Addressing Undernourishment among Pupils in A Depressed Community

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***Abstract*— This study evaluated the supplemental feeding program to address undernourishment among 59 pupils in an elementary school located in one of the depressed communities in Tarlac City, Philippines. Before the feeding program and vitamin supplementation, pupils were found to have Body Mass Indices below normal values. They were subjected to one month heavy breakfast feeding and afternoon snacks. They were also given vitamins daily. Findings revealed that most of the pupils had regained normal Body Mass Indices (BMIs) during a routine weighing at the start of a new school year. Aside from regaining normal nutrition, most of the pupils improved in their academic performance in the last quarter compared to the third quarter period. The researchers recommended that school extension programs should prioritize activities to address undernourishment among pupils. The feeding programs must include heavy meals, to include milk and vitamins to ensure that significant improvement in the pupils' nutrition. It is also important that feacalysis and deworming be performed before feeding and proper handwashing be integrated in the activity. These were done in the supplemental feeding program implemented among the pupils in that community. The researchers also recommend training the mothers on how to prepare low cost nutritious foods to maintain proper nutrition even after the feeding program in school.**

***Index Terms*— Wasted, Severely wasted, Body Mass Index, Supplemental Feeding.**

I. INTRODUCTION

The Philippine government, is a signatory to the Millennium Development Summit in year 2000 and is committed to measure and monitor the eight Millennium Development Goals (MDGs), comprising of a total of 18 targets and 28 indicators. One indicator is the prevalence of malnutrition among children. The government institution which has the mandate of monitoring the nutritional status of the population is the Food and Nutrition Research Institute of the Department of Science and Technology (FNRI-DOST). FNRI-DOST conducts regular Anthropometry Survey every two to three years. It uses the World Health Organization -National Center for Health Statistics (WHO-NCHS) International Reference Standard (IRS) to monitor the growth of under-five year old children [1].

Several studies have proven that malnutrition have direct effects to the mental abilites of children, not to mention the physical, social and psychological effects [2] [3] [4]. In fact the United States is facing a serious public health problem. A mere two percent of children meet the daily recommendations in the Dietary Guidelines for Americans for consuming foods from all five categories in the Food Pyramid. Children are not eating healthy, well balanced diets and, as a result, there is a rising incidence of malnutrition [5].

Philippines is not also spared in this problem. Undernourishments still pervades today and there are even children who go to school physically weak due to malunourishment. A survey was conducted by the Food and Nutrition Research Institute (FNRI) whic revealed that 15.9% or two out of ten children from 0-47 months old were born with low birth weight [6].

Malnutrition affects every organ system in the body and causes impairment of physical growth, immune response, and cognitive functioning. Weakened immune systems make children more susceptible to severe and chronic infections which further exacerbate nutritional problems. Thus, malnourishment detracts from school attendance. Additionally, malnourished children suffer from slow rates of brain development, low brain weight, a thin cerebral cortex, decreased numbers of neurons, deficient myelinization, and changes in dendritic spines [7].

In Laungcupang Elementary School, teachers reported 59 pupils who had Body Mass Indices below the normal standards. Thirteen were severly wasted and 46 were wasted. The College of Education, through its extension program heartily volunteered to feed the pupils and gave them vitamin supplementation for one month. This study evaluated the result of the feeding program.

II. OBJECTIVES OF THE STUDY

1. Describe the undernourished pupils based on the following profile before the supplemental feeding program:
   1.1. common dietary intake,
   1.2. parents' occupation, and
   1.3. academic performance.
2. Describe the supplemental feeding program implemented .
3. Evaluate the feeding program and vitamin supplementation based on :
   3.1. improvement in the nutritional status
   3.2. improvement in the academic performance.

III. METHODOLOGY

The study was conducted in Laungcupang Elementary School in La Paz, Tarlac. This is one of the depressed communities in La Paz town so the College of Education adopted it for its extension services.

The purposive sampling was used in this study since only undernourished pupils were taken as subjects. Fifty-nine

(59) pupils were reported by teachers to have Body Mass Indices (BMIs) below the normal measurement and these were the only ones targeted in this study.

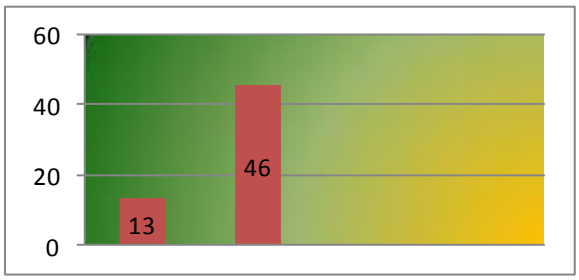

Figure 1. Distribution of the Respondents

There were 13 pupils categorized as severely wasted based on the BMI and 46 wasted. The DepED issued standard charts where teachers would base the interpretation of the results of BMI. Wasted means the pupils' BMIs fell below the normal BMI considering their ages, weights and heights. Severely wasted means the BMIs are even way below the wasted value.

Research Instruments

- Data to determine the profile of the respondents were gathered through interview with the malnourished children and their mothers
- To assess the implementation of the Feeding program, the teachers took the BMI of the pupils in June 2014 and the grades of the pupils were obtained from their advisers.
- To describe the supplemental feeding program implemented among the malnourished children, observation was done by the main proponents of the project who are the researchers themselves.

IV. Results and Discussions

1. Profile of the Respondents

In this study, the profile of the respondents consisted of the common diet intake of the pupils; the occupation of their parents; and their academic performance before the feeding program.

1.1. Common Dietary Intake

The common diet intake of the pupils refers to what they usually had for breakfast, lunch and dinner. Table 1 shows the results.

Table 1. Common Dietary Intake of the Pupils on a Weekly Basis

Meal Time	Diet Intake	f	%
Breakfast	Noodles	23	38.98
	Egg Rice	10	16.95
	Biscuits	12	20.34
	Rice Salted Fish (Bagoong) or Kropek	14	23.73
Lunch	Egg Rice	13	22.03
	Smoked Fish	21	35.59
	Rice		
	Rice with Salted Fish or Kropek	14	23.73
	Rice with Lard	11	18.64
Dinner	Noodles	18	30.51
	Smoked Fish Rice	22	37.29
	Rice with Salted Fish or kropek	19	32.20

Table 1 shows the common dietary intake of the malnourished pupils on a weekly basis. Upon interview with the pupils and some mothers, during breakfast, pupils' diet consisted of noodles (38.98%), some usually had eggs with rice (16.95%), others had biscuits (20.34%), and the rest had rice and salted fish (bagoong) or kropek. According to the pupils, there were times they practically had nothing for breakfast. They wait for their parents to bring home lunch or dinner after working. In times when the parents had no job offers, they settled with just noodles or rice with kropek which they borrowed from the store.

Lunch meals were practically repetition of their breakfast. Some claimed to have smoked fish with rice especially if their parents were able to work during the day (35.39%); other children had egg with rice which their parents managed to pack for them; some had rice with bagoong or kropek (23.73%);and some had to settle for rice and lard.

For dinner, some pupils had noodles (30.51%); smoked fish with rice (37.29%); and rice with salted fish or kropek (32.20%).

Diet intake of the pupils would show that they lacked nutrients for their nourishment. In fact, according to the pupils, there were times they only had two meals in a day. They were lucky if the store nearby would allow them to get goods for their meal and pay later. But if they already had long list, they needed to pay before they were allowed to have another list.

They were also asked if they had fruits and the pupils claimed, they had aratelis or some mangoes they asked from neighbors.

1.2. Parents Occupation

The work of the pupils' parents was also determined in this study. The results are shown in Table 2.

Table 2. Fathers' Occupation

Occupation	f	%
Farmer	19	32.20
Laborer	18	30.51
Driver	8	13.56
Carpenter	7	11.86
None	7	11.86
TOTAL	59	100%

As to the fathers' occupation, 19 or 32.20% were farmers but they do not own the farms. They just worked as tenants or hired during sowing and harvest time. Others were laborers (30.51%) who were hired on a daily basis but their

job calls were not regular. Some were drivers (13.56%) who only had the chance to bring out tricycles at night or early morning when the owners were resting. Few were carpenters (11.86%); and others had no jobs (11.86%) due to physical ailments.

Findings show that fathers of the malnourished pupils had no permanent employment that is why when there were no calls for a job, they would not have money to buy their food for the day.

As to the mothers' occupation, Table 3 shows the results.

Table 3. Mothers' Occupation

Occupation	f	%
Laundry	15	25.42
Laborer	13	22.03
None	31	52.54
TOTAL	59	100%

Findings revealed that some mothers of the malnourished pupils accepted laundry (25.42%) to help augment the small income of their spouses; others went with their spouses to work as laborers (22.03%) in the farms but not on a regular basis; and a little over half of the mothers had no jobs. They were plain housewives who took care of the children while their spouses were away to work.

Results show that mothers hardly helped in providing the financial needs of the households. It is the reason why they could not afford nutritious meals for their children.

1.3. Academic Performance

The academic performance of the pupils was based on the third quarter grades before they were given supplemental feeding program. Results are shown in Table 4.

Table 4. Academic Performance of the Pupils Based in Third Quarter Period

Grade Bracket	Adjectival Grade	f	%
90% and above	Advance	0	0.00
85-89%	Proficient	6	10.17
80-84%	Approaching Proficiency	22	37.39
75-79%	Developing	31	52.54
TOTAL		59	100%

The academic performance of the pupils in the third quarter is shown in Table 4. As seen, nobody obtained a grade of 90% above. Only 6 or 10.17% were proficient as their average grades were within 85-89%. Twenty-two or 37.39% were approaching proficiency which means that students had developed the fundamental knowledge and skills and core understandings and with little guidance from the teacher and/or with some assistance from peers, can transfer these understandings through authentic performance tasks. A big bulk of the students was only developing because their grades were within 75-79%. Students at this level possessed the minimum knowledge and skills and core understandings, but needed help throughout the performance of authentic tasks.

The academic performance of the malnourished pupils showed that although they obtained passing marks, there were more pupils who just obtained the minimum passing grades.

2. The Feeding Program and Vitamin Supplementation

The proponents of the project developed a-month feeding program and vitamin supplementation. Table 5 shows the feeding program.

Table 5. Feeding Program for the Malnourished Pupils (Five Day Cycle)

Meal	Budget Per meal	Total Cost
Day 1: Feb. 24 :Breakfast Arrozcaldo with chicken and egg Rice (Php 2.00) 1 glass of milk (Php 6.00) 1 pc banana (Php 3.00) 1 egg (Php 5.00) 1 pc chicken (Php 7.00) Other expenses: Gas, Oil, Spices (Php8.00) Afternoon snack: 1 Banana q (Php 7.00) 1 glass of juice (Php 7.00)	Total per pupil : PhP 45	PhP 2,655
Feb. 26 : Macaroni Soup Macaroni pasta (Php 4.00) Chicken (Php 4.00) Hotdog (Php 1.00) Vegetable mix (Php 2.00) Pandesal (Php 2.00) Milk (Php 1.00) Milo (Php 6.00) Others (Php 2.00) Afternoon Snack 1 pc turon (Php 5.00) 1 juice (Php 5.00) Total per pupil: Php 32.00	Total per pupil: PhP 32	PhP 1,888
Feb. 27: Fried Chicken meal 1 pc chicken (Php 14.00) Rice (Php 6.00) Milk (Php 6.00) 1 pc Apple (Php 10.00) Total per pupil: 36	Total per pupil: PhP 36	PhP=2,124
Feb. 28: Tinolang Manok 1 pc Chicken (Php 14.00) Rice (Php 6.00) Vegetables (Php 2.00) Milk (Php 6.000 1 orange (Php 5.00) Total per pupil : Php 33.00	Total per pupil: PhP=33	PhP=1,947
March 3: Sinigang na Ribs 1 pc meat (Php 14.00) Rice (Php 6.00) Vegetables (Php 2.00) 1 pc banana (Php 3.00) Milo (Php 6.00) Total per pupil: Php 31.00	Total per pupil: PhP=31	Php =1,829
*Note: The five day menu was repeated for four weeks * Pupils were also given Vitamin C everyday. The project proponents sought donations from the faculty members and some	Total per pupil in a month= PhP 708	Total Expenses for one Month : PhP 41,772

proponents' friends working abroad *Source of budget : voluntary contributions from students and faculty members of the COED and three OFWs * Before the feeding program, fecalysis was performed on their stools and they were given antihelmenthic drugs donated by the Rotary Club of Tarlac		

Table 5 shows the feeding program implemented to the malnourished children. As seen, a five- day cycle menu was developed by the researchers which consisted of a heavy breakfast meal and afternoon snacks. Children were also provided with milk, milo or juice and fruits to balance their meals.

The main project proponent gave the budget to the nutrition leader in the school as they were the ones who went to market and prepared the food. However, to ensure that the feeding program was implemented as planned, the main project proponent, and two of the co-proponents took turns in monitoring the implementation.

Before the feeding program, the proponents provided gas stove and eating utensils in the school.

Figure 1. The Eating Utensils Donated to the School

The COED faculty members and students contributed to provide for the eating utensils for the malnourished pupils. There were also baskets of fruits and delicious meals as shown in Figure 2.

Figure 2. Fruits and Meat, Go, Grow and Glow!

Pupils were also given vitamins from faculty donors. The school's health leader was in-charge of giving the vitamins as shown in Figure 3.

Figure 3. Vitamin Supplementation

The teachers and parents expressed their joy during the feeding program.

Figure 4. Teachers Posed with the Pupils

Teachers were very thankful of the full support of the COED of TSU. According to them, the activity was a very generous feeding program since even snacks were provided in the afternoon.

Figure 5.A Pupil Enjoying the Camote Cue

The feeding program also included an afternoon snack with juice. The pupils really enjoyed the food provided for them.

3. Evaluation of the Feeding Program

The feeding program was evaluated based on the improvement in the academic performance and the measurements of the Body Mass Indices of the Pupils

3.1. Improvement in the Nutritional Status

Before the start of SY 2014-2015, the BMIs of the pupils were measured as part of the routine assessments that DepED teachers were required to do. This is to recommend pupils who needed to be put on a feeding program.

The nutritional status of the pupils is shown in Table 6. It should be noted that the health leader in the school continued the feeding program after a month since the DepEd also allotted budget for them. Mothers were also taught on planting vegetables in their backyards or pots so they could have something to cook for their children.

Table 6. Nutritional Status of the Pupils

Before the Feeding Program			After the Feeding Program		
	f	%		f	%
Severely Wasted	13	22.03	Severely Wasted	0	0
Wasted	46	77.98	Wasted	3	5.08
Normal	0	0.00	Normal	56	94.92
TOTAL	59	100%	TOTAL	59	100%

Findings in Table 6 showed that almost all pupils who were put on supplemental feeding program had gained normal nutrition based on their BMIs. However, teachers must always remind the mothers to feed their children with vegetables and rice, and if possible, should feed them three square meals a day because if not, the nutrition of the children would again regress.

3.2. Academic Performance

The advisers of the 59 pupils were asked for the final grades at the end of the school year. The results are shown in Table 6.

Table 6. Academic Performance of the Pupils Based in the Fourth Quarter Period

Grade Bracket	Adjectival Grade	f	%
90% and above	Advance	3	0.00
85-89%	Proficient	23	10.17
80-84%	Approaching Proficiency	28	37.39
75-79%	Developing	5	52.54
TOTAL		59	100%

Findings revealed that the grades of the pupils improved in their academic performance in the final quarter. During the third quarter, most pupils obtained grades within 75-79%. In the final quarter, most of them had gained grades within 80-84%. In fact, three got 90% above.

V. CONCLUSIONS

1. The malnourished pupils of Laungcupang Elementary School had dietary intake which mostly consisted of rice, noodles, eggs, and smoked fish. Most of the fathers were farmers or laborers who had on and off job calls while their mothers were plain housewives. As to their academic performance, most of the pupils were only "developing," based on the adjectival grade standards from the DepED.

2. The feeding program and vitamin supplementation which the project proponents developed and implemented for the malnourished children ran for one month. Daily meals consisted of rice, meat with vegetables, fruits and milk or milo. They were also given afternoon snacks and vitamins once a day. The feeding program was supported by faculty and students of the College of Education of Tarlac State University. There were also donors from abroad who are the friends of the two researchers.

3. Two months after the feeding program, pupils' Body Mass Indices were measured again in the school opening in June 2014. Only three out of 59 were still undernourished. From the severely wasted status, they only managed to gain slight improvement to a wasted status. The three pupils were observed to be sickly. Their academic performance likewise improved. During the third quarter, most pupils obtained grades from 75-79%. After the last quarter, most pupils had obtained grades within 80-84%. Some had even increased their grades to 85-89%.

VI. RECOMMENDATIONS

1. Undernourishment among pupils must be addressed in order to perform well in school. The government had already released budget for supplemental feeding. School implementers must ensure that they use the budget as intended. Adopting HEIs must participate in the government effort to address malnourishment. Instead of one-time medical missions, they need to consolidate support to feed children so they could attain good health and nutrition which are very important to perform well academically.

2. It is a must that health leaders in public schools must take aggressive steps to address health and nutrition problems among the pupils. They need to put up vegetable gardens in school to serve as models for parents who do little to look for ways in improving the meals they prepare for the children.

They also need to ensure that wash areas are visible in school and monitor proper handwashing among the pupils. They need to integrate the health risks of not washing the hands before eating. They must also remind pupils that swimming in stagnant water poses health risks and very high possibility of parasitic infestation.

4. Extension programs must include teaching parents to be responsible. The root cause of malnourishment is poverty so parents must limit their children and have to work hard. They should not only rely on dole outs. They have to be reminded that there are resources in the surrounding if only they are willing to work. They could be taught how to plant vegetables in pots so that they have something to cook for their children when they do not have income for the day.
5. Mothers must be trained to prepare cheap but nutritious meals at home.
6. A follow-up study must be conducted on the 59 pupils after few months to monitor their nutritional and health status.

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AUTHORS' PROFILE

Alma M. Corpuz is a Doctor of Education major in Educational Management from Tarlac State University. She also holds a master's degree in Education and a Bachelor's Degree in Medical Technology. She is a licensed teacher and a licensed medical technologist.

She is presently a faculty member of the BSEd Department of the College of Education, Tarlac State University, Tarlac City, Philippines. She was a former dean of Medical Technology Department of an educational institution in Tarlac City and a former Research Director in the same school. She was a member of a research team which evaluated the implementation of the maternal and child health services of RHUs in Region III. Likewise, she is one of the team members of a current regional study funded by the Central Luzon Health Research Development which is expected to be completed in October 2015. She had also conducted research on curriculum evaluation of health education institutions.

Dr. Corpuz is the vice president of the Philippine Association of Medical Technologists Tarlac City chapter. She is also the Research Chair of COED in TSU. She has presented several researches locally and internationally. In March 2014, she attended a Multidisciplinary conference in Florida, USA and had the opportunity to present a study there.

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