

RELATIONSHIPS OF HEALTHY LIFESTYLE DETERMINANTS AMONG PRIVATE HIGH SCHOOL STUDENTS IN ILOILO CITY, PHILIPPINES

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ABSTRACT

The choice of healthy lifestyle such as eating habits and physical activity during leisure time corresponds to the fluctuation of the health status of the adolescents today. These prominence represents the public health challenges with particularly alarming trends that includes some regions in the Philippines particularly Iloilo city in Western Visayas Region. Thus, this study aimed to analyze the healthy lifestyle determinants (eating habits and leisure time activity participation) in relation to the Body Mass Index (BMI) levels of selected 293 students (155 boys and 138 girls) from nineteen private high schools in Iloilo City. Descriptive statistics and inferential statistics were utilized. The heights and weights of the respondents were taken to calculate the BMI and its relationship to Eating Time Habits (ETH), Irregular Eating Time Habit (IETH), Food Groups (FG-A, FG-B, FG-C, FG-D, FG-E, FG-F) and Leisure Time Activity Participation (LTAP), grouped by sex, were analyzed based on the responses of the participants to a validated researcher – designed questionnaire. The following results were generated: that the BMIs of boys and girls are not significantly different and most of them have normal BMIs (P5th-P85th). More girls skip their meals than boys do and, at the same time, more girls are eating beyond the regular mealtime. Students in private school in both sexes are not always active and rarely participate in active or passive leisure time activities. Only FG-C and FG-D were found to be significant predictors of BMI. Although the study did not show a more concrete relationship between Passive and Active LTAP and BMI, there is still a need to understand that leisure time physical inactivity related to eating habits is becoming a concern in the developing countries particularly in urban settings. The results provide important evidence to support opportunities to positively influence the adoption of healthful eating and improving active physical pursuits during leisure time in school settings, in order to facilitate the next generations' optimum development.

Key words: Healthy Lifestyle, Eating Habits, BMI, Leisure Time, Private High School

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INTRODUCTION

Background of the Study

Filipino students are now adopting the Western lifestyle habits, including increased recreational inactivity (e.g., television viewing, video games, and surfing the Internet) and decreased participation in vigorous physical activity could signal an emerging epidemic in this developing nation. This way of living is so prevalent that physical inactivity has now been declared a public health concern of the youth today. As mechanization became a way of life, so did a pattern of sedentary living. On the other hand, globally, malnutrition among school age children is becoming a major public health concern. More than 200 million school age children are stunted and underweight and if no action is taken and at this rate, about one billion school children will be growing up by 2020 with impaired physical and mental development (Srivastava, 2012; Ara, 2011 & UNICEF, 2012). Despite the economic growth observed in developing countries, malnutrition and particularly under nutrition is still highly prevalent (Muller, 2005). It has been noted that relatively little research has examined factors influencing adolescent eating behavior (Shannon et al., 2002). In Canada (Taylor et al., 2005) there is no national data on the kinds of foods actually being served in schools, nor on the kinds and amount students are actually eating (Center for Science in the Public Interest <CSPI> Canada, 2007). Nutritional authorities have argued that the schools can play a key role in reversing the trend towards childhood obesity (Briggs et al. 2003). For these reasons, it is useful to know more about the role of foods, and nutrient-poor foods in particular, in the school food environment and to better understand why they are there.

With knowledge of the relationship of eating habits, leisure time participation, and BMI level, students will be more aware and more motivated to actively participate in leisure time activities and be more conscious of their diet. It is, therefore, of significance to the researcher, as a health and physical educator, to investigate healthy-lifestyle-related issues among her constituents in order to further understand and answer their needs through better school health and physical education programs.

This study aimed to analyze the determinants of healthy a lifestyle (BMI level, eating habits and leisure time activity participation) of selected Iloilo City private high school (HS) students. Specifically, it aimed to identify the patterns of eating habits, leisure time activity participation, and BMI level of high school students when grouped according to sex; (boys and girls); determine the differences in eating habits, leisure time participation and level of BMI in terms of sex (boys and girls); and determine the relationship between eating habits, leisure time participation, and BMI level in Iloilo City private high school students.

METHODOLOGY

Participants of the Study

The population targeted for the study is Filipino adolescents, junior and senior high school students, enrolled in private high schools located in Iloilo City for the school year 2011-2012. These year levels were chosen because students in this year levels usually belong to the age group that is

more assertive and independent than those who belong to the younger age groups. Thus, they are more likely to have eating habits and have activities during their free time, limited to the preference of their families and to the available food and activities in their home and school. Varsity players and students with marked unfavorable health conditions were excluded from the study.

The numbers of students who were able answer the questionnaire and provided the completed information is 293. These were composed of 155 (52.90%) boys and 138 (47.09%) females who were enrolled in private high schools located in Iloilo City.

Instrument and Data Analysis

The researcher used a researcher – designed questionnaire that was pre – tested for validity by experts. The internal consistency was analyzed using Cronbach's Alpha coefficient half-split procedure reliability test. Part I of the questionnaire provides information about the participants such as name and sex. Items in Part II of the instrument established the eating habits of the students (Some items in this part of the questionnaire were adapted from the American Dietetic Association and Nutrition & Eating Habits Questionnaire, (2005). Respondents answered the items using the four – point scale as follows: 4 (always), 3 (sometimes), 2 (rarely), 1 (never). Part III included data of the students' activities during their leisure time. It consisted of two sections: Leisure time activity and quantitative physical activity frequency checklist (adapted from a Physical Activity Questionnaire; PAQ-A manual) (Kowalski, et al., 2004). Proper protocol for the data gathering procedure was obtained and strictly followed.

Sex was self-reported by the students. This was treated as a binary variable scored (1) for boys and (2) for girls. In the analysis of interval data, the following scaled interpretations of means were used: always (3.51 – 4.0); sometimes (2.51 – 3.50); rarely (1.51 – 2.50); never (1.0 – 1.50). BMI was calculated based on the height and weight of the respondent. The mean and standard deviation of BMI was calculated, grouped according to sex. A percentage distribution of BMI levels among the students was also made. The BMI cut-off points of four weight categories were based on the National Center for Chronic Diseases Prevention and Health Promotion (2000) guidelines: underweight (BMI= <P5th), Normal (BMI=P5th-85th), Overweight (BMI=P85th-95th), and Obese (BMI=>P95th). BMI levels with these categories was analyzed in relation to the different variables.

Statistical analyses were done using SPSS 17. The mean and the standard deviation were computed to identify the Eating Time Habit (ETH), Irregular Eating Time Habit (IETH), and passive and active Leisure Time Activity Participation (LTAP) of the students. For profile variables, descriptive statistics such as frequency distribution were used. The Mann-Whitney Test was used to compare the BMI of two sexes. The Kruskal-Wallis Test was utilized to compare the BMI of the students in the different levels of such variables as Eating Time Habit (ETH), Irregular Eating Time Habit (IETH), Food Group A-F (FG)body mass index (BMI) and passive and active Leisure Time Activity Participation (LTAP). The p-values less than 0.05 are considered as significant. Gamma was used to measure the relationships of the variables. Multiple Linear Regression was performed with BMI as dependent variable and lifestyle factors as independent variable. p-values < 0.05 are considered as significant. The Odds Ratio was used to show the odds of the students who always consume a certain food group against students who do not always consume that food group to have a normal BMI. Only subjects with complete data were included in the analyses.

RESULTS AND DISCUSSION

Table 1 shows the frequency distribution of the BMI levels of the students. Overall, the BMI levels of this age group are mostly normal with 66.2% of the students having normal (P5th-P85th) BMI levels and most of them are girls. On the other hand, 7.2% of the students are underweight (<P5th), and most of them are boys. However, when it comes to overweight, only 13.8% girls fall into 85th-95th percentile while 16.8% of the boys fall on the same percentile in which more boys in this population are overweight than girls. Overall, there are 11.3% students who are obese, 11.6% of them are girls and 11.0% are boys. There is no significant difference found in the mean BMI of boys ($\bar{x} = 22.3031$ (s) = 5.03358) and girls ($\bar{x} = 21.5104$ (s) = 4.05581) as shown in Table 2 using the Mann-Whitney. This means that the incidence of obesity is similar among adolescents. This finding is in contrast with the study conducted in Baguio City by Cruz, et al., (2009) about obesity in school-aged children: prevalence and causes. Their result showed that the incidence of overweight is noted to be higher in girls, 79 out of 124 or 63.70%, as compared to the girls who accounted for 36.29% or 45 out of 124. As to the percentage of obese children in their study, it is shown that boys accounted for 67.74% while 32.25% were girls. Additionally, the overall normality of the BMI of the students conforms with the report of FRI-DOST during the 7th National Survey in 2008 about the percentage distribution of adolescents, 11-19 years old, nutritional classification using BMI-for-age all over the Philippines. The result of their national survey shows that among males, 21.7% are underweight, 21.1% are mildly-underweight, 52.5% have normal BMI and 4.8% among the boys are overweight; on the other hand, among female adolescents 11.7% are underweight, 14.8% are mildly-underweight, 69.0% have normal BMI, and only 4.4% of the girl adolescents are overweight. Over all, the BMI status of the Filipino adolescents is at normal range most especially among girl adolescents. Moreover, according to their report, under-nutrition remained a public health problem between 2005 and 2008, and under-nutrition among this age group has increased most especially among adolescents in the regions of MIMAROPA, Bicol, and Western Visayas.

Table 1. BMI Level Frequency Distribution of the Respondents

CATEGORIES	BOYS N=155		GIRLS N=138		ALL N=293	
	#	%	#	%	#	%
Underweight	12	7.7	9	6.5	21	7.2
Normal	100	64.5	94	68.1	194	66.2
Overweight	26	16.8	19	13.8	45	15.4
Obese	17	11.0	16	11.6	33	11.3

BMI scale for adolescents <P5th-Underweight, P5-P85th-Normal, P85th-P95th-Overweight, <P95th-Obese

Table 2. BMI according to sex

<i>SEX</i>	<i>Body Mass Index</i>	
	\bar{x}	<i>s</i>
BOYS N=155	22.3031	5.03358
GIRLS N=138	21.5104	4.05581

Regular meal times such as Breakfast, Lunch, and Dinner or Eating Time Habit (ETH) are sometimes skipped by the students and they tend to make up for their missed meal with Irregular Eating Time such as eating while watching TV, eating while having class, and eating while studying. Of the students, 20.5% always have their regular meals. This is usually more practiced by boys with 24.5% of them always taking their regular meals while only 15.9% of the girls take their regular meals. Majority of the students or 45.7% sometimes take their regular meals. Of the boys, 49.0% sometimes take their meals while 42.0% of the girls do so. More girls (41.3%) than their counterpart (25.2% of them) rarely eat their regular meals. Of the students, 58.7% sometimes have EITH and the greater part of this is girls. This means most of the girls sometimes eat snacks or meals in between of their regular mealtime. More girls skip their meals than boys do and at the same time, more girls are eating beyond the regular meal times. This fact is quite related in the report of Nutrition Information Resource Center in USA last (2001), adolescent girls appear to be at the highest risk for dietary adequacies. These maybe related to their eating habits. Compared to other children, female teens have a higher tendency to skip breakfast, eat fewer meals and snacks away from home, and drink the least fluid milk. There is growing literature on the association between eating habits and overweight, particularly on breakfast habits.

In this study, the researcher is also considering the idea that this chosen population goes to school during weekdays and wakes up early in the morning to prepare for school. It takes a lot of effort, and sometimes students are in a hurry for school; maybe this is why they chose to skip breakfast rather than arrive late for school. If students skip regular meals, they may have the tendency to eat food that is served in school to compensate for their missed meal. By taking snacks during recess time, they are and more likely to eat food that is less nutritious.

Moreover, students are more inclined to eat while studying, and mostly eat while watching TV. This result is consistent with the study of Savige, et al., (2007) that adolescents snack more when they skip meals. Their result prove that adolescents who frequently snack on the run, in between meals, on the way to or from school, all day long, or in the middle of the night have greater risks of skipping meals. Adolescents also snack frequently while watching TV and while hanging out with friends. Some previous researches show that snacking among children and adolescents occurs most often in the afternoon (Cross, et al., 1994 and Anderson, et al., 1993) and at home (Adair & Popkin, 2005). Coon, et al. (2001) found that children from households that regularly eat dinner in front of the television are more likely to eat more energy-dense foods such as pizza, snacks, and soft drink, and they are less likely to eat fruit and vegetables.

Table 3. ETH and IET Frequency Distribution of the Respondents

CATEGORIES	BOYS N=155				GIRLS N=138				ALL N=293			
	ETH		IETH		ETH		IETH		ETH		IETH	
	#	%	#	%	#	%	#	%	#	%	#	%
Never	2	1.3	6	3.9	1	0.7	5	3.6	3	1.0	11	3.8
Rarely	39	25.2	47	30.3	57	41.3	36	26.1	96	32.8	83	28.3
Sometimes	76	49.0	88	56.8	58	42.0	84	60.9	134	45.7	172	58.7
Always	38	24.5	14	9.0	22	15.9	13	9.4	60	20.5	27	9.2

ETH-Eating Time habit, IETH – Irregular Eating Time Habit, and EH – Eating Habit

Table 4. Food Group Frequency Distribution of the Boys Respondents

CATEGORIES	FG -A		FG -B		FG -C		FG -D		FG -E		FG -F	
	#	%	#	%	#	%	#	%	#	%	#	%
Never	9	5.8	5	3.2	0	0	19	12.3	26	16.8	3	1.9
Rarely	40	25.8	44	28.4	3	1.9	53	34.2	63	40.6	35	22.6
Sometimes	59	38.0	88	56.8	68	43.9	73	47.1	56	36.1	102	65.8
Always	47	30.3	18	11.6	84	54.2	10	6.5	10	6.5	15	9.7

Table 5. Food Group Frequency Distribution of the Girls Students

CATEGORIES	FG -A		FG -B		FG -C		FG -D		FG -E		FG -F	
	#	%	#	%	#	%	#	%	#	%	#	%
Never	9	6.5	4	2.9	0	0	17	12.3	19	13.8	4	2.9
Rarely	42	30.4	51	37.0	7	5.1	72	52.2	64	46.4	48	34.8
Sometimes	58	42.0	72	52.2	56	40.6	42	30.4	48	34.8	77	55.8
Always	29	21.0	11	8.0	75	54.3	7	5.1	7	5.1	9	6.5

Table 6. All Population Food Group Frequency Distribution

CATEGORIES	FG -A		FG -B		FG -C		FG -D		FG -E		FG -F	
	#	%	#	%	#	%	#	%	#	%	#	%
Never	18	6.1	9	3.1	0	0	36	12.3	45	15.4	7	2.4
Rarely	82	28.0	95	32.4	10	3.4	125	42.7	127	43.3	83	28.3
Sometimes	177	60.4	160	54.6	124	42.3	115	39.2	104	35.5	179	61.2
Always	76	25.9	29	10.0	159	54.3	17	5.8	17	5.8	24	8.2

To achieve the optimum nourishment we need to consume array of nutritious foods from the different food groups. Foods are group together, because different foods vary for nutrients that they provide needed for our daily activities. In this study, Food Group was categorized into six: **FG-A**(bread/cereal/rice/ grains and pasta), **FG-B**(fruits & vegetables), **FG -C** (meat/ poultry/fish/beans and nuts), **FG-D**(Dairy products/milk group), **FG-E**(fats and sweets), **FG-F**(instant and processed foods). Tables 4, 5, and 6 show that **FG-C** is always present in the students' regular meals with 54.3% of the entire population is consuming it. **FG-A**(bread /cereal/rice/ grains and pasta) (25.9%) is the next most-consumed food. It is more likely that FG-C is the usual viand because rice is the main source of carbohydrates among Filipinos. However, it is also noticeable that F-G F is sometimes taken regularly in their daily meal.). FG-F (instant and processed foods) is also observed

to be consumed at a high percentage. This kind of food is easy to prepare and is constantly available, making it more attractive to the consumers especially students. Students consume (FG-B) fruits and vegetables less often, with sometimes reported highest in both boys and girls as shown in Tables 4 and 5. This food group is less popular among adolescents maybe due to its taste and flavor. Some studies show that food commonly ostracized is mainly vegetable and bitter foods are discarded.

Table 7. LTAP Active and LTAP Passive Frequency Distribution of the Respondents

CATEGORIES	BOYS N=155				GIRLS N=138				ALL N=293			
	LTAP Active		LTAP Passive		LTAP Active		LTAP Passive		LTAP Active		LTAP Passive	
	#	%	#	%	#	%	#	%	#	%	#	%
Never	17	11.0	3	1.9	38	27.5	4	2.9	55	18.8	7	2.4
Rarely	109	70.3	141	91.0	95	68.8	123	89.1	204	69.6	264	90.1
Sometimes	28	18.2	11	7.1	4	2.9	11	8.0	32	10.9	22	7.5
Always	1	0.65	0	0.0	1	.72	0	0.0	2	.68	0	0.0

Activities were classified into Passive and Active Leisure Time Activity Participation. Data were compared between boys and girls using frequency distribution as shown in Table 7. Boys and girls in private school are less likely to be active during their leisure time. Most of them rarely participate in either active or in passive leisure time activities. Since that the type of school in this population is private, most of their school building, are situated in an enclosed area where in students are limited to do active physical activities or being restrained to do activities that may result to physical injury and other more serious problems. Studies further found that the sedentary and active leisure activities have a significant impact on leisure choice. Leisure-time activity preference for youngster much observational research showed that if the same immediate objective could be achieved through two equally accessible facilities, one requiring physical exertion and the other not (e.g., stairs and escalator), the sedentary option was tended to be chosen by people (Tsai & Coleman, 2007; Blamey, Mutrie, & Aitchison, 1995).

Table 8. Average BMI of the students according to Eating Habits

CATEGORIES	ETH		IETH	
	\bar{x}	s	\bar{x}	s
Never	21.4135	2.08282	24.5200	6.60710
Rarely	22.3565	5.07803	21.9559	4.49924
Sometimes	22.0964	4.54293	21.8591	4.41184
Always	20.9006	3.93276	21.2441	5.14806

Table 9. Average BMI of the students according to Food Groups

CATEGORIES	FG -A		FG -B		FG -C		FG -D		FG -E		FG -F	
	\bar{x}	<i>s</i>	\bar{x}	<i>s</i>	\bar{x}	<i>s</i>	\bar{x}	<i>s</i>	\bar{x}	<i>s</i>	\bar{x}	<i>S</i>
Never	22.32	4.13	27.34	6.39	0	0	23.57	5.99	22.11	4.41	28.25	5.64
Rarely	22.40	4.99	21.75	4.11	26.13	7.70	21.97	4.50	21.74	4.61	21.20	3.50
Sometimes	21.63	4.53	21.31	4.02	22.24	4.41	21.38	4.27	21.81	4.34	21.83	4.75
Always	21.78	4.44	24.25	6.64	21.43	4.39	21.83	3.82	23.66	6.49	23.35	5.15

Table 10. Average BMI of the students according to LTAP

CATEGORIES	LTAP Active		LTAP Passive	
	\bar{x}	<i>s</i>	\bar{x}	<i>S</i>
Never	20.9517	3.83629	21.4054	5.28088
Rarely	22.2133	4.77548	22.0045	4.70268
Sometimes	21.8543	4.73838	21.1994	3.10598
Always	0	0	0	0

Tables 8 through 10 show the average BMIs of the students at different levels of ETH, IETH, FG-A, FG-B, FG-C, FG-D, FG-E, FG-F, Active LTAP and Passive LTAP. The Kruskal-Wallis Test shows that the BMIs of the students who rarely skip regular meals, students who sometimes skip regular meals, students who rarely skip regular meals, and students who never skip regular meals are not significantly different at 5% level as shown in Table 8. The same is true with the IETH, FG-A, FG-B, FG-D, FG-F, Active LTAP and Passive LTAP. Only in FG-C and FG-D are the BMIs of the students significantly different. This result supports in the national report in United States last 2002, among high school students, 79% of high school students ate less than 5 servings of fruits and vegetables per day and 84% drank less than 3 glasses of milk per day. Additionally, 31% did not participate in either vigorous or moderate physical activity, 48% were not enrolled in a physical education class, and 68% did not attend a physical education class daily (Grunbaum et al., 2004).

Table 11. Cross tabulation of BMI according to Food Group-C and Food Group-D

BMI Level	Food Group - C				Food Group - D			
	Never	Rarely	Sometimes	Always	Never	Rarely	Sometimes	Always
Underweight	0	2	10	9	6	6	8	1
Normal	0	7	80	107	21	92	73	8
Overweight	0	0	22	23	7	12	23	3
Obese	0	1	12	20	2	15	11	5

Table 12. Test of association among variables.

Variables	r	<i>p-value</i>
BMI vs. FG-C	.095	.365
BMI vs. FG-D	.174	.063

* Significant at $\alpha = 0.05$.

The Gamma statistic was calculated to assess the relationships between the dependent variable BMI and the independent variables FG-C and FG-D. Both BMI and FG-C $\Gamma = 0.095, p - value .365$ and FG-D $\Gamma = 0.174, p - value = .063$ have a modest positive association at 5% level significance. Hence, there will be an increase in the level of BMI if the students always consume FG-C & FG-D in their regular meals as shown in Table 12. This means that the more they consume FG-C & FG-D, which is protein rich food, the more likely they will become overweight. Too often, it is assumed that over fatness is solely due to eating too much and overweight people are chided for undisciplined eaters. But there are number of factors may contribute to being overweight or obese. Some are internal and involve how efficiently the body processes food.

Additionally, during pubertal period, the proportion of fat and muscle in boys and girls tends to be similar (body fat approximately 15% and 19%, respectively) and lean body mass is about equal for both sexes. But androgens, for boys gain proportionately more muscle mass than fat, experiences increases linear growth to produce a heavier skeleton, and develop greater red blood cell mass than girls (Gong & Spear, 1988).

Table 13. Collapsed Cross-tabulation of BMI Level according to FG-C & FG-D

<i>BMI Level</i>	<i>FG-C</i>		<i>OR</i>	<i>FG-D</i>		<i>OR</i>
	Always	Not Always		Always	Not Always	
Normal	107	87	1.11	8	186	0.43
Not Normal	52	47		9	90	

The odds ratio of BMI Level versus FG-C is 1.11, which suggests that students who always consume FG-C are more likely to have Normal BMI than students who do not always consume FG-C. However, the odds are small.

The odds ratio of BMI Level versus FG-D is 0.43, which suggests that students who always consume FG-D are less likely to have Normal BMI than students who do not always consume FG-D. However, the odds are small as displayed in Table 13.

Table 14. Multiple regression analysis among variables.

<i>Independent Variables</i>	<i>Coefficient (β)</i>	<i>p-value</i>
FG-C	-1.341	.017
FG-D	-.934	.012

* Significant at $\alpha = 0.05$.

Aside from testing the relationship among variables using Gamma Coefficient, Multiple Linear Regression was performed with BMI as the dependent variable. Of the 8 initial independent variables (ETH, IETH, FG-A, FG-B, FG-C, FG-D, FG-E, FG-F, LTAP Active, and LTAP Passive), only FG-C $\beta = -1.341, p - value = .017$ and FG-D $\beta = -0.934, p - value = .012$ were found to be significant predictors of BMI as presented in Table 14. They are the only predictors that can explain the variability of BMI. This is in contrast with the study of Humenikova & Gales (2007) where in they determine the dietary intakes, physical activity and predictors of child obesity among 4-6th graders in the Czech Republic. A linear regression model with z-scores for BMI as the dependent variable revealed that children's younger age was the only significant predictor of higher z-scores for BMI ($R^2 = 0.144; p < 0.05$). In their study, none of the parental, dietary or physical activity variables were found to be significant predictors of children's weight.

CONCLUSIONS

This paper shows that the BMIs of boys and girls are not significantly different and most of them have normal BMIs. More girls skip their meals than boys do, and, at the same time, more girls are eating beyond the regular mealtime. Students in private schools are not always active and rarely participate in active or passive leisure time activities. Only FG-C and FG-D were found to be significant predictors of BMI.

RECOMMENDATIONS

A comparative study on the relationship of LTAP and BMI among private and public high school students should be conducted. Promote to the students the importance of taking regular meals through their health and home technology classes. It is necessary to introduce physical activities to the students during their free time and this active LTAP should be encouraged more for an ideal active lifestyle. Canteens in schools as well as parents should include in their menu protein-rich food and avoid selling and preparing food that is high in fats and sugar. Based on the need of the children for a particular school, an intervention programmes should be developed and implemented.

BIBLIOGRAPHY

- Adair, L. & B. Popkin (2005) "*The Cebu Longitudal Health and Nutrition Survey: History and Major Contributions of the Project.*" *Philippine Q Cult Soc* 29: 5-37.
- American Dietetic Association (2005). Position of the American Dietetic Association: Fat replacers. *Journal of the American Dietetic Association*, 105, 266–275.
- Anderson, R.E., Crespo, C.J., Bartlett, S.J., Cheskin, L.J., Pratt, M. (1993) *Relationship of physical activity and television watching with body weight and level of fatness among children: results from the Third National Health and Nutrition Examination Survey.* *JAMA*. 279:938-942.
- Ara R, Huque SR, Adhikary M, Uddi MN, Mahmood AR, et al. (2011) Nutritional status among primary school children in a selected rural community. *J Dhaka Med Coll* 20, 97-101.
- Blamey, A., Mutrie, N., & Aitchison, T. (1995). Health promotion by encourage use of stairs. *British Medical Journal*, 311, 289 290.
- Briggs, M., S. Safaii, and D.L. Beall. (2003) Nutrition services: An essential component of comprehensive school health programs. *Journal of the American Dietetic Association* 103 (4): 505–514.

- Center for Science in the Public Interest (CSPI). (2007) Are schools making the grade? School Nutrition policies across Canada. Ottawa, Ontario: <http://www.cspinet.org/canada>. Accessed 10 October 2007.
- Center for Disease Control and Prevention. About BMI for Children and Teens (2000) Retrieved from http://www.cdc.gov/ncdphp/dnpa/bmi/childrens_bmi/about_bmi.htm.
- Chou, S.Y., Rashad, I., & Grossman, M. (2005) *Fast-Food Restaurant Advertising On Television And Its Influence On Childhood Obesity*. National Bureau of Economic Research 1050 Massachusetts Avenue, Cambridge.
- Coon, K., Goldbeg, J., Rogers, B., Tucker, K. (2001) *Relationships between use of television during meals and children's food consumption patterns*, *Pediatrics* [serial online], 107, e7.
- Cross, A.T., Babicz, D, Cushman, L.F. (1994) *Snacking patterns among 1,800 adults and children*. American Dietetic Association, 94:1398-1403.
- Cruz, V.A., Hisa, Q. Z., Imson, M.G., Mang-usan, D.A. (2009) *Obesity in school-aged children: prevalence and causes*. University of Cordilleras, Baguio City, Philippines.
- FNRI-DOST (2008) *7th National Nutrition Survey:2008 An Anthropometric Survey Component among Pre-school children, Adolescents, Adults, pregnant and lactating mothers*.
- Gong, E.J & Spear, B.A. (1988) *Adolescent growth and development: Implications for nutritional needs*. *J Nutr. Educ.* 20:273-279
- Grunbaum, J. A., Kann, L., Kinchen, S., Ross, J., Hawkins, J. G., Lowry, R., Harris, W. A., McManus, T., Chyen, D., Collins, J. (2004) *Youth risk behavior surveillance--United States, 2003*. Morbidity and Mortality Weekly Review, 53(SS-2), 1-29.
- Humenikova, L. & Gales, G. E. (2007) *Deitary Intakes, Physical Activity and Predictors of Child Obesity Among 4-6th Graders in the Czech Republic*. *Cent. Eur J Public Health*: 15 (1): 23-28.
- Kowalski, K.C., Crocker, P.R.E., & Honours, R.M.D. (2004) *The Physical Activity Questionnaire for Older Children (PAQ-A) Manual*. College of Kinesiology. University of Saskatchewan, Saskatoon, SK, Canada.
- Muller O, and Krawinkel M. (2005) *Malnutrition and health in developing countries*. *Cmaj*, 173(3), 279-286.
- National Center for Health Statistics, Centers for Disease Control and Prevention, (2000) "Obesity Still a Major Problem," , <http://www.cdc.gov/nchs/pressroom/>

- Nutrition Information Resource Center (NIRC).2001. Health Program. Promoting Lifelong Healthy Eating.
- Omondi, D.O, Othuon, L.O.A and Mbagaya, G. M. (2010) Can Physical Activity and Dietary Fat Intake Influence Body Mass Index in a Cross-sectional Correlational Design? International Journal of Biological and Life Sciences 8:3.
- Shannon, C., M. Story, J.A. Fulkerson, and S. French. (2002) Factors in the school cafeteria influencing food choices by high school students. The Journal of School Health 72 (6): 229–234.
- Savidge G, Macfarlane A, Ball K, Worsley A, Crawford D. (2007) *Snacking behaviours of adolescents and their association with skipping meals*. Int J Behav Nutr Phys Act; 17(4):
- Srivastava A., Mahmood S.E., Srivastava P. M., Shrotriya V. P and Kumar B. (2012) Nutritional status of school-age children - A scenario of urban slums in India. Archives of Public Health ,70:8
- Taylor, J.P., S. Evers, and M. McKenna. (2005) Determinants of healthy eating in children and youth. Canadian Journal of Public Health 96: S20–S26. (July/August).
- Tsai, H.L., & Coleman, D.J.(2007). Preferences for active recreation and perceived constraints to regular active recreation participation: A cross-cultural study of Hong Kong and Australian university students. Leisure/ Loisir, 31(1), 155-189.
- UNICEF, The State of World's Children, 2004. Available at http://www.unicef.org/sowc04/files/SOWC_O4_eng.pdf (accessed 5 October 2012).
- U.S. Department of Health and Human Services. Healthy People. (2010) *Conference Edition*. Washington, DC: U.S. Department of Health and Human Services, 2000.