RESEARCH ARTICLE

THE NUTRITIONAL STATUS OF PNU STUDENTS

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ABSTRACT

Recognizing the nutrition problems among Filipino school children, this study was undertaken to assess the nutritional status of PNU students to create a University nutrition program. Respondents were Grades 1 to 10 pupils and 15% of the college population. Body Mass Index (BMI), eating patterns, eating habits, and nutrition knowledge were measured. The body mass index show that 43% of the grade school respondents and at least 60% of the college respondents are of normal weight. There is preponderance of overweight to obesity among pupils, while 30% among college respondents weigh below normal to severe thinness. Lunch is the most regularly taken meal. Food consumption is below the required serving set by the National Nutrition Council and the World Health Organization. The respondents scored moderate to high in the nutrition knowledge survey. Recommendations include the launching of a breakfast program, "no junk food" policy, and the distribution of nutrition tips to parents.

Keywords: *education, nutrition, school management*

INTRODUCTION

To learn well, one need to have a healthy body. Very importantly for children who are still growing and developing, their body needs nutrition, not just food. Physically, a child's body is different from

that of an adult, and it can be hard to understand that a child is not a miniature adult. Particularly for children, parents must be informed of the appropriate nutritional requirements. Giving children nutritionally dense food options is important for proper overall growth and development (Kelly, 2010).

When children are healthy, the promise of a developing nation toward its desired goals is within reach. For the Philippines to prosper, a balanced, varied diet must never be compromised. Unhealthy school children forebode the rise of unproductive work force. Unhealthy citizens presage economic problems. Regrettably, malnutrition is prevalent among Filipino children below five years old (Trading Economics Report, 2012). Data from the Food and Nutrition Research Institute (FNRI) reveal that problems in nutrition among children are increasing in terms of underweight and under-height (Fernandez, 2010). Already aware of this crisis way back in 1987, then President Corazon Aquino signed Executive Order No. 128 mandating the FNRI of the Department of Science and Technology (DOST) to undertake research to define the nutritional status of the population, particularly the malnutrition problem and its causes and effects, and to identify alternative solutions. Undertaken every five years, the National Nutrition Survey (NNS) and its results serve as inputs to national plans and programs. The NNS is also useful in providing benchmarks to gauge the country's progress toward achieving the Millennium Development Goals, including the eradication of hunger, reduction of child mortality and improvement of maternal health. The last [nutrition] survey, 7th National Nutrition Survey, conducted in 2008 (FNRI, 2012) revealed the prevalence of nutrition problems, particularly among school-age children and even among youngsters 11-19 years old, such as malnutrition, under height, deficiency, over nutrition, poor eating patterns and eating habits.

Despite feeding programs sponsored and manned by private organizations, reports showed that thirty per cent (30%) of Grades 1 and 2 children eventually drop out of school due to malnutrition (Fernandez, 2011). In 2011, the Department of Education (DepEd) advertised its renewed partnerships with private companies to boost its drive against malnutrition (IPNAP, 2011). According to DepEd Secretary Armin Luistro, the feeding program is expected to

improve school attendance and better performance for students who often go to schools on empty stomachs. "There is a direct correlation between learning and nutrition as evidenced by many studies and situations we observe in public schools" (Hernando-Malipot, 2011).

Poor children usually suffer from malnutrition since they are the ones who tend to eat improper amount and kinds of food. However, rich children, whose parents have no time to check their nutritional intake, can also be malnourished (Smart Schools, 2012). Apart from this, the rise of consumerism and the proliferation of fast-food chains and ready-to-eat food play an invasive role in spreading malnutrition.

What seems to exacerbate the issue of undernourishment relates to the prevailing and misleading notion equating beauty with being skinny. Thus, the young do anything just to be "beautiful", even at the cost of their health. This dangerous propaganda is one reason why a large population of school children, both rich and poor, is malnourished (FNRI, 2012). Poverty, lack of guidance, consumerism, and wrong choices make people, especially school children, suffer in terms of improper nourishment enough to prompt schools to initiate nutrition programs. Undoubtedly, health status has direct consequence on one's academic performance and over-all quality of life.

This is especially true among students who face the rigors of school work, while their bodies continue to grow and develop. Good nutrition helps assure optimal fruition of one's potential, talents and abilities.

The study, spread in four phases (four semesters) intends to determine the nutritional status of Philippine Normal University students as basis for an institutional nutrition program, policy formulation, and the creation of curriculum materials to ensure a sustainable health care program.

This particular write-up concerns the nutritional status study of PNU students on the following: 1) assess the nutrition status of all pupils in the Center for Teaching and Learning and 15% of the college

students population in terms of body mass index (BMI), eating patterns, eating habits, and nutritive value of food intake; and 2) assess the nutrition knowledge of these respondents.

Figure 1 shows the conceptual framework of the study.

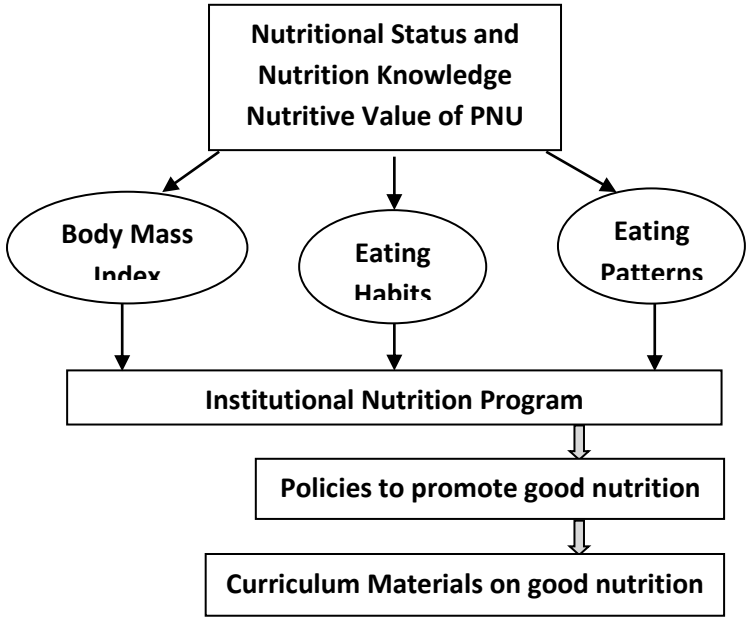


Figure 1. Conceptual Framework

Data from the PNU respondents will provide inputs in creating an institutional nutrition program, propose policies to promote good nutrition, and develop curriculum materials to promote good nutrition.

METHODOLOGY

The descriptive survey method of research was utilized to gather data on the nutrition status and nutrition knowledge of selected PNU students.

Research Instruments

Two survey instruments were used to evaluate the nutrition status of respondents.

The first instrument, created by the research team, measured the eating habits and patterns of the respondents. Facts and information from other nutrition surveys were considered. The instrument began with simple demographics of the participants, followed by questions dealing on eating patterns and eating habits.

It inquired on the respondent's eating habits and patterns: choice and quantity of food for breakfast, lunch, dinner, and for morning, afternoon, and midnight snacks.

The first instrument was pilot tested in June 2012; suggestions and comments were considered in revising it.

The second survey instrument, already validated by the National Nutrition Council (NNC), intended to elicit the nutrition knowledge of the participants. Because Grades 1 to 3 pupils do not have Home Economics and Livelihood Education (HELE) in their curriculum that would have taught them basic food and nutrition information, a simpler research instrument on nutrition knowledge was used. Respondents from Grades 4 to 10 and those from college had the same research instrument, which measured nutrition knowledge, also pre-validated by the NNC.

Before to answering the instruments, the respondents had been given a consent letter that explained the nature and purpose of the study. The instruments were administered from July 23 to September 15, 2012. The respondents' body weight and height were also recorded.

Respondents

Ninety-three per cent (93%) of Grade 1 to 10 pupils of the Center for Teaching and Learning were involved in the study.

Six hundred ninety-two (692) college students (approximately 15% of the undergraduate population) were randomly selected across year levels from the College of Education, College of Arts and Social Sciences, College of Science, and College of Languages, Linguistics and Literature.

Statistical Treatment

Quantitative data gathered from the survey were analyzed using descriptive and inferential statistics.

To measure nutrition knowledge, the range used is as follows:

Levels of Knowledge	Score
Low	(1 – 3)
	(1 – 7)
Moderate	(4 – 6)
	(8 – 13)
High	(7 – 10)
	(14 - 20)

The Nutrition Knowledge instrument for the Grades 1 to 3 respondents had 10 statements, while that for Grade 4 to college respondents had 20 statements.

RESULTS AND DISCUSSION

To assess the nutrition status of the respondents, the following data were obtained: body mass index, eating patterns, eating habits, nutritive intake, and nutrition knowledge.

Body Mass Index

Body Mass Index is computed using age plus weight, height, and gender. Guided by the simplified field tables on body mass index per age and gender as provided by WHO, Figures 2 and 3 illustrate how the respondents fared: a) only 43% of respondents are of normal weight; b) one out of 10 respondents from Grades 2 and 3 are classified as severely thin; c) two out of 10 respondents from Grade 1 are obese; d) only three out of 10 respondents from Grades

2 and 7 have normal weight; and e) two to three of 10 respondents are at risk of being overweight or are already overweight.

Available literature indicates that lack of physical activity and exercise probably explains the propensity of grade school respondents toward obesity. The age of computer games and electronic gadgets inevitably nurtures a "sit down" recreation and leisure posture that breed physical dormancy.

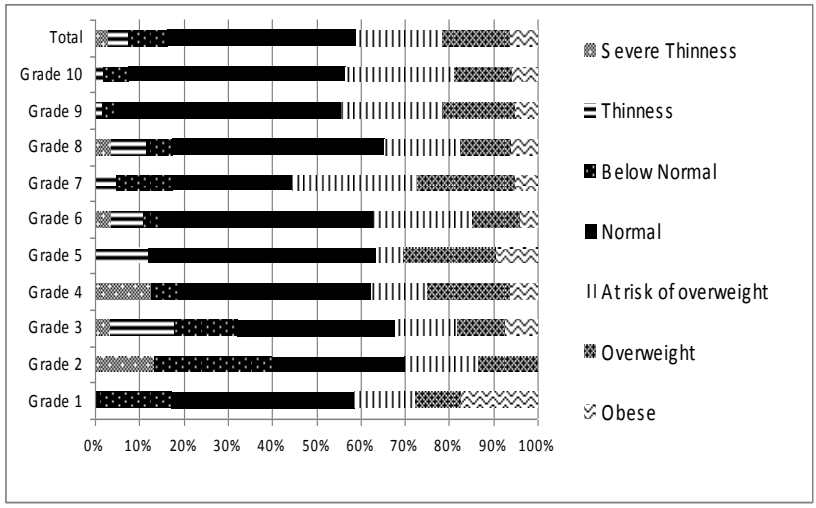


Figure 2: Body Mass Index of Grades 1 - 10 Respondents

The Body Mass Index of the college respondents (Figure 3) reveals that two out of three are of normal weight. One-third were evaluated to be below normal to severely thin; one-tenth fell on the range of being at risk of being overweight to obese, and at least one out of 10 respondents from among the 1st to 3rd year college respondents was classified thin to severely thin. At least one out of 10 respondents from the 2nd to 4th year college respondents were at risk of being overweight to obese.

Some of these findings are consistent with the 7th National Nutrition Survey (NNS) results (FNRI, 2012): that among children 0 – 10 years old, two out of 10 are overweight and one out of four are underweight. Also, the 7th NNS reported that among adolescents 11

– 19 years old, about two out of every 10 were underweight and five out of 10 overweight.

Eating Patterns

Eating Patterns simply refer to "when food is eaten". The majority (94.56%) of Grades 1 to 10 pupils take Lunch as compared to Breakfast (86.05%) and Supper (87%). The inability to take breakfast is adverse to optimal readiness for learning and other school activities. Most online literature cites the importance of breakfast and the harmful effects of skipping this meal. Nevertheless, it is a known fact that breakfast is one of the most often skipped meals (Penuela, 2009) probably due to several reasons, such as lack of time, lack of appetite, boring breakfast meals, and the myth that skipping breakfast helps one to lose weight.

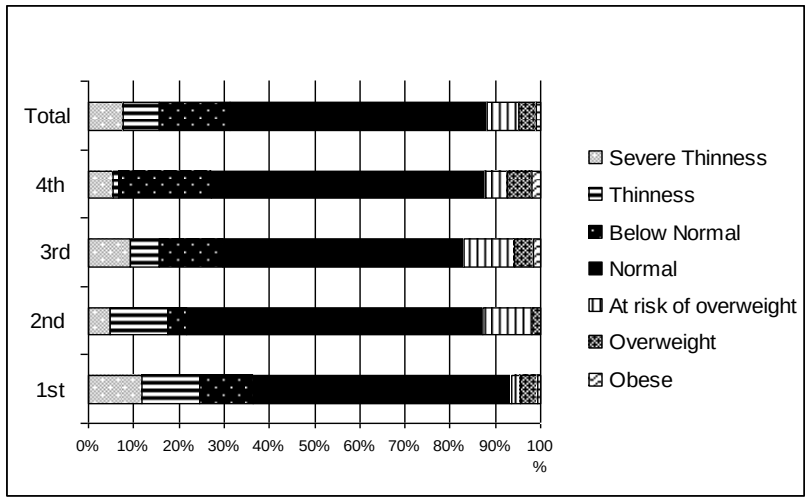


Figure. Body Mass Index of College Respondents

Morning classes for Grades 1 to 10 begin at 7:30. It is surmised that some of the pupils have simply gotten used to coming to school without eating breakfast.

Even in Australia, one in four children skips breakfast (HealthyKids.nsw.gov.au). Consequently, a hungry school child can lose concentration in class, lacks energy for playtime and snacks on

unhealthy foods, such as chips or biscuits. To prevent this problem a calm and healthy breakfast every day is the best defense, as it also helps children develop good habits that they can observe through life. Furthermore, researches reveal that eating breakfast is linked to improved academic performance and psychosocial behavior (Coldwater Community Schools, 2012; Penuela, 2009; Kartha, 2012).

Table 1. Profile of Eating Patterns of Grades 1 to 10 Respondents (in %)

GRADE LEVEL	BREAKFAST	LUNCH	SUPPER
1 (n=29)	79.31	86.21	75.86
2 (n=32)	84.38	90.63	75.00
3 (n=32)	93.75	90.63	84.38
4 (n=32)	100.00	100.00	78.13
5 (n=33)	81.82	84.85	75.76
6 (n=29)	93.10	96.55	86.21
7(n=65)	95.38	96.92	95.38
8 (n=53)	73.58	96.23	88.68
9 (n=62)	80.65	100.00	91.94
10 (n=56)	75.00	85.71	83.93
TOTAL (n=423)	**86.05**	**94.56**	**87.00**

Children who eat a good breakfast tend to perform better in school, have better attendance and decreased hyperactivity. They have energy for improved memory, concentration, and productivity; improved attention, creativity, and improved mood behaviors and school performance. In constrast, children who don't eat breakfast tend to perform poorly and have behavior problems, such as fighting, stealing, and inattentiveness in class.

Studies show that there is a direct correlation between eating breakfast and test scores. Students who have breakfast regularly tend to score better in tests (Kartha, 2012).

Scrutinizing further the data of grade school respondents, one sees that out of 59 who skip breakfast, 32 make sure they eat morning snacks. Some 18 respondents finally get to eat by lunch time. Worse, out of 59 who skip breakfast, only 44 eat lunch. Still a few respondents do not eat both meals.

Of those who take afternoon snacks (n=281), 259, or 92%, eat dinner. Apparently, some respondents do not seriously observe meal times, and may even have the tendency to substitute major

meals with mid-day snacks.

Out of 368 who partake of dinner, 118, or 32%, enjoy midnight snacks. From the 136 who have midnight snacks, 127 eat breakfast the following morning.

Table 2 reveals the percent of respondents who partake of snacks.

Table 2. Profile of Eating Patterns of Grades 1 to 10 Respondents (in %)

GRADE LEVEL	MORNING SNACK	AFTERNOON SNACK	MIDNIGHT SNACK
1 (n=29)	72.41	72.41	48.28
2 (n=32)	62.50	65.63	40.63
3 (n=32)	68.75	75.00	34.38
4 (n=32)	96.88	90.63	31.25
5 (n=33)	81.82	78.79	60.61
6 (n=29)	93.10	89.66	68.97
7(n=65)	66.15	72.31	32.31
8 (n=53)	52.83	41.51	24.53
9 (n=62)	48.39	61.29	16.13
10 (n=56)	55.36	42.86	17.86
TOTAL (n=423)	**66.19**	**66.43**	**32.15**

From among the college respondents (Table 2), breakfast was the least taken meal (69.8%), particularly from senior respondents (62.1%). Almost all (94.2%) eat lunch, and 85.3% have supper.

Dissecting the data further, three out of four of those who skip breakfast do not either take morning snacks. Their first meal of the day is lunch. In short, out of 208 respondents who skip breakfast, only 48 take morning snack. Considering that the average class load of these respondents is 24 units, which imply whole day classes, the absence of food intake from early morning till noon is alarming.

Specifically, out of 161 college respondents who skip breakfast and morning snack, 142 eat lunch. Of the 484 respondents who eat breakfast, 30% or 141 also eat morning snack. Out of 659 who eat lunch, 49% or 322 also eat afternoon snack. Out of 659 who eat lunch, 87% or 570 also eat supper. Out of 590 who eat supper, 18% or 106 eat midnight snack. Out of 112 who eat midnight snack, 81% or 91 eat breakfast.

Considering the socio-economic status of PNU college respondents wherein the majority are not the poorest of the poor (Source: PNU Admissions Office), the inclination to skip breakfast and morning snacks may be aggravated by wrong prioritization of financial resources and the tricky notion that "skinny is beautiful and sexy".

Table 3. Profile of Eating Patterns of College Respondents (in %)

YEAR LEVEL	BREAKFAST	LUNCH	SUPPER
1 (n=171)	83	89.5	83.6
2 (n=146)	73.3	95.2	89.7
3 (n=193)	62.7	96.9	85.5
4 (n=182)	62.1	95.1	83.0
TOTAL (n=692)	**69.8**	**94.2**	**85.3**

Table 4. Profile of Eating Patterns of College Respondents (in %)

YEAR LEVEL	MORNING SNACK	AFTERNOON SNACK	MIDNIGHT SNACK
1 (n=171)	28.1	40.4	16.4
2 (n=146)	31.5	50.0	18.5
3 (n=193)	30.1	52.3	20.2
4 (n=182)	20.3	47.8	10.4
TOTAL (n=692)	**27.3**	**47.7**	**16.3**

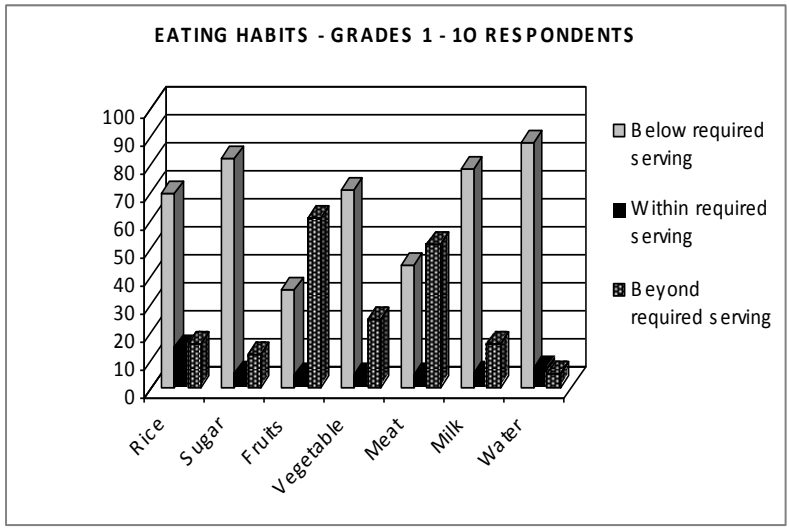
Eating Habits and Nutritive Value

The term eating habits includes, among others, what people eat (Rodriguez, 2012) and how much of what food is eaten (Medline Plus, 2012). Undoubtedly, the consumption of food as outlined in circulated Food Pyramid, must be varied and balanced. The Food Pyramid consists of grains, vegetables, fruits, oils, milk, meat and beans.

Body (2012) simplifies the three basic rules for a healthy diet: variety, balance, and moderation. Variety means that one must include many different foods from each level of the Food Pyramid because no single food can supply all nutrients that the growing body needs on a daily basis. Balanced means that one must eat the right amounts of foods from all levels of the Food Pyramid each day. This way one will get all the calories and nutrients required for proper growth and development. Moderation means that one is careful not to eat too much of any one type of food.

Both grade school and college respondents are way below the

required food serving, as illustrated in the graphs. None of the food/drink items are properly taken as advised for healthy living. The data appears more alarming among college respondents. Perhaps lopsided priorities, hectic lifestyle, and nutrition miseducation due to the barrage of deceptive advertisements trigger this dismal health status.



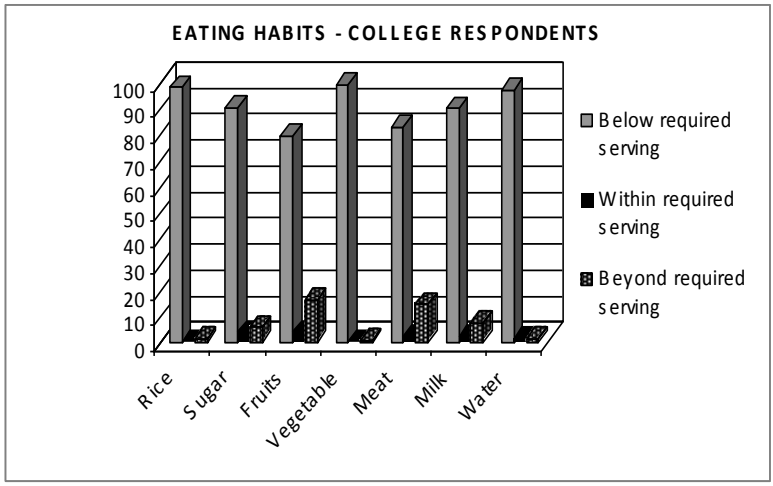
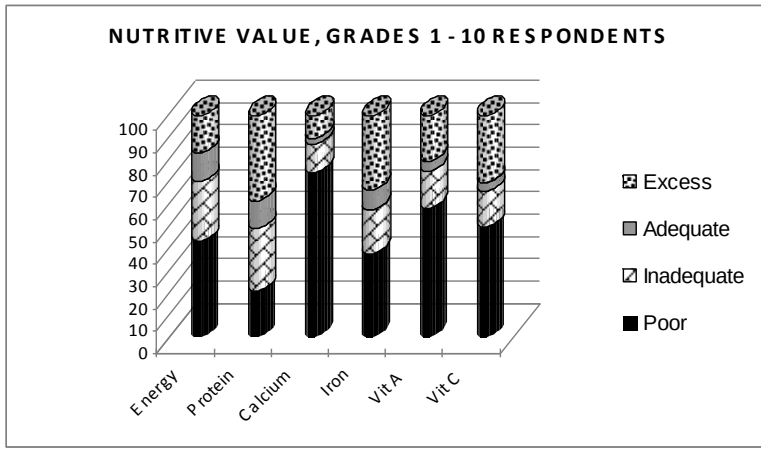


Figure 4. Eating Habits



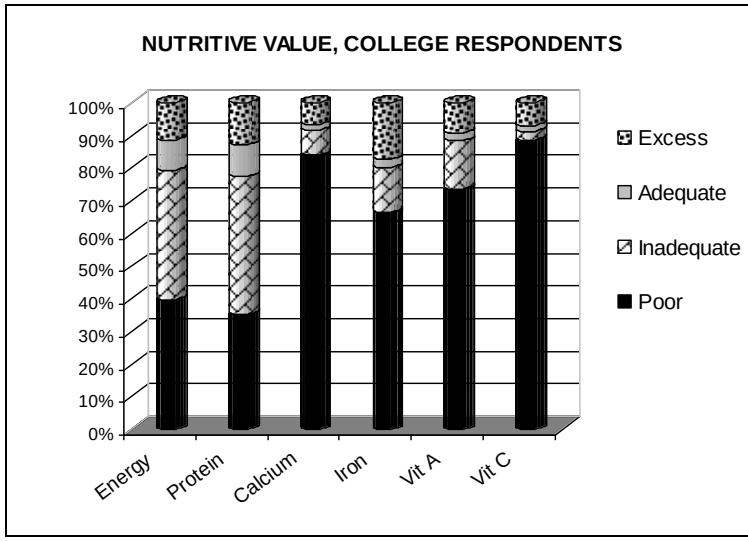


Figure 5. Nutritive Value

None of the nutrients shown in Figure 4 are adequately taken by the grade school and college respondents. The graphs illustrate an imbalance in food intake in all levels of the Food Pyramid. Specifically, 75% of the grade school respondents have insufficient

calcium intake, followed by 58% in Vitamin A and 50% in Vitamin C. At least three out of 10 respondents take excessive portions of protein, iron, and Vitamin C. Noted too is the inadequate portions by two to three out of 10 respondents in all nutrients. Among the college respondents, eight out of 10 suffer poor intake of Vitamin C and calcium. Four out of 10 are poorly deprived of energy and protein. One to 2 out of 10 respondents ingest excessive energy, protein, and iron. In short, a high majority of both grade school and college respondents are deemed undernourished. This fact can be explained by the unwholesome eating habits, as shown in Figure 4. The nutrients enumerated in the food pyramid are not adequately consumed due to low serving quantity and the deficient balance in all food variety.

Nutrition Knowledge

Out of 10 items, the mean score of Grade 1 to 3 respondents was 7.15 which projected a *high* level of nutrition knowledge.

Table 5. Level of Nutrition Knowledge, Grades 1 - 3 Respondents

GRADE	N	Mean	Std. Deviation
1	29	7.3448	1.11
2	32	7.0938	1.28
3	32	7.0312	1.23
Total	93	7.1505	1.21

The standard deviation and ANOVA (F value = 0.563, significant at .05 level) reveal that the spread of scores was not much, and that the grade level of respondents did not influence one's score.

Among the Grades 4 to 10 respondents, the mean score was 11.29, interpreted as *moderate* in the level of nutrition knowledge.

Table 6. Level of Nutrition Knowledge, Grades 4 - 10 Respondents

GRADE	N	Mean	Std. Deviation
4	30	7.7667	1.86960
5	32	8.2500	2.55267
6	28	9.3214	2.38907
7	65	11.3231	3.08782
8	53	12.3208	3.17910
9	62	13.5323	2.88988
10	51	12.5686	2.78032
Total	321	11.2991	3.40830

ANOVA results (F value = 25.82), significant at .01) showed that one's grade level significantly affected performance in the instrument. One must consider that the subject Home Economics is taught starting only in Grade 4. At the time this research was conducted in July 2012, the Grade 4 respondents had just begun their Home Economics lessons that might explain their lowest mean. The moderate level of nutrition knowledge among the grade school respondents might help explain why they revealed dismal eating habits, leading to poor nutritive value intake.

Among the college respondents, the mean score in the nutrition knowledge survey was 12.56, interpreted as *moderate* level of nutrition knowledge. The ANOVA results showed that one's year level did not significantly affect performance in the instrument.

Table 7. Level of Nutrition Knowledge, College Respondents

COLLEGE YEAR LEVEL	N	Mean	Std. Deviation
1	171	11.51	3.81
2	146	12.84	2.95
3	193	12.90	3.25
4	182	12.94	3.12
TOTAL	692	12.56	3.35

The *moderate* to *high* level of knowledge score in most statements would have given the impression that college respondents know how to take care of themselves nutritionally. However, knowledge and its suitable application can be compromised due to insufficient financial resources and misguided nutrition beliefs. The respondents do not seem to value nutrition knowledge enough. Results in their eating patterns, eating habits, and the nutritive value of food intake are inconsistent with nutrition knowledge survey results. What may compound these unhealthy eating habits despite one's knowledge of what is nutritionally proper is the abundance of fast foods and instant foods, which are easily accessible and affordable.

CONCLUSION

The body mass index shows that 43% of grade school respondents and at least 60% of college respondents are of normal weight. There is a preponderance of overweight to obesity among pupils,

while the contrary is true among college respondents, of which 30% weigh below normal to severe thinness.

Lunch is the most popularly ingested meal for both grade school (94.56%) and college respondents (94.2%) – a low 69.8% of college respondents and 86% of grade school respondents take breakfast, while almost nine out of 10 of all respondents eat supper. What stands out among the findings is that eating three square meals a day is not a universal practice, after all. Moreover, the notion that Filipinos eat six times a day is untrue based on data from the respondents. Eating mid-day snacks is only an option for most respondents, especially those from college.

All respondents have their daily serving of rice, sugar, fruits, vegetables, meat, milk, and water. However, except for excess serving on fruit and meat among grade school respondents, all are consumed below the required servings by the National Nutrition Council and the World Health Organization. Consequently, the unwholesome eating habits help trigger a generally poor nutritive value in evaluating the nutritional status of the respondents.

Notwithstanding the dire body mass index, eating habits, eating patterns, and nutritive value results, the respondents scored *moderate* to *high* in the nutrition knowledge survey. This implies cognitive dissonance among the respondents, an apparent lack of knowledge application particularly among the older respondents assumed to be capable of discerning how to maintain physically fit.

RECOMMENDATIONS

Based on the results of this nutrition status evaluation of PNU students, the recommendations are as follows:

For the University Management

- That good nutrition be emphasized by ensuring the inclusion of a nutrition education program in related areas of discipline: HELE for grade school; TLE for high school, and PE and Health subjects for college students;

- That the Medical Clinic utilize the pupils' and students' database on height and weight to regularly monitor, guide and advise those with below-normal body mass index;
- That a breakfast program be made available as early as 6 in the morning in the University for all pupils and students, subsidized through solicited funding;
- That the policy of "no junk food and soda drinks" be proposed to the academic community and to all food stalls inside the campus;
- That food services begin at 6 in the morning since accessibility and convenience encourage one to eat properly and promptly
- That a kiosk or food stall be established, serving low-cost but highly nutritious foods that can be prepared by students who have cooking laboratory activities in TLE classes, or by Nutrition and Dietetics college students;

For Pupils and Students

- That pupils and students attend nutrition lectures designed for their level of understanding to remind them constantly on the importance of good nutrition

For Parents of Grade School Pupils

- That, through a hand-out or letter, they are informed of the results of this nutrition status evaluation and be provided with tips and information on proper nutrition habits, intakes, and practices to be implemented at home

For Faculty

- That a physical activity or exercise, at least for 5 minutes, be encouraged at the start of every class period to instill the love for physical activity among pupils and students and help promote proper weight maintenance;
- That the faculty update themselves regularly with nutrition status, including problems and issues, to encourage students to observe a healthy lifestyle;
- That students of first period classes in the morning be allowed to bring breakfast in the classroom;

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