

Physical Activity Among Older Schoolchildren *

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Abstract

The objective of the study was to assess the physical activity levels of older schoolchildren using a structured questionnaire, as an initial step to gather baseline data due to dearth in studies on the physical activity of children in the Philippines, and possibly assist planners to formulate prevention programs and policies that will help children to become more physically active. The study included 1,217 children, 11-18 years old selected by stratified-cluster sampling from 2 public and 2 private schools. Data on levels of physical activities (light, moderate and vigorous) on a Physical Education (P.E.) day, non-P.E. day and a weekend were gathered through a self-administered questionnaire. A scoring system to determine the physical activity levels was used. Results showed there was twice as much female (815) than male students (402). Statistical test revealed existing significant differences in physical activity scores as the year level increased which indicates increasing “inactivity” among the students as they move up to the higher level. Females were more inactive than the males. Overall, majority of the students (86%) were inactive in both public and private schools. In all the 3 days record, children had a high frequency count of just watching television and did light activities (i.e. play video or just sitting down or talking with friends at school after lunch) and 3 out of 10 did not do sports during weekends. Common moderate activities done by 14% of the students were walk for exercise, basketball, volleyball, and jog/run and were mostly done in school. Thus, in order to help children become more physically active, health-related physical activity programs must be introduced and implemented at a young age to ensure appropriate physical activity habits.

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Introduction

A sedentary lifestyle is a risk factor for a number of diseases that become more prevalent with age in both genders. In contrast, regular physical activity performed in a variety of circumstances is proving to be a health-related behavior with favorable consequences on commonly recognized outcomes (Bouchard C and Despres JP, 1995) like prevention of lifestyle diseases, improved academic performance and alertness among children, improved strength and endurance, and many more. Regular physical activity is important throughout the life cycle, from childhood to old age. In the young child, the main effects of effective promotion of a physically active lifestyle will lead to a “long term” adoption of practices which the children will learn to grow up with. During adolescence, intensity often increases, which results in more physical risks but also counters developing cardiac risk factors. In adult life, benefits shift to the prevention of work loss and premature death from chronic disease. Finally, in old age, exercise conserves function and improves the quality of life (Shepard 1995). Many benefits are also gained by regular physical activity (moderate in amount and intensity) because scientific evidence (Vuori 1995) is sufficient to recommend regular lifelong physical activity as part of a healthy lifestyle for everyone in order to enhance musculoskeletal health and functions for individual and population level. Likewise, regular physical activity and exercise has much to offer from a population point of view in terms of risk reduction for overweight and obesity and other lifestyle-diseases i.e. diabetes mellitus, hypertension coronary heart disease, and many more, in later life.

The prevalence of obesity is rising to epidemic proportions around the world at an alarming rate. The rise in obesity is not restricted to more developed countries. With increasing Westernization, the prevalence of overweight and obesity appears to be rising among the more affluent populations of Less Developed Countries, even in those countries with current food security problems and significant rates of under-nutrition (WHO Report. 1997). In the Philippines, recent findings have shown an increasing trend in overweight prevalence among schoolchildren. According to the FNRI survey results as reported in the 2001 Philippine Nutrition Facts and Figures and the 2002 Philippine Nutrition Facts and Figures Supplement 1, trends in the prevalence of overweight among children, reported per cent prevalence change from 0.4 per cent in 1998 to 1.0 per cent in 2001 among the 0-5 years old and from a negligible finding in 1998 to 0.8 per cent in 2001 among the 6-10 years old. The 2003 National Nutrition Survey results also showed increasing prevalence of overweight from 2.2% in 1993 to 4.2% in 2003, among the 11 to 12 years old and from 2.5% in 1993 to 3.4% in 2003 among the 13 – 19 years old, with a larger percentage increase among the females than males (Pedro, et al, 2006). Although obesity has yet to reach a serious stage in the Philippines, still there is a growing tendency for people to become overweight later on in life. In order to address this problem, it is important to assess physical activity levels of schoolchildren as an initial step in formulating prevention programs.

Objective

In general, the objective of the study is to assess the physical activity levels of older schoolchildren, 11-18 years of age, using a structured questionnaire. Specifically it aims to assess levels of physical activities by gender and by year level and likewise assess moderate and vigorous activities on a physical education (P.E.) and non-P.E. day and a weekend in both public and private schools.

Method

High school students in 2 Public and 2 Private randomly selected schools in the City of Manila served as respondents/subjects of the study. Subjects gathered were from first year to fourth year high school students. A stratified-cluster sampling was used in the selection of subjects where a section for every year level was drawn and the total number of students in the selected section became the sample population. A total of 1,217 students were covered with 815 females and 402 males. Age range of the students was from 11 years to 18 years old.

A pre-tested structured physical activity questionnaire was administered among the High School Students. The questionnaire which was also used in a previous study (Tanchoco CC et. al., 2005) was adapted from Kowalski et. al., 1997 with some modifications in the activity checklist applicable to the activities and population/children being studied. The questionnaire assessed levels of light, moderate to vigorous physical activity among the students on a physical education (P.E.) day, non-P.E. day and weekend.

The questionnaire was self-administered in that the students were instructed by trained researchers on how to accomplish the form checking the frequency of activities done in each of a particular day (P.E., non-P.E. and weekend) after which, these were screened by the researchers for missed items. A list of activities from light (i.e., walk to and from school) to moderate (i.e. walk for exercise, dancing) to vigorous (i.e., jogging/running) activities was included in the questionnaire.

The scoring system adapted Pate's physical activity record (Pate, 1994) with some modifications, to determine the physical activity levels based on 3 categories with higher scores indicating higher levels of activities: Less active = 1-7; Moderately active = 8-14; and active = >14. Categories of physical activity levels were then cross-tabulated by gender, school category and year level. The Chi-Square test was used to determine the association between the variables mentioned.

Result

Table 1. Distribution of students by gender, school category and year level

Year	Male		Total n (%)	Female		Total n (%)
	Public	Private		Public	Private	
1	69	32	101 (33%)	96	105	201 (67%)
2	77	32	109 (34%)	98	110	208 (66%)
3	65	32	97 (32%)	95	108	203 (68%)
4	71	24	95 (32%)	85	118	203 (68%)
Total	282	120	402	374	441	815

Table 1 shows the distribution of students by gender, school category and year level. Of the total 1,217 students in both private (656) and public schools (561) there was twice as much female students (815 or 67%) than male students (402 or 33%) and even by year level. In the private school, there was thrice as much number of female students (441) than male students (120). In the male category, there was twice as much number of students in the public than in the private school from years 1 to 3 and thrice as much in the 4th year.

Table 2. Distribution of subjects by year level and age

Age	Year Level								Total	
	1		2		3		4		n	%
	n	%	n	%	n	%	n	%		
11	5	1.7	-	-	-	-	-	-	5	0.4
12	77	25.5	1	3.0	-	-	-	-	78	6.4
13	174	57.6	82	25.9	6	2.0	-	-	262	21.5
14	36	11.9	183	57.7	49	16.3	1	3.0	269	22.1
15	6	2.0	39	12.3	194	64.7	47	15.8	286	23.5
16	1	0.3	10	3.2	42	14.0	193	64.8	246	20.2
17	2	0.7	1	0.3	8	2.7	54	18.1	65	5.3
18	1	0.3	1	0.3	1	0.3	3	1.0	6	0.5
Total	302	100.0	317	100.0	300	100.0	298	100.0	1217	100.0

Table 2 show age ranges of students were from 11 to 18 years old. By year level, first year students were mostly 13 years old; second year, 14 years old; third year, 15 years old; and fourth year, 16 years old.

Table 3. Mean physical activity score by year level.

Total of Means

Year Level	Mean	n	Standard Deviation
1	6.1482	302	2.39120
2	5.5220	317	2.08972
3	4.8193	300	2.24356
4	4.7316	298	2.05453
Total	5.3106	1217	2.26858

a. $F=27.488$; p value = 0.000

Table 3 shows the mean physical activity score by year level. It shows a decreasing trend in mean score with increasing year level. Statistical test revealed existing significant differences in physical activity scores as the year category increases. This indicates an increase in “inactivity” among the students as they move to the higher year level.

Table 4. Distribution by category of physical activity by gender and year level

Gender	Category of Physical Activity	Year Level				TOTAL
		1	2	3	4	
Female	INACTIVE					
	Frequency % of Total	160 19.6	186 22.8	185 22.7	194 23.8	725 89.0
	MODERATELY ACTIVE					
	Frequency % of Total	41 5.0	22 2.7	18 2.2	9 1.1	90 11.0
Male	INACTIVE					
	Frequency % of Total	74 18.4	91 22.6	84 20.9	79 19.6	328 81.5
	MODERATELY ACTIVE					
	Frequency % of Total	27 6.7	18 4.5	13 3.2	16 4.0	74 18.4
TOTAL	INACTIVE					
	Frequency % of Total	234 19.2	277 22.8	269 22.1	273 22.4	1053 86.5
	MODERATELY ACTIVE					
	Frequency % of Total	68 5.6	40 3.3	31 2.5	25 2.0	164 13.5

Table 4 shows that both females (89%) and males (81.5%) were inactive. The females were more inactive than the males for all year levels (first year to fourth year). However, there were a higher proportion of the males who were more moderately active than the females. Overall, by category of physical activity per year level by gender, the proportion of inactive schoolchildren was almost equal from 2nd year to 4th year. First year students had the highest proportion considered as moderately active. There were a decreasing proportion of moderately active children with increasing years as has been shown in the physical activity score (Table 3). It can be noted that regardless of year level, majority of the students were inactive (86%) than moderately active (14%).

Table 5. Distribution of subjects by school, gender and level of physical activity.

	Public	Private	TOTAL
Female			
Inactive	340 (47%)	385 (53%)	725 (89%)
Moderate	34 (38%)	56 (62%)	90 (11%)
Total	374	441	815 (100%)
Male			
Inactive	233 (71%)	95 (29%)	328 (82%)
Moderate	49 (66%)	25 (34%)	74 (18%)
Total	282	120	402 (100%)

Table 5 shows the distribution of subjects by school, gender and level of physical activity. In both public and private schools, results of the study revealed more inactive female and male students.

Reason for being inactive.....

Table 5. Distribution of Public and Private School Children Watching TV and Playing video Games on a Non-PE and PE day and a Weekend

Activity	Frequency	Non-PE Day		PE Day		Weekend	
		Public n = 656	Private n = 561	Public n = 656	Private n = 561	Public n = 656	Private n = 561
Watch TV	No	54 (8%)	76 (14%)	152 (23%)	148 (26%)	63 (9%)	26 (5%)
	1 – 2 x/d	440 (67%)	374 (67%)	402 (61%)	345 (62%)	195 (30%)	206 (37%)
	>3 x/d	162 (25%)	108 (19%)	102 (16%)	67 (12%)	398 (61%)	319 (57%)
Play video	No	441 (67%)	404 (72%)	488 (74%)	425 (76%)	343 (52%)	644 (53%)
	1 – 2 x/d	198 (30%)	146 (26%)	159 (24%)	128 (23%)	226 (35%)	428 (35%)
	>3 x/d	17 (3%)	11 (2%)	8 (1%)	8 (1%)	87 (13%)	144 (12%)

Table 5 shows the distribution of public and private school children who watched TV and play video games on a non-PE and PE day and on a weekend. Results showed that in all the 3 days of interview children had a high frequency count of just watching TV. On a weekend playing video also gave the highest frequency count.

Likewise, results revealed that a high percentage of the students normally sit down or walk around the vicinity of their canteen and classrooms after lunch (students who have classes the whole day), about 36% did dance or sports activity right after school while waiting for their school service to take them home or their relatives to pick them up and 3 out of 10 children did not do any sports during weekend. Results also revealed that only 33% of the children were always active during their PE class, 41% were active sometimes and the rest were either hardly ever active or did not join their PE class.

The usual moderate and vigorous activities done by the students...

Figure 1. Percentage distribution of moderate and vigorous activities done by the students 1 to 2 times per day on a Non-P.E. day

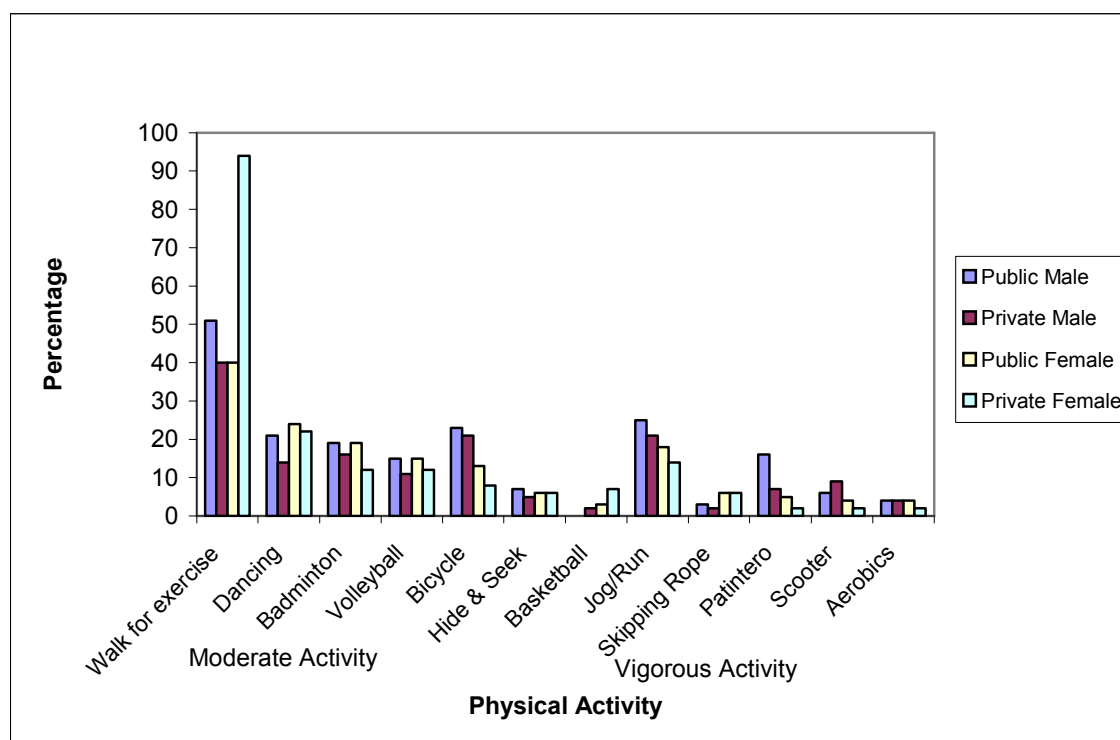


Figure 1 shows that moderate activities of students done once or two times per day, on a non-P.E. day, comprised of walking for exercise, which registered the most frequency, in both public and private as well as in both genders. Other activities most often done were dancing, badminton, volleyball, bicycle, hide and seek and basketball. Vigorous activities

were jogging or running which registered the most frequent (ranging from 14% - 25%), playing “patintero”, skipping rope scooter and aerobics. A very small percentage (0.5% - 8%) of students did the mentioned activities (both moderate and vigorous), 3 or more times per day.

Figure 2. Percentage distribution of moderate and vigorous activities done by the students 1 to 2 times per day on a P.E. day

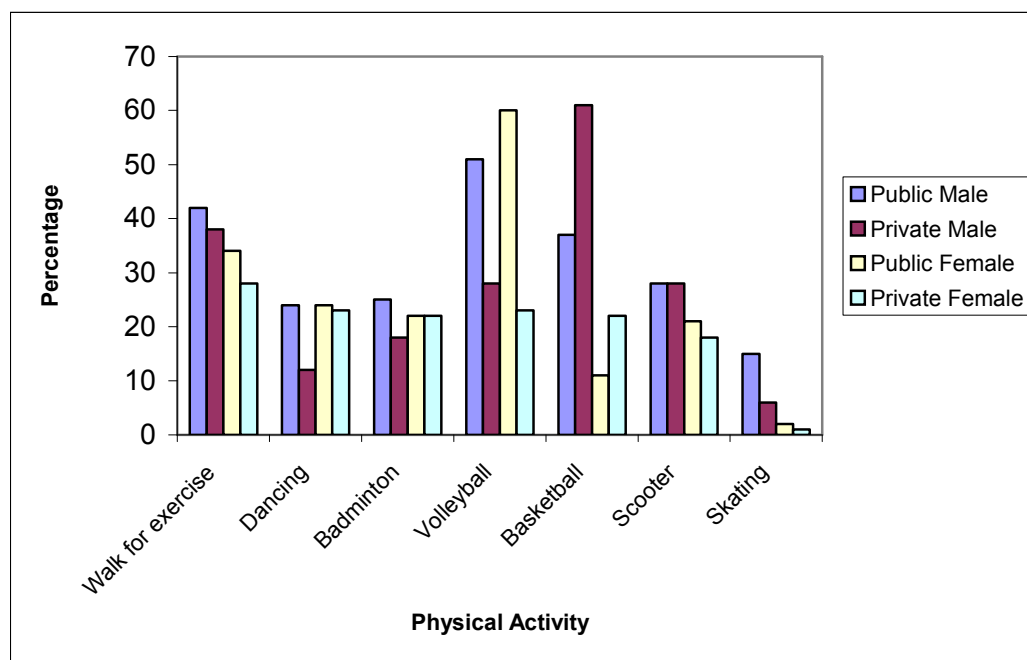
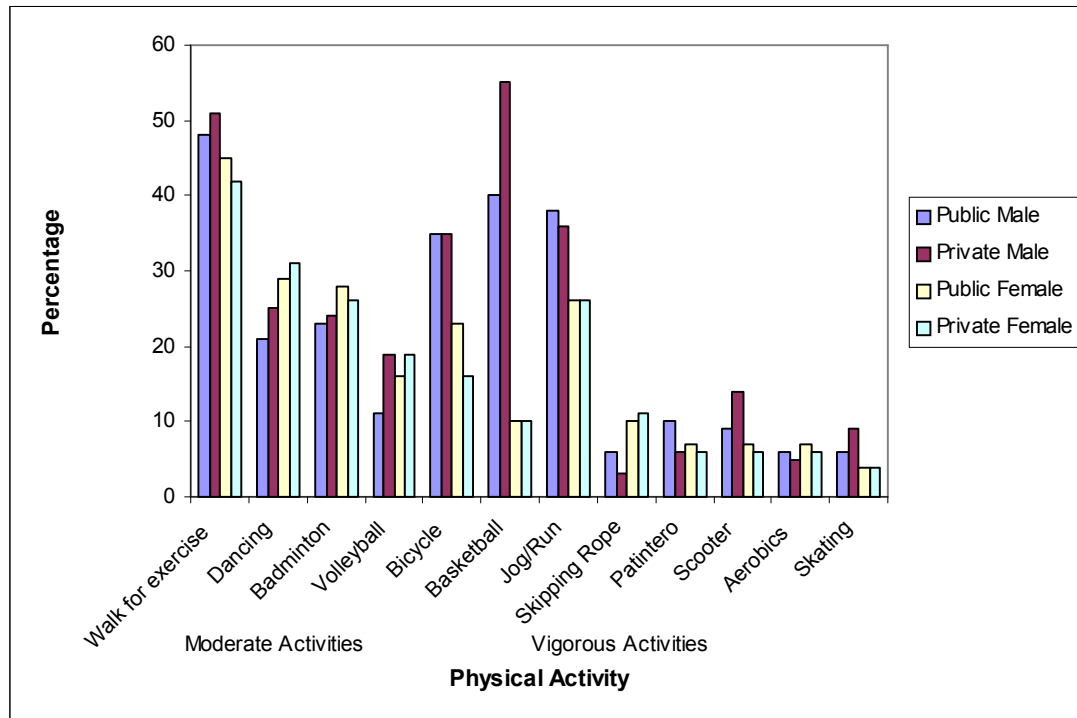


Figure 2 shows the distribution of moderate and vigorous activities done by the students 3 or more times per day on a P.E. day. Volleyball (23%-51%) and basketball (11%-61%) both registered the most frequent moderate activities done by the students. Scooter (18%-28%) and skating (2%-15%) registered the most for vigorous activities. Again, a small percentage of students did the mentioned activities 3 or more times per day.

In figure 3, moderate activities on a weekend showed walking for exercise (42%-51%), basketball (10% among females and 40%-55% among males), and bicycle (16%-35%) registered the most frequently done. For vigorous activity, jogging or running (26%-38%) was the most frequently done. A small percentage (1%-11%) of students did the activities three or more times during weekend.

Figure 3. Percentage distribution of moderate and vigorous activities done by the students 1 to 2 times per day on a weekend



Discussion and Conclusion

The problems of making appropriate recommendations for action are exacerbated by the lack of baseline data concerning physical activity among children and that the lack of information is greater in children because the methodological options are few. As an initial step to gather baseline data due to dearth in studies on the physical activity of children in the Philippines, this study aimed to assess the physical activity levels of older schoolchildren, 11-18 years of age, first year to fourth year high school, using a structured questionnaire (on activity involvement), self-administered. Likewise, to assess levels of physical activities by gender and by year level and assess moderate and vigorous activities on a physical education (P.E.) and non-P.E.day and a weekend, in 2 public and 2 private schools.

Results of the study showed a high percentage of inactive male (82%) and female (89%) students in both public and private schools. In all the 3 days record of activities, children had a high frequency count of 61%-67% of just watching television on a non-PE and PE day and 57% - 61% during weekends. A high percentage of the students also did sedentary to light active activities like sit down after lunch, 3 out of 10 did not do sports during weekends. In a study in Nova Scotia (Campagna, 2001), on the physical activity levels of children and youth, they also found that only approximately 1/3 of junior high and high school students met the physical activity recommendation similar to results

reported by their National Population Health Survey of 1999 or that only 35% of youth have been active enough to achieve optimal health benefits. The Canadian Fitness and Lifestyle Research Institute (CFLRI, 2001) in their study also found that greater than half of 5-17 year old youths were not sufficiently active for optimal development and growth.

It was also noted that the males were more active than the females. Gender, other than age, race and other demographic factors have been shown to have an influence in the physical activity in young people. Results of a study by the CDCP-1999 YRBS (2000) and Andersen (1998) have shown that boys are more active than girls, especially in the older age groups.

The study also revealed the fourth year high school female students with mean age of 16 years, had the most number of inactive students. In the male category, the second to fourth year students were more inactive than the first year students (mean age 13 years old). Activity levels have been shown to decrease with age. King and Coles (1992), in their study, indicated that from the age of 11 to 15 years, boys and girls dramatically decreased involvement in community based and school based sports programs and that levels of participation were significantly lower in females. Similarly, a study by Crocker and Faulkner (1999) showed that elementary students typically have higher physical activity scores than high school students with males consistently demonstrating higher physical activity levels than females.

The trend towards decreased involvement in physical activity for females is a robust finding (De Knop et al, 1998). Prior research has examined the link between childhood and adult patterns of physical activity and inactivity. There is evidence that physical activity levels in childhood (Pate, 1999) and adolescence (Raitakara et al, 1994) remain relatively stable across time. In a study by Tremblay (1998), he noted that childhood behaviors perpetuate adult behaviors in the realm of physical activity; if individuals are inactive as children, they tend to be inactive as adults.

Although it is true that, not everyone who is physically active on a regular basis will remain free from vascular and metabolic diseases, yet the protective effects and reduction in risk levels are substantial enough to justify the promotion of a physically active lifestyle in all segments of the population. A regular physical activity may well represent the most cost effective and important preventive medicine measure that could be promoted by developed and developing countries, particularly in the light of the escalating health care budgets around the world. (Bouchard C and Despres JP, 1995).

This research study and findings may be an important step in establishing a benchmark from which we will be able to measure changes in physical activity levels of children using the questionnaire, as well as plans to formulate prevention programs and policies that will help children to become more physically active. Obviously, to make these changes, it first needs to buy in to the importance of findings of studies. In a study of Dennison et (1988), he concluded that in order to be most effective, health-related physical activity programs must be implemented at a young age to ensure appropriate exercise habits to be formed early.

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References

1. Andersen RE, Crespo CJ, Bartlett SJ, et al. 1998. 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*. 270:203-942.
2. Bouchard, Claude and Jean-Pierre Despres. 1995. Physical Activity and Health: Atherosclerotic, Metabolic, and Hypertensive Diseases. *Research Quarterly for Exercise and Sport (RQES)* by the American Alliance for Health, P.E., Recreation and Dance. Vol 66, No.4, pp 268-275.
3. Campagna P, Nordqvist D. 2001. Measuring Physical Activity Levels of Nova Scotia Children and Youth Research Pilot Report January, 2001. Nova Scotia Sport and Recreation Commission.
4. Canadian Fitness and Lifestyle Research Institute(CFLRI). 2001. Increasing physical activity: building a supportive recreation and sport system. Brochure. Ottawa: Author.
5. Crocker PRE and Faulkner RA. 1999. Self-report of physical activity intensity in youth: Gender and grade level considerations. *AVANTE*, 5, 43-51.
6. De Knop P, Engstrom LM, Skirstad B and Weiss MR. 1996. World wide trends in youth sport. Champaign, IL: Human Kinetics.
7. FNRI, DOST. 2001. Philippine Nutrition Facts and Figures. Food and Nutrition Research Institute, Department of Science and Technology, Bicutan, Taguig, Metro Manila.
8. FNRI, DOST. 2002. Philippine Nutrition Facts and Figures Supplement 1: 2001 Update of the Nutritional Status of 0-10 Year-Old Filipino Children. Food and Nutrition Research Institute, Department of Science and Technology, Bicutan, Taguig, Metro Manila.
9. King AJC and Coles B. 1992. The health of Canada's youth: views and behaviours of 11-, 13- and 15-year olds from 11 countries. Ottawa, Ontario: Minister of Supply and Services, Canada.
10. Kowalski KC, Croker PRE, Kowalski N. 1997. Consequent validity of the physical activity questionnaire for adolescence. *Pediatr Exerc Sci* 9:342-352.
11. Pate RR and Hohn RC. 1994. Health and Fitness through Physical Education. Nutrition and Fitness Chapter. University of South Carolina.

12. Pate RR, Trost SG, Dowda M, Ott AE, Ward DS, Saunders R and Felton G. 1999. Tracking of physical activity, physical inactivity, and health-related physical fitness in rural youth. *Pediatric Exercise Science*, 11, 364-376.
13. Pedro MRA, Benavides RC and Barba CVC. 2006. Dietary changes and their health implications in the Philippines. For FAO publication. With permission from the author.
14. Raitakari OT, Porkka KVK, Taimela S, Telama R, Rasanen L and Viikari JSA. 1994. Effects of persistent physical activity and inactivity on coronary risk factors in children and young adults. *American Journal of Epidemiology*, 140: 195-205.
15. Shepard, Roy. 1995. Physical Activity, Health, and Well-Being at Different Life Stages. *Research Quarterly for Exercise and Sport (RQES)* by the American Alliance for Health, P.E., Recreation and Dance. Vol 66, No.4, pp 298-302.
16. Tanchoco CC, Yuchingtat GP, Gayya CT, Barrameda MB and Panugao MP. 2005. Physical activity assessment of Filipino schoolchildren ages 9-12 years. Unpublished.
17. Vuori, Ilkka. 1995. Exercise and Physical Health: Musculoskeletal Health and Functional Capabilities. *Research Quarterly for Exercise and Sport (RQES)* by the American Alliance for Health, P.E., Recreation and Dance. Vol 66, No.4, pp 276-285.
18. WHO Report. 1997. Obesity: Preventing and Managing the Global Epidemic. Geneva, World Health Organization (WHO Technical Report Series, No. 894).
19. 1999 Youth Risk Behavior Surveillance (YRBS) – United States. 2000. Centers for Disease Control and Prevention (CDCP). *Morb Mortal Wkly Rep* 2000, 49: 1-95.