feeding practice become more important since under five's dependence to caregiver. Latham, M.C. (1992) stated that, Infant and young children up to three years old are almost totally depends on other for food. While, children three to five years of age have some ability to gather food, to select a diet, and to feed themselves, but in most society children up to about age six years are considered to need feeding care.

Care-related feeding behaviors determine the actual amount of food ingested by young child, and ultimately determines the delivery of adequate food and health to the child. Care-related feeding behaviors also determine how available health services, for both preventive and curative purposes, are utilized to optimize child health and thereby influence nutrition (Ramakrishnan, 1995).

Feeding practices of caregiver that could affect the child's nutrient intake including adaptation of feeding to the child's characteristic, taking into consideration psychomotor capabilities (such as use of finger foods, spoon handling ability, ability to munch or chew) and appetite; responsiveness of the caregiver to feeding situations, including encouraging the child to eat, offering additional foods, providing second helpings, stimulating eating through threats, timing of feeding, responding to poor appetite, and interacting positively with the child; and appropriateness of the feeding situation, including the organization and

regularity of feeding, supervision and protection of the child while eating, frequency of feeding, monitoring with whom the child eats, and elimination of distraction during eating (Engle, P. L. et al., 1997).

2.4.1 Feeding frequency

Feeding frequency has appeared to be associated with child anthropometric status (Ramakrishnan, 1995; Engle, P.L et. al., 1997; WHO, 2005). For infant 0-6 month, breast fed should be provided whenever they want, at least eight times in a day. For feeding non-breastfed children 6-24 months of age, meals should be provided 4-5 times per day, with additional nutritious snacks (such as pieces of fruit or bread) offered 1-2 times per day, as desired. Meanwhile, for children more than 24 months, meals should be provided three times a day 1/3-1/2 adult's portion, with snacks 1-2 times between meal's times (WHO, 2005; Ministry of Health, 2010).

The appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding. If energy density or amount of food per meal is low, more frequent meals may be required. The minimum number of meals required with three different estimates of energy density. At the lowest energy density (0.6 kcal/g), 5-6 meals/day would be needed. This decreases to ~ 4 meals/day when energy density is at least 0.8 kcal/g and to ~ 3 meals/day when energy density is at least 1.0 kcal/g. If a child typically consumes amounts that are less than the assumed gastric capacity at each meal, meal frequency would need to be higher. Thus, not all children will need the number of meals. As it is not possible to know which children have higher or lower energy requirements, caregivers should be attentive to the child's hunger cues when judging how often and how much to feed the child (WHO, 2005).

2.4.2 Feeding responsiveness

Responsive feeding refers to interaction between caregiver and child that lead to a positives feeding experience, adequate dietary intake, and enhanced developmental opportunities. Responsive feeding includes: 1) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; 2) feed slowly and patiently, and encourage children to eat, but do not force them; 3) when children reject many foods, experiment with

different food combinations, tastes, textures and methods of encouragement; 4) minimize distractions during meals if the child loses interest easily; and 5) talking to children during feeding, with eye to eye contact because feeding times are periods of learning and love (WHO, 2005).

Referring to Engle, P.L. et.al. (1997), responsiveness of the caregiver to feeding situation, are including encouraging children to eat, offering additional foods, providing second helpings, stimulating eating through treat, timing of feeding, responding to poor appetite, and interacting positively with the child. Particularly with young children, feeding can be an active process, but in many societies, caregivers are passive feeders, leaving initiative to eat to children.

Passive feeding may be due to the lack of time and energy or due to beliefs that children should not be pressured to eat, that "the stomach knows its limits" (Bentley, Black, and Hurtado, 1995 as cited by Engle, P.L et.al., 1997). If a child has anorexia or a poor appetite, extra encouragement may be necessary for adequate nutrient intake because they are difficult to feed. When anorexia is a problem, caregivers need actively to encourage food consumption. Recent study findings from Vietnam seem logical; when children are verbally encouraged to eat, they respond favorably; when children are physically forced to eat, they may have little opportunity to reject food (Dearden, K.A. et.al., 2009).

2.4.3 Feeding during and after illness

During illness, the need for fluids is often higher than normal. For example, non-urinary water losses during diarrhea can be 2-3 times greater than usual. Illness may reduce a child's appetite (Engle, P.L. et.al., 1997) therefore continued consumption of foods is recommended to increase fluid intake during illness and encourage the child to eat soft, varied, appetizing, favorite foods to maintain nutrient intake and enhance recovery (Brown, 2001 as cited by WHO, 2005).

After illness, the child needs greater nutrient intake to make up for nutrient losses during the illness and allow for catch-up growth. Extra food is needed until the child has regained any weight lost and is growing well again. Thus, giving food more often than usual and encourage the child to eat more. Fever can also increase water losses. In such circumstances, it is essential that extra fluids be provided in addition to the water that would be coming from the normal diet. If a

non-breastfed child refuses the quantity of water needed, it may be necessary to restrict the intake of foods that are high in potential renal solute load during illness, such as fish, cheese, chicken, beef, and liver (WHO, 2005).

2.4.4 Food type

At the beginning of six months, infants can eat purees, mashed and semi-solid foods. By eight months most infants can also eat "finger foods" (snacks that can be eaten by children alone), and by 12 months, most children can eat the same types of foods as consumed by the rest of the family (WHO, 2005). It is required close attention by the caregiver to give type of food appropriately.

Semi-solid or pureed foods are needed at first, until the ability for munching or chewing appears. When foods of inappropriate consistency are offered, the child may be unable to consume more than a trivial amount, or may take so long to eat that food intake is compromised (WHO, 2005). There is suggestive evidence for introducing "lumpy" solid foods: if these are delayed beyond ten months of age, it may increase the risk of feeding difficulties later on (Northstone et al., 2001). Thus, although it may save time to continue feeding semi-solid foods, for optimal child development it is advisable to gradually increase food consistency with age (WHO, 2005).

2.5 Food available in the orphanage

2.5.1 Food variety of daily menus

Balance menu is menu consisting of varied food in appropriate quantity and proportion, for meet nutrient need to maintain and amelioration cells, life process, also growth and development. Presence or absence of essential nutrients could affect existence, absorption, metabolism, and requirement of other nutrients. Therefore, these interrelated among nutrients emphasize varied food in daily menus (Almatsier, S., 2004).

Poor food choice and unhealthy eating habit adopted during childhood can lead to a range of diseases and health related problems in later life. The National Health and Medical Research Council of Australia (NHMRC) recommend that children and adolescents maintain a varied diet which includes the five main food groups (Owens, A., 2008).

According to NHMRC, children and adolescents need to be encouraged to eat plenty of vegetables, fruit and legumes, and cereals (including bread, rice, pasta, and noodles) preferably wholegrain. The NHMRC also stated that a healthy diet includes; lean meat, fish, poultry; milk, yogurt, cheeses; and limited serving of saturated fat, margarine, butter, and oil. The balance of these food groups is essential for maintaining children's health and wellbeing. The NHMRC also advises that children be encouraged to drink plenty of water throughout the day and to choose water as a prefer drink or refreshment. Moreover, children also need to be offered healthy snacks throughout the day to help maintain their energy levels. Snacks should be nutritious, and should vary in colour, texture and flavor to make them more appetizing for children (Owens, A., 2008).

Appetite is identified as extremely important and interrelated factors where inadequate care determines the actual food intake of the child (Ramakrishnan, 1995). Factors such as a monotonous diet, lack of nutrients needed for appetite (for example zinc) (Engle, P.L. et.al., 1997). To cope monotonous diet and lack of nutrients needed for appetite, giving food variety of daily menus could be one of the methods to increase child's appetite. It is also helpful to ensure that nutrient needs are meet. Sadik, A. (2010) indicated, poor planning menus could affect adequate nutritional intake, then could be linked to nutritional status of children.

2.5.2 Cooking method.

Cooking makes food easy to digest, improve the appearance, texture, flavor, and tastes of the food. Cooking also makes variety of dishes and safe food for eating. Cooking food is important, but some nutrients are lost during cooking. There are some cooking method include moist-heat (e.g. boiling and steaming), dry-heat (e.g. roasting and sautéing), and frying.

Good to remember positive and negative effect of cooking method to nutrition value of the food. Boiling enable great loss of nutrients such as water-soluble vitamins (e.g. folate, vitamin B_1, C) as much as 35-60%, whereas steaming is more nutrient-friendly and enable minimal loss of vitamins (10-25%). Meanwhile, by roasting heat-sensitive vitamins are par tially destroyed, some loss of water/fat vitamins (10-47%) if stock is not kept for the sauce. In addition, if fat

is used the fat content of the food becomes higher. Roasting also enable formation of acrylamide. Fortunately, by frying there is no loss of water soluble vitamins, only a small amount of heat-sensitive vitamins are destroyed, and possible increase of vitamin E based on oil used for cooking, but by deep-frying, high absorption of fat (energy rich) and formation of acrylamide are enable to happen (Nestleprofesional, 2006).

2.6 Morbidity status

As immediate determinant of nutritional status, health status is influenced by presence of diseases. Acute respiratory infections and diarrhea diseases are the most prominent in developing countries (Gross, R. et.al., 1997). Acute respiratory infection (ARI) is the major cause of morbidity and mortality among infants in developed countries (Tulchinsky, T. and Varavikova, E., 2009).

ARI is a common disease with mild to severe symptoms (Riskesdas, 2007). If the child suffers at least one of the following symptoms: common cold, earache, sore throat, cough, raspy and/or rapid breathing (breathing rate $\geq$ 60/minute for < 2 months, $\geq$ 50/ minute for 2-12 months, $\geq$ 40/minute for 12 months to 5 years, acute respiratory infection is likely (Gross, R. et.al., 1997; WHO/FCH/CAH, 2000).

ARI attacks pulmonary tissue and often severe ARI leads to pneumonia. Pneumonia is an infectious disease which becomes major cause of death particularly in children under five years (Riskesdas, 2007). WHO has estimated a third of 14-15 million deaths a year in children under five due to ARI (Webber, R., 2009). Meanwhile in Indonesia, the prevalence of acute respiratory infection disease was 25.5% (Riskesdas, 2007).

Meanwhile, diarrhea remains the second leading causing of death among children under five globally. About 1.5 million child deaths each year is due to diarrhea (UNICEF, 2009). The harm of infectious diarrhea to people embodies in the rapid spread, broad infected area and high incidence rate (China CDC, 2005).

Defined as having loose or watery stools at least three times per day, or more frequently than normal for an individual (UNICEF, 2009), diarrhea is one of communicable disease transmitted through food or water (Riskesdas, 2007). Eighty eight percent of diarrheal deaths worldwide are attributable to unsafe water,

inadequate sanitation and poor hygiene (UNICEF, 2009). Therefore, by adequate quantities of safe water, good sanitation facilities, and hygiene practice probably the prevention of diarrhea diseases (WHO, 2005).

Diarrhea is a common symptom of gastrointestinal infections caused by a wide range of pathogens, including bacteria, viruses and protozoa. Most pathogens that cause diarrhea share a similar mode of transmission from the stool of one person to the mouth of another which is known as faecal-oral transmission (UNICEF, 2009). This communicable disease transmitted through food or water (Riskesdas, 2007).

During diarrhea there is an increased loss of water and electrolytes (sodium, potassium and bicarbonate) in the liquid stool (WHO/FCH/CAH, 2000). Though most episodes of childhood diarrhea are mild, acute cases can lead to significant fluid loss and dehydration (UNICEF, 2009). Dehydration occurs when these losses are not adequately replaced and a deficit of water and electrolytes develop (WHO/FCH/CAH, 2000). It may result in death or other severe consequences if fluids are not replaced at the first sign of diarrhea (UNICEF, 2009).

The degree of dehydration is graded according to symptoms and signs that reflect the amount of fluid lost. The rehydration regimen is selected according to the degree of dehydration (WHO/FCH/CAH, 2000). In general, children with some dehydration should be given ORS solution for the first 4 hours. If the child has another non-severe illness in addition to the diarrhea, start treatment for dehydration before the other illness is treated. However, if the child has a severe illness in addition to diarrhea, assess and treat this illness first (WHO/FCH/CAH, 2000).

However, with or without dehydration, children with diarrhea should receive extra fluid, and home treatment should apply. There are three rules of home treatment: 1) give extra fluids, for the non-exclusively breastfed give the children one or more of the; ORS solution, food-based fluids (such as soup, rice water, or yoghurt drink), or clean water. Give extra fluids as much as the child will take; for children <2 years, about 50-100 ml after each loose stool; for children 2 years or over, about 100-200 ml after each loose stool, 2) continue

feeding, and 3) when to return to clinic, the child has to immediately return to the clinic if the child more sick or is unable to drink or drinks poorly, or develop fever, or shows blood in the stool. If the child shows none of these signs but is still not improving, the child has to return for follow-up at 5 days (WHO/FCH/CAH, 2000).

2.7 Health service and health environment

WHO data on the burden of disease shows that "approximately 3.1 % of deaths (1.7 million) and 3.7% of disability-adjusted-life-years (DALYs) (54.2 million) worldwide are attributable to unsafe water, sanitation and hygiene" (WHO, 2005). In addition, approximately four billion cases of diarrhea each year cause 2.2 million deaths mostly among children under the age of five, and about 10% of the population of the developing world are infected by Intestinal worms (WHO/UNICEF, 2000) related to inadequate water supply and sanitation (Feutrell, N and Collford, J.M., 2004).

Access to water supply and sanitation is a fundamental need and a human rights (WHO/UNICEF, 2000). Adequate quantities of safe water and good sanitation facilities are necessary conditions for healthy living, but their impact will depend upon how they are used. The primary direct impact of sanitation and hygiene practice is on health and the most significant is probably the prevention of diarrhea diseases and controlling worm infection (WHO, 2005).

There are three keys hygiene behaviors are of greatest likely benefit: hand washing with soap (or ash or other aid), safe disposal of children's feces, and safe water handling and storage. It could be primary barrier to other water-related disease transmissions (WHO, 2005).

Most of the diarrhea and a large proportion of intestinal worm infection infect an individual through fecal-oral mechanism, in which some of the feces of an infected individual are transmitted to the mouth of the new host through one of variety of routes. Fingers, fluids, flies, or field/floor could be agent transmission of pathogen from feces is infected to the mouth of new host directly or by contaminating drinking water or food (WHO, 2005). Often called food poisoning, food borne illness comes from eaten contaminated food pathogenic bacteria. Pathogenic bacteria get in food in a number of ways. It can end up

contaminating food when proper guidelines for cleaning hands, surfaces, and utensils for avoiding cross-contamination are not followed (USDA, 2008).

Cross-contamination is the transfer of harmful bacteria to a food from other foods, cutting boards, utensils, surfaces, or hands. It is prevented by keeping food separated and by keeping hands, utensils, and food handling surfaces clean (USDA, 2008). Practice good hygiene and proper food handling could be done by a) washing caregivers' and children's hands before food preparation and eating, b) storing foods safely and serving foods immediately after preparation, c) using clean utensils to prepare and serve food, d) using clean cups and bowls when feeding children, and e) avoiding the use of feeding bottles, which are difficult to keep clean (WHO, 2004). Moreover, constructing sanitation facilities which can prevent the spread of disease by flies and the contamination of drinking water, fields and floors should be done to erect primary barriers which prevent pathogen from entering the environment (WHO, 2005).

CHAPTER 3
METHODS

3.1. Variable Indicator Matrix

Table 3.1. Variable Indicator Matrix

No	Variable	Indicator	Method	Reference
1	Nutritional status of under five	• Weight for age • Height for age • Weight for height	Anthropometry measurement	Gibson, 2005
2	Nutrient intake	• The amount of energy and protein intake • The amount of micronutrient intake (Ca, Zn, Fe, Vit. A) • Nutrient inadequacy	2 days food record with non-consecutive day	Gibson, 2005
3	morbidity status	• Presence of diarrhea in the past two weeks • Presence of ARI in the past two weeks	• Observation • Secondary data	Gross, R. et.al., 1997
4	Feeding practices received by the children	• Frequency meals and snack per day • Feeding responsiveness of caregiver • Food type • Dietary diversity • Use of supplement	Observation	Engle, P. L. et.al., 1997 WHO, 2005 Regulation of Indonesia ministry of health. no. 155, 2010
		• Feeding during and after illness	Interview	
5	Food available in the orphanage	• Food variety of daily menus • Nutrient content • Cooking method	Observation	WHO, 2005 Regulation of health minister no. 155, 2010
6	Health service and health environment	• Access to health care • Clean water supply • Food handling • Hygiene and sanitation • Growth Monitoring • Vit. A supplementation • Immunization • Deworming	• Interview • Observation	WHO, 2004, WHO, 2005, USDA, 2008
7	Characteristic of caregiver	• Age • Gender • Education • Working duration	• Secondary data • Interview	

7		• Motivation • Job description • Obstacle • Suggestion • Workload		Engle and Henry, 1995 Engle, P.L. et.al., 1997 Engle, P.L and Lida, L., 1999 Jayasekara, C.R., 2006
8	Characteristic of under five children	• Age • Gender • Duration of stay in the orphanage • History of LBW	Secondary data	
9	Characteristic of orphanage	• Funding resources • Ratio between caregiver and children • Orphanage's regulation • Schedule for caregivers	• Secondary data • In-depth interview	

3.2 Study Design

Design of this study was cross-sectional study. It was conducted from July to August 2011 in three selection orphanages (Panti Sosial Asuh Anak Tunas Bangsa (TB), Yayasan Sayap Ibu (SI), Pondok si Boncel (PsB)).

3.3 Population

Subject population of this study was children aged 0-59 months living in orphanages, caregivers, and the person in charge on health, child care, and food service in each orphanage. List of orphanages was obtained from the Social Ministry (Director General of Services and Social Rehabilitation) and Social Department of Jakarta Province. Among 87 orphanages registered in Jakarta, which was mostly for school-aged children to adolescent, there were three orphanages which were specifically intended to take care of under five children, i.e PsB, SI, and TB. The orphanages were chosen because it met the inclusion criteria of the study, which are registered in Social Ministry, and or Social Department of Jakarta Province and specifically intended for under five children.

3.4 Sample size of the study

Sample size in this study was not based on minimum sampling calculation. This study was recruited all of under five children living in orphanage in Jakarta. There were three orphanages registered in Social Ministry (Director General of Services and Social Rehabilitation) and Social Department of Jakarta Province, i.e PSAA Tunas Bangsa (TB), Sayap Ibu (SI) Foundation, Pondok si Boncel (PsB).

In total, there were 199 children (82, 31, and 86 children) respectively registered in PsB, SI, and TB. Among them, 144 children aged 0-59 months (63, 22, and 59 children respectively) were included in the study.

This study also recruited person in charge (vice or vice head of the orphanages, staff of health service, and food handler) and caregiver in the orphanages. Caregivers' number in those orphanages was 77. Two of them took a leave and 13 persons refused to participate. In total, there were 62 caregivers which were interviewed.

Table 3.2 Number of children and caregivers of the study

Respondent's number	PsB	SI	TB
Children living in the orphanage	82	31	86
Children aged 0-59 months	63	22	59
Caregivers in the orphanage	27	17	33
Caregivers which were interviewed	26	15	21

3.5. Data Collection Procedure

Data collection was done using several methods. Such as anthropometry assessment, food record, observation, interview, in-depth interview, and secondary data.

3.5.1 Anthropometry assessment

Anthropometry assessments were performed to measure body weight and length/height of the children.

Body weight

Body weight of the children was measured by using electric scale weight scale SECA. The scale was positioned in flat surface and the starting point should be on zero. The children who can stand alone were asked to stand in the center of the platform with upright position. Meanwhile for the children who could not weighed on stand position were weighed in caregiver's hold. Caregiver's weight was measured first. While the caregiver still standing on the weighed scale, the scale was set on zero point, then the child was passed to the caregiver arms. During weighing, the child should not wear any slipper/shoes, hat, and should wear minimum cloth as possible. The body weight recorded to the nearest 0.2 kg.

The measurements were done twice for every child. The end result was the average of two measurements (Gibson, 2005).

Body height

Height of the children (more than 24 months) was measured in standing position by using microtoice. To perform height measurement, microtoice was placed in flat wall. During the measurement, slippers or shoes was taken off, as well as hair accessories. The child stands straight, feet together, and knees straight. The enumerators make sure the subject's heels, buttocks, and shoulder blades are in contact with the vertical surface of the wall. Subject's arms should be hanging loosely at the sides with palms facing the thighs. When the child's position was correct, the head-bar is then lowered until it touches the crown of the head and compressed the head, and then the measurement was read to the nearest 0.2 cm. The measurement was done twice for every child, and the end result was the average of two measurements (Gibson, 2005).

Recumbent length

The recumbent length was done for infants and under five children whose age less than 24 months, by using length board. The length board was placed on a horizontal surface. Two enumerators were required to correctly position the child and ensure the accurate and reliable measurement of length. The child was laid down with face up-ward and the head toward the fixed end of the board and the body parallel to the board's axis. Then, one enumerator applied a gentle traction applies to bring the crown of child's head into contact with the fixed headboard and position the head so that the frankfrurt plane was vertical. The second enumerator held the child's feet, without shoes or socks, toes pointing directly upward and kept the child's knee straight, brought the movable footboard to rest firmly against the heels. The reading was taken to the nearest 0,2 cm. The measurement was done twice for every subject, and the end result was the average of two measurements (Gibson, 2005).

3.5.2. Food record

Dietary intake of the children was assessed through food records instead of food recall in order to minimize recall bias since one caregiver was responsible to

take care more than one child and they work based on shift system. The food record was done with following points:

1. For the children aged less than 6 months who only consumed formula milk, the researcher asked for assistance from caregivers to record amount and frequency of milk intake for each child, since the child consumed milk based on demand and no specific schedule.
2. For the children aged more than 6 months, record of food intake was done through observation by researcher team. The researcher also asked for caregiver's assistance to record child's consumption if the child wakes up at night and consumed some foods, milk, or other fluid, meanwhile the researcher was not in place.
   - To estimate amount of the child's meal, the researcher used sample of one portion of the meal. The foods were weighed using food weighing scale (SOEHNLE) then adjusted to the portion consumed by the child.
   - If the child was fed from the sharing plate with others, the amount of the child's food intake was estimated by observing the amount of the actual consumption using household measurement (table spoon), how many spoon he/she was fed and what foods were consumed.
3. To estimate amount of consumption of children who consumed soft or semi solid food (mostly children age 6-18 months) the researcher used the following methods:
   - In Pondok si Boncel portion of soft food for each child was weighed because the condition was not too crowded and researcher was permitted in the room during meal time.
   - In Tunas Bangsa and Sayap Ibu, weighing of foods served for each children were not possible to be conducted because the condition was too crowded and researcher was not permitted inside the children's room.

Quality control for estimating the children's intake

There are some food type consumed by the children, i.e children who only consumed formula milk, children who consumed semi solid food, and children who consumed solid food.

Estimating energy and nutrient intake of children who only consumed formula milk:

1. The researcher asked for assistant from caregivers to fill in a form provided by researcher.
2. The information should be filled in the form, i.e the name of the child, the time when the milk was given, how many spoon the formula milk was made, how much (ml) the milk was made, if the children didn't finished their milk how much the left over (ml), and the name of caregiver who filled in the form.
3. The form administered twice a day at around 6 am when the researcher arrived at the orphanage and 6 pm when the researcher left the orphanage.
4. When giving the form, the researcher explained to the caregiver what they should do with the form.

Estimating energy and nutrient intake of children who consumed soft food:

1. Mostly, soft food was made of *nasi tim* which was blended
2. The researcher asked the food handler information of the ingredients and amount of the ingredients that they used to make *nasi tim*.
3. To estimate the amount of macro and micronutrient content in the food the researcher made a recipe for each soft food that was served by the orphanages by using nutrisurvey program for windows 2004.
4. Most of children who consumed soft food received formula milk based on demand especially at night. To estimate the amount of formula milk that was consumed by the children, the researcher used the same way as that applied for children who only consumed formula milk.
5. During the day the researcher was in the orphanages, and left the orphanages before the children sleep at night.
6. In one day one enumerator only observed intake of two children and recorded, except in PsB.

Estimating energy and nutrient intake of children who consumed solid food:

1. Some children in TB were fed from sharing plate. To estimate the amount of foods consumed by this children, the researcher used household

measurements and observed how many spoon of each food item consumed by the children.

2. For children who feed themselves or being fed but using his/her own plate, the researcher made estimation by weighing sample of one portion of the children's food. The researcher weighed the left-over foods, if any.
3. During the day the researcher was in the orphanages, and left the orphanages before the children sleep at night.
4. Before starting daily activity, the researcher always asked the caregiver if any children consumed something at night.

Estimation of the energy and nutrient content in the food and formula milk which was served by the orphanage

Estimation for formula milk

The amount of energy and nutrient content in formula milk was estimated from the average of energy and nutrient content of formula milk which was served for children per one serving in each orphanage for each group. For children who only consume formula milk, the milk was served based on demand. For children who consume semi solid food, in Tb formula milk was served based on demand, while in SI and PsB formula milk was served twice and once respectively during the day but on demand during night. Meanwhile, children who consume solid food received formula milk two times a day and could be more if there were shipment from donors.

Estimation for soft food

The amount of energy and nutrient content in soft food which was served by the orphanages was estimated from the average of energy and nutrient content in soft food which was served per day. List of food in TB was based on 14 days record, in SI was based on 5 days record, and in PsB was based on 4 days record. The different days was because of the different number of children in each orphanage, condition. In TB and SI semi solid food served by the orphanages was provided for two times a day -lunch and dinner-, for breakfast usually children received infant cereal. Meanwhile, in PsB semi solid food served by the orphanage was provided three times a day.

Estimation for solid food

The amount of energy and nutrient content in solid food served by the orphanages was estimated from the average of energy and nutrient content in the sample portion of solid food which was served per day. List of food in TB was based on 16 days record, in SI was based on 9 days record and in PsB was based on 9 days record. The different days was related with the different number of children in each orphanage and condition. In one orphanage the situation was more conducive, thus enumerators be able to observe more than two children in one day. The researcher used sample portion for solid food since basically almost all of the children in the same orphanage received the same portion.

3.5.3. Morbidity status record

Morbidity status of the children was recorded by two weeks observation (check list) through an orphanage visit. Researcher also cross checked the observation result to health record book available at every child's room in each orphanage. The recording was done by caregivers' everyday before they shift exchange. The observations and cross checked were done daily for two weeks before the children were measured for their body weight and height/length.

3.5.4. Observation

Observation was used to explore feeding practice received by the children, and was done observed during the meal time. Every child was observed on how they were fed by caregiver. Observation was also conducted to observe food available in the orphanages and some health care and health environment indicators.

3.5.5 Interview using structural questionnaire

Interview was addressed to the caregivers to know generally their motivation, obstacle, and workload of being a caregiver in the orphanage. They were also asked about their suggestion. Interview to caregiver was also delivered to know feeding practice in terms of feeding during and after illness of the children who experience illness or recovery during the study. Besides to caregivers, interview was also addressed to the person in health section to obtain information about health care and health environment.

3.5.6. In-depth interview

In-depth interview was addressed to the vice head of Tunas Bangsa, to one of the managers in Sayap Ibu, and to the head of Pondok si Boncel to obtain the information about characteristic of the orphanage.

3.5.7 Secondary data

Secondary data was used to get the data about characteristics of under five (date of birth, birth weight history, date of entrance), caregivers (general information), and the orphanage.

3.6. Data analysis

3.6.1 Nutritional status

The data of body weight and height/length was transferred into WHO anthro 2005 to get the value of Z-Score. Nutritional status of the children was then classified based on WHO classification (WHO, 2006).

Table 3.3 Nutritional status classification

Indices (z-score)	Categories	Reference
WAZ > -2 SD	Well-nourished	WHO, 2006
WAZ < -2 – (-3 SD)	Moderately underweight	
WAZ < -3 SD	Severely underweight	
HAZ > -2 SD	Well-nourished	
HAZ < -2 – (-3 SD)	Moderately stunting	
HAZ < -3 SD	Severely stunting	
WHZ > -2 SD	Well-nourished	
WHZ < -2 – (-3 SD)	Moderately wasting	
WHZ < -3 SD	Severely wasting	

3.6.2 Nutrient intake

Nutrient intake of the children was analyzed by using nutrisurvey program for Windows 2004 with Indonesian baseline as the main source. When food item was not available in nutrisurvey, the study used FCT from Persagi 2009 or nutrition fact from the label for food manufactured. To assess prevalence of inadequate intake of the children, the study used the following method:

- Energy and protein

  Energy and protein intake was compared to the nutrient requirement of children using Indonesia RDA (2004).

  Table 3.4 Energy and protein requirement at different age group.

Age (months)	WHO 1998	
	Energy (Kcal)	Protein (g)
0 – 3.00	437	6.7
3.01 – 6.00	474	7.3
	WHO 2005	
	Energy (Kcal)	Protein (g)
6.01-9.00	600	9.1
9.01– 12.00	700	9.6
Age (months)	Indonesian RDA 2004	
	Energy (Kcal)	Protein (g)
12.01 – 36.00	1000	25
36.01 – 59.99	1550	39

As shown in the table 3.4, the energy and protein intake was classified as inadequate if the intake is less than 77% RDA.

- Calcium, Zinc, and Vitamin A

Short-cut probability analyses EAR cut point method was used to assess the prevalence of inadequate nutrients (Ca, Zn, and Vitamin A) intake of the children (Smolin, L.A., & Mary, N. G., 2005).

Table 3.5 EAR for calcium, zinc, and vitamin A in different group

Age (months)	EAR[a]		
	Calcium (mg)	Zinc (mg)	Vitamin A (RE)
12.01 – 36.00	416.67	6.83	285.71
36.01 – 59.99	416.67	8.08	321.43

[a]EAR = RDA/Conversion factor, (conversion factor for children aged 12-59.9 months is 1.2 for Ca and Zn; 1.4 for vitamin A)

- Iron

For assessing prevalence of iron inadequacy, the study used full probability approach method with 10% bioavailability from probability of inadequate iron intake.

Table 3.6 Probability of inadequate iron intakes for different age groups

P for inadequacy	10% Bioavailability	
	12.01 – 36 months	36.01 – 59.99 months
1.0	<1.8	<2.4
0.96	1.8 –2.3	2.4 – 3.0
0.93	2.3 –2.8	3.0 – 3.7
0.85	2.8 –3.6	3.7 – 4.8
0.75	3.6 – 4.2	4.8 – 5.7
0.65	4.2 – 4.8	5.7 – 6.5
0.55	4.8 – 5.4	6.5 – 7.4
0.45	5.4 – 6.1	7.4 – 8.4
0.35	6.1 – 6.9	8.4 – 9.5
0.25	6.9 – 7.9	9.5 – 11.0
0.15	7.9 – 9.5	11.0 – 13.2
0.08	9.5 – 10.9	13.2 – 15.2
0.04	10.9 – 12.3	15.2 – 17.2
0	>12.3	>17.2

Source: Gibson, R.S., and Fergusson, E.L. (1999).

3.6.3 Feeding practice

Frequency of meals and snack. Frequency of meals and snack was derived from food record and was counted as number of meals and snack received by the children. For children aged more than six months, the number of meals and snack was categorized into sufficient meals frequency (≥3 times/day), insufficient meals frequency (<3 times/day), sufficient snacks (> 2 times/day) and insufficient snacks frequency (< 2 times/day).

Feeding responsiveness. Information of feeding responsiveness received by the children was percentage based on each items in feeding responsiveness indicators since not all of the items applicable with all of the children's condition. The denominator is children who show variables of feeding responsiveness under study, i.e cues of hunger, in case of children refuse to eat or didn't finished meal.

Food type. Food type was analyzed based on WHO guidelines about food consistency and recommendation feeding from Ministry of Health. At the beginning of six months should a child had complementary food and advisable to gradually increase food consistency with age. More than nine months a child should receive semi solid food, and by 12 months children have started to recognize the type of family meals (MoH, 2010). Food type was categorized as inappropriate if child more than six months had not received food, more than nine months still receive soft food or still had semi solid food for child more than 12 months.

Dietary diversity score (DDS). The score of dietary diversity was used as a proxy measure of the food quality intake of the children. DDS was calculated number of different food group consumed for each child using a set of food groups (grain, roots and tubers, legumes and nuts, dairy products, flesh food (meat, fish, poultry, liver/organ meats), eggs, vitamin A rich vegetables and fruits, other fruit and vegetable) (WHO/UNICEF 2007). The total score (ranged 0-7) were then categorized into three groups, as follows:

Table 3.7 Cut off point for children dietary diversity

Dietary diversity category	Cut off point (food groups)
Low dietary diversity	≤3
Medium dietary diversity	4-5
High dietary diversity	≥ 6

(FAO, 2007)

Feeding during illness and recovery. Feeding during illness and recovery was described based on the percentage of each items in feeding during illness and recovery indicator. The denominator was obtained from the number of children who was ill or/and recovery during two weeks observation.

3.6.4 Food available in the orphanage.

Food variety of daily menu. Food variety of daily menu was described by food items variation from solid and semi solid food served by the orphanages. Food items were grouped based on food group used in dietary diversity variable. The groups are consist of grain, roots and tubers, legumes and nuts, dairy products, flesh food (meat, fish, poultry, liver/organ meats), eggs, vitamin A rich vegetables and fruits, other fruit and vegetable (WHO, 2008)

Cooking method. Data on cooking method was derived during food records. Cooking method was calculated by summing the number of each cooking method practiced by the orphanages during the study. The result was described by percentage of methods to cooked vegetables, plant protein, and animal protein.

3.6.5 Health service and health environment.

Data on health service and health environment presented from orphanage level. Description of each indicators of health service and environment variable described by access to health care, clean water supply, food handling, hygiene and sanitation, and government's programs (growth monitoring, vitamin A supplementation, immunization, deworming) related condition in each orphanage.

3.6.6 Data entry and statistical analysis

Data of caregivers on motivation, obstacle, suggestion and workload from interview was transcribed, coded, and summarized. Data entry and statistical analysis was done using SPSS program version 18. Descriptive statistic was used to describe frequency, mean, median, standard deviation, and percentiles. Non parametric test (Kolmogorov-Smirnov) was used to test normality of data distribution.

3.7 Ethical consideration

This study was conducted by following approval from the Ethical Committee of Faculty of Medicine, University of Indonesia. Consent from local government and head of orphanage is also requested before the data collection.

All of the study activities in the orphanage will be done under the agreement after the information about this study is agreed. *A*ll information were treated confidentially and only be used for the purpose of this study.

CHAPTER 4
RESULTS

4.1 General information of the orphanages

The study was conducted in three orphanages in Jakarta. As many as 144 children aged 0-59 months and 62 caregivers were involved in the study.

Table 4.1. General characteristic of the orphanages

Variable	Tunas Bangsa	Sayap Ibu	Pondok si Boncel
Orphanage's status	Under Social Department of Jakarta Province	Private orphanage	Private orphanage
Years of establishment	1985	1955	1972
Number of children	77	36	82
Number of caregivers	33	17	27
Number of child's room	3 bed rooms: • One room for 16 babies aged 0-6 months • One room for 21 children 6-24 months • one room for 40 children more than two years 1 isolation room: only for children under 2 years during illness	5 bed rooms: • One room for 13 boys aged more than two years • One room for 3 girls aged more than two years • One room for 12 children aged 8-24 months • Two rooms for 8 babies aged 0-7 months	5 bed rooms (they called units): • Three rooms (unit1-3) for 58 children aged 3-7 years • One room (unit 4) for 11 children aged 1,5-3 years • One room (unit 5) for 13 children aged 0-18 months every unit has isolation rooms except unit 3

Variable	Tunas Bangsa	Sayap Ibu	Pondok si Boncel
Schedule for caregiver	• Time off every three days • Work with 2 shift schedule: 7:30 am-5pm and 5pm-7:30 am • Every room was handled by 2-3 caregivers. They work in rotation from one room to another room every day	• time off once a week, but due to lack of caregivers they are often asked to work overtime • Work with 3 shifts schedule: 6 am-2 pm, 2 pm- 9 pm, 9 pm-7am • Every room was handled by 2-3 caregivers in rotation from one room to another room every day	• Time off once a week • Work with 3 shift schedule: 5:30- 12:30 pm, 12:30 pm-19:00 pm, 19:00 pm-7:00 am • Unit 1-3 was handled by 5 caregivers and unit 4-5 was handled by 6 caregivers • During the day, unit 1-4 was handled by 2 caregivers, while unit 5 was handled by 3 caregivers. At night each unit was handled by one caregivers • There was no rotation, the caregivers are placed at specific unit and focus on the unit that they were placed.
Monitoring and evaluation system	Activities of caring was monitored by the head of care assisted by four staffs	Activities of caring was under responsibility of head of orphanage and head of care	Activities of caring was monitored by head of orphanage assisted by six nuns.
Funding resources	• Fixed: (APBD) was 21000,- IDR per child/day and only allocated for 60 instead of all children (77 children) • Non-fixed: community which have significant contribution to fulfill the needs of orphhanage	Fixed: • The government about 3000,- IDR per day/child. • Dharmais Foundation. Non-fixed: Volunteers or donors.	Fixed: • Catholics Churches throughout the Archdiocese. • The government as much as 3000,- IDR per day/child for 70 children • Dharmais Foundation. Non-fixed: Volunteers or donors.

PSAA Tunas Bangsa

The orphanage under the social services was established in 1985 with the name of Panti Asuhan Balita. On 1st May 1996 all social institutions under the target of social services changed the name including this orphanage become Panti Sosial Asuhan Anak (PSAA) Balita Tunas Bangsa 01 Cipayung, without changing the basic functions and tasks.

The vision of this orphanage is to save children from abandonment to grow and develop with reasonable. Meanwhile, the mission are to restore the abandoned children into a normal life and normative, as well as children have a discipline, confidence, enthusiasm and responsibility. As for the objectives of the establishment of this orphanage are as Jakarta Provincial Government's efforts in dealing with abandoned children can live decent and normative, as well as Provincial Social Service of DKI Jakarta' effort to save the children from abandonment in order to grow and develop with reasonable.

With the capacity 50 children but there were more than 75 children live there, Tunas Bangsa was helped by 33 caregivers who work with two shift system. The first shift works from 7:30 am to 5 pm, while the second shift worked from 5 pm until 7:30 am. Caregiver gets time off per every three days. By the system every room was handled by 2-3 caregivers on duty about child caring.

According to the head of care, to monitor the activities of caring, she was assisted by four people on staff who was responsible for monitoring each room. If there was a problem, staff will report to the head for further follow-up. While, routine evaluation was held every 3 months.

About the training, sufficient knowledge given to the caregivers during this time majority was only in the form of a presentation delivered by the visits of college such as nursing academy or high school of health science. Even then, it can't be followed by all caregivers because it was hampered by labor time. Residential caregivers who do not live in the orphanage were also a constraint, i.e. if they are off it would be difficult to ask them to attend because most would prefer to rest.

Raised the question of services, besides caring, there are three principal services provided by the orphanage; meals, education, and health. About meals,

although they have a 10-day menu schedule but in fact it doesn't always correspond to the menu are cooked. According to the caterer it depends on market availability. However, recent changes in the system of social services that in terms of food aid is no longer the form of funding but there are partner of the government sending food to the orphanage. Unfortunately, the quality of foodstuffs obtained from partner was not perceived as good as quality food when they are spending themselves into the market.

In terms of education, in the orphanage itself, there are several educational facilities for children, ranging from play group study room and a teacher, some games such as swings and slide as well as some toys for children aged under two years. While, for children aged more than four years they were school in kindergarten outside the orphanage.

For health service the orphanage has collaboration with several hospitals. According to the health section, for hospitals partner orphanage children free of charge or at a particular hospital they have a certificate that can be used to get relief costs.

Sayap Ibu Foundation

Started from a concern for abandoned children, on September 30th 1955 some volunteers set up a place for the children with the name of Sayap Ibu Foundation. Was disbanded for some time, but because of the struggle of the board, especially Mrs. Nasution, the foundation was able to run again even been progressing quite well.

In its development, other than humanitarian mission, Sayap Ibu Foundation also carries the national mission that is tried to achieve social welfare. The center of Sayap Ibu Foundation has become a national board member of Indonesia for social welfare (DNIKS). There are two branches in Jakarta and Yogyakarta as a member of the coordinating body of social welfare activities (BKKKS).

Under the stewardship of 15 volunteers who are the holder of the authority, Sayap Ibu Foundation which is located in Kebayoran Baru, South Jakarta, deal with 36 children aged 0-7 years. Children are grouped by age and development. They are divided into 4 groups according to the room.

In caregiving activities, Sayap Ibu Foundation assisted by 16 caregivers, one nurse who also plays a role in caregiving activities and a head of care whose status was an employee. They were live in the orphanage. Caregivers working with the 3 shift systems, from 6 am to 2 pm, 2 pm to 9 pm, and 9 pm to 7 am. They got time off once a week but due to the small number of caregivers they are often asked to work overtime.

Supervision of the activities carried out by the head of orphanage as well as the head of care who was there every day. Every two weeks or at least once a month the stewards with employees held a meeting to discuss problems in the field.

About training, according to one of steward, actually Sayap Ibu Foundation has a certified baby sitter training and about two years ago some caregivers included in the training. Unfortunately, because of limited number of caregivers, current training is eliminated. Nevertheless, Sayap Ibu still holds the caring refresher information in order to increase caregivers' knowledge about child caring, although the timing was not necessarily. For a new caregiver, no special training is given, only information verbally and oversight of the way they work.

In the other thing, the requirement of meals, education, and health to be a big thing that must be met. Especially for meals, according to one of stewards, that thing requires substantial allocation of funds compared to education and health. For education itself is only a fraction of the orphanage children who has school, while they have their own kindergarten also a playground in the orphanage. In side of health service, Sayap Ibu has relation with several hospitals such as RSCM, Fatmawati Hospitals, as well as Pertamina Hospital. When the children need a doctor at the hospital they can show Gakin card to get relief. Moreover, they also work with local health centers for immunization or growth monitoring report.

To cover all of the requirements, Sayap Ibu Foundations, received fixed funding from the government about Rp.3000,- per day per child and funding from Dharmais Foundation. For the rest, they have unfixed funding from some volunteers or donors.

Pondok si Boncel

Established since 1972, Pondok si Boncel specifically aims to take care of orphaned children who are under seven years. This orphanage is part of Vincentius Jakarta (PVJ) which is one of Jakarta archdiocese's social work (KAJ) which manages four orphanages.

The vision of this orphanage is to establish an independent and faithful person, educated and noble character with the spirit of service and love that brings joy and salvation. While the mission are to accommodate and nurture, teach and educate children orphaned, displaced and other children who need help with the imitation of Christ's life, optimize growth and development of the child according to his time according to his ability to hone talent and creativity through a variety of orphanage's activities, and increase professionalism of employees to work and serve in a spirit of brotherhood.

With a capacity of 100 children, this orphanage has 82 children were divided into five rooms or units. Different from the others, there was no rolling across the room in this orphanage. Caregivers caring for children only focus on their place in the assigned unit. Thus, they are expected to know the characteristics and needs of the children. In addition, most of units have isolation room for children who suffer from infectious diseases.

According to the head of orphanage, to monitor the activities of the care she was assisted by six nuns who every day visit the units to monitor the situation. Besides that, there was also daily evaluation. Each unit shall send a representative to attend morning prayers together, if in the previous day nuns found things that need to be repaired, it will be delivered after the prayer together.

About training, both from inside or outside of the orphanage training quite often provide to the caregivers. Recently, there was training on psychological tests which organized by "enlighten" to caregivers to know the characteristics of them. Furthermore, caregivers who ultimately have the same characteristics will maintain.

Besides caring, meals, education, and health service of the orphanage are a major part of children needs. In side of meals, they entrust it to the caterer that some of them already working more than 20 years. Since 5 am they have started

to prepare breakfast. They always cook meals ahead of time so there is no "warmth food". In terms of menu, like in other orphanage despite the daily menu was available, but all returned to the availability in the market.

For education, Pondok si Boncel has its own kindergarten under Vincentious Foundation. Not only the orphanage children, the school is also quite in demand by local people. Ranging from computer classes, swimming and making crafts from clay they teach to the children. Meanwhile, in side of health service, the orphanage has collaboration with Carolus Hospital and community health center (Balkesmas) which is near with the orphanage. They also has some volunteers such as pediatricians, dentists, midwives through reflexology especially to massage the children aged 0-3 years and children with physiological problems.

To meet the various needs, PVJ received funding from various sources, the biggest basic funding they get from various Churches Catholics throughout the Archdiocese Jakarta. Every year they also received funding from the government as much as Rp.3000,- per day per child for 70 children and funding from Dharmais Foundation. For the rest, they have unfixed funding or help from some volunteers or donors.

4.2. General characteristic of the caregivers

This study recruited 62 caregivers working in the orphanages. Table 4.2 provide descriptive characteristics of the caregiver. All of caregivers were females, with the age ranging from 17-55 years. Span of their devotion in the orphanage ranged from 1 month up to 30 years. Their education level is quite good, most of them had education more than 9 years (79.1%). The head in one of the orphanage revealed that basically they want the minimum education for a caregiver is a high school, but is constrained by a lack of applicants to become a caregiver.

Table 4.2. Characteristic of caregiver

Variables	Total (n=62)
Sex of caregivers[1]	
Females	62 (100)
Age of caregivers (year) [2]	27.97 (17-55)
Duration of work (year) [2]	1.71 (0.08-30.25)
Formal education[1]	
<9 year	13 (20.9)
≥9 year	49 (79.1)
Religion[1]	
Moslem	37 (59.7)
Catholic	23 (37.1)
Christian	2 (3.2)
Ethnicity[1]	
Javanese	42 (67.7)
Sundanese	12 (19.4)
Others*	8 (12.9)

[1] n (%)
[2] med (min-max)
*others (batavian, bataknese, flores)

The main motivation of caregivers working in the orphanage was because they love children, followed by economic reasons and a few other reasons (Figure 4.1).

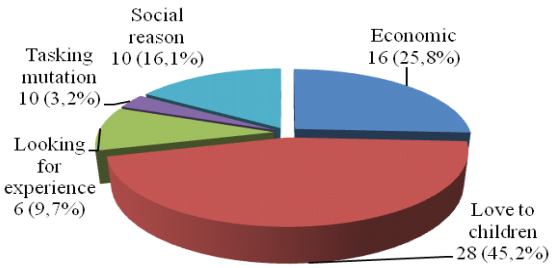


Figure 4.1 Proportion of caregiver's motivation working in the orphanage, n=62

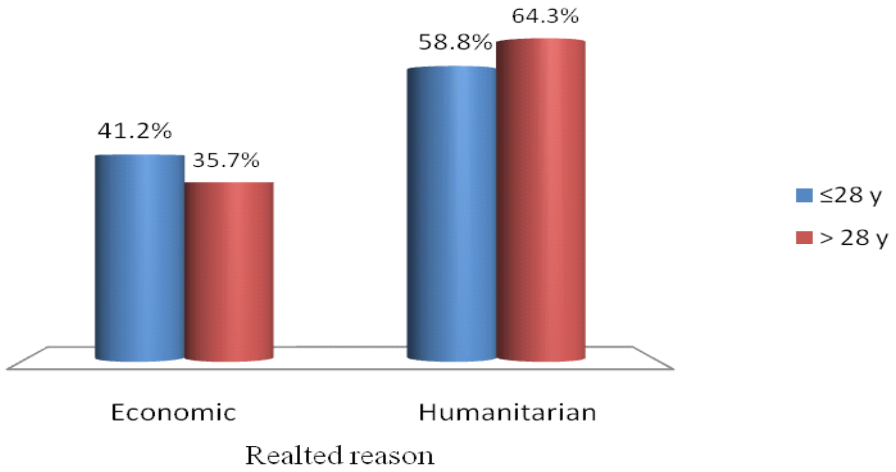


Figure 4.2 Proportion of caregiver's motivation according to age, n=62

Economic related reason: economic, looking for experience, tasking mutation
Humanitarian related reason: love to children, social reason
Chi Square test (p>0.05)

After caregiver's motivation is regrouped into economic related reason and humanitarian related reason, caregivers aged 28 years old or less was more due to economic related reason. Meanwhile, caregivers aged more than 28 years old was more due to humanitarian related reason.

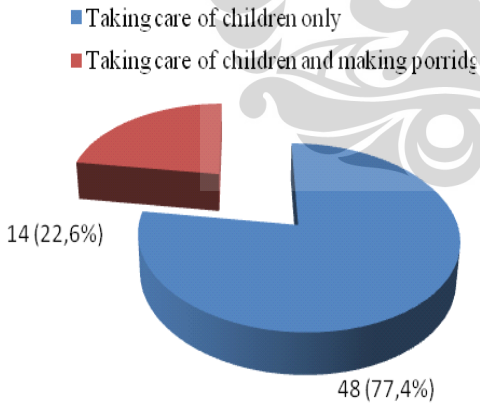


Figure 4.3 Proportion of caregiver's job description in the orphanage, n=62

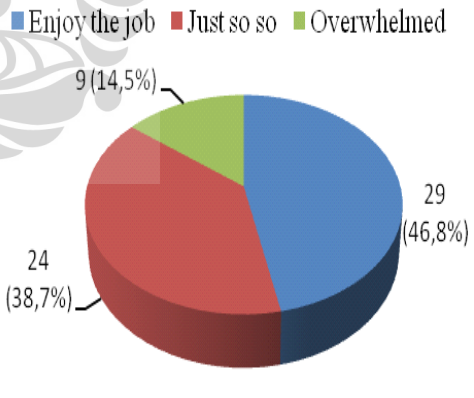
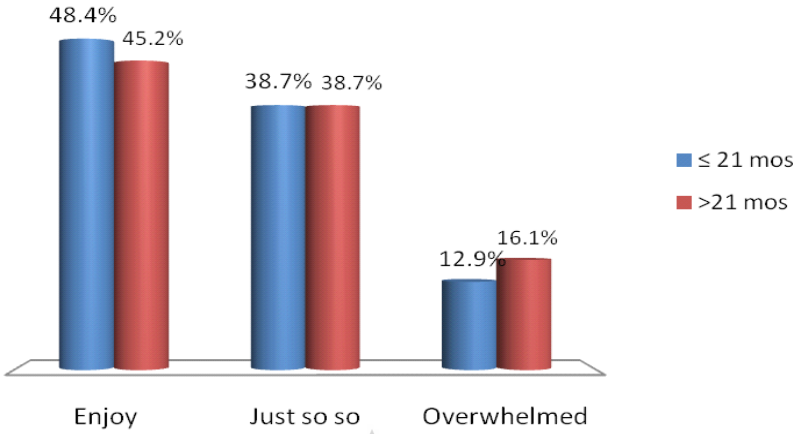


Figure 4.4 Proportion of caregiver's feeling with the job in the orphanage, n=62

Caregiver's main task was to take care of the children, including help them to take a bath, feed them, take care of the children when they were ill, and play with them. Some of the caregiver were also assigned to made porridge for children (4.3). With this responsible, most of caregivers felt happy with the job (47%), but 14.5% of caregivers felt overwhelmed (figure 4.4). According to working duration, caregivers who work for less than 21 months have higher

proportion who enjoy the job. Meanwhile caregivers who work for more than 21 months have slightly higher proportion who felt overwhelmed with the job (Figure 4.5)



4.5 Proportion of caregiver's feeling with the job according to working duration (n=62), *Chi Square test* (p>0.05)

Caregivers who were motivated by humanitarian related reason to work in orphanage tend to enjoy the job more. Meanwhile, felt overwhelmed with the job was mostly experienced by caregivers who work due to economic related reason (figure 4.6).

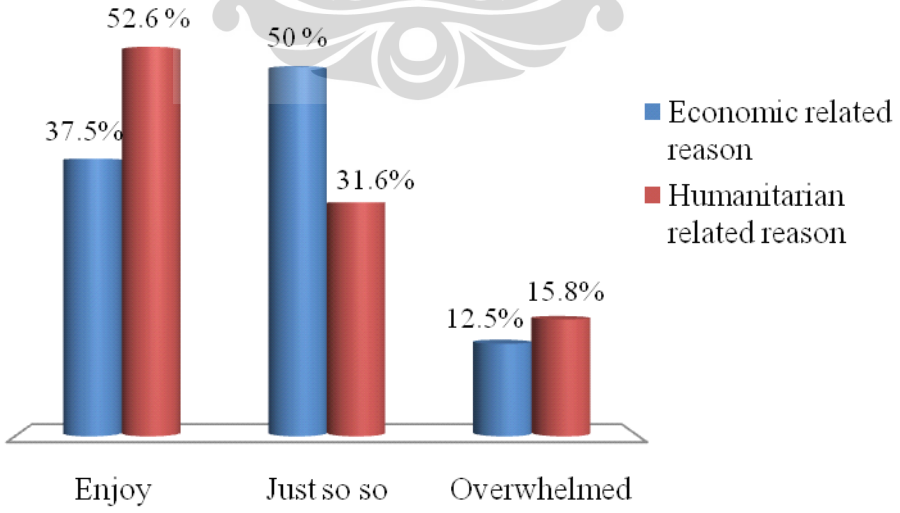


Figure 4.6 Proportion of caregiver's feeling with the job according to caregiver's motivation (n=62), *Chi Square test* (p>0.05)

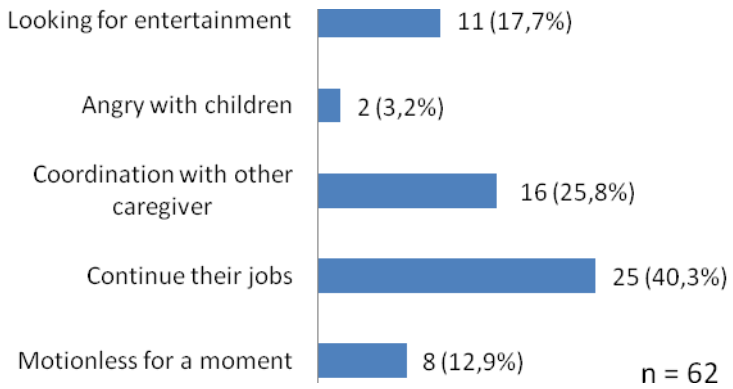


Figure 4.7 Proportion of caregiver's habitual attitude in overwhelmed situation

In overwhelmed situation usually most of caregivers just continued their jobs (40.3%). While, around one to fourth caregivers have better way, i.e coordinate with other caregivers when they felt overwhelmed.

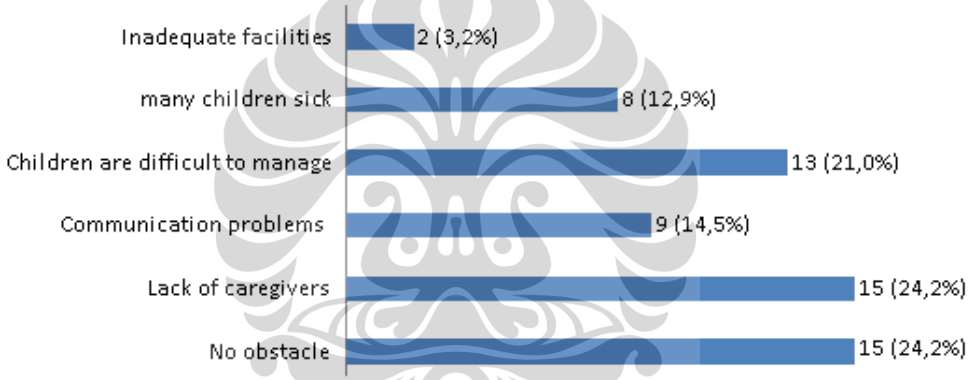


Figure 4.8 Proportion of obstacle of the job, n=62

Majority caregivers were facing some obstacle in their work. Major obstacle were lack of caregiver (24,2%) and children are difficult to manage (21%) (figure 4.8).

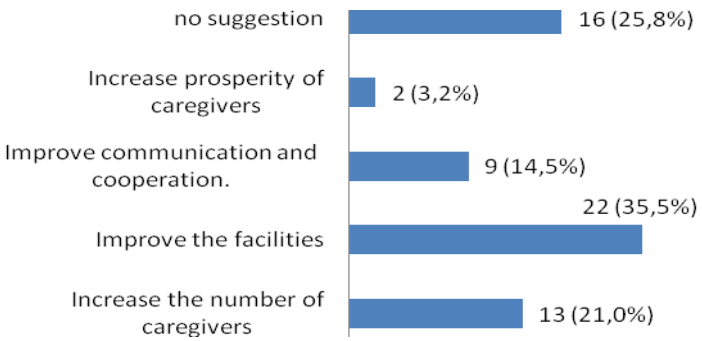


Figure 4.9. Proportion of caregiver's suggestion to the orphanage, n=62

Caregivers have some suggestion that they want to convey to the orphanage. Although the facilities was not the major obstacle of their job, but most of them (35,5%) suggest to improve the facilities especially those related to orphanage' facilities (figure 4.9).

4.3. General characteristic of the children

This study recruited 144 children aged 0-59 months living in the orphanages. Tables 4.3 provides descriptive characteristics of the children, including their status as the reason why they live in the orphanages.

Table 4.3. General characteristic of the children

Variables	Total (n=144)
Sex of children[1]	
Boys	101 (70.1)
Girls	43 (29.9)
Age of children (months)[2]	23.99 (0.16-59.10)
Age group of children (months)[1]	
0 - 6	18 (12.5)
6.01 -12.00	24 (16.7)
12.01 - 36.00	47 (32.6)
36.01 - 59.99	55 (38.2)
Duration of stay in orphanage	
≤ 12 months	71 (49.3)
> 12 months	73 (50.7)
Child's family status[1]	
Waif	50 (34.7)
Poor parents	32 (22.2)
"Unwanted" children	22 (15.3)
Divorce parents	16 (11.1)
Disabled parents	15 (10.4)
Orphaned	9 (6.3)
LBW history[1]	
Normal	40 (27.8)
LBW	28 (19.4)
Unknown	76 (52.8)

[1]n (%), [2]med (min-max)

*LBW history of children obtained from the orphanage based on hospital's information, place of babies comes from.

Majority of the orphanage children were boys, with the mean age of 23.99 in which a group of children aged 36.00-59.99 months have the biggest proportion. Children living in the orphanage were not only orphan children. The study shows, waif children have the biggest proportion among the others child's status. As the orphanage children who came to orphanage without clear identity, most of their history was unknown. But, from 68 children whose birth weight data was available, 28 children have low birth weight history (Table 4.3).

4.4 Nutritional status of underfive

Nutritional status of children is classified into three categories for each indicator, as shown in table 4.4. The prevalence of underweight, stunting, and wasting was 21.9%, 35.2%, and 6.5% respectively.

Table 4.4. Nutritional status of under five (0-59 months)

Variables	Total, n(%)
Nutritional status using indicator weight for age, n=128	
Well nourished	100 (78.1)
Moderately underweight	22 (17.2)
Severely underweight	6 (4.7)
Nutritional status using indicator height for age, n=128	
Well nourished	83 (64.8)
Moderately stunting	23 (18.0)
Severely stunting	22 (17.2)
Nutritional status using indicator weight for height, n=138	
Well nourished	129 (93.5)
Moderately wasting	8 (5.8)
Severely wasting	1 (0.7)

*Date of birth of 12 children was unknown
*Data on weight and height of 6 children was not available because the children was not in the orphanage when anthropometric measurement was conducted

According to sex, it was found that the prevalence of underweight and wasting among boys (24.4% and 7.1%) were higher than girls (15.8% and 5%) respectively. Meanwhile, the prevalence of stunting among girls (39.5%) was higher than boys (33.3%). However there is no significant difference for each indicator of nutritional status according to sex (Figure 4.10).

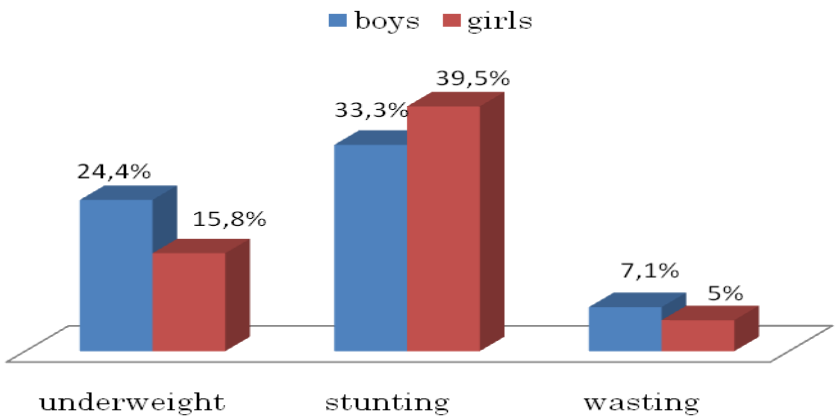


Figure 4.10 nutritional status of children according to sex, boys (n=90) girls (n=38)

[a]*Chi Square* test (p>0.05) * n=128 children (90 boys, 38 girls), **n=138 children (98 boys, 40 girls)

Table 4.5 The prevalence of undernutrition according to morbidity status

	Diarrhea, n (%)	ARI, n (%)	Diarrhea & ARI, n(%)
Underweight, (n=28)	12 (42.9)[a]	23 (82.1)[b]	10 (35.7)[a]
Stunting, (n=45)	7 (15.6)[b]	34 (75.6)[b]	6 (13.3)[b]
Wasting, (n=9)	5 (55.6)[a]	8 (88.9)[b]	4 (44.4)[a]

[a] *Chi Square* test ($p < 0.05$)
[b] *Chi Square* test ($p > 0.05$)

Table 4.5 showed there were significant association among underweight and wasting with diarrhea status and combination between diarrhea-ARI. Meanwhile, 75.6% children who were stunted, suffered from ARI .

4.5. Food available in the orphanage

In general food served by the orphanages was presented into soft, semi solid and solid food. In the orphanages, children received type of food in accordance with their room instead of their age. Although semi solid food has been introduced for children aged more than 12 months, but it was given very few and inconsistent.

Table 4.6 Feeding practice in the orphanages

Variable	Age group (months)	Reference*	TB	SI	PsB
Food type	0-6	Milk only	Formula milk only		
	6-9	Soft food	Soft foods		
	9-12	Semi solid			
	12-59	Family foods/solid	- Most of children aged 12-24 months received soft & few children received semi solid food - Most of children aged more than 24 months received solid food	-Children less than 15 months received soft & few children received semi solid semi solid -Most of children more than 15 months received solid food	-Children aged 12-18 moths received soft food -Most of children aged 18-36 months received porridge instead rice as the main source of carbohydrate -all children more than 36 months received solid food
Meal freq /day	6-9	2-3 times	3 times	3 times	3 times
	9-59	3 times			

Variable	Age group (months)	Reference*	TB		
The amount of food	6-9	6-8 spoon pressed	No standard portion		
	9-12	9-11 spoon pressed			
	12-24	1/3 of adult's potion			
	>24	1/2 of adult's portion			
Snack freq/day	6-9	-	-Children who received soft/semi solid food, received snack 1-2 times -Children who received solid food, receive snack 2-3 times		2-3 times
	9-59	2 times			
Milk freq /day	0-6	On demand	On demand	On demand	On demand
	6-9				1 time during the day but on demand during night
	9-11.9				
	12-36		Children who still received semi solid food receive milk on demand	2 times during the day but on demand during night	
	36-59		2 times		

*WHO, 2005 & Indonesian MoH, 2010

4.5.1 Energy and nutrient content in the food served by the orphanages

Energy and nutrient intake of the children was mainly obtained from the food served by the orphanage. Therefore, energy and nutrient content in the food served by the orphanages is important to assess. In addition, orphanages sometimes received donation in the form of manufactured food and drink i.e biscuits, milk, and sweetened drink.

Table 4.7 showed the average of energy and nutrient content of the food served per serving. Overall, the energy and nutrient content in the food served had fulfilled energy and nutrient requirement of the children, except for zinc. However, for children who received soft or semi solid food, actually their requirement had could be filled from three times meals, two times snack, and two times of milk. Meanwhile, the average of energy and nutrient content in formula milk was far beyond the requirement of children who only consume formula milk, which is mostly children under six months.

4.7 Energy and nutrient content in the food and formula milk served by the orphanages

Energy/ Nutrient^	Source	Meals	Snacks	Milk	Total~
Energy (kcal)	Formula milk only[a]	-	-	83.1 ± 13.5	831
	Soft/semi solid food[b]	118.3 ± 24.9	58.1± 24.9	83.6 ± 9.3	805 ± 132.2
	Solid food[c]	254.4 ± 16.4	111.9 ± 35.6	117.6 ± 46.7	1222.1 ± 308.1
Protein (g)	Formula milk only[a]	-	-	1.9 ± 0.4	190
	Soft/semi solid food[b]	4.7 ± 0.6	1.1 ± 0.6	2.7 ± 0.2	27.1 ± 6.1
	Solid food[c]	8.6 ± 1.2	1.8 + 0.6	4.0 ± 1.5	37.3 ± 11.7
Calcium (mg)	Formula milk only[a]	-	-	63.5 ± 9.9	635
	Soft/semi solid food[b]	37.2 ± 14.9	15.0 ± 8.6	97.9 ± 17.7	533.0 ± 189.7
	Solid food[c]	28.4 ± 4.9	21.3 ± 1.3	238.4 ± 122.8	604.5 ± 239.2
Zinc (mg)	Formula milk only[a]	-	-	0.4 ± 0.2	40
	Soft/semi solid food[b]	0.6 ± 0.1	0.13 ± 0.09	0.7 ± 0.02	4.8 ± 1.2
	Solid food[c]	1.0 + 0.2	0.23 ± 0.02	1.0 + 0.3	5.4 ± 1.3
Iron (mg)	Formula milk only[a]	-	-	0.9 ±0.2	90
	Soft/semi solid food[b]	0.9 + 0.5	0.4 ± 0.3	1.1 ± 0.4	7.9 ± 1.7
	Solid food[c]	1.3 ± 0.2	0.3 ± 0.1	1.3 ± 0.4	7.1 ± 1.7
Vitamin A (µg RE)	Formula milk only[a]	-	-	75.9 ± 21.7	759
	Soft/semi solid food[b]	25.0 ± 10.9	5.3 ± 1.4	82.3 ± 6.9	415.4 ± 168.2
	Solid food[c]	68.1± 9.7	17.3 ± 9.8	94.3 ± 42.01	427.7 ± 93.7

[a]Attended for children who only consume formula milk. In average, frequency of formula milk was 10, which is from the average of formula milk in TB was 11, in PsB was 11, in SI was 7

[b]energy and nutrient content from food per serving (based on 14 days record in TB, 5 days record in SI, and 4 days record in PsB)

[c]energy and nutrient content from food per serving (based on 16 days record in TB, 9 days record in SI, and 9 days record in PsB)

*Energy and nutrient is presented based on type of food instead of age group of children because within the orphanage, children with the same group may receive different type of food.

~Total from 3times of meals, 2 times of snack, and 2 times of milk for children who received solid food but 4 times of milk for children who received soft/semi solid food (getting from the average since most of children who received soft/semi solid food was provided milk on demand)

4.5.2 Food variety of daily menu

In one orphanage, daily menu was made by the orphanage staff, but unclear in the other orphanage. There was no substitute menu if the ingredient of the menu on the day was not available in the market. However, in practice the daily menu was generally depend on the financial condition and the availability of raw materials in the market.

Table 4.8. List of soft and semi solid foods served by the orphanages

Food groups^	Food items#		
	Tunas Bangsa	Sayap Ibu	Pondok si Boncel
Grain, roots, and tubers	Infant cereal, *nasi tim*, corn, potatoes, biscuit	Infant cereal, *nasi tim*, biscuit	Porridge, *nasi tim*, corn, biscuit, macaroni, infant cereal
Legumes and nuts	Tofu, tempeh	Tofu, tempeh, green bean	Tempeh, tofu, green bean, red bean
Dairy product	Milk	Milk	Milk
Flesh foods	Tuna	-	Tuna
- Fish			
- Meat and poultry	Beef, chicken liver, chicken, chicken claw, chicken head	Beef, chicken claw, chicken	Beef corned, sausage, chicken
Eggs	-	Chicken egg	Chicken egg
Vitamin A rich fruit and vegetable	Broccoli, carrot, spinach, *katuk,* bean	Tomatoes, water spinach, spinach, carrot,	Carrot, bean,
Other fruit and vegetable	mushroom, orange, apple	Banana, apple	Banana, guava, apple, cabbage

Food items are base on 14 days records (TB), 5 days records (SI), 4 days records (PsB)
^ Food groups are based on (WHO, 2008)

During the study almost all of the food groups were served in the soft and semi-solid food provided by the orphanage. However, within 14 days record in TB, only one type of fish was served and the orphanage never provided eggs. The similar condition of food variety was found at SI, from five days record. Chicken egg was served but fish was never served. Meanwhile, within four days in PsB, although fish was served but it was only one item. Moreover, variety of vitamin A-rich fruits and vegetables was limited as well (Table 4.8).

Almost all of the food groups were fulfilled in the solid food served by the orphanages. However, variety of fish served was still limited. Fish was not served during 9 days food records in PsB. In SI, only one type of fish which was served within nine days food record (Table 4.9). Moreover, in each orphanage, processed

food (i.e nugget, sausage, and meatball) were often served. In addition, children often received additional snacks from donors.

Table 4.9 List of solid foods served by the orphanages

Food groups^	Food items[#]		
	Tunas Bangsa	Sayap Ibu	Pondok si Boncel
Grain, roots, and tubers	Rice, instant noodles, corn, vermicelli, potatoes	Rice, porridge, potatoes, vermicelli	Corn, rice, instant noodle, bread, macaroni, vermicelli
Legumes and nuts	Tempeh, tofu, beansprout,	Tempeh, tofu , red beans, long beans	Tofu , long bean, green bean, tempeh, bean sprout
Dairy product	Milk, ice cream, fermented milk	Milk	Milk, ice cream
Flesh foods			
- Fish and seafood	Pomfret, tuna, carp, sardine, shrimp	Mackerel	-
- Meat and poultry	*Abon*, chicken, beef, meatball, chicken liver, nugget,	Chicken, beef, meatball, sausage, nugget, chicken liver	Sausage, beef corned, chicken, meatball
Egg	Quail egg and chicken egg	Quail egg and chicken egg	Chicken egg
Vitamin A rich fruits and vegetables	Melon, apple, *katuk*, bean, carrot, water spinach, spinach, mustard	Apple, spinach, carrot, broccoli, mustard	Papaya, melon, apple, carrot, bean, spinach, mustard
Other fruit and vegetables	Guava, cabbage, mushroom, *sayur lodeh*,	Banana, orange, *sayur asem,* cabbage, flask, pear, water melon	Banana, guava, water melon, pear, cabbage, *gudeg*, squash, flask
Snacks	Biscuit, cake, wafer, crackers, sponge, jelly, bread, *kue cucur*, fried banana, donuts	Jelly, bread, sponge, biscuit	Sponge, *pastel*, biscuit, green bean with coconut milk

[#] Food items are based on 16 days food records (Tunas Bangsa), 9 days food records (Sayap Ibu), 9 days food records (Pondok si Boncel)

^ Food groups are based on (WHO, 2008)

4.5.3. Cooking method

4.5.3.1 Cooking method of semi solid food

Most of vegetables were steamed (78.72%). Animal and plant-protein source were also mostly steamed (57.14% and 52.17%) respectively (figure 4.11).

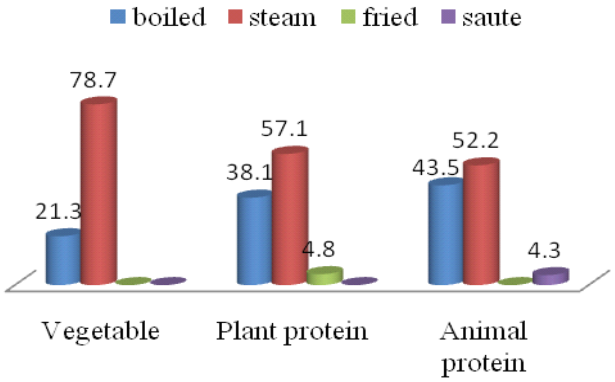


Figure 4.11. Cooking method of semi solid food served by the orphanage

4.5.3.2 Cooking method of solid food

Most of vegetables were boiled (75%). Animal and plant-protein source were also mostly boiled (56,25% and 52,05%) respectively (figure 4.12)

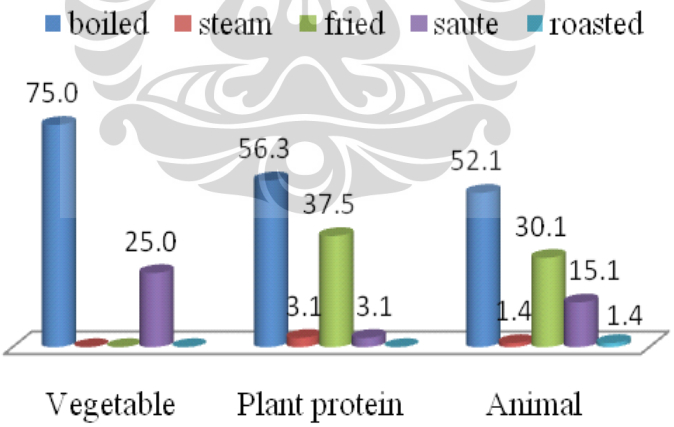


Figure 4.12 Cooking method of solid food served by the orphanages

4.6 Energy and Nutrient intake of the children

Compared with the requirement, most of the children had fulfilled energy and nutrient requirement except for zinc. The older the children, contribution of energy and nutrient intake from meals and snack was higher than younger children. Meanwhile, vice versa for contribution of energy and nutrient intake from milk (Table 4.10).

4.10 Energy and nutrient intake of the children

Energy/ Nutrient ^	Age group	Require-ment	Source	Cut off adequacy*	Meals	Snacks	Milk	Total~
Energy (kcal)	0.0-6.0[a]	437-474	WHO, 1998	336.5-364.9	-	-	745.4 ± 244.6	745.4 ± 244.6
	6.01-12.00[b]	600-700	WHO, 2005	462-539	205.4 ± 139.4	102.3 ± 61.6	424.3 ± 214.4	690.8 ± 135.3
	12.01-36.00[c]	1000	Indonesia RDA, 2004	770	770 ± 215.3	124.7 ± 94.5	289.8 ± 186.2	954.5 ± 221.3
	36.01-59.99[d]	1550	Indonesia RDA, 2004	1194	766.9 ± 175.4	183.7 ± 102.7	215.5 ± 106.7	1167.7 ± 120.2
Protein (g)	0.0-6.0[a]	6.7-7.3	WHO, 1998	5.2-5.6	-	-	20.5 (12.4-24.5)	20.5 (12.4-24.5)
	6.01-12.00[b]	9.1-9.6	WHO, 2005	7.01-7.39	8.3 ± 5.7	2.1 ± 1.7	13.3 ± 6.8	22.9 ± 4.9
	12.01-36.00[c]	25	Indonesia RDA, 2004	19.25	19.7 ± 8.9	2.3 ± 1.9	9.7 ± 6.3	31.6 ± 6.6
	36.01-59.99[d]	39	Indonesia RDA, 2004	30.03	22.8 ± 8.6	2.5 ± 1.9	8.2 ± 5.3	33.5 ± 5.7
Calcium (mg)	0.0-6.0[a]	188.2-204.1	WHO, 1998	-	-	-	613.3 ± 220.5	613.3 ± 220.5
	6.01-12.00[b]	525	WHO, 2005	-	66.1 ± 57.3	29.2 ± 31.9	451 + 219.3	577.2 ± 190.8
	12.01-36.00[c]	500	Indonesia RDA, 2004	416.7	69.1 (55.6-107.1)	13.2 (5-37.7)	323 (171.3-607.5)	550.3 (276.5-768.7)
	36.01-59.99[d]	500	Indonesia RDA, 2004	416.7	60.4 (56.0-94.9)	9.8 (4.5-35.6)	408 (286.3-572.4)	484.4 (430.9-814.9)
Zinc (mg)	0.0-6.0[a]	0.7	WHO, 1998	-	-	-	5.04 ± 3.2	5.04 ± 3.2
	6.01-12.00[b]	2.8	WHO, 2005	-	1.1. ± 0.7	0.3 ± 0.2	3.15 ± 1.5	4.5 ± 1.2
	12.01-36.00[c]	8.2	Indonesia RDA, 2004	6.8	2.4 ± 1.1	0.3 ± 0.1	2.5 ±1.5	5.1 ± 1.3
	36.01-59.99[d]	9.7	Indonesia RDA, 2004	8.1	2.5 (2.3-3.2)	0.3 (0.1-0.4)	1.4 (0.8-2.3)	4.4 (4.0-5.6)
Iron (mg)	0.0-6.0[a]	NA	WHO, 1998	-	-	-	7.5 ± 3.4	7.5 ± 3.4
	6.01-12.00[b]	11	WHO, 2005	-	1.3 (0.5-2.4)	0.5 (0.2-1.5)	4.5 (2.9-5.9)	5.7 (4.9-8.5)
	12.01-36.00[c]	8	Indonesia RDA, 2004	10%	3.2 ± 1.3	0.6 ± 0.4	3.5 ± 2.3	7.2 ± 2.1
	36.01-59.99[d]	9	Indonesia RDA, 2004	bioavailability	3.0 (2.5-3.6)	0.3 (0.1-0.4)	1.8 (1.7-2.8)	6.0 (5.1-7.5)
Vitamin A (µg RE)	0.0-6.0[a]	NA	WHO, 1998	-	-	-	797.0 ± 361.5	887.7 ± 479.7
	6.01-12.00[b]	350	WHO, 2005	-	47.8 ± 47.9	9.4 ± 8.3	435.5 + 266.0	509.6 ± 234.7
	12.01-36.00[c]	400	Indonesia RDA, 2004	285.7	160.7 ± 106.4	7.6 (1.3-2.1)	277.2 + 188.0	540.2 (422.5-595.6)
	36.01-59.99[d]	450	Indonesia RDA, 2004	321.4	121.5 (83.2-251.4)	10.3 (7.2-18)	116.6 (91.6-227.6)	394.9 (349.2-539.5)

[a] n=18, [b] n=24 [c] n=47 [d] n=55

^ mean ± SD / med (25th-75thpercentile).

~ Total is the sum up from meals, milk, snack, and vitamin

*supplement consumed by the children was mainly content of calcium and vitamin A

***Energy and protein cut off are based 77% RDA, Ca, Zn, and Vitamin A based on EAR, while iron is based on full probability approach.

Note: energy/nutrient intake of the children aged 0-2.99 & 3.00-6.00 were merged as 0-6.00 months and 6.01-8.9 & 9-11.9 were merged as 6.01-12.00 months

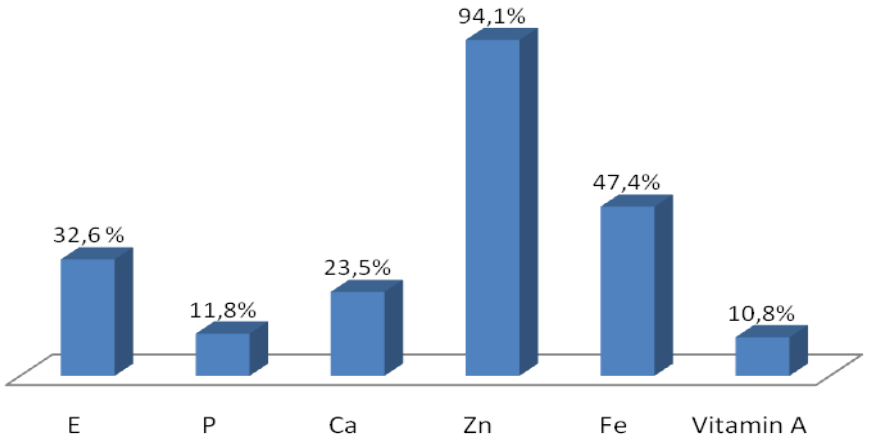


Figure 4.13 Percent inadequacy of energy and nutrient intake of the children

Percent inadequacy of E&P were based on 77% RDA
Percent inadequacy of Ca, Zn, and vitamin A were based on EAR cut-point method
Percent inadequacy of Fe based on Full probability approach
Note: E & P (n=144), Ca, Zn, Fe &Vitamin A (n=102 (getting from children aged 12-59))

Overall, almost 90% of the children had adequate protein and vitamin A intake, but more than 90% of them had inadequate zinc.

4.7. Morbidity status of under five

In orphanage, children is living together under one roof. this condition make possibility that infectious diseases can spread more easily, as shown in figure 4.14.

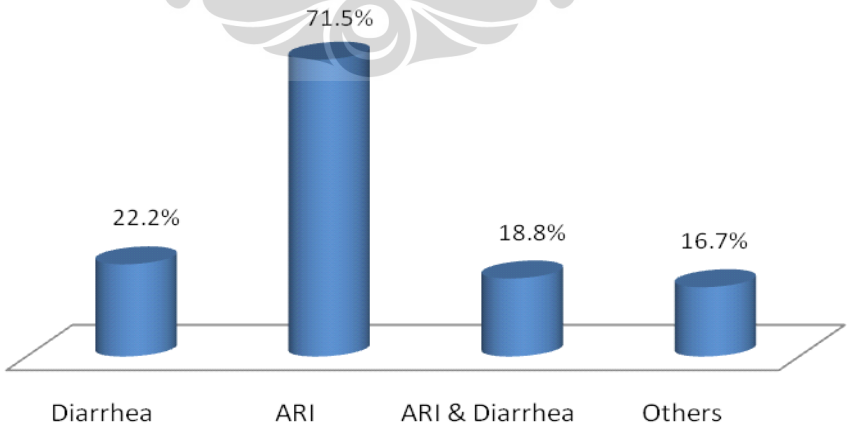


Figure 4.14 Morbidity status of children in the past two weeks

More than one-fifth children suffered from diarrhea (22.2%), almost three-quarters children suffered from ARI (71.5%), and there were 18.8% children suffered from ARI and diarrhea. Other diseases suffered by the children were measles, lung spots, hernia, sore ears, and mental disorder (Figure 4.14).

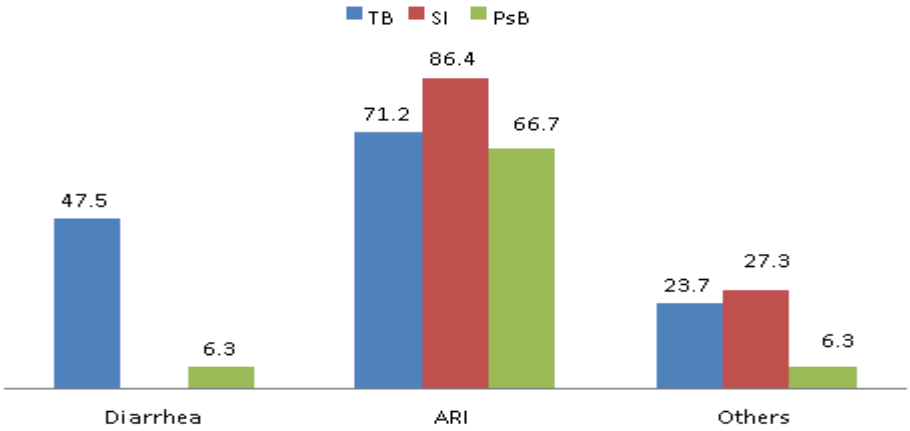


Figure 4.15. Morbidity status of under five children in each orphanage

The figure showed, in the orphanage in which bottle feeding was used for fed children who received soft food have the highest prevalence of diarrhea (47.5%). Meanwhile, for orphanage which didn't have isolation room have the highest prevalence of ARI (86.4%).

4.8. Feeding practice received by under five

4.8.1 Frequency of meals and snack

Most of the children had sufficient meals frequency (97.6%) and snack frequency (88.6%) with the same median score. For milk frequency, median score of the children who consume milk only and who had received food was 11 (7-14) and 2 (1-8) respectively (Table 4.11).

Table 4.11 Frequency of meals and snack received by under five

Variable	
Meals frequency/day*	3 (1-3)
Snacking frequency/day*	3 (1-4)
Meals frequency/day category**	
Insufficient	3 (2.4)
Sufficient	120 (97.6)
Snacking frequency/day category**	
Insufficient	14 (11.4)
Sufficient	109 (88,6)
Milk Frequency	
Children who received food (n=123)*	2 (1-8)
Children who consume milk only (n=21)*	11 (7-14)

* median (min-max)
**n(%)

4.8.2 Supplement consumption

Almost 70% of the children received supplement. Majority supplement was to increase immune system, growth and development which mainly consist of vitamin A, B, C, D, and calcium.

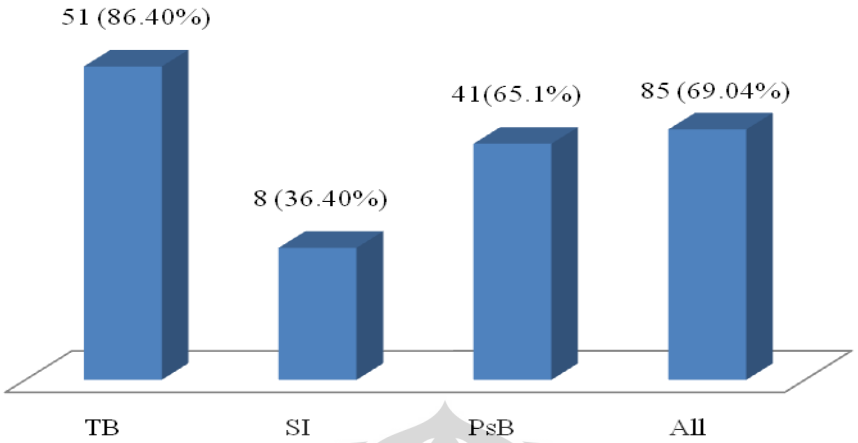


Figure 4.16 Supplement consumption of underfive in each orphanage

4.8.3 Food type

There were 27.8% children received inappropriate type of food according to their age, in which 19.4% of children more than 12 months still received semi solid, 5.6% children aged more than 9 months still received soft food, 2.1 % children aged more than six months had not received complementary food, and 0.8% children aged less than 6 months had received food (figure 4.17).

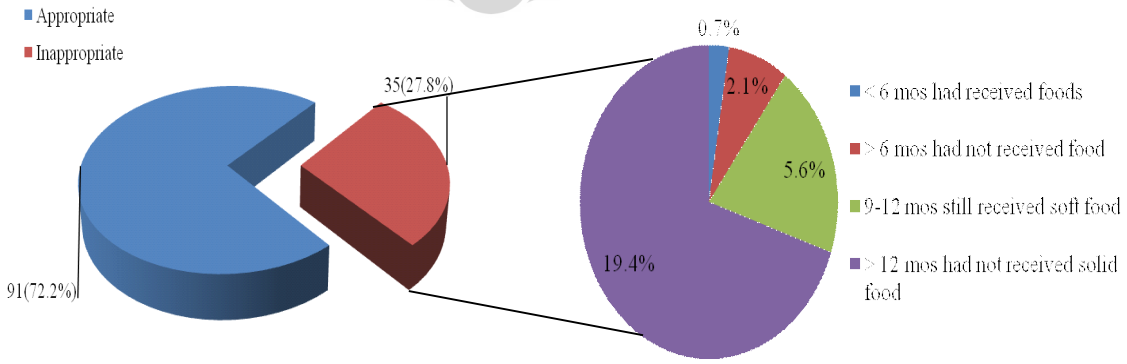


Figure 4.17 Food type appropriateness receive by children

4.8.4. Dietary diversity

In general, many children (46.5%) have high dietary diversity score with the median score was 6 (2-7), especially in SI and PsB (table 4.12).

Table 4.12 Dietary diversity of underfive in each orphanage

Variable	TB n=43	SI n=20	PsB n=60	Total n=123
DDS, med (min-max)	5 (2-7)	5.5 (2-7)	5 (2-7)	6 (2-7)
Dietary diversity category, n(%)				
Low	8 (18.6)	1 (5)	0 (0.0)	9 (6.3)
Medium	19 (44.2)	9 (45)	19 (31.7)	47 (32.6)
High	16 (37.2)	10 (50)	41 (68.3)	67 (46.5)

4.8.5 Feeding responsiveness

As one of indicators of feeding practice, feeding responsiveness of caregiver is very important since under five children highly depend on them.

Table 4.13 Feeding responsiveness received by under five

Variable	n (%)
Caregivers' was sensitive to children hunger cues (n=49)	34 (69.4)
Caregivers helped infants directly to drink milk (n=21)	8 (38.1)
The way of caregivers feed the children (n=88)	
Slowly and patiently:	77 (87.5)
Talk to children with eye contact:	
Yes gently	66 (75)
Yes roughly	8 (9.1)
Children were allowed to add the portion of food (n=11)	
Yes, for all menus	7 (63.6)
Yes, but only rice or some menus	3 (27.3)
Children were allowed to choose desired food (n=13)[3]	2 (15.4)
Caregivers' respond if the children refused food/milk since the beginning (n=51)	
Encourage the children	14 (27.5)
Delay to feed	11 (21.6)
Do nothing	3 (5.9)
Force the children	12 (23.5)
Others	11 (21.6)
Caregivers' respond if the children didn't finish their food/milk (n=79)	
Encourage the children	22 (27.8)
Do nothing	37 (46.8)
Force the children	16 (20.3)
Others	4 (5.1)

Note: n is a number of children which was relevant with the variable' item

Among 49 children who showed hunger cues, most of them (69.4%) received a positive respond from caregivers. Among 21 children who only consumed formula milk, only 38.1% of them who were helped directly to drink milk. Majority milk bottles were placed on a pile of blankets and directed to the baby's mouth. In addition, among 88 children who were fed by caregivers, most of

them were fed through a proper way. Some children were also allowed to add their portion of food. However, among the number of children who were refusing to ate or did not finish their food, only a few of them who received encouragement as the caregiver's respond to the children's behavior (Table 4.13).

4.8.6 Feeding during illness and recovery

During illness and recovery, feeding practice has important role, since during that condition, energy and nutrient needs is higher than normal condition. Table 4.14 showed how is feeding practice received by the children during illness and recovery.

Table 4.14 Feeding practice received by underfive (who had received food) during illness and during recovery (n=101)

Variables	n (%)
Children's appetite during illness	
Less than usual	33 (32.7)
Like usual	68 (67.2)
The amount of food received during illness	
Less than usual	6 (5.9)
Like usual	95 (94.1)
Frequency of food received during illness	
Less than usual	1 (1)
Like usual	100 (99)
Frequency of fluid received during illness	
Like usual	100 (99)
More than usual	1 (1)
Children's appetite during recovery	
Less than usual	22 (21.8)
Like usual	79 (78.2)
The amount of food received during recovery	
Less than usual	1 (1)
Like usual	100 (99)
Frequency of food received during recovery	
Less than usual	1 (1)
Like usual	100 (99)
Frequency of fluid received during recovery	
Like usual	100 (99)
More than usual	1 (1)

According to the caregivers, most of children had appetite as usual either during illness or during recovery (67.2% and 78.2%) respectively. During this period, most of the children received usual amount of food and frequency of food and fluid (Table 4.14).

Meanwhile, for children who only received formula milk, most of them had lost appetite during illness (81.3%) but better during recovery (60%). During illness and recovery, they should receive more fluid as intake to restore their condition. Unfortunately, most of them received fluid as usual both quantity and frequency during illness or during recovery (Table 4.15).

Table 4.15 Feeding practice received by under five (who only consume formula milk) during illness and during recovery

Variables	n (%)
Children's appetite during illness, (n=16)	
Less than usual	13 (81.2)
Like usual	3 (18.8)
Frequency of fluid received during illness, (n=16)	
Less than usual	2 (12.5)
Like usual	12 (75)
More than usual	2 (12.5)
The amount of fluid received during illness, (n=16)	
Less than usual	4 (25)
Like usual	12 (75)
Children's appetite received recovery, (n=10)	
Less than usual	2 (20)
Like usual	6 (60)
More than usual	2 (20)
Frequency of fluid received during recovery, (n=10)	
Like usual	8 (80)
More than usual	2 (20)
The amount of fluid received during recovery, (n=10)	
Like usual	8 (80)
More than usual	2 (20)

4.9. Health service and health environment of the orphanages

4.9.1 Health service access

All of the orphanages have a relationship with health services and hospital. When the children were seriously ill, they will be taken to the hospital for more intensive care. In Sayap Ibu and Pondok si Boncel, they had a nurse who lives in the orphanages, while Tunas Bangsa had a paramedic who was in there on weekdays. They became the first referral for treatment if the children were sick.

The orphanages also have a specific room for storage some medicine. Indeed, researcher found that Sayap Ibu and Pondok si Boncel have steam healer usually used when children has serious cold or cough. Also, "isolation room" was available in Tunas Bangsa and Pondok si Boncel for separating children having infectious diseases. But then, in one of the orphanages, in the practice coordination was still needed because researcher ever found that a child without infectious disease in the place, the caregiver at that time said didn't know why the children there whereas the caregiver felt nothing wrong with the child. Meanwhile, in Sayap Ibu "isolation room" was not available, according to head of care they realize it's needed but they didn't have space enough (Table 4.16).

Table 4.16 Health service facilities in the orphanages

	TB	SI	PsB
Relationship with health services and hospital	v	v	v
Nurse/Paramedic in the orphanages	v	v	v
Medicine' room	v	v	v
Steam healer facility	v	v	v
Isolation room	v	-	v

4.9.2 Clean water supply

In general, the orphanages use mineral water or gallon as source of drinking water especially for children under two years (in Tunas Bangsa and Sayap Ibu) and under three years (in Pondok si Boncel). For cooking, mineral water also used as water resource in Sayap Ibu, since the kitchen for cooking soft food was separate with solid food which used tap water shipment from another place as water resource for cooking. In the others orphanage, Tunas Bangsa used drill well water as water resource for cooking soft and solid food, in which the distance between wells and septic tank was more than 3 meters. Unfortunately, in Pondok si Boncel water resource for cooking was unknown because the researcher didn't has permission to do observation around the kitchen.

4.9.3 Food handling

There are some similarities and differences of each orphanage on how they prepare food for the orphanage children. At Tunas Bangsa, the kitchen was only handled by two people and one lady who sometimes helped them when her job was finished. According to the head of the kitchen, they started the activity since

early in the morning to prepare breakfast. Meanwhile, meals for lunch and dinner were usually cooked after they finished preparing menu for breakfast. However, vegetables were usually cooked just before lunch or dinner. semi-solid food was cooked once in the morning. Near the lunch or dinner time, the caregiver took it from the kitchen and blended the food in the room.

At Sayap Ibu Foundation there were two kitchen, one kitchen for cooking solid food which was handled by two food handler and the other one, they call it "milk kitchen" was used to cooked semi-solid solid food. The one who have to cooked semi solid food was caregiver based on the scheduled. However, solid or semi-solid foods, especially for main course were only cooked in the morning, ahead of time to eat those foods just warmed.

At the Pondok si Boncel, kitchen was handled by five people who always cook meals for each meal time. When the food was ready and the time was approaching the meal time, caregivers of each unit took the food and put it on the plate of children according to their portions.

Table 4.17 The way of food handler prepare the food

Type	TB	SI	PsB
Number of food handler	2	2	5
Soft/Semi solid	-Food handler cooked the food for lunch and dinner once in a day -For breakfast children usually received infant cereal	- One of the caregivers has the schedule to cook the food. -Food was cooked once for lunch and dinner - For breakfast children usually received infant cereal	Food handler cooked the food for each meal time (breakfast, lunch, and dinner)
Solid	- Food handler cook the food two times a day - For breakfast usually they just made noodle or fried rice	- Food handler cook the food two times a day	- Food handler cooked the food for each meal time
	The same food was also provided for the other people in the orphanage i.e caregivers, staff, and employee		

4.9.4 Hygiene and sanitation

According to WHO (2005), hygiene and sanitation have a direct impact on health, diarrhea, and worm infection. In orphanage, hygiene and sanitation condition have major influence to health condition of the children as they live under the same place.

Table 4.18 Hygiene and sanitation condition of the orphanage environment

variable	TB	SI	PsB
Food hygiene:			
Raw and cooked foods were not separately stored	x	v	-
Used bottle feeding for children who eat blended food	**v**	x	x
Children drink from sharing glass	v	x	x
Children eat from sharing plate	v	x	x
Food was protected from flies	x	v	v
Used clean utensils for cooking	v	v	-
Used clean utensils for serving food	v	v	-
Children have a clean plate/bowl to eat	**v**	v	v
Children are encouraged to washing hands before eating	**x**	x	x
Caregivers washing hands when preparing food	**x**	x	x
Caregivers washing hands to fed the children	**x**	x	x
A clean kitchen	x	v	-
Hand washing practice with soap of the caregivers after cleaning the babies bottom	v	v	v
Cleanliness of toilets	v	v	v
Cleanliness of environmental conditions in the orphanage	v	v	v
The proper way to handle garbage	v	v	v

[v] Yes; [x] No; [-] NA

Table 4.18 showed, sanitation in the orphanages was good enough. However, this study found some inappropriate practice on food hygiene, i.e the used of feeding bottle, children drank and ate from the sharing plate, hand washing which was not practiced by children and caregivers.

4.9.5 Government's programs

Following the government's program is very important for toddlers, since they are still vulnerable to disease. As for their condition in this period will greatly affect their future.

Table 4.19 Government's programs running in the orphanages

Programs	TB	SI	PsB
• Growth assessment	v	v	v
• Data on weight/height of each child was transferred into graphic (KMS)	-	v	-
• Vitamin A capsules	v	v	v
• Immunization	v	v	v
• Deworming	-	-	v

All of the orphanages follow the basic government programs for under five children i.e immunization, provision of vitamin A capsules, and body weight and height measurement. Unfortunately, only one orphanage which transferred

data on the children' weight into graphic (KMS) to know the nutritional status of the children. The other orphanages, recorded the data either in health book's of the health staff, or in health book of each child. According to health section in each orphanage, growth monitoring usually did by nurse or health staff, then the data was sent to the primary health center (PHC). Because most of the orphanages did not have KMS, they usually consult to the health center only if child's weight was much lower than the weight in previous month.

Deworming program was only provided in one orphanage routinely in June and December. Meanwhile, in the other orphanages, according to health staff, deworming was only provided when the children were suspected suffer from worm infection. Immunization was provided by PHC, either the official come to the orphanage when the orphanage asked them to immunize some children or the children were bought to the PHC.

CHAPTER 5
DISCUSSION

All of the orphanages in this study have been established for more than 25 years. Fixed funding sources were mainly from government and foundations, while unfixed funding usually come from volunteers. According to the head or vice head of the orphanage, funding from volunteers give significant contribution for daily operational.

During in-depth interview it was known that orphanage' regulations were made based on the internal decision. Indonesian Social Minister's has a guideline for accreditation of social institutions (Social Ministry, 2004), but none the orphanages were aware about the guidelines. The components in the guidelines are more on the procedural system, it's only cover the administration or organization management and general services that have to available in '*panti sosial'* in Indonesia. For example, in the standard implementation of caring activities, orphanage must made a report on the activities and the results. The information, unfortunately, is not sufficient as a reference for daily activities in the orphanage to be practiced.

Basically, some components implemented in the three orphanages have been in accordance with the government's guideline, such as availability of legal documents, organization structure, facilities, funding resources, and human resources. For human resources, each orphanage has a nurse or paramedic and teacher, but the ratio did not fulfill the guideline. In the guideline, the ratio of doctor as well as teacher to children is 1:5. The same ratio is also intended for ratio of caregiver to children. In fact, most of orphanage had not fulfilled the guideline because 2-3 caregivers have to be responsible to take care of about 20 children or more in one room. Caregivers work based on shift system and depend on each orphanage's regulation.

For daily activities, each orphanage refers to the internal regulations developed by each orphanage. During observation, standard operational procedure for each unit was only found in one orphanage, i.e. procedures for cleanliness of the orphanage, standards of child care procedures, and procedures for food preparation. However, the procedure mostly was only containing those

responsible on the duties and what to do. In food preparation procedure there was no regulation requiring food handler or caregiver to wash their hands before handling the food. Also there was no regulation about proper food storage, such as raw and cooked food should separately stored which is it can cause cross-contamination of harmful bacteria (USDA, 2008).

Unavailable regulation about hygiene or food handling could affect daily practice in the orphanage. In fact, this study found that some of children ate from sharing plate and drink from sharing glass, especially children who eat solid food. Obviously, this practice can cause infectious disease to spread easily. This study also found that children and caregivers did not wash their hands before feeding. Also, flies were found in the kitchen or in the room during eating. According to Ruel, et.al (2003) washing hands thoroughly before food preparation and handling is very needed to interrupt transmission of potential pathogens through food or infant feeding. Meanwhile, fingers and flies, could be agent transmission of pathogen that is infected to the mouth of new host directly or by contaminating drinking water or food (WHO, 2005). That poor practice may put children in high risk of getting worm infection, meanwhile this study found only one orphanage which provide deworming program.

In addition, the used of bottle-feeding for feeding children with soft food also found in one orphanage. Whereas, bottle-feeding should be avoided because they are difficult to be cleaned (WHO, 2001; WHO, 2003). One study in Bogor found that, all of under five children who used bottle-feeding have diarrhea (Nurcahyo & Briawan, 2010). This results support other studies that the use of bottle feeding is one of the causes of the diarrhea incidence among children under five, since the bottle are difficult to keep clean and allows the transmission of germ during bottle-feeding (WHO, 2004). In this study also, the highest prevalence of diarrhea was found in the orphanage which use bottle-feeding. Combination of feeding using unwashed hands and the use of feeding bottle which was practiced in the orphanage might contribute to the high prevalent of diarrhea of under five children in this study (22.2%) which was far beyond the national prevalence (9.0%) (Riskesdas, 2007).

Besides diarrhea, the prevalence of ARI in this study (71.5%) was also higher than national prevalence (25.5%) (Riskesdas, 2007). The high prevalence of ARI, which is transmitted through air or splashing saliva, is highly possible since the children live together under one roof. One orphanage didn't have isolation room. Two others have isolation room, but during observation the study found that, if any children have cold or cough they didn't stay in the isolation room. According to the health section in each orphanage, isolation room is only intended for children who have serious illness such as measles or high fever. In one orphanage, isolation room is only intended for children under two years. According to vice head in the orphanage, if children had serious illness, caregivers have to report to person in health section, then health staff would coordinate with others to make decision for the treatment.

During illness, child's appetite may reduce (Engle, et.al, 1997), while energy and nutrient needs is often higher than normal to make up for nutrient losses during illness and enhance recovery (WHO,2005). Thus, appropriate feeding practice during this period is very important. In this study, most of children who suffered from illness had appetite as usual, especially for children who already received food. It might the reason why most of them received usual portion and kind of foods during illness and or during recovery.

According to the health staff in one orphanage, special food was only prepared when the illness is suffered by many children. Food handler had to cook for all, including staffs, employees, and caregivers in the orphanage. Thus, they often did not have enough time to cook special food for only certain children.

The other inappropriate feeding practice found in this study were type of food and feeding responsiveness of caregivers. Refer to WHO and MoH guideline about type of food for under five children, it is advisable to gradually increase food consistency with age. Based on the guideline, by 6 months children should start to receive soft food (*nasi lumat*), by 9 months they should start to receive semi-solid food (*nasi lembek*), and by 12 months, most children can eat the same types of foods as consumed by the rest of the family (WHO, 2005; MoH, 2010). In this study, as much as 27.8% of children received inappropriate food type, in which 19.4% children more than 12 months had not received solid food. There is

suggestive evidence that if solid foods are delayed to be offered to the children beyond ten months of age, it may increase the risk of feeding difficulties later on (Northstone et al., 2001). This study found, in one orphanage energy from milk served by the orphanage had more than 50% contribution to the total energy content in the type of soft or semi solid food served, which was also served for children aged more than nine months or even 12 months. Meanwhile, energy contribution from milk, especially for children aged more than nine months, it should be less than 45%, even 30% for children aged more than 12 months (WHO, 1998).

In addition, this study was found some inappropriate feeding responsiveness showed by caregivers. For example, inappropriate response (i.e do nothing, force the children, or delay to feed) when the children refused to eat or did not finish their meal, not sensitive to the children hunger cues, and talk to children roughly during feeding. Inappropriate feeding responsiveness was also found among caregivers who feed infants. In two orphanage, milk bottles were placed on a pile of blankets and directed to the baby's mouth. In another orphanage, there was a regulation that the infants should be sited on the caregiver's lap when they were fed. The head of care unit in that orphanage said that, according to the doctor when infant are not sited on lap when they are fed, it is possible that the milk can get into the ear and cause damage of the ear canal.

Caregiver's condition may have a big role in this practice. Based on interview, it was known that only less than half of caregivers who enjoy their jobs, 14.5% of caregivers even feel overwhelmed with their duties. Lack of number of caregivers is perceived as an obstacle that felt by caregivers. Lack of caregiver was one of the reason why some caregiver just continue their job, even they felt overwhelmed. According to Johnson (2004), when a person felt overwhelmed, they often lack the energy to resolve problems as they arise. As a result, the entire new problem piles up on top of the difficulties. Obviously it can affect caregiver's job performance. Calm down for a moment or coordinate with others might help them to collect the energy and stabilize the emotions so they can resolve the problems and handle the situations well.

Overall, how is feeding practices received by the children could affect their intake (Engle, 1997). In fact, majority of the orphanage children in this study had adequate energy and nutrient intake, except for energy intake of children age 36-59 months, also iron and zinc intake for children aged 12-36 and 36-59 months.

In one orphanage, some children were fed from sharing plate. According to Engle & Lida (1999), when children are fed from a common pot, the amount is not easy to determine. It means that for the child who is a slow eater, it makes possibility for her/him to get fewer food. In addition, there were only two to three caregivers who were responsible to feed about 20 children at the same time. In that condition, caregiver might have difficulties to determine which child have been fed enough food which child who received less food.

Besides energy, inadequacy of nutrient which is highly prevalent is zinc and iron. Zinc is essential nutrient for human health and every human needs zinc to survive. Ensuring adequate level of zinc intake is a key component in efforts to reduce child illness, enhance physical growth and decrease mortality in developing countries (IZA, 2011). A study by Lind, et.al (2004), deficiencies of zinc are associated with delayed development, growth faltering, and increased infectious diseases during infancy and childhood.

Basically, as the source of zinc, milk and flesh foods, except fish and seafood was commonly consumed by the children, but the amount of meat and poultry were low. Compared with another nutrient such as iron, zinc content in the milk was lower than iron but the requirement is higher especially for children aged more than 12 months (i.e in average of 30 grams of formula milk is content with 1.2 mg of zinc (12%-15% RDA) and 1.5 mg of iron (17%-19% RDA). Meanwhile, percent inadequacy of iron and zinc was mainly found among children aged 12-59 months in which their milk intake were less compare to the younger children.

In this case, the role of food availability in the orphanage is very important to ensure that children requirement could be fulfilled from the food service. Previous study stated that growth failure in institutionalized children didn't necessarily reflect an insufficient quantity and quality of available food, but rather to caregivers to ensure that the available food was fed to children to feed

themselves (Frank & Lucas, 1996 as cited by Sadik, 2010). In this study, both food availability and caregiver's practice have the same important role and need to be improved.

This study found that energy and nutrient content in the food served by the orphanages had fulfilled child's requirement, except for zinc. That means, when the nutrient which was served for children was not fulfilled the requirement, it might cause the nutrient intake of the children would not fulfilled the requirement.

Almost fifty percent of children have dietary diversity in low and medium category. Meanwhile, dietary diversity is very important, since presence or absence of essential nutrients could affect existence, absorption, metabolism, and requirement of other nutrient (Almatsier, 2004)

During 14 days record, egg was not served in one of the orphanages and in the other orphanage fish was not served during 5 days records. According to the health staff in one orphanage, when most of children suffered from illness (esp. diarrhea), food handler only made soft food with tempeh or tofu. Since they have to provide the food for many children, children who were not suffered from diarrhea also received the same food and the menu was made for several days.

Variety of cooking method for solid food was also not varied enough. Whereas, variety of food item and cooking method related with variety of daily menu and affect the child's appetite. Meanwhile, appetite is extremely important and interrelated with the actual food intake of the child (Ramakrishnan, 1995). To cope monotonous diet and lack of nutrients giving food variety of daily menus with cooking method variation could be one of the methods to increase child's appetite. It is also helpful to ensure that nutrient needs are met. Sadik (2010) indicated, poor planning menus could affect adequate nutritional intake, and could be linked to nutritional status of children.

Compared to the national prevalence (Riskesdas, 2010), the prevalence of undernutrition in this study is 4% higher (for underweight prevalent), almost similar (for stunting prevalent), and 7% lower (for wasting prevalent). Compared with other studies, the prevalence of undernutrition of this study is not conclusive (higher than some studies, but lower than the other studies). For example, the prevalence of undernutrition in this study is lower than studies in one of sub-

district in East Jakarta, but the prevalent were higher than the prevalence in two sub-district in Bogor, specifically for underweight and wasting (Sari, 2005; Sukandar, et.al, 2010). Compared with other studies conducted among orphanage children, the prevalence of underweight, stunting, and wasting of the orphanage children's in this study was lower than the prevalence in Malawi (54.8%, 64.6%, and 9.7% respectively) and Sri Lanka (63.5%, 51.9%, and 25.0% respectively), but the prevalence of underweight and stunting were higher than study's findings in Ghana (10% each for underweight and stunting, and 15% for wasting) (Panpanich, et.al., 1999; Jayasekara, 2006; Sadik, 2010;).

Based on the prevalence of underweight, stunting, and wasting found in this study, the problem in the orphanage is more on chronic rather than acute nutritional problem. The children may have had stunting problem already when they started to stay in the orphanage. Also, they are assumed as non-breastfed that put them in high risk of stunting. Stunted children is more prone to diseases. This study found that among 75.6% of stunted children suffered from ARI. This study also found some inappropriate feeding practice in the orphanages. When inappropriate condition (feeding practice and repeated infection such as ARI) occur for a long time, it might cause stunting (MoH, 2007).

Therefore, growth monitoring is very important to be conducted. Not only conducted weight and height measurement, but also put the data on the graphic (KMS). Unfortunately, in most of the orphanages the data was only noted in the recording book. Only one of the orphanages which transferred the result of measurement into graphic (KMS). In one orphanage, the data of measurement was recorded in a health staff's book then reported to the primary health center. Meanwhile, in other orphanage each child has a health book, but the data was not plotted into graphic (KMS). Thus, weight and height of the children was only possible to be compared with result of measurement in the previous month, with no information on their nutritional status. Meanwhile by plotting the data into the graphic, the child growth could be easier to monitor and necessary action can be done as early as possible for children who have growth problem i.e children with body weight under the red line or belong to yellow area.

CHAPTER 6
CONCLUSION AND RECOMMENDATION

6.1 Conclusion

1. Most of the orphanages were not aware with the government guideline. However, some component in the government guideline had been fulfilled by the orphanage, except the ratio between children and caregivers.
2. Most of the orphanages did not have clear standard operational procedure, especially about food handling and food hygiene.
3. Undernutrition was prevalent among the orphanage children, especially underweight (21.9%) and stunting (35.2%) which were classified as high prevalence based on WHO classification.
4. Almost fifty percent of children still have dietary diversity in low and medium category. Meanwhile, cooking method especially to cook solid food was not varied enough.
5. With the existing food service in the orphanage, the average energy and nutrient content in soft or semi solid food and solid food had fulfilled child's requirement by having three times of meals, two times of snacks and two times of milk, except for zinc.
6. Most of the children have adequate energy and nutrient intakes, except for zinc and iron (for children aged 12-59 months). Low of flesh food consumption and milk frequency in this age group, compared to the younger children, could be one of the factors associated with high prevalence of zinc inadequacy. Meanwhile, nutrient content in solid food served for children was also less of zinc content.
7. Inappropriate food type (i.e. served semi solid food for children aged more than 12 months), feed infant without sited them on caregiver's lap, improper feeding during illness and recovery, and some inappropriate responds of caregiver during feeding were considered as inappropriate feeding practices that could affect the actual intake of the children.
8. Living together under one roof without appropriate number of isolation room might cause the risk of high prevalence of infectious diseases. The prevalence of ARI and diarrhea in this study were (71.5% and 22.2%) respectively.

9. In general, health service facilities and sanitation in the orphanages were considered as good. However, some practices were not appropriate such as hand washing, flies in the kitchen, and the use of bottle-feeding .

6.2 Recommendation

1. The government guideline for orphanage should provide information on technical activity (i.e guideline for menu planning, food handling) that can be implemented by orphanage for daily activity. The guideline can be developed by having cooperation with other stakeholders such as Ministry of Health or Universities.
2. The government should conduct socialization of the standardization of *Panti Sosial*, since most of the orphanages in this study were not aware with the guideline.
3. Early detection of undernutrition is very important. Thus, orphanages are suggested to continue the regular weight and height assessment of the children and translate the data into graphic (KMS) in order to get info whether or not child's growth is accordance with the guideline.
4. Considering that the absence of an essential nutrient can affect the availability, absorption, and metabolism, it is recommended to enrich the variety of food served in the daily menu especially for semi solid food. Also, better not to be often serve processed food in daily menu.
5. Considering number of percent inadequacy of energy and nutrient intake of the children, especially zinc inadequacy, the orphanage is expected to pay more attention to the food served for children, not only the quality but also the quantity. Food with high content of zinc such as flesh food, especially fish have to be used and more varied.
6. Considering the disadvantages of giving inappropriate food type to the children, it is suggested to gradually increase food consistency accordance with age of children. Thus, children more than nine months have to received semi solid food, not soft food any more, and more than 12 months children have to be introduced solid food.
7. Since the prevalence of infectious diseases was very high, it is suggested for the orphanage to have isolation room to minimize the spread of the diseases.

8. The orphanage should pay more attention to hygiene activities (e.g create standard operational procedure on child feeding procedures, such as hands washing, food storage, feeding responsiveness, feeding during illness and recovery). The practice of feeding children from sharing plate and the use of bottle feeding have to be minimized or eliminated.
9. Some unhygienic practices found in this study might pose the children with risk of having worm infection. Considering that deworming program was only provide in one orphanage, it is expected that government provide deworming program for the orphanage and put the program as an obligatory program for each orphanage.

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APPENDIX 1

(Manuscript)

MANUSCRIPT FOR PUBLICATION

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TITLE:

NUTRITIONAL STATUS AND FEEDING PRACTICESS OF CHILDREN AGED 0-59 MONTHS LIVING IN ORPHANAGE IN JAKARTA

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ABSTRACT

Objective: In general, this study aims to determine nutritional status and feeding practice of orphanage children aged 0-59 months in Jakarta.

Design: Data was obtained based on cross-sectional study.

Setting: Study was conducted in orphanage which are specifically for underfive in Jakarta.

Subject: Children aged 0-59 months living in three registered orphanages in Jakarta, caregivers, and person in charge on health, child care, and food service in each orphanage. Totally, 144 under five children and 62 caregivers in the orphanages were included in this study.

Result: This study found, 21.9% of children were underweight, 35.2% were stunting, and 6.5% were wasting. Almost 90% children had adequate protein and vitamin A, but more than 90% of them had zinc inadequacy. In fact, nutrient content in the food served by orphanage was also not fulfilled child's requirement for zinc. This study found inappropriate feeding practice received by children, i.e in appropriate food type, inappropriate respond from caregiver during feeding and improper feeding during illness and recovery. 71.5% of children were suffered from ARI, 22.2% suffered from diarrhea and 18.8% children suffered from ARI and diarrhea. This study found some inappropriate practice of food handling such as the use of bottle feeding, hand-washing which was not practiced by children or caregivers when serve food or feeding children, as well as some other things that could allow cross-contamination, or facilitate the spread of infectious diseases.

Keywords: Orphanage, underfive, nutritional status, dietary intake, feeding practices, ARI, diarrhea.

INTRODUCTION

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full human potential. That period is very critical for the promotion of optimal growth, health, and development (48). When nutrition is inadequate it can lead to undernutrition. In 2010, the prevalence of underweight, stunting, and wasting among underfive in Indonesia were 17.9%, 35.6%, and 13.3% respectively (19).

Referring to UNICEF conceptual framework (1997), food intake and morbidity status are directly determine nutritional status of children. Meanwhile, the actual amount of food ingested by the children is determined by feeding practices which is related with caring activity (34).

Quality of care received by the orphanage children is obviously different from what is gained by children living with family. They are likely to receive less attention, less concern and lack of attachment (22;33). The orphanage children also considered as the most vulnerable and disadvantaged members of the community. They are susceptible to disease and might suffer nutritionally (33).

Indonesian law number 23 of 2002 about child protection, stated that basically every children -including the orphanages children- has an equal right to be guaranteed, protected and fulfilled their needs by parents, families, communities, governments and countries.

Unfortunately, research and accurate data about the orphanages children is still limited. This study is conducted to support information about children in orphanage particularly in nutrition sector. Moreover, it might be used as reference of another study or nutrition program which will be conducted in orphanage as well as to support the government in formulating policies.

METHODS

This cross-sectional study was conducted from July to August 2011 in three selection orphanages (Panti Sosial Asuh Anak Tunas Bangsa (TB), Yayasan Sayap Ibu (SI), Pondok si Boncel (PsB)).

Population. Subject population of this study was children aged 0-59 months living in orphanages, caregivers, and the person in charge on health, child care,

and food service in each orphanage. Procedure of subject recruitment is shown in Table 1.

Data Collection. Data collection was done using several methods. Such as anthropometry assessment, food record, observation, interview, in-depth interview, and secondary data.

Data analysis.

Nutritional status. The data of body weight and height/length was transferred into WHO anthro 2005 to get the value of Z-Score. Nutritional status of the children was then classified based on WHO classification (51).

Nutrient content. Nutrient intake of the children was analyzed by using nutrisurvey program for Windows 2004 with Indonesian baseline. To assess prevalence of inadequate intake of the children, the study used the following method: ***Energy and protein***. Energy and protein intake was compared to the nutrient requirement of children using Indonesia RDA (2004). The energy and protein intake was classified as inadequate if the intake is less than 77% RDA. ***Calcium, Zinc, and Vitamin A.*** Short-cut probability analyses EAR cut point method was used to assess the prevalence of inadequate nutrients (Ca, Zn, and Vitamin A) intake of the children (38). ***Iron***. The study used full probability approach method with 10% bioavailability from probability of inadequate iron intake to assess prevalence of iron inadequacy.

Feeding practice. Frequency of meals and snack. Frequency of meals and snack was categorized into sufficient meals frequency (≥3 times/day), insufficient meals frequency (<3 times/day), sufficient snacks (> 2 times/day) and insufficient snacks frequency (< 2 times/day). ***Feeding responsiveness.*** The denominator is children who show variables of feeding responsiveness under study, i.e cues of hunger, in case of children refuse to eat or didn't finished meal. ***Food type.*** Food type was categorized as inappropriate if child more than six months had not received food, more than nine months still received soft food or still had semi solid food for child more than 12 months (18). ***Dietary diversity score (DDS).*** DDS was calculated number of different food group consumed for each child using a set of food groups (53). The total score (ranged 0-7) were then categorized based on FAO classification. ***Feeding during illness and recovery.*** The

denominator was obtained from the number of children who was ill or/and recovery during two weeks observation.

Food available in the orphanage. Food variety of daily menu. Food variety of daily menu was described by food items variation from solid and semi solid food served by the orphanages. Food items were grouped based on food group used in dietary diversity variable (53). ***Cooking method.*** Cooking method was calculated by summing the number of each cooking method practiced by the orphanages during the study. The result was described by percentage of methods to cooked vegetables, plant protein, and animal protein.

Health service and health environment. Data was presented descriptively based on orphanage level.

Data entry and statistical analysis

Data of caregivers on motivation, obstacle, suggestion and workload from interview was transcribed, coded, and summarized. Data entry and statistical analysis was done using SPSS program version 18 for descriptive statistic. Non parametric test (Kolmogorov-Smirnov) was used to test normality of data distribution.

RESULTS

Orphanage's Characteristics

All of the orphanages in this study has been established for more than 25 years. Fixed funding resource were mainly from government and foundation. The orphanage admitted that funding from volunteers give significant contribution for daily operational.

Caregiver's Characteristics

All of caregivers were females, with the age ranging from 17-55 years. Span of their devotion in the orphanage ranged from 1 month up to 30 years. Their education level is quite good, most of them had education more than 9 years (79.1%) (Table 3). Main motivation of caregivers working in the orphanage was because they love children. Most of them felt happy with the job (47%) but there was 14% of caregivers who felt overwhelmed. In overwhelmed situation, most of caregivers just continue their jobs (40.3%), it might because they felt that lack of caregiver was a major obstacle of their job (24.2%).

Under five Characteristics

Majority of the orphanage children were boys, with the mean age was 23.99 in which a group of children aged 36.00-59.99 months have the biggest proportion. Children living in the orphanage were not only orphan children. Among 68 children whose birth weight data was available, 28 children have low birth weight history.

Nutritional Status of Under five

The prevalence of underweight, stunting, and wasting of the children were 21.9%, 35.2%, and 6.5% respectively. According to sex, it was found that the prevalence of underweight and wasting among boys (24.4% and 7.1%) were higher than girls (15.8% and 5%) respectively. Meanwhile, the prevalence of stunting among girls (39.5%) was higher than boys (33.3%). However there is no significant difference for each indicator of nutritional status according to sex.

Food Available in The Orphanages

In general food served by the orphanages was presented into soft, semi-solid and solid food. Overall, the energy and nutrient content in the food served had fulfilled energy and nutrient requirement of the children, except for zinc (Table 2). Although each orphanage has list of menu, but in practice the daily menu was generally depend on the financial condition and the availability of raw materials in the market. Within some days record in each orphanage, this study only found one type of fish served, even one orphanage never provided eggs (Table 3).

In the daily solid food served, generally food item of the food group were more varied than that in semi solid food. However, variety of fish served was still limited (Table 4). For cooking method, either soft, semi-solid or solid food were mostly boiled.

Energy and Nutrient intake of the children

Compare with the requirement, mean or median of energy and nutrient intake of the children had fulfilled cut off adequacy except for zinc (Table 5). Almost 90% of the children were adequate for protein and vitamin A, but more than 90% of them were inadequate for zinc (Figure 1.).

Morbidity status of under five

More than one-fifth children suffered from diarrhea (22.2%), almost three-quarters children suffered from ARI (71.5%), and there were 18.8% children suffered from ARI and diarrhea. Other diseases suffered by the children were measles, lung spots, hernia, sore ears, and mental disorder. In the orphanage which was used bottle feeding for fed children who received soft food have the highest prevalence of diarrhea (47.5%). Meanwhile, for orphanage wich didn't have isolation room have the highest prevalence of ARI (86.4%).

Feeding practice received by under five

Most of the children had sufficient meals frequency (97.6%) and snack frequency (88.6%) and most of children (46.5%) have high dietary diversity score .

There were 27.8% children received inappropriate of food according to their age. In which 19.4% of children more than 12 months still received semi solid, 5.6% children aged more than 9 months still received soft food, 2.1 % children aged more than six months had not received complementary food, and 0.8% children aged less than 6 months had received food .

Some improper feeding responsiveness also was found in the orphanages i.e. milk bottles were placed on a pile of blankets and directed to the baby's mouth, some children were fed from sharing plate, while when the children refusing to ate or did not finish their food, only a few of them who received encouragement as the caregiver's respond to the children's behavior (Table 6).

Most of children had lost appetite during illness (81.3%) but better during recovery (60%). Most of them received fluid as usual both quantity and frequency during illness or during recovery.

Health service and health environment of the orphanages

All of the orphanages have a relationship with health services and hospital. Most of the orphanages had a nurse who lives in the orphanage, the other had a paramedic who was in the orphanage on the weekdays. The orphanages also have steam healer and isolation room except in one orphanage.

Most of the orphanages used mineral water or gallon as water resources. One orphanage used drill well water as water resource for cooking soft and solid food, but the distance between wells and septic tank was more than 3 meters.

Food handler in the orphanages not only responsible to serve meals for children, but also for any people in the orphanage. Meanwhile, most of the orphanage had only two food handler, the other one have 5 food handler.

Sanitation in the orphanages was good enough. However, this study found some inappropriate practice on food hygiene, i.e the used of feeding bottle, children drank and ate from the sharing plate, hand washing which was not practiced by children and caregivers.

All of the orphanages follow the basic government programs for under five children i.e immunization, provision of vitamin A capsules, and body weight and height measurement. Unfortunately, only one orphanage which transferred data on the children' weight into graphic (KMS) to know the nutritional status of the children. The other orphanages, recorded the data either in health book's of the health staff, or in health book of each child. In addition, only one orphanages which provide deworming program two times a year routinely.

DISCUSSION

Indonesian Social Minister's has a guideline for accreditation of social institutions (39), but none the orphanages were aware about the guidelines. The components in the guidelines are more on the procedural system, it's only cover the administration or organization management and general services that have to available in '*panti sosial'* in Indonesia. For example, in the standard implementation of caring activities, orphanage must made a report on the activities and the results. The information, unfortunately, is not sufficient as a reference for daily activities in the orphanage to be practiced.

Basically, some components implemented in the three orphanages have been in accordance with the government's guideline, such as availability of legal documents, organization structure, facilities, funding resources, and human resources. For human resources, each orphanage has a nurse or paramedic and teacher, but the ratio did not fulfill the guideline. In the guideline, the ratio of doctor as well as teacher to children is 1:5. The same ratio is also intended for ratio of caregiver to children. In fact, most of orphanage had not fulfilled the guideline because 2-3 caregivers have to be responsible to take care of about 20

children or more in one room. Caregivers work based on shift system and depend on each orphanage's regulation.

For daily activities, each orphanage refers to the internal regulations developed by each orphanage. During observation, standard operational procedure for each unit was only found in one orphanage, i.e. procedures for cleanliness of the orphanage, standards of child care procedures, and procedures for food preparation. However, the procedure mostly was only containing those responsible on the duties and what to do. In food preparation procedure there was no regulation requiring food handler or caregiver to wash their hands before handling the food. Also there was no regulation about proper food storage, such as raw and cooked food should separately stored which is it can cause cross-contamination (44).

Unavailable regulation about hygiene or food handling could affect daily practice in the orphanage. In fact, this study found that some of children ate from sharing plate and drink from sharing glass, especially children who eat solid food. Obviously, this practice can cause infectious disease to spread easily. This study also found that children and caregivers did not wash their hands before feeding. Also, flies were found in the kitchen or in the room during eating. Washing hands thoroughly before food preparation and handling is very needed to interrupt transmission of potential pathogens through food or infant feeding. Meanwhile, fingers and flies, could be agent transmission of pathogen that is infected to the mouth of new host directly or by contaminating drinking water or food (50). That poor practice may put children in high risk of getting worm infection, meanwhile this study found only one orphanage which provide deworming program.

In addition, the used of bottle-feeding for feeding children with soft food also found in one orphanage. Whereas, bottle-feeding should be avoided because they are difficult to be cleaned (48). One study in Bogor found that, all of under five children who used bottle-feeding have diarrhea (31). This results support other studies that the use of bottle feeding is one of the causes of the diarrhea incidence among children under five, since the bottle are difficult to keep clean and allows the transmission of germ during bottle-feeding (49). In this study also, the highest prevalence of diarrhea was found in the orphanage which use bottle-feeding. Combination of feeding using unwashed hands and the use of feeding bottle

which was practiced in the orphanage might contribute to the high prevalent of diarrhea of under five children in this study (22.2%) which was far beyond the national prevalence (9.0%) (18).

Besides diarrhea, the prevalence of ARI in this study (71.5%) was also higher than national prevalence (25.5%) (18). The high prevalence of ARI, which is transmitted through air or splashing saliva, is highly possible since the children live together under one roof. One orphanage didn't have isolation room. Two others have isolation room, but during observation the study found that, if any children have cold or cough they didn't stay in the isolation room. According to the health section in each orphanage, isolation room is only intended for children who have serious illness such as measles or high fever. In one orphanage, isolation room is only intended for children under two years. According to vice head in the orphanage, if children had serious illness, caregivers have to report to person in health section, then health staff would coordinate with others to make decision for the treatment.

During illness, child's appetite may reduce (10), while energy and nutrient needs is often higher than normal to make up for nutrient losses during illness and enhance recovery (50). Thus, appropriate feeding practice during this period is very important. In this study, most of children who suffered from illness had appetite as usual, especially for children who already received food. It might the reason why most of them received usual portion and kind of foods during illness and or during recovery.

According to the health staff in one orphanage, special food was only prepared when the illness is suffered by many children. Food handler had to cook for all, including staffs, employees, and caregivers in the orphanage. Thus, they often did not have enough time to cook special food for only certain children.

The other inappropriate feeding practice found in this study were type of food and feeding responsiveness of caregivers. Refer to WHO and MoH guideline about type of food for under five children, it is advisable to gradually increase food consistency with age. Based on the guideline, by 6 months children should start to receive soft food (*nasi lumat*), by 9 months they should start to receive semi-solid food (*nasi lembek*), and by 12 months, most children can eat the same types of

foods as consumed by the rest of the family (20; 50). In this study, as much as 27.8% of children received inappropriate food type, in which 19.4% children more than 12 months had not received solid food. There is suggestive evidence that if solid foods are delayed to be offered to the children beyond ten months of age, it may increase the risk of feeding difficulties later on (30). This study found, in one orphanage energy from milk served by the orphanage had more than 50% contribution to the total energy content in the type of soft or semi solid food served, which was also served for children aged more than nine months or even 12 months. Meanwhile, energy contribution from milk, especially for children aged more than nine months, it should be less than 45%, even 30% for children aged more than 12 months (45).

In addition, this study was found some inappropriate feeding responsiveness showed by caregivers. For example, inappropriate response (i.e do nothing, force the children, or delay to feed) when the children refused to eat or did not finish their meal, not sensitive to the children hunger cues, and talk to children roughly during feeding. Inappropriate feeding responsiveness was also found among caregivers who feed infants. In two orphanage, milk bottles were placed on a pile of blankets and directed to the baby's mouth. In another orphanage, there was a regulation that the infants should be sited on the caregiver's lap when they were fed. The head of care unit in that orphanage said that, according to the doctor when infant are not sited on lap when they are fed, it is possible that the milk can get into the ear and cause damage of the ear canal.

Caregiver's condition may have a big role in this practice. Based on interview, it was known that only less than half of caregivers who enjoy their jobs, 14.5% of caregivers even feel overwhelmed with their duties. Lack of number of caregivers is perceived as an obstacle that felt by caregivers. Lack of caregiver was one of the reason why some caregiver just continue their job, even they felt overwhelmed. According to Johnson, when a person felt overwhelmed, they often lack the energy to resolve problems as they arise (23). As a result, the entire new problem piles up on top of the difficulties. Obviously it can affect caregiver's job performance. Calm down for a moment or coordinate with others might help them

to collect the energy and stabilize the emotions so they can resolve the problems and handle the situations well.

Overall, how is feeding practices received by the children could affect their intake (Engle, 1997). In fact, majority of the orphanage children in this study had adequate energy and nutrient intake, except for energy intake of children age 36-59 months, also iron and zinc intake for children aged 12-36 and 36-59 months.

In one orphanage, some children were fed from sharing plate. According to Engle & Lida, when children are fed from a common pot, the amount is not easy to determine (9). It means that for the child who is a slow eater, it makes possibility for her/him to get fewer food. In addition, there were only two to three caregivers who were responsible to feed about 20 children at the same time. In that condition, caregiver might have difficulties to determine which child have been fed enough food which child who received less food.

Besides energy, inadequacy of nutrient which is highly prevalent is zinc and iron. Zinc is essential nutrient for human health and every human needs zinc to survive. Ensuring adequate level of zinc intake is a key component in efforts to reduce child illness, enhance physical growth and decrease mortality in developing countries (21). A study by Lind, et.al, deficiencies of zinc are associated with delayed development, growth faltering, and increased infectious diseases during infancy and childhood.

Basically, as the source of zinc, milk and flesh foods, except fish and seafood was commonly consumed by the children, but the amount of meat and poultry were low. Compared with another nutrient such as iron, zinc content in the milk was lower than iron but the requirement is higher especially for children aged more than 12 months (i.e in average of 30 grams of formula milk is content with 1.2 mg of zinc (0.12%-0.15% RDA) and 1.5 mg of iron (0.17%-0.19% RDA). Meanwhile, percent inadequacy of iron and zinc was mainly found among children aged 12-59 months in which their milk intake were less compare to the younger children.

In this case, the role of food availability in the orphanage is very important to ensure that children requirement could be fulfilled from the food service. Previous study stated that growth failure in institutionalized children didn't necessarily reflect an insufficient quantity and quality of available food, but rather to

caregivers to ensure that the available food was fed to children to feed themselves (36). In this study, both food availability and caregiver's practice have the same important role and need to be improved.

This study found that energy and nutrient content in the food served by the orphanages had fulfilled child's requirement, except for zinc. That means, when the nutrient which was served for children was not fulfilled the requirement, it might cause the nutrient intake of the children would not fulfilled the requirement.

Almost fifty percent of children still have dietary diversity in low and medium category. Meanwhile, food diversity is very important, since presence or absence of essential nutrients could affect existence, absorption, metabolism, and requirement of other nutrient (2)

During 14 days record, egg was not served in one of the orphanages and in the other orphanage fish was not served during 5 days records. According to the health staff in one orphanage, when most of children suffered from illness (esp. diarrhea), food handler only made soft food with tempeh or tofu. Since they have to provide the food for many children, children who were not suffered from diarrhea also received the same food and the menu was made for several days.

Variety of cooking method for solid food was also not varied enough. Whereas, variety of food item and cooking method related with variety of daily menu and affect the child's appetite. Meanwhile, appetite is extremely important and interrelated with the actual food intake of the child (34). To cope monotonous diet and lack of nutrients giving food variety of daily menus with cooking method variation could be one of the methods to increase child's appetite. It is also helpful to ensure that nutrient needs are met. Sadik indicated, poor planning menus could affect adequate nutritional intake, and could be linked to nutritional status of children (36).

Compared to the national prevalence (20), the prevalence of undernutrition in this study is 4% higher (for underweight prevalent), almost similar (for stunting prevalent), and 7% lower (for wasting prevalent). Compared with other studies, the prevalence of undernutrition of this study is not conclusive (higher than some studies, but lower than the other studies). For example, the prevalence of undernutrition in this study is lower than studies in one of sub-district in East

Jakarta, but the prevalent were higher than the prevalence in two sub-district in Bogor, specifically for underweight and wasting (37). Compared with other studies conducted among orphanage children, the prevalence of underweight, stunting, and wasting of the orphanage children's in this study was lower than the prevalence in Malawi (54.8%, 64.6%, and 9.7% respectively) and Sri Lanka (63.5%, 51.9%, and 25.0% respectively), but the prevalence of underweight and stunting were higher than study's findings in Ghana (10% each for underweight and stunting, and 15% for wasting) (22;33;36).

Based on the prevalence of underweight, stunting, and wasting found in this study, the problem in the orphanage is more on chronic rather than acute nutritional problem. The children may have had stunting problem already when they started to stay in the orphanage. Also, they are assumed as non-breastfed that put them in high risk of stunting. Stunted children is more prone to diseases. This study found that among 75.6% of stunted children suffered from ARI. This study also found some inappropriate feeding practice in the orphanages. When inappropriate condition (feeding practice and repeated infection such as ARI) occur for a long time, it might cause stunting (18).

Therefore, growth monitoring is very important to be conducted. Not only conducted weight and height measurement, but also put the data on the graphic (KMS). Unfortunately, in most of the orphanages the data was only noted in the recording book. Only one of the orphanages which transferred the result of measurement into graphic (KMS). In one orphanage, the data of measurement was recorded in a health staff's book then reported to the primary health center. Meanwhile, in other orphanage each child has a health book, but the data was not plotted into graphic (KMS). Thus, weight and height of the children was only possible to be compared with result of measurement in the previous month, with no information on their nutritional status. Meanwhile by plotting the data into the graphic, the child growth could be easier to monitor and necessary action can be done as early as possible for children who have growth problem i.e children with body weight under the red line or belong to yellow area.

Conclusion

1. Most of the orphanages were not aware with the government guideline. However, some component in the government guideline had been fulfilled by the orphanage, except the ratio between children and caregivers.
2. Most of the orphanages did not have clear standard operational procedure, especially about food handling and food hygiene.
3. Undernutrition was prevalent among the orphanage children, especially for underweight and stunting which were classified as high prevalence based on WHO classification.
4. Most of the children have adequate energy and some nutrient intake, except for zinc (for children aged 12-59 months). Less animal consumption and milk frequency in this age group, compared to the younger children, could be one of the factors associated with high prevalence of zinc inadequacy. Meanwhile, nutrient content in solid food served for children was also less of zinc content.
5. With the existing food service in the orphanage, the average energy and nutrient content in semi solid food can meet the requirement for children 6-12 months old by having three times of meals, two times of snacks and two times of milk. For children >12 months old who still receive semi solid food, their energy and nutrient requirement can not be met.
6. Cooking method and food variety of daily menu served by the orphanage was not varied, especially for semi solid food.
7. Living together under one roof without appropriate number of isolation room might cause the risk of high prevalence of infectious diseases
8. In general, health service facilities and sanitation in the orphanages were considered as good. However, some practices were not appropriate such as hand washing, flies in the kitchen, and the use of feeding bottle.
9. Inappropriate food type (i.e. served semi solid food for children aged more than 12 months), feed infant without sited them on caregiver's lap, improper feeding during illness and recovery, and some inappropriate respond from caregiver during feeding were considered as inappropriate feeding practices that could affect the actual intake of the children.

Recommendation

1. The government should conduct socialization of the standarization of *Panti Sosial*, since most of the orphanages in this study were not aware with the guideline.
2. The government guideline about orphanage should provide information on technical activity that can be implemented by orphanage (i.e guideline for menu planning, food handling)
3. Since orphanage was under responsibility of Social Ministry, the ministry may have coordination with other stakeholders such as Ministry of Health, universities to improve the guideline especially in terms of health and nutrition, and monitoring and evaluation.
4. Considering number of percent inadequacy of energy and nutrient intake of the children, especially zinc inadequacy, the orphanage is expected to pay more attention to the food served for children. Food with high content of zinc such as animal foods (i.e chicken liver, meat, fish, and eggs) have to be used as ingeredients of the children's menu
5. Considering that the absence of an essential nutrient can affect the availability, absorption, and metabolism, it is recommended to enrich the variety of food served in the daily menu especially for semi solid food.
6. Considering the disadvantages of giving inappropriate food type to the children, it is suggested to gradually increase food consistency accordance with age of children. Thus, children more than 12 months old have to be introduced solid food
7. The orphanage should pay more attention to hygiene activities (e.g create standard operational procedure on child feeding procedures, such as hands washing, food storage, feeding responsiveness, feeding during illness and recovery). The practice of feeding children from sharing plate and the use of feeding bottle have to be minimized or eliminated.
8. Since the prevalence of infectious diseases was very high, it is suggested for the orphanage to have issolation room to minimize the spread of the diseases.
9. Some unhygienic practices found in this study might pose the chilren with risk of having worm infection. Considering that deworming program was only provide in one orphanage, it is expected that government provide

deworming program for the orphanage and put the program as an obligatory program for each orphanage

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Table 1. Number of children and caregivers of the study

Respondent's number	PsB	SI	TB
Children living in the orphanage	82	31	86
Children aged 0-59 months	63	22	59
Caregivers in the orphanage	27	17	33
Caregivers which were interviewed	26	15	21

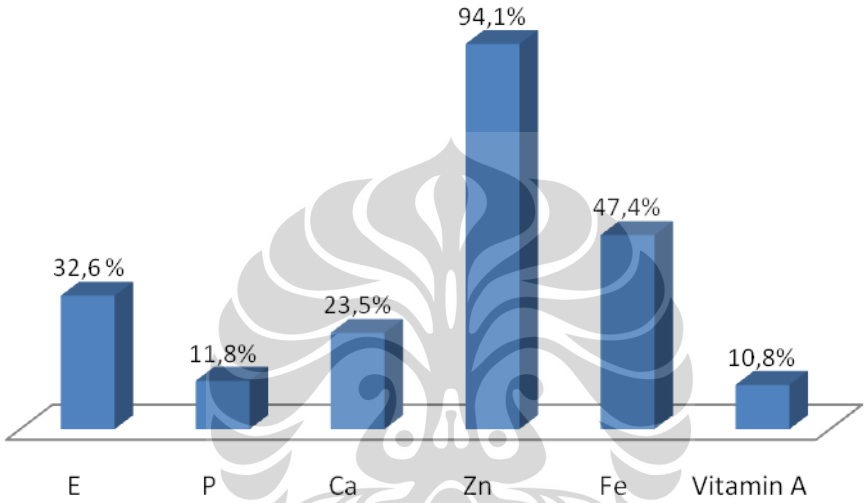

Figure 1 Percent inadequacy of energy and nutrient intake of the children

Percent inadequacy of E&P were based on 77% RDA
Percent inadequacy of Ca, Zn, and vitamin A were based on EAR cut-point method
Percent inadequacy of Fe ased on Full probability approach
Note: E & P (n=144), Ca, Zn, Fe &Vitamin A (n=102 (getting from children aged 12-59))

Table 2. Energy and nutrient content in the food and formula milk served by the orphanages

Energy/ Nutrient^	Source	Meals	Snacks	Milk	Total~
Energy (kcal)	Formula milk only[a]	-	-	83.1 ± 13.5	831
	Soft/semi solid food[b]	118.3 ± 24.9	58.1± 24.9	83.6 ± 9.3	805 ± 132.2
	Solid food[c]	254.4 ± 16.4	111.9 ± 35.6	117.6 ± 46.7	1222.1 ± 308.1
Protein (g)	Formula milk only[a]	-	-	1.9 ± 0.4	190
	Soft/semi solid food[b]	4.7 ± 0.6	1.1 ± 0.6	2.7 ± 0.2	27.1 ± 6.1
	Solid food[c]	8.6 ± 1.2	1.8 ± 0.6	4.0 ± 1.5	37.3 ± 11.7
Calcium (mg)	Formula milk only[a]	-	-	63.5 ± 9.9	635
	Soft/semi solid food[b]	37.2 ± 14.9	15.0 ± 8.6	97.9 ± 17.7	533.0 ± 189.7
	Solid food[c]	28.4 ± 4.9	21.3 ± 1.3	238.4 ± 122.8	604.5 ± 239.2
Zinc (mg)	Formula milk only[a]	-	-	0.4 ± 0.2	40
	Soft/semi solid food[b]	0.6 ± 0.1	0.13 ± 0.09	0.7 ± 0.02	4.8 ± 1.2
	Solid food[c]	1.0 ± 0.2	0.23 ± 0.02	1.0 ± 0.3	5.4 ± 1.3
Iron (mg)	Formula milk only[a]	-	-	0.9 ±0.2	90
	Soft/semi solid food[b]	0.9 ± 0.5	0.4 ± 0.3	1.1 ± 0.4	7.9 ± 1.7
	Solid food[c]	1.3 ± 0.2	0.3 ± 0.1	1.3 ± 0.4	7.1 ± 1.7
Vitamin A (µg RE)	Formula milk only[a]	-	-	75.9 ± 21.7	759
	Soft/semi solid food[b]	25.0 ± 10.9	5.3 ± 1.4	82.3 ± 6.9	415.4 ± 168.2
	Solid food[c]	68.1± 9.7	17.3 ± 9.8	94.3 ± 42.01	427.7 ± 93.7

[a]Attended for children who only consume formula milk. In average, frequency of formula milk was 10, which is from the average of formula milk in TB was 11, in PsB was 11, in SI was 7

[b]energy and nutrient content from food per serving (based on 14 days record in TB, 5 days record in SI, and 4 days record in PsB)

[c]energy and nutrient content from food per serving (based on 16 days record in TB, 9 days record in SI, and 9 days record in PsB)

*Energy and nutrient is presented based on type of food instead of age group of children because within the orphanage, children with the same group may receive different type of food.

~Total from 3times of meals, 2 times of snack, and 2 times of milk for children who received solid food but 4 times of milk for children who received soft/semi solid food (getting from the average since most of children who received soft/semi solid food was provided milk on demand)

Table 3. List of semi-solid foods served by the orphanages

Food groups^	Food items[#]		
	Tunas Bangsa	Sayap Ibu	Pondok si Boncel
Grain, roots, and tubers	Infant cereal, *nasi tim*, corn, potatoes, biscuit	Infant cereal, *nasi tim*, biscuit	Porridge, *nasi tim*, corn, biscuit, macaroni, infant cereal
Legumes and nuts	Tofu, tempeh	Tofu, tempeh, green bean	Tempeh, tofu, green bean, red bean
Dairy product	Milk	Milk	Milk
Flesh foods			
- Fish	Tuna	-	Tuna
- Meat and poultry	Beef, chicken liver, chicken, chicken claw, chicken head	Beef, chicken claw, chicken	Beef corned, sausage, chicken
Eggs	-	Chicken egg	Chicken egg
Vitamin A rich fruit and vegetable	Broccoli, carrot, spinach, *katuk,* bean	Tomatoes, water spinach, spinach, carrot,	Carrot, bean,
Other fruit and vegetable	mushroom, orange, apple	Banana, apple	Banana, guava, apple, cabbage

[#] Food items are base on 14 days records (TB), 5 days records (SI), 4 days records (PsB)
^ Food groups are based on (WHO, 2008)

Table 4. List of solid foods served by the orphanages

Food groups^	Food items[#]		
	Tunas Bangsa	Sayap Ibu	Pondok si Boncel
Grain, roots, and tubers	Rice, instant noodles, corn, vermicelli, potatoes	Rice, porridge, potatoes, vermicelli	Corn, rice, instant noodle, bread, macaroni, vermicelli
Legumes and nuts	Tempeh, tofu, beansprout,	Tempeh, tofu , red beans, long beans	Tofu , long bean, green bean, tempeh, bean sprout
Dairy product	Milk, ice cream, fermented milk	Milk	Milk, ice cream
Flesh foods			
- Fish and seafood	Pomfret, tuna, carp, sardine, shrimp	Mackerel	-
- Meat and poultry	*Abon*, chicken, beef, meatball, chicken liver, nugget,	Chicken, beef, meatball, sausage, nugget, chicken liver	Sausage, beef corned, chicken, meatball
Egg	Quail egg and chicken egg	Quail egg and chicken egg	Chicken egg
Vitamin A rich fruits and vegetables	Melon, apple, *katuk*, bean, carrot, water spinach, spinach, mustard	Apple, spinach, carrot, broccoli, mustard	Papaya, melon, apple, carrot, bean, spinach, mustard
Other fruit and vegetables	Guava, cabbage, mushroom, *sayur lodeh*,	Banana, orange, *sayur asem,* cabbage, flask, pear, water melon	Banana, guava, water melon, pear, cabbage, *gudeg*, squash, flask
Snacks	Biscuit, cake, wafer, crackers, sponge, jelly, bread, *kue cucur*, fried banana, donuts	Jelly, bread, sponge, biscuit	Sponge, *pastel*, biscuit, green bean with coconut milk

[#] Food items are based on 16 days food records (Tunas Bangsa), 9 days food records (Sayap Ibu), 9 days food records (Pondok si Boncel) ^ Food groups are based on (WHO, 2008)

Table 5. Energy and nutrient intake of the children

Energy/ Nutrient ^	Age group	Require-ment	Source	Cut off adequacy*	Meals	Snacks	Milk	Total~
Energy (kcal)	0.0-6.0[a]	437-474	WHO, 1998	336.5-364.9	-	-	745.4 ± 244.6	745.4 ± 244.6
	6.01-12.00[b]	600-700	WHO, 2005	462-539	205.4 ± 139.4	102.3 ± 61.6	424.3 ± 214.4	690.8 ± 135.3
	12.01-36.00[c]	1000	Indonesia RDA, 2004	770	770 ± 215.3	124.7 ± 94.5	289.8 ± 186.2	954.5 ± 221.3
	36.01-59.99[d]	1550	Indonesia RDA, 2004	1194	766.9 ± 175.4	183.7 ± 102.7	215.5 ± 106.7	1167.7 ± 120.2
Protein (g)	0.0-6.0[a]	6.7-7.3	WHO, 1998	5.2-5.6	-	-	20.5 (12.4-24.5)	20.5 (12.4-24.5)
	6.01-12.00[b]	9.1-9.6	WHO, 2005	7.01-7.39	8.3 ± 5.7	2.1 ± 1.7	13.3 ± 6.8	22.9 ± 4.9
	12.01-36.00[c]	25	Indonesia RDA, 2004	19.25	19.7 ± 8.9	2.3 ± 1.9	9.7 ± 6.3	31.6 ± 6.6
	36.01-59.99[d]	39	Indonesia RDA, 2004	30.03	22.8 ± 8.6	2.5 ± 1.9	8.2 ± 5.3	33.5 ± 5.7
Calcium (mg)	0.0-6.0[a]	188.2-204.1	WHO, 1998	-	-	-	613.3 ± 220.5	613.3 ± 220.5
	6.01-12.00[b]	525	WHO, 2005	-	66.1 ± 57.3	29.2 ± 31.9	451 + 219.3	577.2 ± 190.8
	12.01-36.00[c]	500	Indonesia RDA, 2004	416.7	69.1 (55.6-107.1)	13.2 (5-37.7)	323 (171.3-607.5)	550.3 (276.5-768.7)
	36.01-59.99[d]	500	Indonesia RDA, 2004	416.7	60.4 (56.0-94.9)	9.8 (4.5-35.6)	408 (286.3-572.4)	484.4 (430.9-814.9)
Zinc (mg)	0.0-6.0[a]	0.7	WHO, 1998	-	-	-	5.04 ± 3.2	5.04 ± 3.2
	6.01-12.00[b]	2.8	WHO, 2005	-	1.1. ± 0.7	0.3 ± 0.2	3.15 ± 1.5	4.5 ± 1.2
	12.01-36.00[c]	8.2	Indonesia RDA, 2004	6.8	2.4 ± 1.1	0.3 ± 0.1	2.5 ±1.5	5.1 ± 1.3
	36.01-59.99[d]	9.7	Indonesia RDA, 2004	8.1	2.5 (2.3-3.2)	0.3 (0.1-0.4)	1.4 (0.8-2.3)	4.4 (4.0-5.6)
Iron (mg)	0.0-6.0[a]	NA	WHO, 1998	-	-	-	7.5 ± 3.4	7.5 ± 3.4
	6.01-12.00[b]	11	WHO, 2005	-	1.3 (0.5-2.4)	0.5 (0.2-1.5)	4.5 (2.9-5.9)	5.7 (4.9-8.5)
	12.01-36.00[c]	8	Indonesia RDA, 2004	10%	3.2 ± 1.3	0.6 ± 0.4	3.5 ± 2.3	7.2 ± 2.1
	36.01-59.99[d]	9	Indonesia RDA, 2004	bioavailability	3.0 (2.5-3.6)	0.3 (0.1-0.4)	1.8 (1.7-2.8)	6.0 (5.1-7.5)
Vitamin A (µg RE)	0.0-6.0[a]	NA	WHO, 1998	-	-	-	797.0 ± 361.5	887.7 ± 479.7
	6.01-12.00[b]	350	WHO, 2005	-	47.8 ± 47.9	9.4 ± 8.3	435.5 + 266.0	509.6 ± 234.7
	12.01-36.00[c]	400	Indonesia RDA, 2004	285.7	160.7 ± 106.4	7.6 (1.3-2.1)	277.2 + 188.0	540.2 (422.5-595.6)
	36.01-59.99[d]	450	Indonesia RDA, 2004	321.4	121.5 (83.2-251.4)	10.3 (7.2-18)	116.6 (91.6-227.6)	394.9 (349.2-539.5)

[a] n=18, [b] n=24 [c] n=47 [d] n=55

^ mean ± SD / med (25th-75thpercentile).

~ Total is the sum up from meals, milk, snack, and vitamin

*supplement consumed by the children was mainly content of calcium and vitamin A

***Energy and protein cut off are based 77% RDA, Ca, Zn, and Vitamin A based on EAR, while iron is based on full probability approach.

Note: energy/nutrient intake of the children aged 0-2.99 & 3.00-6.00 were merged as 0-6.00 months and 6.01-8.9 & 9-11.9 were merged as 6.01-12.00 months

Table 6. Feeding responsiveness received by under five

Variable	n (%)
Caregivers' sensitive to children hunger cues (n=49)	34 (69.4)
Caregivers help infants directly to drink milk (n=21)	8 (38.1)
The way of children eat (n=123)	
Self-feeding using their own plate	43 (35.0)
Fed by caregiver using their own plate	53 (43.1)
Fed by caregiver using sharing plate	27 (21.9)
The way of caregivers feed the children (n=88)	
Slowly and patiently:	77 (87.5)
Talk to children with eye contact:	
Yes by gentle	66 (75)
Yes by rough	8 (9.1)
Children allowed to add the portion of food (n=11)	
Yes, for all menus	7 (63.6)
Yes, but only rice or some menus	3 (27.3)
Children allowed choosing food that are desired (n=13)[3]	2 (15.4)
Caregivers' respond if the children refusing food/milk since the beginning (n=51)	
Encourage the children	14 (27.5)
Delay to feed	11 (21.6)
Do nothing	3 (5.9)
Force the children	12 (23.5)
Others	11 (21.6)
Caregivers' respond if the children didn't finish their food/milk (n=79)	
Encourage the children	22 (27.8)
Do nothing	37 (46.8)
Force the children	16 (20.3)
Others	4 (5.1)

Note: n is a number of children which was relevant with the variable' item

APPENDIX 2

(Other results and information)

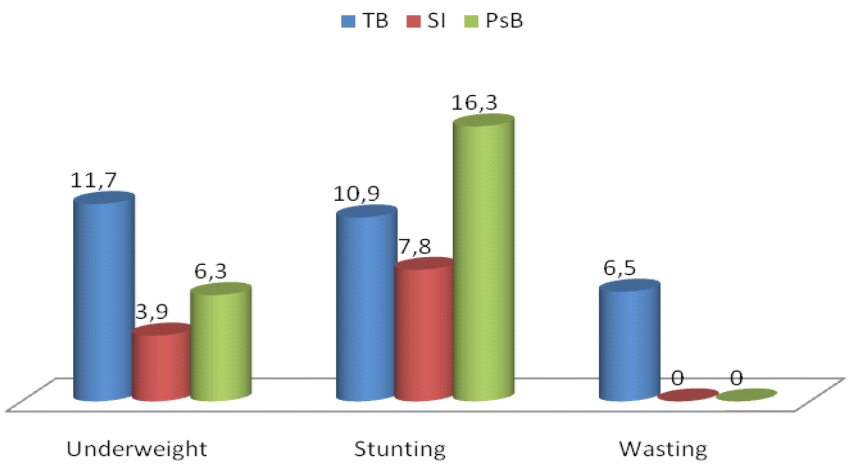

Figure 1.Nutritional status of underfive in each orphanage

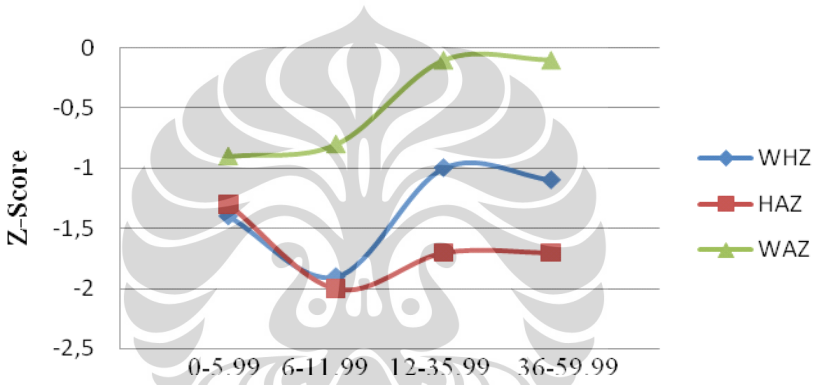

Figure 2. Z-score of under five according to age group.

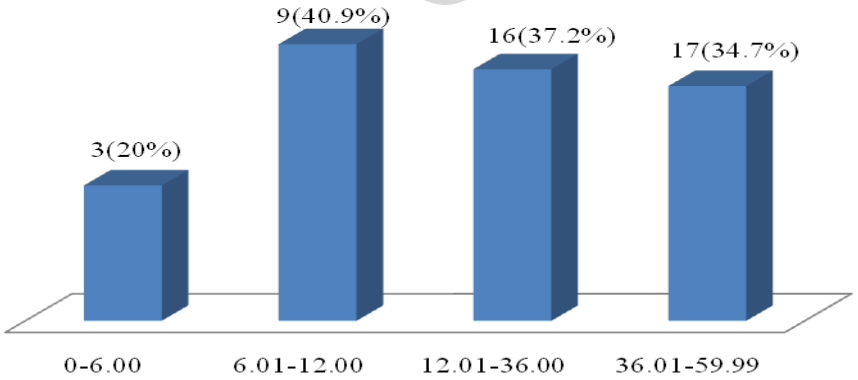

Figure 3. The prevalence of stunting according to age group, n=144

Chi Square test (p>0.05)

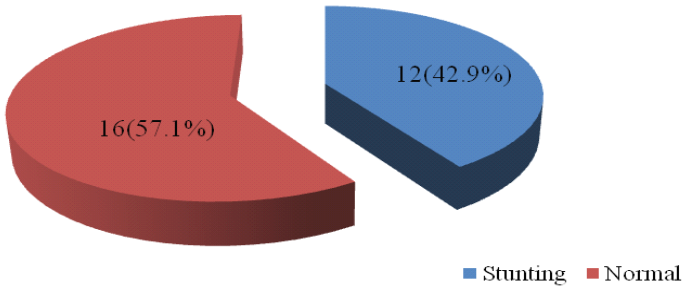

Figure 4. Prevalence of stunting according to LBW history, n=28

Chi Square test (p<0.05)

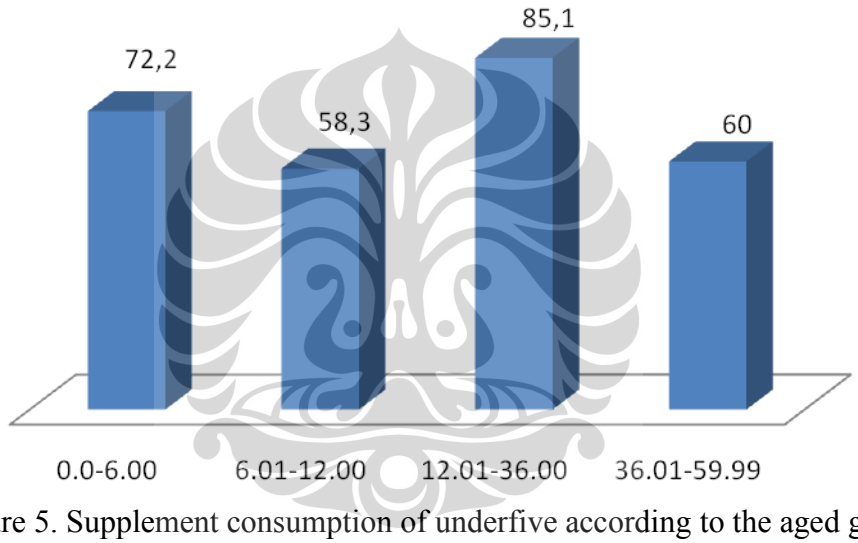

Figure 5. Supplement consumption of underfive according to the aged group

Table 1. Dietary diversity of underfive according to the aged group

Variable	6.01-12.00 n=20	12.01-36.00 n=47	36.01-59.99 n=55
DDS, med (min-max)	5(2-7)	6 (3-7)	6 (4-7)
Dietary diversity category, n (%)			
Low	3 (15.0)	5 (10.6)	0 (0.0)
Medium	8 (40.0)	14 (29.8)	25 (45.5)
High	9 (45.0)	28 (59.6)	30 (54.5)

[1] med (min-max), [2] n (%)

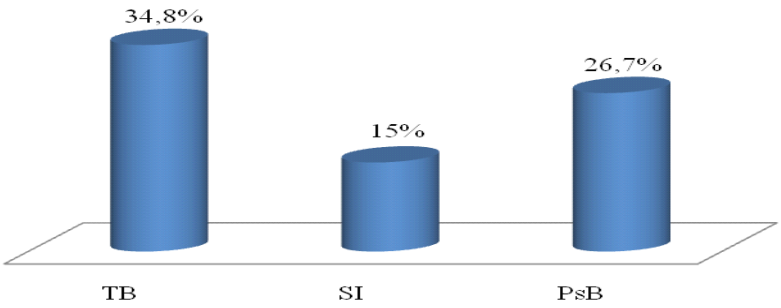

Figure 6 Proportion of inappropriate food type received by the children in each orphanage

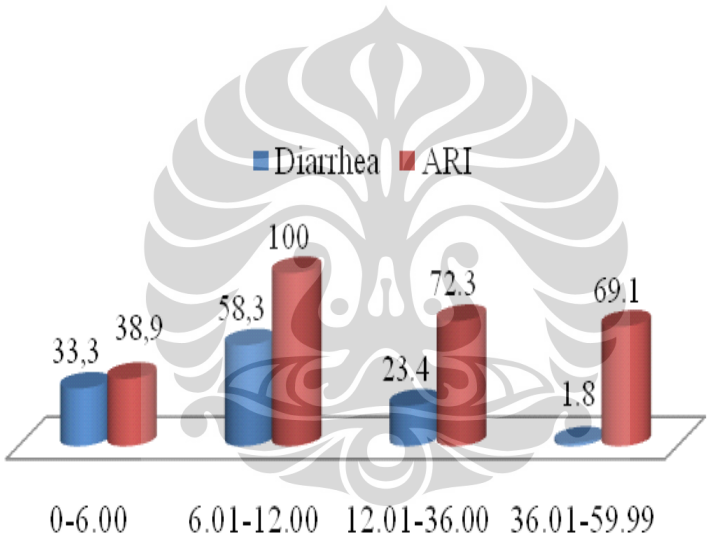

Figure 7. Morbidity status of underfive according to the aged group

Table 2. Energy and nutrient content in the food and formula milk served by the orphanages (per serving)

Energy/ Nutrient	Type of food	TB			SI			PsB		
		Meal	Snack	Milk	Meal	Snack	Milk	Meal	Snack	Milk
Energy (kcal)	Formula milk only[a]	-	-	91.7 ± 2.7	-	-	67.5±21.6	-	-	90±0.0
	Soft/semi solid food[b]	141.9 ± 18.8	30.2 ± 8.9	87.8 ± 15.3	92.4 ± 39.7	78.1 ± 19.1	90.1 ± 11.1	120.6±57.0	66.2±21.9	72.9±22.3
	Solid food[c]	235.9 ± 49.4	85.3 ± 46.1	169.2 + 32.9	265.2 ± 61.7	140.3 ± 87.1	105.1 ± 32.9	261.4±46.8	110.2 ± 48.3	78.4±6.4
Protein (g)	Formula milk only[a]	-	-	2.3±0.3	-	-	1.5±0.4	-	-	1.9±0
	Soft/semi solid food[b]	4.2 ± 0.6	0.5 ± 0.2	2.9 ± 0.7	4.5 ±1.9	1.7 ± 0.9	2.5 ± 0.2	5.4±2.2	1.2±0.5	2.6±1.0
	Solid food[c]	8.0 ± 2.6	1.3 ± 1.0	5.7 + 1.7	9.9 + 2.6	2.2 ± 0.9	3.3 ± 0.9	7.7±3.0	1.8±1.6	3.1±1.8
Calcium (mg)	Formula milk only[a]	-	-	69.1±17.5	-	-	52±16.1	-	-	69.3±0
	Soft/semi solid food[b]	52.5 ± 13.3	11.3 ± 7.7	116.3 ± 65.6	36.5 ± 23.5	8.8 ± 7.1	81.1 ± 18.9	22.5±11.3	24.8±18.5	96.3±30.5
	Solid food[c]	23.1 ± 10.2	22.5 ± 21.2	380.2 + 83.0	29.2 + 25.4	16.8 ± 8.9	168.1±131.2	32.9±26.3	24.7±20.8	166.8±33.1
Zinc (mg)	Formula milk only[a]	-	-	0.7±0.2	-	-	0.3±0.04	-	-	0.3±0
	Soft/semi solid food[b]	0.7 ± 0.2	0.1 ± 0.05	0.6 ± 0.2	0.6 ± 0.3	0.1 ± 0.09	0.7 ± 0.06	0.5±0.3	0.23±0.1	0.7±0.4
	Solid food[c]	0.9 ± 0.3	0.3 ± 0.2	1.3 + 0.3	1.2 + 0.5	0.2 ± 0.06	0.9 ± 0.4	0.9±0.2	0.21±0.17	0.8±0.61
Iron (mg)	Formula milk only[a]	-		0.9±0.2	-		0.8±0.3	-	-	1.1±0
	Soft/semi solid food[b]	1.4 ± 0.4	0.06 ± 0.04	0.7 ± 0.4	0.5 ± 0.3	0.6 ± 0.5	1.2 ± 0.3	0.9±0.4	0.6±0.3	1.4±0.4
	Solid food[c]	1.1 ± 0.5	0.23 ± 0.17	1.7 + 0.5	1.5 + 1.2	0.5 ± 0.3	1.1 ± 0.5	1.4±0.9	0.3±0.2	1.0±0.3
Vitamin A (µg RE)	Formula milk only[a]	-		98.6±21.6	-	-	55.4±17.2	-	-	73.8±0
	Soft/semi solid food[b]	27.6 ± 12.9	3.8 ± 1.2	83.9 ± 25.2	13.3 ± 8.3	6.4 ± 3.6	88.3 ± 10.6	34.8±17.9	5.7 ± 4.1	74.7±32.1
	Solid food[c]	79.3 ± 38.0	28.9 ± 25.1	135.5 + 26.4	62.0 ± 35.9	9.6 ± 4.1	95.9 ± 24.5	62.0±35.9	13.5±10.4	51.6±28.3

[a]For children who only consume formula milk presented as average. The frequency were; 11 (9-14) in TB mostly 18 g for one serving, 11 (10-12) in PsB mostly 9 mg for one serving since two from 3 babies were under 1 month, 7 (7-7) in SI with 18 g for one serving.

[b]energy and nutrient content from food per serving (based on 14 days record in TB, 5 days record in SI, and 4 days record in PsB)

[c]energy and nutrient content from food per serving (based on 16 days record in TB, 9 days record in SI, and 9 days record in PsB).

^supplement i.e apialys drop, scott's emultion, 7 seas emultion (in TB), scott's emultion (in SI), curcuma plus emultion, fitkom, scott's emultion, biolysin smart (in PsB)

*Energy and nutrient is presented based on type of food instead of age group of children because within the orphanage, children with the same group may receive different type of food.

**Based on observation, type of food given was mostly based on the children's room, children within the same room received same type of food regardless the age

Table 3. Energy and nutrient contribution from meals-snacks and milk energy to total energy and nutrient content in the food served

Energy/ Nutrient	Type of food	TB			SI			PsB		
		Meals & Snack^	Milk~	Total	Meals & Snack^	Milk~	Total	Meals & Snack^	Milk~	Total
Energy (kcal)	Soft/semi solid food	468.3	526.8	1013.1±245.4	433.3	270.3	703.7±67.9	494.0	291.8	785.8±117.5
	Solid food	878.4	338.4	1216.6±274.8	1078.2	210.2	1288.5±320.8	983.5	156.7	1140.2±333.3
Protein (g)	Soft/semi solid food	13.6	17.3	30.9±8.4	16.8	7.6	24.5±5.0	18.7	10.3	29.0±6.9
	Solid food	26.7	11.5	38.1±10.8	34.5	6.5	40.9±14.2	29.4	6.2	35.6±12.1
Calcium (mg)	Soft/semi solid food	180.0	697.7	877.7±357.3	127.0	243.3	370.3±113.5	117.3	385.2	502±188.8
	Solid food	114.2	760.3	874.5±406.2	121.2	336.2	457.4±161.4	134.5	333.6	468.0±154.8
Zinc (mg)	Soft/semi solid food	2.2	3.9	6.1±1.9	2.1	1.98	4.1±0.9	1.9	2.8	4.7±1.2
	Solid food	3.2	2.68	5.9±1.2	3.9	1.7	5.7±1.6	3.4	1.6	5.0±1.3
Iron (mg)	Soft/semi solid food	4.2	4.0	8.2±2.3	2.6	3.5	6.1±1.3	4.0	5.6	9.6±2.3
	Solid food	3.8	3.4	7.1±1.7	5.2	2.3	7.5±1.8	4.5	1.9	6.5±1.7
Vitamin A (µg RE)	Soft/semi solid food	90.2	503.2	593.4±267.2	52.9	264.8	317.7±138.3	115.9	298.6	414.6±146.5
	Solid food	295.8	271.1	566.9±114.7	205.3	191.8	397.1±98.1	231.4	103.1	334.5±88.9

^getting from 3times of meals and two times of snack

~getting from two times of milk (for solid food), while from average for soft/semi solid food (6 times in TB, 3times in SI, and 4 times in PsB).

DAILY MENU AVAILABLE IN THE ORPHANAGE

Table 5. Daily menu available in Tunas Bangsa orphanage

Days	Breakfast	SNACK	Lunch	SNACK	Dinner	SNACK
I	Susu Bubur ayam	Roti bakar Air putih	Nasi putih Bistik daging, tahu kecap Tumis wortel,buncis Buah jeruk	Teh manis Agar-agar	Nasi putih Udang goreng Tempe goreng Capcay	Susu ultra Biskuit
II	Susu Mie goreng Sosis	Bubur kacang ijo Air putih	Nasi putih Ayam goreng, tempe Sayur sop Buah pepaya	Teh manis Kue lemper	Nasi putih Lele goreng Bacem tahu Cah kangkung	Susu Bolu kukus
III	Susu Nasi goreng Telur dadar	Bakso kuah Air putih	Nasi putih Ikan kembung Tempe bacem, sayur asem Buah pisang	Teh manis Pisang goreng	Nasi putih Empal goreng Tempe goreng Tumis sawi	Susu Biskuit
IV	Susu Nasi putih Nugget goreng	Arem2 Tahu sumedang Air putih	Nasi putih Semur ati, tempe goreng Sayur kare Buah apel	Teh manis Keu malam	Nasi putih Gurame gulai Tempe kering Sayur lodeh	Susu Roti manis
V	Susu Bubur ayam Telur rebus	Bubur sum2 Air putih	Nasi putih Perkedel kentang, krupuk Soto ayam Buah pier	Teh manis Kue mangkok	Nasi putih Semur daging Tahu goreng Bayam bening	Susu Biskuit
VI	Susu Nasi putih Telur dadar Tumis buncis + Tempe	Kue hungkwe Pisang Air putih	Nasi putih Gurame goreng Tahu sumedang tumis kangkung, buah semangka	Teh manis Bolu kukus	Nasi putih Rawon daging Tempe goreng Tumis bayam	Susu Kue mangkok

Days	Breakfast	SNACK	Lunch	SNACK	Dinner	SNACK
VII	Susu Nasi putih Sardencis Lalap ketimun	Jus jambu	Nasi putih Daging empal Tempe goreng mendoan,sayur katuk, buah melon	Teh manis Nogo sari	Nasi putih Telor dadar Kerupuk udang Sayur lodeh	Susu Biskuit
VIII	Susu Mie rebus, Sawi Telur, Bakso	Pukis keju Kue pepek Air putih	Nasi putih ayam goreng,tahu goreng Sop kimlo Buah jeruk	Teh manis Risol	Nasi putih Udang tepung Tempe goreng Orak arik sawi	Susu Kue pisang
IX	Susu Nasi uduk Semur tahu & Telur dadar	Nogo sari Jus jeruk	Nasi putih Semur daging,tahu goreng Tumis buncis,wortel Buah apel	Teh manis Lemper	Nasi putih Opor ayam Bakwan Tumis sawi ijo	Susu Biskuit
X	Susu Lontong sayur Opor ayam & Kerupuk	Bika ambon Teh manis	Nasi putih Ikan tuna&tempe goreng Sayur bening +ayam wortel Buah apel	Teh manis Pastel	Nasi putih Soto ayam Perkedel Kentang	Susu Martabak

Table 6. Daily menu available in Sayap Ibu

Days	Menu
Monday	Ikan tengiri ½ Kangkung 1 ikat Tomat ½ Tahu ¼ Daun bawang secukupnya Seledri secukupnya Cempaka (c) : jus apel Anyelir (a) dan begonia (b) : apel
Tuesday	Bubur : Hati ayam ¼ Tomat ½ Tempe ¼ Daun bawang sckpnya Seledri secukupnya buah : c: jus pir a b ; pir
Wednesday	Bubur ; Tahu ¼ Tempe ¼ Tomat ½ Seledri sckpnya Kacang merah sckpnya Daun bawang sckpny buah: c: jus pepeya a dan b : salak
Thursday	Bubur Dgng giling ¼ Bayam merah ¼ Tomat ½ Seledri scpnya Daun bawang sckpnya buah c: jus pisang a b : jeruk

Friday	Bubur Daging giling ayam ¼ Brokoli 2 Tomt ½ Tempe ¼ Daun bwg dan sldri sckpnya	buah a b dan c : jus alpukat
Saturday	Bubur Dgng giling sapi ¼ Tomat ½ Tahu ¼ Daun bwg, sldri sckpnya	buah c: jus pir a dan b : semangka
Sunday	Bubur Ceker ayam kampung 5 Telur ayam kmpng 3 Tomqt ½ Tempe ¼ Daun bwg, sldri sckpnya	bubur kacang ijo

ACTUAL DAILY MENU IN THE ORPHANAGE DURING OBSERVATION

DAFTAR MENU MAKANAN PADAT DI PANTI ASUHAN TUNAS BANGSA

	SARAPAN	SNACK KE-1	MAKAN SIANG	SNACK KE-2	MAKAN MALAM	SNACK KE-3
1	Nasi Mi rebus Abon sapi Teh manis	Susu Biskuit	Nasi Ikan bawal goreng Sayur Bening (katuk, jagung, wortel)	-	Nasi Opor ayam Sayur Bening kangkung	Susu Biskuit
2	Nasi Telu dadar Teh manis	Susu	Ikan tuna kuah kecap Sayur Bening (sawi, wortel, jagung)	-	Nasi Tumis (Jamur ,Daging cincang)	Susu Bolu
3	Nasi Opor (telur puyuh, tahu putih)	Susu Madu	Nasi Ayam bumbu sate	Potongan apel Donat	Nasi Semur (daging, tahu) Sayur bayam (bayam, wortel) Kerupuk	(Yakult Sate)*
4	Nasi	Susu	Nasi	Yakult	Nasi	Susu

	Tumis (sawi,bakso)	Gorengan (tempe, pisang)	Soup (jamur, jagung, wortel, bihun)	Bolu kecil	Ayam goreng	
5	Nasi Mi rebus Nuget goreng	Susu	Nasi Oreg tempe Gurame goreng Sayur Lodeh	-	Nasi Sayur bening (katuk, wortel) Sate (Ati rempela)	Susu Biskuit
6	Nasi Telur dadar kecap	Susu	Nasi Ayam goreng	(Wafer, biskuit, coklat, minuman ringan)*	Nasi Soto (bihun, ayam, kol) Perkedel kentang	Susu Wafer
7	Nasi Telur dadar Kecap	Susu (Tango wafle Indomilk coklat Richeese nabati Biskuir oreo/ Gery stick)*	Nasi Sayur Bening (Bayam, wortel) Gurame bumbu kecap Tahu bacem	-	Nasi Soup (wortel, kol) Semur daging Oreg tempe	Susu Roti
8	Nasi	Susu	Nasi	-	Nasi	Susu

	Sarden Sayur tahu	Wafer	Semur daging Sayur bening (katuk, wortel, jagung), Tahu goreng		Telur dadar Sayur lodeh	Roti Melon
	SARAPAN	SNACK KE-1	MAKAN SIANG	SNACK KE-2	MAKAN MALAM	SNACK KE-3
9	Nasi Mi rebus Semur tahu Teh manis	Susu Biskuit	Nasi Sup Kimlo (wortel, soun, ayam, jamur kuping) Ayam goreng	-	Nasi Sup Kimlo (wortel, soun, ayam, jamur kuping) Udang balado Tempe oreg	Susu Jeruk
10	Nasi Telur dadar Kecap	Susu Kue mangkok Roti	Nasi Daging semur Soup (sawi, jagung, buncis,	(Coklat Biskuit Es krim	Nasi Opor ayam Soup (sawi, jagung, buncis,	Susu

		keju/coklat*	bakso, ayam)	Yakult)*	bakso, ayam)	
11	Nasi goreng telur	Susu Biskuit	Nasi Ayam bakar Tempe bacem Tahu bacem	(Biskuit (slai olay, hello panda, rechees), Inaco Jelly, Susu bantal, Biskuat bolu, Permen lolipop, Chiki taro,yakult)*	Nasi Tuna kuah kecap Sayur bening (sawi,wortel, jagung)	Susu
12	Nasi Telur dadar Kecap Teh manis	Susu Biskuit	Nasi Soup (wortel,bakso,buncis) Semur daging	Jeruk	Nasi Soup (Sawi,wortel,tauge,telur) Suiran ayam kecap	Susu Wafer Biskuit
13	Nasi	Susu	Nasi	Ice cream	Nasi	Susu

	Mi rebus campur telur dan sawi	Gorengan (singkong/ ubi/ pisang molen) Susu kotak	Ayam kecap Sayur bening (bayam,wortel)	Jeruk	Ayam goreng	
14	Nasi Mi rebus campur sawi dan sosis Teh Manis	Susu Bolu*	Nasi Sayur bening (katuk,wortel,jagung) Udang goreng	Jus jambu Kue cucur Apel	Nasi Opor (ayam,tahu,buncis,wortel)	Susu
	SARAPAN	SNACK KE-1	MAKAN SIANG	SNACK KE-2	MAKAN MALAM	SNACK KE-3
15	Nasi	Susu	Nasi	Susu botol	Nasi	Susu

	Sarden	Bolu coklat/ Tempe goreng	Tumis (sawi,jagung,wortel) Tuna goreng tepung		Ayam kecap Sayur bayam Kerupuk	
16	Nasi Tumis (sawi,bakso,telur)	Susu Pisang coklat Bakso goreng	Nasi Tuna goreng tepung Tahu goreng Sayur bening (bayam,wortel)	Apel/Jeruk	Nasi Udang goreng Tempe goreng Tumis (sawi,wortel,bakso)	Susu Wafer

*Pemberian *volunteer*

DAFTAR MENU MAKANAN SEMI PADAT DI PANTI ASUHAN TUNAS BANGSA

	SARAPAN	SNACK KE-1	MAKAN SIANG	SNACK KE-2	MAKAN MALAM	SNACK KE-3
1	Bubur susu (Nestle beras merah, susu)	Susu	Nasi tim (tuna, kaldu ayam, brokoli, wortel, jagung)	Susu	Nasi tim (tuna,ayam, brokoli,wortel,jagung)	Susu

2	Bubur susu (Nestle beras merah, susu)	Susu	Nasi tim (daging sapi, wortel, jagung, brokoli, kentang)	Apel	Nasi tim (daging sapi, wortel, jagung, brokoli, kentang)	Susu
3	Bubur susu (Nestle beras merah, susu)	Susu	Nasi tim (wortel, jagung, brokoli)	Susu	Nasi tim (wortel, jagung, brokoli)	Susu
4	Nestle beras merah	Susu	Nasi tim (hati ayam, buncis, jamur, brokoli, wortel, kentang)	Susu	Nasi tim (hati ayam, buncis, jamur, brokoli, wortel, kentang)	Susu
5	Nestle beras merah	Susu	Nasi tim (hati ayam, buncis, brokoli, wortel)	Susu	Nasi tim (hati ayam, buncis, brokoli, wortel)	Susu
6	Nestle beras merah	Susu Biskuit	Nasi tim (beras merah, beras putih, hati ayam, brokoli, kentang,wortel,jagung,buncis)	Susu	Nasi tim (beras merah, beras putih, hati ayam, brokoli, kentang,wortel,jagung,buncis)	Susu

7	Nestle beras merah	Susu	Nasi tim (beras merah, beras putih, tempe)	Susu Biskuit	Nasi tim (beras merah, beras putih, tempe)	Susu Biskuit
8	Nestle beras merah	Susu	Nasi tim (beras merah, beras putih, tahu)	Susu Biskuit	Nasi tim (beras merah, beras putih, tahu)	Susu Biskuit
	SARAPAN	SNACK KE-1	MAKAN SIANG	SNACK KE-2	MAKAN MALAM	SNACK KE-3
9	Nestle beras merah	Susu	Nasi tim (beras merah, beras putih, tempe)	Susu	Nasi tim (beras merah, beras putih, tempe)	Susu
10	Nestle beras merah	Susu	Nasi tim (beras merah, beras putih, tahu)	Susu	Nasi tim (beras merah, beras putih, tahu)	Susu
11	Nestle beras merah	Susu Biskuit	Nasi tim (beras merah, beras putih, tempe, ayam, katuk)	Susu	Nasi tim (beras merah, beras putih, tempe, ayam, katuk)	Susu

12	Nestle beras merah	Susu	Nasi tim (beras merah, beras putih, wortel, buncis, ayam,)	Susu Sari jeruk	Nasi tim (beras merah, beras putih, wortel, buncis, ayam,)	Sari jeruk
13	Nestle beras merah	Susu Biskuit	Nasi tim (tahu, ceker ayam, wortel, buncis)	Susu Biskuit	Nasi tim (tahu, ceker ayam, wortel, buncis)	Susu
14	Nestle beras merah	Susu	Nasi tim (ayam, kentang, wortel, buncis, tahu)	Susu	Nasi tim (ayam, kentang, wortel, buncis, tahu)	Susu

DAFTAR MENU MAKANAN PADAT DI PONDOK si BONCEL

	SARAPAN	SNACK KE-1	MAKAN SIANG	SNACK KE-2	MAKAN MALAM	SNACK KE-3
1	Nasi goreng sosis Teh manis	Biskuit Susu kotak	Nasi Kornet sapi Sayur oyong	Pisang goreng Teh manis	Nasi Sayur bayam Tahu goreng tepung Teh manis	Susu
2	Nasi Sayur tahu + wortel	Susu kotak Wafer Biskuit	Nasi Soup (bakso, wortel, sawi, bunga kol, ayam) Telur mata sapi	Pisang Teh manis	Nasi Sayur gudeg Bakwan jagung	Susu
3	Nasi	Susu	Nasi	Bolu kukus	Nasi	Susu

	Sayur tempe	Cake roll	Soup Pepaya Kerupuk Mi rebus	Teh manis	Sayur tahu,buncis	
4	Donat coklat Teh manis	Susu Biskuit	Nasi Soup (sosis, ayam, makaroni, wortel) Kerupuk	Jus jambu	Nasi Sayur santan (labu,wortel) Tempe bacem	Susu
5	Nasi Tempe oreg Teh manis	Bubur kacang hijau	Nasi Ayam goreng tepung Teh kotak	Apel	Nasi Mi rebus Sosis goreng	Susu

					Soup (ayam, wortel, kentang, kol)	
6	Nasi Tahu kecap	Es krim mini	Nasi Soto bening (kol, bihun, tauge, ayam)	Pir	Nasi Sayur santan (buncis, tahu, wortel)	Susu
7	Nasi Tempe oreg Teh manis	(Biskuit Susu kotak)/Bolu kukus	Nasi Sayur bening (oyong, bihun, wortel) Perkedel kentang	Bolu kukus Susu	Nasi Sayur lodeh (kacang panjang, eortel, labu siam) Tahu bacem	Susu
	SARAPAN	SNACK KE-1	MAKAN SIANG	SNACK KE-2	MAKAN MALAM	SNACK KE-3
8	Nasi Tempe oreg	Pastel Susu	Mi rebus	Melon serut	Nasi Ayam goreng	Susu

	Tumis (kacang panjang, ayam)					
9	Nasi Tempe oreg Teh manis	Susu	Mi goreng (mi, sawi, kol) Minuman rasa jeruk	Semangka	Nasi Sayur bening (tahu, buncis)	Susu

DAFTAR MENU MAKANAN SEMI PADAT DI PONDOK si BONCEL

	SARAPAN	SNACK KE-1	MAKAN SIANG	SNACK KE-2	MAKAN MALAM	SNACK KE-3
1	Nasi tim (makaroni, wortel, tahu, buncis, tuna)	Nestle beras merah Teh manis	Nasi tim (wotel, buncis, ayam, tuna)	Apel Susu	Nasi tim (ayam, sosis, tahu, wortel, kacang merah)	Susu

2	Bubur Sosis kuah kecap Soup (buncis, wortel, ayam)	Bubur kacang hijau	Bubur Kornet Sayur bening (buncis, wortel)	Pisang	Bubur Tempe bacem Soup (ayam, sosis, wortel)	Susu
3	Bubur Tempe goreng Soup (jagung, buncis, wortel) Teh manis	Agar-agar	Bubur Soup (ayam, buncis, wortel)	Apel	Bubur Soup (wortel, buncis, jagung) Tempe goreng	Susu
4	Nasi tim (wortel, ayam, tahu, buncis,	Bubur kacang hijau Teh manis	Nasi tim (wortel, kol, kacang merah, ayam,	Jus jambu Susu	Nasi tim (wotel, makaroni, tahu, ayam)	Susu

	telur)		tempe)			

DAFTAR MENU MAKANAN PADAT DI PANTI ASUHAN SAYAP IBU

	SARAPAN	SNACK KE-1	MAKAN SIANG	SNACK KE-2	MAKAN MALAM	SNACK KE-3
1	Nasi Bihun goreng (bihun, sawi) krupuk	Jelly drink Roti meces	Nasi Daging rendang Tahu goreng tepung Capcay (bakso, wortel, brokoli, kol, sawi)	Pir	Nasi Soup (kacang merah, wortel, daging) perkedel	Susu
2	Nasi Ayam goreng (bagian sayap) Sayur bening (buncis, kentang)	Sari kacang hijau	Bubur Ceker ayam Telur rebus Tempe	Susu	Paket hemat hoka-hoka bento	Susu
3	Nasi Soun goreng (soun, kacang panjang, kentang)	Susu	Nasi Sayur asem Ikan tenggiri goreng	Pisang	Nasi Sayur asem Ikan tenggiri goreng	Susu
4	Bubur ayam cakwe	Susu Biskuit	Nasi Rawon (labu, daging sapi)	Jus jeruk	Nasi Rawon (labu, daging sapi)	Susu

			Telur asin		Telur asin	
5	Nasi Kentang Telur puyuh kecap	Susu Pilus garuda Oreo soft cake	Nasi Sayur bening (bayam, labu) Ayam goreng (bagian sayap)	Semangka	Nasi Sayur bening (bayam, labu) Ayam goreng (bagian sayap) Tempe bacem	Susu
6	Nasi goreng telur	Susu	Nasi Capcay (wortel, kol, bakso, brokoli, buncis) Sosis goreng	Pisang	Nasi Capcay (wortel, kol, bakso, brokoli) Sosis goreng	Susu
7	Nasi Telur rebus Sayur tumis (kol, wortel, kentang)	Jus strawbery Bolu kukus bakwan	Nasi Sayur nangka (nangka, daging) Hati ayam goreng	Apel	Nasi Sayur nangka (nangka, daging) Hati ayam goreng	Susu
8	Nasi Semur tahu Kerupuk	Biskuit Susu Snack jagung coklat	Nasi Soup (wortel, brokoli) Nugget ayam	Pisang	Nasi Soup (wortel, brokoli) Nugget ayam	Susu

DAFTAR MENU MAKANAN SEMI PADAT DI PANTI ASUHAN SAYAP IBU

	SARAPAN	SNACK KE-1	MAKAN SIANG	SNACK KE-2	MAKAN MALAM	SNACK KE-3
1	Bubur cerelac/Susu	Biskuit Susu	Nasi tim (daging sapi, tomat, tahu)	Pisang ambon	Nasi tim (daging sapi, tomat, tahu)	Susu
2	Bubur cerelac	Sari kacang hijau	Nasi tim (ceker, telur ayam, tomat, tempe)	Susu	Nasi tim (ceker, telur ayam, tomat, tempe)	Susu
3	Bubur cerelac/Susu	Susu	Nasi tim (kangkung, tomat, daun bawang seledri, tempe, ceker)	Pisang ambon	Nasi tim (kangkung, tomat, daun bawang seledri, tempe, ceker)	Susu
4	Bubur cerelac/Susu	Susu	Nasi tim (daging sapi, bayam, tomat)	Pisang ambon	Nasi tim (daging sapi, bayam, tomat)	Susu
5	Bubur cerelac/Susu	Susu	Nasi tim (ayam, wortel, tomat, tempe)	apel	Nasi tim (ayam, wortel, tomat, tempe)	Susu

APPENDIX 3

(Questionnaire)

Date:
Orphhanage code:
Enum's code

Anthropometric Form

Child's Name	DOB	S/L	BB1 (kg)	BB2 (kg)	TB1 (cm)	TB2 (cm)

					Orph		
Date of record: ……./							

MORBIDITY STATUS (record by enumerator)

Child's name	diarrhea	cold	cough	sore throat	fever	Others (mention)

Note: only be filled if there is a sick child

CHARACTERISTIC OF CAREGIVER

No	Caregiver's code	Name	Age	Sex	Formal education	Non-formal education	Working period	Job description	Note

Orphanage Characteristics

	1	2	3
Name			
Position			
Age			
Working duration			
Asignment			

No	(							ı/ han	Note

1. When the orphanage was established?

2. How is the history of this orphanage?

3. Who are currently leads this orphanage and how long he/she led?

4. How does the child care system that applied in this orphanage?
   (distribution by age group, number of children per room, number of caregiver per room)

5. What are the responsibilities of the caregiver?

6. How is the working system of caregivers?

7. How many children should be handled by each caregiver during working hours?

8. How is caregivers reqruitment system in this orphanage?

9. How is monitoring system of caring activities in this orphanage?

10. Are there any training given to caregivers either organized by the orphanage or outside the orphanage? What kind of training?
11. Whether the training is followed by all caregivers or only represented? why?
12. Education services and facilities?

	Services and Facilities	
	interview	**Observation**
0-6 mos		
>6-18 mos		
>18-59 mos		

13. Health services and facilities

	Services and facilities	
	interview	**Observation**
0-6 mos		
>6-18 mos		
>18-59 mos		

14. How is the feeding system at the orphanage children for each age group?

15. Who is decision maker to make daily menu?

16. What is the consideration to make daily menu?

17. Who have to take responsbility for cooking and food serving to the children?

18. If the children suffered from illness, is there any different food in terms of variety or quantity?

19. How about menu for children during recovery?

20. When the children suffered from diseases how to handle, how about fundings alocation for that situation?

21. About funding, how is the funding resources (fixed nad non fixed), is it regular or not?

22. Whether the budget is enough to meet the needs of this orphanage?

23. If not, what is the strategy?

24. Whether the problem affect to food and health service of this orphanage?

25. How about the government' support (Kind and regularity) ?

26. From the budget, how is the ratioallocation for food, health and education for the children?

27. Whether every children in this orphanage have insurance?

28. Is there any regular check up for the children?

29. Who is conduct the activity?

30. Whether this orphnage has the guideline from the government? If yes, what is your suggestion for the guideline? If not do this orphanage have own guideline?

Date of
interview : ……./…

RESEARCH QUESTIONNAIRE

(In-depth interview to caregiver)

Caregiver's name :

Sex : 1. M 2. F

Caregiver's birth date: ……./……./…….. dd/mm/yy

Age :

Working period :

Education :

Enumerator's name :

Orphanage's identity (give a circle):

1. Tunas Bangsa
2. Sayap Ibu
3. Pondok si Boncel

Open Question

1. What is your motivation to become a caregiver in here?

2. What do you have to do as your responsibility?

3. What obstacle do you often encounter on the job (both from the children or the environment)?

4. Do you like your job? why?

5. Do you feel your workload is very heavy and you feel overwhelmed? why?

6. What do you usually do when you already feel overwhelmed?

7. Do you have any suggestion to improve the orphanage situation?

Child's code

Date of interview/observation : ……./…

RESEARCH QUESTIONNAIRE

(for children who only consume formula milk)

Child's name :

Sex : 1. M 2. F

Child's birth date: ……/……/…….. dd/mm/yy

Enumerator's name :

Survey's team :

1. 4.

2. 5.

3.

Orphanage's identity :

1. Tunas Bangsa

2. Sayap Ibu

3. Pondok si Boncel

ANTHROPOMETRIC MEASUREMENT

Weight of the child (Kg) (1) (2)
Length of the child (Cm) (1) (2)

FOOD RECORD FOR INTAKE

Day of intake: (circle one)

Monday Tuesday Wednesday Thursday Friday Saturday Sunday

Time	Milk brand	Amount (ml)	Note*

*finished/not finished

Additional question:

1. Is the intake different than usual? If yes, in what way(s)?

2. Does the child take any medication or vitamin/supplements? If yes, what medication/supplements?

MORBIDITY STATUS (filled based on previous record)

1. Did the child had diarrhea in the past two week	1. Yes 2. No	
2. Did the child suffered from ARI in the past two week	1. Yes 2. No	Kinds of symptom :
3. Others disease		

FEEDING PRACTICES RECEIVED BY THE CHILD

FREQUENCY MEALS AND SNACKS (filled by enumerator based on observation/ derived from food record)		
How many times the child drinks milk in a day?		
FEEDING RESPONSIVENESS (filled by enumerator based on observation)		CODE
1. When the infant shows hunger cues, are caregivers sensitive to the cues	1. Yes Kind of cues… 2. No	
2. What caregivers do?		
3. Does caregiver assist the infant directly to drink milk?	1. Yes 2. No	
4. Whether caregiver assist the infant to drink milk with slowly and patiently	1. Yes 2. No 3. Not applicable	
5. During assist the infant to drink milk, does the caregiver talk to the infant with eye to eye contact	1. Yes 2. No 3. Not applicable	
6. If the infant rejects the milk (since first time given), what does caregiver do?	1. encourage the infant Kind of encouragement …… ……. 2. delay to giving milk (what they do to the milk…….) 3. do nothing 4. force the infant 5. other, specify…	
7. After several time, the infant does not finish the milk, what does caregiver do?	1. encourage the infant Kind of encouragement ……	

	……. 2. take the milk (what they do to the milk…….) 3. do nothing 4. force the infant 5. other, specify…	
8. Are there animals near by?	1. Yes …….. 2. No	

FEEDING DURING AND AFTER ILLNESS (filled by enumerator based on observation)		CODE
1. What happen with infant appetite during illness?	1. decreased appetite 2. like usual 3. good appetite	
2. When the infant is ill, how much fluid is given to the infant?	1. less than usual 2. like usual 3. more than usual	
3. When the infant is ill, how often fluid is given to the infant?	1. less than usual 2. like usual 3. more than usual	
4. What happen with infant appetite during recovery?	1. decreased appetite 2. like usual 3. good appetite	
5. When the infant is ill, how much fluid is given to the infant?	1. less than usual 2. like usual 3. more than usual	
6. When the infant is recover from ill, how often fluid is given to the infant?	1. less than usual 2. like usual 3. more than usual	

Child's code

Date of

interview/observation : ……./…

RESEARCH QUESTIONNAIRE

(For children consume soft/semi-solid food)

Child's name :

Sex : 1. M 2. F

Child's birth date: ……./……./…….. dd/mm/yy

Enumerator's name :

Survey's team :

1. 4.

2. 5.

3.

Orphanage's identity :

1. Tunas Bangsa

2. Sayap Ibu

3. Pondok si Boncel

ANTHROPOMETRIC MEASUREMENT

Weight of the child (Kg) (1) (2)
Height of the child (Cm) (1) (2)

FOOD RECORD FOR INTAKE

Day of intake: (circle one)

Monday Tuesday Wednesday Thursday Friday Saturday Sunday

ime	Meal Type	Food	Method*	Ingredient*	If any, specification ingredient*	Amount		note
						Household measures	Weigh t (g)	
eak-fast								
1st nack								
unch								
2nd nack								
nner								

Note: * filled if the child's food is different with the others

Additional question:

1. Is the intake different than usual? If yes, in what way(s)?

2. Does the child take any medication or vitamin/supplements? If yes, what medication/supplements?

MORBIDITY STATUS (filled based on previous record)

1. Did the child had diarrhea	1. Yes	

in the past two week	2. No	
2. Did the child suffered from ARI in the past two week	1. Yes 2. No	Kinds of symptom :
3. Others disease		

FEEDING PRACTICES RECEIVED BY THE CHILD

FREQUENCY MEALS AND SNACKS (filled by enumerator based on observation/ derived from food record)		CODE
1. How many times of meals does the child eat in a day?	1. 1 times 2. 2 times 3. 3 times 4. > 3times	
2. How many times of snack does the child eat in a day?	1. No snack 2. 1 times 3. 2 times 4. > 2times	
FEEDING RESPONSIVENESS (filled by enumerator based on observation)		CODE
1. When the child shows hunger cues, are caregivers sensitive to the cues	1. Yes Kind of cues…. 2. No	
2. What caregivers do?		
3. Whether the child eats from his/her own pot?	1. Yes 2. No	
4. Is the child able to feed him/herself?	1. Yes 2. No	
5. If not, how does the caregiver help the child to eat?		
6. When the child is fed, does the caregiver fed the child slowly and patiently	1. Yes 2. No 3. Not applicable	
7. When the child is fed, does the caregiver talk to the child with eye to	1. Yes 2. No	

eye contact	3. Not applicable	
8. If the child rejects the food (since first time given), what does caregiver do?	1. encourage the child to eat Kind of encouragement… …… 2. stop feeding 3. do nothing 4. force the child to eat 5. other, specify…	
9. If the child does not finish the foods while eating, what does caregiver do?	1. encourage the infant Kind of encouragement …… ……. 2. stop feeding 3. do nothing 4. force the child to eat 5. other, specify…	
10. Are there animals near by?	1. Yes …….. 2. No	

FEEDING DURING ILLNESS (filled by enumerator based on observation)		CODE
1. What happen with child appetite during illness?	1. decreased appetite 2. like usual 3. good appetite	
2. When the child is ill, how much food received by the child?	1. less than usual 2. like usual 3. more than usual	
3. When the child is ill, how often food received by the child?	1. less than usual 2. like usual 3. more than usual	
4. Whether the food is different with food for the others children (health)	1. Yes Mention…….	

	2. No	
5. When the child is ill, how often fluid is given to the child?	1. less than usual 2. like usual 3. more than usual	
6. What happen with child appetite during recovery?	1. decreased appetite 2. like usual 3. good appetite	
7. When the child is recover from ill, how much food is given to the child?	1. less than usual 2. like usual 3. more than usual	
8. When the child is recover from ill, how often food is given to the child?	1. less than usual 2. like usual 3. more than usual	
9. Whether the food is different with food for the others children	1. Yes Mention……. 2. No	
10. When the child is recover from ill, how often fluid is given to the child?	1. less than usual 2. like usual 3. more than usual	

Child's code

Date of
interview/observation : ……./…

RESEARCH QUESTIONNAIRE

(For children who have consume family food)

Child's name :

Sex : 1. M 2. F

Child's birth date: ……./……./…….. dd/mm/yy

Enumerator's name :

Survey's team :

1. 4.

2. 5.

3.

Orphanage's identity :

1. Tunas Bangsa
2. Sayap Ibu
3. Pondok si Boncel

ANTHROPOMETRIC MEASUREMENT

Weight of the child (Kg) (1) (2)
Height of the child (Cm) (1) (2)

FOOD RECORD FOR INTAKE

Day of intake: (circle one)

Monday Tuesday Wednesday Thursday Friday Saturday Sunday

ime	Meal Type	Food	Method*	Ingredient*	If any, specification ingredient*	Amount		note
						Household measures	Weigh t (g)	
eak-fast								
1st nack								
unch								
2nd nack								
nner								

Note: * filled if the child's food is different with the others

Additional question:

1. Is the intake different than usual? If yes, in what way(s)?

2. Does the child take any medication or vitamin/supplements? If yes, what medication/supplements?

MORBIDITY STATUS (filled based on previous record)

1. Did the child had diarrhea in the past two week	1. Yes 2. No	
2. Did the child suffered from ARI in the past two week	1. Yes 2. No	Kinds of symptom :
3. Others disease		

FEEDING PRACTICES RECEIVED BY THE CHILD

FREQUENCY MEALS AND SNACKS (filled by enumerator based on observation/ derived from food record)		CODE
1. How many times of meals does the child eat in a day?	1. 1 times 2. 2 times 3. 3 times 4. > 3times	
2. How many times of snack does the child eat in a day?	1. No snack 2. 1 times 3. 2 times 4. > 2times	
FEEDING RESPONSIVENESS (filled by enumerator based on observation)		CODE
1. When the child shows hunger cues, are caregivers sensitive to the cues	1. Yes Kind of cues…. 2. No	
2. What caregivers do?		
3. Whether the child eats from his/her own pot?	1. Yes 2. No	
4. Is the child able to feed him/herself?	1. Yes 2. No	
5. If not, how does the caregiver help the child to eat?		
6. When the child is fed, does the caregiver fed the child slowly and patiently	1. Yes 2. No 3. Not applicable	
7. When the child is fed, does the	1. Yes	

caregiver talk to the child with eye to eye contact	2. No 3. Not applicable	
8. If the child rejects the food (since first time given), what does caregiver do?	1. encourage the child to eat Kind of encouragement… …… 2. stop feeding 3. do nothing 4. force the child to eat 5. other, specify…	
9. If the child does not finish the foods while eating, what does caregiver do?	1. encourage the infant Kind of encouragement …… …… 2. stop feeding 3. do nothing 4. force the child to eat 5. other, specify…	
10. Are there animals near by?	1. Yes …….. 2. No	

FEEDING DURING ILLNESS (filled by enumerator based on observation)		CODE
1. What happen with child appetite during illness?	1. decreased appetite 2. like usual 3. good appetite	
2. When the child is ill, how much food received by the child?	1. less than usual 2. like usual 3. more than usual	
3. When the child is ill, how often food received by the child?	1. less than usual 2. like usual 3. more than usual	

4. Whether the food is different with food for the others children (health)	1. Yes Mention……. 2. No	
5. When the child is ill, how often fluid is given to the child?	1. less than usual 2. like usual 3. more than usual	
6. What happen with child appetite during recovery?	1. decreased appetite 2. like usual 3. good appetite	
7. When the child is recover from ill, how much food is given to the child?	1. less than usual 2. like usual 3. more than usual	
8. When the child is recover from ill, how often food is given to the child?	1. less than usual 2. like usual 3. more than usual	
9. Whether the food is different with food for the others children	1. Yes Mention……. 2. No	
10. When the child is recover from ill, how often fluid is given to the child?	1. less than usual 2. like usual 3. more than usual	

APPENDIX 4

(Permission Letter)

UNIVERSITAS INDONESIA
FAKULTAS KEDOKTERAN

Jalan Salemba Raya No. 6, Jakarta Pusat
Pos Box 1358 Jakarta 10430
Kampus Salemba Telp. 31930371, 31930373, 3922977, 3927360, 3912477, 3153236, Fax. : 31930372, 3157288, e-mail : office@fk.ui.ac.id

Nomor : 5 57 /PT02.FK/ETIK/2011

KETERANGAN LOLOS KAJI ETIK

ETHICAL CLEARANCE

Komite Etik Penelitian Kesehatan Fakultas Kedokteran Universitas Indonesia dalam upaya melindungi hak asasi dan kesejahteraan subyek penelitian kedokteran, telah mengkaji dengan teliti protokol berjudul:

The Ethics Committee of the Faculty of Medicine, University of Indonesia, with regards of the Protection of human rights and welfare in medical research, has carefully reviewed the research protocol entitled:

"Gizi dan Kesehatan Anak Usia 0-59 Bulan Penghuni Panti Asuhan di Jakarta (Nutrition and Health Related Condition of Orphanage Children Aged 0-59 Mounths in Jakarta)".

Peneliti Utama **: Kartika Wandini. SP**
Principal Investigator

Nama Institusi **: Seameo-Tropmed UI**
Name of the Institution

dan telah menyetujui protokol tersebut di atas.
and approved the above-mentioned protocol.

Jakarta, 20 Juni 2011

Ketua
Chairman

Prof. Dr. dr. Rianto Setiabudy, SpFK

***Ethical approval* berlaku satu tahun dari tanggal persetujuan**
****Peneliti berkewajiban**

1. Menjaga kerahasiaan identitas subyek penelitian
2. Memberitahukan status penelitian apabila
   a. Setelah masa berlakunya keterangan lolos kaji etik, penelitian masih belum selesai, dalam hal ini *ethical clearance* harus diperpanjang
   b. Penelitian berhenti di tengah jalan
3. Melaporkan kejadian serius yang tidak diinginkan (*serious adverse events)*
4. Peneliti tidak boleh melakukan tindakan apapun pada subyek sebelum penelitian lolos kaji etik dan *informed consent*

PEMERINTAH PROVINSI DAERAH KHUSUS
IBUKOTA JAKARTA

KEPUTUSAN GUBERNUR PROVINSI DAERAH KHUSUS
IBUKOTA JAKARTA

NOMOR 841/2011

TENTANG

PEMBERIAN IZIN PENELITIAN KEPADA TIM PENELITI ATAS NAMA
KARTIKA WANDINI, SP. DAN KAWAN-KAWAN

DENGAN RAHMAT TUHAN YANG MAHA ESA

GUBERNUR PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA,

Menimbang :

a. bahwa sehubungan dengan surat Direktorat Jenderal Kesatuan Bangsa dan Politik Kementerian Dalam Negeri Republik Indonesia tanggal 18 Mei 2011 Nomor 440.02/1065.D.I dan memperhatikan Rekomendasi Kepala Badan Kesatuan Bangsa dan Politik Provinsi DKI Jakarta tanggal 24 Mei 2011 Nomor 1927/-1.751 hal izin penelitian, untuk kegiatan penelitian dimaksud diperlukan izin;

b. bahwa berdasarkan pertimbangan sebagaimana dimaksud dalam huruf a, perlu menetapkan Keputusan Gubernur tentang Pemberian Izin Penelitian kepada Tim Peneliti atas nama Kartika Wandini, SP. dan kawan-kawan;

Mengingat :

1. Undang-Undang Nomor 10 Tahun 2004 tentang Pembentukan Peraturan Perundang-undangan;
2. Undang-Undang Nomor 32 Tahun 2004 tentang Pemerintahan Daerah sebagaimana telah beberapa kali diubah terakhir dengan Undang-Undang Nomor 12 Tahun 2008;
3. Undang-Undang Nomor 29 Tahun 2007 tentang Pemerintahan Provinsi Daerah Khusus Ibukota Jakarta sebagai Ibukota Negara Kesatuan Republik Indonesia;
4. Peraturan Daerah Nomor 10 Tahun 2008 tentang Organisasi Perangkat Daerah;
5. Keputusan Gubernur Nomor 69 Tahun 2004 tentang Prosedur Pelayanan pada Badan Kesatuan Bangsa Propinsi Daerah Khusus Ibukota Jakarta;
6. Peraturan Gubernur Nomor 98 Tahun 2009 tentang Organisasi dan Tata Kerja Badan Kesatuan Bangsa dan Politik Provinsi Daerah Khusus Ibukota Jakarta;
7. Peraturan Gubernur Nomor 168 Tahun 2009 tentang Organisasi dan Tata Kerja Sekretariat Daerah;
8. Peraturan Gubernur Nomor 47 Tahun 2011 tentang Pedoman Pelayanan Izin Penelitian;

MEMUTUSKAN :

Menetapkan	:	KEPUTUSAN GUBERNUR TENTANG PEMBERIAN IZIN PENELITIAN KEPADA TIM PENELITI ATAS NAMA KARTIKA WANDINI, SP. DAN KAWAN-KAWAN.
KESATU	:	Memberikan izin penelitian kepada Tim Peneliti atas nama Kartika Wandini, SP. dan kawan-kawan dari SEAMEO Regional Center For Food and Nutrition (SEAMEO RECFON).
KEDUA	:	Izin sebagaimana dimaksud pada diktum KESATU dengan judul "Gizi dan Kesehatan Anak Usia 0-59 Bulan Penghuni Panti Asuhan di Jakarta", yang diberikan selama 2 (dua) bulan di Provinsi DKI Jakarta.
KETIGA	:	Pemegang izin sebagaimana dimaksud pada diktum KESATU, wajib menyampaikan laporan tertulis hasil kegiatan yang telah dilaksanakan kepada Gubernur melalui Kepala Biro Tata Pemerintahan Setda Provinsi DKI Jakarta dengan tembusan kepada Kepala Badan Kesatuan Bangsa dan Politik Provinsi DKI Jakarta, paling lama 1 (satu) bulan setelah habis masa berlakunya izin untuk mendapatkan rekomendasi publikasi.
KEEMPAT	:	Peneliti dapat melakukan publikasi hasil penelitian jika laporan sebagaimana dimaksud pada diktum KETIGA telah diterima dan mendapatkan rekomendasi publikasi.
KELIMA	:	Keputusan Gubernur ini mulai berlaku pada tanggal ditetapkan.

Ditetapkan di Jakarta
pada tanggal 9 Juni 2011

a.n. GUBERNUR PROVINSI DAERAH KHUSUS
IBUKOTA JAKARTA
ASISTEN PEMERINTAHAN SEKDA,

SYLVIANA MURNI
NIP 195810111985112001

Tembusan :

1. Kepala Badan Kesatuan Bangsa dan Politik Provinsi DKI Jakarta
2. Para Walikota Provinsi DKI Jakarta
3. Kepala Dinas Sosial Provinsi DKI Jakarta
4. Kepala Biro Tata Pemerintahan Setda Provinsi DKI Jakarta
5. Para Kepala Suku Dinas Sosial Provinsi DKI Jakarta
6. Deputi Direktur Program SEAMEO RECFON

PEMERINTAH PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA

BADAN KESATUAN BANGSA DAN POLITIK

Jl. Abdul Muis No. 66 Telp.3800590, 3865703 Fax 3454451
Jakarta

Kode Pos 10160

Nomor : 1927/-1.751.
Sifat : Penting
Lampiran :
Hal : Izin penelitian

24 Mei 2011

Kepada

Yth. Kepala Biro Tata Pemerintahan Setda
Provinsi DKI Jakarta
di
Jakarta

REKOMENDASI

Sehubungan dengan Surat Direktorat Jenderal Kesatuan Bangsa dan Politik Kementerian Dalam Negeri Republik Indonesia Nomor : 440.02/1065.D.I, tanggal 18 Mei 2011, hal izin penelitian, dengan ini diberikan rekomendasi kepada :

Nama	: Kartika Wandini, SP., dkk
Alamat	: Jl. Tanah Merdeka 1 RT. 010 RW 004 Kelurahan Rambutan Kecamatan Ciracas Jakarta Timur
Pekerjaan	: Mahasiswa
No. Mahasiswa/KTP/SIM	: 09.5410.511286.0091
Tingkat	: Peneliti
Univ/fakultas/jurusan	: SEAMEO Regional Center For Food and Nutrition (SEAMEO RECFON)
Tujuan	: Penelitian berjudul "Gizi Dan Kesehatan Anak Usia 0-59 Bulan Penghuni Panti Asuhan Di Jakarta"
Waktu	: 31 Mei s.d. 31 Juli 2011
Peserta	: 6 (enam) orang
Lokasi	: DKI Jakarta
Penanggung jawab	: Dr. Drupadi HS Dillon, PhD.

Untuk melakukan Penelitian dimaksud, dengan ketentuan :

1. Sebelum melakukan penelitian, terlebih dahulu melapor kepada pimpinan daerah/wilayah setempat.
2. Mematuhi peraturan-peraturan yang berlaku di daerah / wilayah setempat.
3. Tidak dibenarkan melakukan penelitian yang materinya bertentangan dengan topik/judul penelitian dimaksud.
4. Ijin Rekomendasi yang diberikan dapat dibatalkan sewaktu-waktu apabila tidak sesuai dengan ketentuan yang berlaku.

Demikian disampaikan untuk menjadi bahan lebih lanjut.

KEPALA BADAN KESATUAN BANGSA DAN POLITIK
PROVINSI DKI JAKARTA,

ZAINAL MUSAPPA
NIP 195911081982111001

Tembusan :

1. Gubernur Provinsi DKI Jakarta
2. Sekretaris Daerah Provinsi DKI Jakarta
3. Asisten Pemerintahan Sekda Provinsi DKI Jakarta

PEMERINTAH PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA
DINAS SOSIAL
Jalan Gunung Sahari II No. 6 - Jakarta Pusat
Telp. (021) 4222497 - 4222498 Fax. 4253639
JAKARTA
Kode Pos : 10610

Nomor : 140 /-1.785.4
Sifat : Biasa
Lampiran :
Hal : Permohonan Izin Penelitian

25 Mei 2011

Kepada
Yth. Deputi Direktur
Program Magister Gizi
Komunitas SEAMEO RECFON
di
Jakarta

Sehubungan dengan surat Saudara tanggal 18 Mei 2011 nomor 052/RECFON-PROG/V/2011 hal seperti tersebut pada pokok surat, kami tidak keberatan memberikan izin kepada Mahasiswa Program Magister Gizi Kumunitas SEAMEO RECFON Jakarta atas nama Kartika Wandini.SP, yang akan mengadakan kegiatan penelitian di Panti Sosial Asuhan Anak Balita Tunas Bangsa dan kegiatan tersebut akan dilaksanakan mulai tanggal 27 Mei 2011 s.d selesai.

Sehubungan dengan hal tersebut di atas, kami minta Saudara melaporkan hasil kegiatan dimaksud kepada Dinas Sosial Provinsi DKI Jakarta cq Sub.Bag. Kepegawaian Dinas Sosial Provinsi DKI Jakarta.

Atas perhatian Saudara disampaikan terima kasih.

KEPALA DINAS SOSIAL
PROVINSI DKI JAKARTA,

H. KIAN KELANA
NIP. 195811141982081001

Tembusan :
- Ka. Panti Sosial Asuhan Anak Balita Tunas Bangsa