Chula Med J Vol. 45 No. 2 February 2001

Health promoting behavior among students of upper secondary schools in Bangkok

Ninlapa Jiraradtanawanna*
Jiruth Sriratanaban** Ong-arj Viputsiri**

Jiraradtanawanna N, Sriratanaban J, Viputsiri O. Health promoting behaviors among students of upper secondary schools in Bangkok. Chula Med J 2001 Feb; 45(2): 143 - 60

Objective : *The purpose of this study was to determine the health promoting behavior of high – school students in the Bangkok metropolitan area, particularly in selected dietary habits, physical exercise and condition of mental – health.*

Methods : *A cross-sectional descriptive survey was conducted on a sample of 2,874 students in 26 randomly chosen schools in Bangkok. The pre-tested questionnaires were distributed and collected by the researcher under the supervision of the teachers during December 1998 to February 1999. All distributed questionnaires were returned.*

Results : *Some 62.6 % of the sample students were female. The mean age was 16.9 years. Some 35.4 % of these studied in public high schools, 15.4 % in private high schools, 8.5 % in public vocational schools, and 40.7 % in private vocational schools. Regarding dietary habits, the majority of the students stated that they ate food of all 5 groups had 3 meals per day, adequate water intake, and cooked and cleaned their food. However, around one-third of students preferred high-fat and spicy food with the same number reporting that they did not use shared-spoons. Some 39.3 % consumed a lot of carbonated soft drink, while 47.2 % preferred milk. Significant relationships ($p<0.01$) in selected dietary habits were found according to marital status of parents, family economics, allowances, health promoting activities at school,*

* Master of Science (Community Medicine) 1998, Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University.

** Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University

and types and levels of education. Regarding physical activities, 33.6 % of the students had regular exercise, and 20.3 % had undertaken no exercise at all over the last 6 months, citing the reasons as of lack of time (60.4 %) and facilities (33.4 %). Distinctively significant associations ($p<0.01$) were found with gender, and types and levels of education. Regarding mental health condition, 6.0 % of the students expressed unhappiness and experienced insomnia with use of sleeping pills. Some 10.8 % felt inferiority while 19.5 % were of quick temper. As many as 60 % of the students indicated stress from studying and 57.7 % used music to alleviate their stress. Mental health status was found related to gender, illness condition and personal sickness, family economics, monthly allowance, well-being, marital status of parents and health promoting activities at schools. ($p<0.05$)

Conclusions : *This study indicated that dietary habits, physical exercises, and stress from studying were crucial issues. Health promoting activities at schools should be more actively promoted.*

Key words : *Health promotion, Health behavior, Secondary school, Bangkok.*

Reprint request : Jiraradtanawanna N, Master of Science (Community Medicine) 1998, Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University.

Received for publication. November 15, 2000.

นิลภา จิระรัตนวรรณะ, จิรุตม์ ศรีรัตนบัลล์, องอาจ วิพุธศิริ. พฤติกรรมส่งเสริมสุขภาพของนักเรียนระดับมัธยมศึกษาตอนปลาย ในกรุงเทพมหานคร. จุฬาลงกรณ์เวชสาร 2544 ก.พ; 45(2): 143 - 60

วัตถุประสงค์ : *เพื่อศึกษาพฤติกรรมส่งเสริมสุขภาพของนักเรียนมัธยมศึกษาตอนปลาย ในกรุงเทพมหานคร เกี่ยวกับการบริโภคอาหาร การออกกำลังกาย และสุขภาพจิต*

ระเบียบวิธีการวิจัย : *การสำรวจเชิงพรรณนาชนิดตัดขวาง กับนักเรียนจำนวน 2,874 คน ใน 26 โรงเรียน ซึ่งได้จากการสุ่มตัวอย่างจากโรงเรียนระดับที่ทำการศึกษาทั้งหมดในกรุงเทพมหานคร ซึ่งแบบสอบถามที่ผ่านการทดสอบแล้วได้ถูกแจกและเก็บโดย ผู้วิจัยภายใต้การดูแลจากครู ในช่วงระหว่างธันวาคม 2541 ถึง กุมภาพันธ์ 2542*

ผลการศึกษา : *นักเรียนที่ตอบเป็นเพศหญิง 62.6 % และเพศชาย 36.7 % อายุเฉลี่ย 16.9 ปี ซึ่งศึกษาในโรงเรียนมัธยมศึกษารัฐบาล 35.4 % มัธยมศึกษาเอกชน 15.4 % อาชีวศึกษารัฐบาล 8.5 % และอาชีวศึกษาเอกชน 40.7 % นักเรียนส่วนมากมี พฤติกรรมการบริโภคอาหารที่ดี โดยกินอาหารครบ 5 หมู่, ครบ 3 มื้อ, ดื่มน้ำเพียงพอ, เลือกกินอาหารปรุงสุก และสะอาด อย่างไรก็ตามนักเรียน 1 ใน 3 ระบุว่าชอบกินอาหารไขมันสูง, รสจัด และไม่ใช้ช้อนกลาง มีนักเรียน 39.3 % นิยมดื่มน้ำอัดลมมาก ส่วนผู้ที่ชอบดื่มนมมากมี 47.2 % การบริโภคอาหารมีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติ ($p<0.01$) กับสถานภาพสมรสบิดามารดา, เศรษฐานะครอบครัว, ค่าใช้จ่ายที่ได้รับ, กิจกรรมส่งเสริมสุขภาพของโรงเรียน, ประเภทโรงเรียนและระดับชั้นเรียน เกี่ยวกับการออกกำลังกาย พบว่านักเรียนออกกำลังกายเป็นประจำ 33.6 % และไม่ออกกำลังกายเลย 20.3 % ภายใน 6 เดือนที่ผ่านมา โดยระบุว่าไม่มีเวลาและสถานที่ (60.4 % และ 33.4 %) ทั้งนี้การออกกำลังกายมีความสัมพันธ์อย่างชัดเจน ($p<0.01$) กับเพศ ประเภทโรงเรียน และระดับชั้นเรียน เกี่ยวกับสุขภาพจิต มีผู้ระบุว่ามีความสุขน้อยและ นอนไม่หลับต้องพึ่งยาอยู่ 6.0 %, รู้สึกมีปมด้อย 10.8 %, และมีผู้ที่มักหงุดหงิด ฉุนเฉียว 19.5 % โดย 60.7 % ของนักเรียนทั้งหมด ระบุว่ามีความเครียดจากการเรียนและส่วนใหญ่จะใช้วิธีการ ฟังเพลง หรือร้องเพลงเป็นการผ่อนคลายความเครียด (57.7 %) สุขภาพจิตมีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติ ($p<0.05$) กับเพศ, ความเจ็บป่วย/มีโรคประจำตัว, เศรษฐานะครอบครัว, ค่าใช้จ่ายที่ได้รับ, สภาพการอยู่อาศัย, สถานภาพสมรสของบิดามารดา กิจกรรมส่งเสริมสุขภาพของโรงเรียน*

สรุป : *จากการศึกษาครั้งนี้แสดงให้เห็นว่า พฤติกรรมการบริโภคอาหาร การออกกำลังกาย และความเครียดจากการเรียนของนักเรียน ยังเป็นประเด็นสำคัญต่อการจัดให้มีกิจกรรมการส่งเสริมสุขภาพแก่นักเรียนให้เพิ่มมากขึ้น*

คำสำคัญ : *การส่งเสริมสุขภาพ, พฤติกรรมสุขภาพ, โรงเรียนมัธยมศึกษา, กรุงเทพมหานคร.*

Health promotion is a worthwhile investment. It serves as a basis for health development that enables us to take care of our own wellbeing, thereby ensuring good health and lessening health inequality. Good health is a basic need of human beings. Studies on health-related matters over a long period of time and advancement in this field due to knowledge in health science, have generated better understanding of several risk factors and better epidemiologic information on health status, illness and basic causes of death in various groups in society.[1]

During the current period of epidemiologic transition, infectious diseases have been overtaken as causes of poor health by non-infectious conditions, such as accidents, improper way of life such as smoking, drinking, bad dietary habits, lack of exercise and high-risk sexual practice.[2] A study by Harvard University on disease burden estimated that illness due to non-contagious diseases as opposed to contagious diseases would increase from 36.1 percent in 1990 to 56.7 percent in 2020.[3]

Information on the health status of school-age children and adolescents over the past 50 years in Thailand has suggested that people in this age range (6-19 years old) undergo both physical and mental growth and learning processes as well as having a low risk of infection. Their health problems and causes of death are largely related to the aforementioned unhealthy behaviors.[4] According to the 1996 Health Statistics Report, school-age children and adolescents, aged between 10 and 24 years old, accounted for 15.58% of all HIV/AIDS patients, while those aged between 15-24 years old accounted for 53.1 percent of patients treated for sexually transmitted diseases. Teenagers comprised 18.7 percent of smokers while 12.4 million teenagers nationwide started consuming alcoholic drinks at the age of 14. At the same time, cases of Improper nutrition and the use of drugs and addictive substances increased every year.[5] According to information from the Drug Suppression Division in 1997, the spread of amphetamines increased by 1.1 percent among high-school students and by 2.4 percent among vocational students.[6]

Given the above, it is important to promote health and growth-related behavior among school-age children, particularly teenagers, so as to ensure that they become healthy adults in the future. In this study, therefore, particular attention was given to the existing health promoting behaviors among high-school students in both ordinary and vocational schools in Bangkok with the objective being to study their dietary habits, exercise habits and mental health condition in stress management. It also aimed to examine any associations that these behaviors might have with personal, family and school characteristics. It was hoped that the results of this study would be useful for the planning of health promoting activities in schools.

Methods

A cross-sectional descriptive study was conducted on high-school and vocational-school students in Bangkok. Applying a stratified sampling technique, the schools were proportionally selected at random from the sampling frame of 269 schools in Bangkok, comprising 110 public secondary schools, 43 private secondary schools, 22 public vocational schools and 94 private vocational schools. The sampling algorithm could be demonstrated in Figure 1. The sample comprised 2,874 students studying in 26 secondary and vocational schools under the Ministry

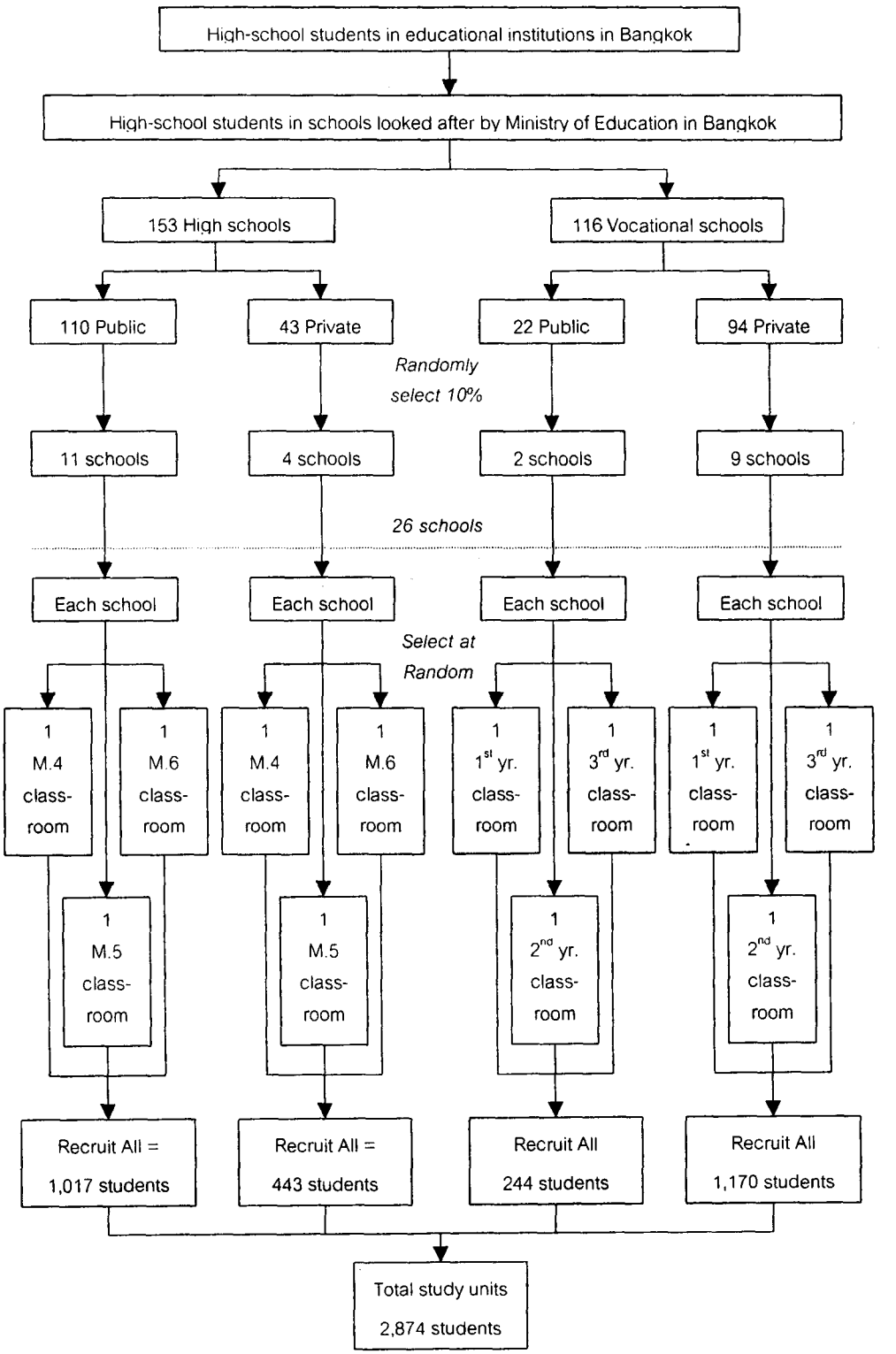

Figure 1. Sampling algorithm

of Education (Department of Education, Department of Vocational Education and the Office of the Board of Private Education), both boys' schools, girls' schools and mixed schools. In each school, three classrooms from grades 4, 5 and 6 were randomly selected. The sample size was calculated based on the estimated proportion of exercise habits among the 17-24 students in Bangkok, which were around 15 percent.[7]

The survey was conducted between December 1998 and February 1999 using questionnaires prepared in accordance with the objectives of this study, investigating :

1. General Information: (comprising a 12 checklist and fill-in questions)

1.1 Personal information, i.e., age, gender, health record, personal illness and participation in health-related activities;

1.2 Family information, i.e., economic status of parents, members sharing the same house, family size and personal expenses;

1.3 Education information, i.e., types and levels of education.

2. Information on Health Promoting Behavior

2.1 Dietary Habits, 15 questions requesting the respondents to choose one among 5 choices as the question applied (least,little,average, much or most);

2.2 Physical Exercise Habits, a 4 check-list and fill-in questions;

2.3 Mental Health and Stress Management Behavior, 12 questions requesting the respondents to choose one among 5 choices-Least, Little, Average, Much, or Most.

Data analyses applied descriptive and inferential statistics based on mean ranks, including the Mann-Whitney U tests and Kruskal-Wallis H tests to compare the differences in rank of scores of dietary habits, physical exercise habits, and mental health behavior.

Table 1. Number and Percentage of High-School Students in Bangkok, Divided by Types of School and Levels of Education (n = 2,874)

Type/ Level of education	Public		Private		Total	
	Number	%	Number	%	Number	%
High School						
Grade 10 (M.4)	317	66.9	157	33.1	474	100.0
Grade 11 (M.5)	353	72.0	137	28.0	490	100.0
Grade 12 (M.6)	347	70.0	149	30.0	496	100.0
Subtotal	1,017	35.4	443	15.4	1,460	50.8
Vocational School						
1st year	68	15.4	374	84.6	442	100.0
2nd year	105	21.4	386	78.6	491	100.0
3rd year	71	14.8	410	85.2	481	100.0
Subtotal	244	8.5	1,170	40.7	1,414	49.2
Total	1,261	43.9	1,613	56.1	2,874	100.0

Results

Table 1 shows that the sampled students consisted of 43.9 percent from public schools and 56.1 percent from private schools. Some 50.8 percent were normal high-school students while 49.2 percent were vocational school students. The number of sample students in each level of schooling was similar.

Of the students under study, 62.6 percent were female with an average age of 16.9 years old: The youngest student was 14 and the oldest 25 years old. Some 31.0 percent of these were 17 years old. Over the last 6 months, as many as 50.3 percent of the students reportedly experienced certain kinds of illness. Some 15.5 percent of all the students had had an illness personally. There were 23.6 percent who did not participate in the health promoting activities provided by the school. Most of the high-school students (66.8 percent) lived with their parents, and 74.4 percent of their parents lived together. The economic status of 45.3 percent of the students was financially secure with no debt. Some 76.3 percent of the students reportedly received adequate monthly allowances. (See Table 2)

Table 2. Personal, and familial characteristics of the sampled students.

Personal characteristics	Number (%)	Familial characteristics	Number (%)
Gender		*Person who is living with*	
- Male	1,055 (36.7)	- Both parents	1,921 (66.8)
- Female	1,798 (62.6)	- Father only	329 (11.4)
- Not specified	21 (0.7)	- Mother only	101 (3.5)
Age (in years)		- Relatives	445 (15.5)
- 14	12 (0.4)	- Friends	32 (1.1)
- 15	319 (11.1)	- Living with others or in dormitory	33 (1.1)
- 16	761 (26.5)	- Not specified	13 (0.5)
- 17	890 (31.0)	*Parental marital status*	
- 18 or more	858 (29.8)	- Living together	2,137 (74.4)
- Not specified	34 (1.2)	- Separated	285 (9.9)
History of illness during the past 6 month		- Divorced	197 (6.9)
- Yes	1,445 (50.3)	- Father dead	192 (6.7)
- No	1,391 (48.4)	- Mother dead	44 (1.5)
- Not specified	38 (1.3)	- Both parents dead	6 (0.2)
Having personal illness		- Not specified	13 (0.5)
- Yes	445 (15.5)	*Family economic status*	
- No	2,365 (82.3)	- Not enough and in debt	169 (5.9)
- Not specified	64 (2.2)	- Not enough but no debt	83 (2.9)
Participation in school health activities		- Enough but in debt	688 (23.9)
- Never	679 (23.6)	- Enough with no debt	1,303 (45.3)
- Only the required	611 (21.3)	- Enough with saving	591 (20.6)
- Only the favorite	819 (28.5)	- Not specified	40 (1.4)
- All voluntarily	712 (24.8)		
- Not specified	53 (1.8)		

Table 3. Number (percentage) of high-school students in Bangkok according to their dietary habits (n = 2,874).

Dietary Habits	Number(Students) / (%)						Average
	Least	Little	Average	Much	Most	N/A	
1. Eat 5-group nutrition	93	368	1,382	733	281	17	3.26
	(3.2)	(12.8)	(48.1)	(25.5)	(9.8)	(0.6)	
2. Have 3 meals per day	118	486	769	805	675	21	3.50
	(4.1)	(16.9)	(26.8)	(28.0)	(23.5)	(0.7)	
3. Drink water intake	111	517	1,019	705	495	27	3.34
(6-8 glasses per day)	(3.9)	(18.0)	(35.5)	(24.5)	(17.2)	(0.9)	
4. Eat fish	129	554	1,098	761	311	21	3.20
	(4.5)	(19.3)	(38.2)	(26.5)	(10.8)	(0.7)	
5. Eat vegetables, fruits	54	237	934	1,021	612	16	3.66
	(1.9)	(8.2)	(32.5)	(35.5)	(21.3)	(0.6)	
6. Eat oily and High-fat food*	158	563	1,220	676	230	27	3.09
	(5.5)	(19.6)	(42.5)	(23.5)	(8.0)	(0.9)	
7. Eat very sweet, salty, sour,	307	641	947	669	393	17	3.00
spicy food or fermented food*	(10.7)	(22.3)	(33.0)	(23.3)	(10.2)	(0.6)	
8. Eat cooked food	17	64	321	892	1,562	18	4.37
	(0.6)	(2.2)	(11.2)	(31.0)	(54.3)	(0.6)	
9. Consider hygiene of food and	45	223	909	996	677	24	3.71
vendors before purchase	(1.6)	(7.8)	(31.9)	(34.9)	(23.8)	(0.8)	
10. Wash hands before meals	198	601	1,107	616	333	19	3.10
	(6.9)	(20.9)	(38.5)	(21.4)	(11.6)	(0.7)	
11. Use sharing spoons when	394	644	971	546	342	22	2.98
eating with others	(12.1)	(22.4)	(33.8)	(19.0)	(11.9)	(0.8)	
12. Eat fast food, such as	564	782	920	434	151	23	2.59
hamburgers, pizza*	(19.6)	(27.2)	(32.0)	(15.1)	(5.3)	(0.8)	
13. Eat packaged instant food*	358	816	1,002	515	165	18	2.75
	(12.5)	(28.4)	(34.9)	(17.9)	(5.7)	(0.6)	
14. Drink carbonated soft drink *	287	537	902	688	443	17	3.16
	(10.0)	(18.7)	(31.4)	(23.9)	(15.4)	(0.6)	
15. Drink milk	151	381	930	742	615	55	3.46
	(5.3)	(13.3)	(32.4)	(25.8)	(21.4)	(1.9)	

*Negative health behavior

Health Promoting Behaviors

Table 3 demonstrates that favorable proportions of the high-school students had positive dietary behaviors. The only exception was a relatively low use of sharing spoons when eating with other people, with only 34.5 percent of the students indicating that they seldom or rarely did so. At the same time, the practice of negative behaviors among the students on the whole ranged from average to low. However, quite a number of students consumed carbonated soft drink, spicy food and oily and high-fat food with 39.3 percent, 33.5 percent and 31.5 percent of the students respectively indicating that they did so much or most of the time.

Table 4 shows that 33.6 percent of the students had had regular exercise over the last 6 months while as many as 20.3 percent never did so. The most common reasons raised by the students for not exercising included having no time (60.4 percent), having no access to exercise facilities (33.4 percent) and having no exercise equipment (17.0 percent).

Table 5 indicates that, on average, high-school students in Bangkok had positive mental health. Most students were close to friends (78.0 percent) and were fun-loving and cheerful (72.1 percent), as well as feeling close to their parents (68.4 percent). Negative behavior findings were relatively low, but there were cases of students who sometimes felt themselves easily getting angry or irritated (19.5 percent), saw themselves as inferior to others (10.8 percent), liked to work alone (7.8 percent), and experienced insomnia or needed to use sleeping pills (5.9 percent,).

Table 4. Number and Percentage of High-School Students in Bangkok According to Their Physical Exercise Habits (n = 2,874)

Physical Exercise Habits	Number (Students)	%
Physical Exercises Over the Last 6 Months		
Exercise regularly	967	33.6
Exercise occasionally	1,316	45.9
Never exercise	583	20.3
Not applicable	8	0.2
Reason for not exercising (more than 1 answer ,n =583)		
No time	352	60.4
No facilities	195	33.4
No equipment	99	17.0
Laziness	31	5.3
Don't like exercising	10	1.7
No companion	9	1.5
Already strong/ poor health/ obesity	5	0.9

Table 5. Number (Percentage) of High-School Students in Bangkok According to Their Mental Health (n = 2,874).

Mental Health	Number of Students (%)						Average
	Least	Little	Average	Much	Most	N/A	
1. Feel happy	31	140	1,052	1,171	469	11	3.67
	(1.1)	(4.9)	(36.6)	(40.7)	(16.3)	(0.4)	
2. Be fun-loving, pleasant and joyful	10	69	711	1,194	879	11	4.00
	(0.3)	(2.4)	(24.7)	(41.5)	(30.6)	(0.4)	
3. Feel close to parents	72	157	669	988	978	10	3.92
	(2.5)	(5.5)	(23.3)	(34.4)	(34.0)	(0.3)	
4. Feel close to friends	21	54	543	1,302	941	13	4.08
	(0.7)	(1.9)	(18.9)	(45.3)	(32.7)	(0.5)	
5. Feel close to teachers	115	440	1,508	658	143	12	3.10
	(4.0)	(15.3)	(52.4)	(22.9)	(5.0)	(0.4)	
6. Feel oneself inferior to	655	867	1,020	236	76	20	2.37
others*	(22.8)	(30.2)	(35.5)	(8.2)	(2.6)	(0.7)	
7. Experience insomnia or	2,160	297	203	97	73	44	1.45
need sleeping pills in order	(75.2)	(10.3)	(7.1)	(3.4)	(2.5)	(1.5)	
to sleep*							
8. Easily get angry or irritated*	537	855	05	76	82	16	
	(18.7)	(29.7)	(31.5)	(13.2)	(6.3)	(0.6)	2.59
9. Like helping people in	69	271	1,545	738	239	12	3.00
trouble	(2.4)	(9.4)	(53.8)	(25.7)	(8.3)	(0.4)	
10. Like to work alone and not	1,306	791	524	141	82	30	1.91
socialize with others*	(45.4)	(27.5)	(18.2)	(4.9)	(2.9)	(1.0)	

*Negative behavior or feeling

Relationships between Health promoting behavior and personal, family and school factors

Health promoting behavior was found to be related to a number of personal, familial and school characteristics based on bivariate non-parametric analyses. Better dietary habits were significantly associated with students who were younger in age (p= 0.003), voluntary participated in health promoting activities at school (p=0.001), lived in the same house with both parents (p=0.035), were well-off and had savings (p<0.001), and studied in public high-schools (p<0.001). In addition, significantly better physical exercise habits were found in students who were male (p=0.001), were well-off and had saving (p=0.021), and studied in public high-schools (p<0.001). More mental-health behaviors were found among female students

(p<0.001), younger students (p=0.017), students without any illness for the past 6 months (p=0.015) and without personal illnesses (p=0.002). Students who voluntarily participated in health promoting activities at school (p=0.001), those who lived in the same house with both parents (p<001) and were well-off and had saving (p<0.001) also had more positive mental health behaviors. However, mental health behaviors of the students were not significantly related to school characteristics. (See Tables 6-8)

Table 6. Relationships between health promoting behaviors and personal characteristics.

Behavioral score mean ranks		Dietary habits	Physical exercise	Mental health behaviors
Gender	Male	1371.5	1382.8	1306.9
	Female	1375.5	874.7	1435.3
	p-Value	**0.899**	**0.001**	**<0.001**
Age (years)	14	1958.7	1264.3	1540.9
	15	1472.6	1104.1	1503.1
	16	1397.8	1101.8	1406.5
	17	1341.3	1054.2	1370.8
	18 or more	1319.5	1067.9	1329.7
	p-Value	**0.003**	**0.404**	**0.017**
History of illness	No	1377.3	1088.8	1418.0
during the past 6	Yes	1355.2	1068.5	1344.3
month	p-Value	**0.464**	**0.125**	**0.015**
Personal illness	No	1355.6	1063.1	1387.6
	Yes	1348.6	1094.2	1261.6
	p-Value	**0.865**	**0.815**	**0.002**
Participation in school	Never	1264.0	1048.0	1279.2
health activities	Only the required	1282.6	1021.2	1311.9
	Only the favorite	1382.5	1104.5	1382.4
	All voluntarily	1472.3	1080.9	1488.1
	p-Value	**0.001**	**0.830**	**0.001**

Table 7. Relationships between health promoting behaviors and familial characteristics.

Behavioral score mean ranks		Dietary habits	Physical exercise	Mental health behaviors
Person with whom the subject is living	Both parents	1401.2	1097.6	1443.0
	Father only	1311.8	1066.5	1361.4
	Mother only	1220.1	1102.4	1215.1
	Relatives	1380.8	1038.0	1256.9
	Friends	1346.4	1082.5	1314.9
	Living with others or in dormitory	1089.9	1067.6	1177.5
	p-Value	**0.035**	**0.652**	**<0.001**
Parental marital status	Living together	1412.7	1090.5	1433.1
	Separated	1298.0	1109.5	1229.5
	Divorced	1195.1	1070.0	1229.1
	Father dead	1254.1	1029.7	1338.2
	Mother dead	1499.1	972.7	1330.4
	Both parents dead	1551.6	877.3	1911.3
	p-Value	**<0.001**	**0.534**	**<0.001**
Family economic status	Not enough and in debt	1133.1	1059.5	1119.0
	Not enough but no debt	1188.7	1037.2	1078.3
	Enough but in debt	1319.3	1096.5	1364.0
	Enough with no debt	1376.1	1048.2	1389.1
	Enough with saving	1491.2	1135.1	1492.1
	p-Value	**<0.001**	**0.021**	**<0.001**

Table 8. Relationships between health promoting behaviors and school characteristics.

Behavioral score mean ranks		Dietary habits	Physical exercise	Mental health behaviors
Types of schools	Public high-school	1,489.8	1,189.3	1384.5
	Private high-school	1,353.1	1,160.0	1,367.1
	Public vocational school	1,359.8	957.7	1,434.0
	Private vocational school	1,304.7	983.5	1,414.6
	p-Value	**<0.001**	**<0.001**	**0.599**
Levels of education	Grade 10 (M.4)	1,525.8	1,200.2	1414.9
	Grade 11 (M.5)	1,472.9	1,175.2	1378.7
	Grade 12 (M.6)	1,349.4	1,163.9	1345.5
	1st year vocational	1,248.0	1,002.9	1436.2
	2nd year vocational	1,316.8	989.9	1399.5
	3rd year vocational	1,372.5	948.5	1399.5
	p-Value	**<0.001**	**<0.001**	**0.569**

Discussions

Considering the dietary habits of the students sampled, these students maintained unhealthy dietary habits in not using serving spoons while eating with other people. The selection of food also had certain deficiencies. Students enjoyed drinking carbonated soft drink as much as they did milk, and preferred spicy and high-fat food. These findings were similar to those in the study by Suchada Manohthai, which indicated that high school students in grades 7 to 9 liked high-fat food, sweets, ice cream and cookies.[8] It is widely recognized that food which is either excessively sweet or salty could have adverse effects on health, while high-fat food could lead to obesity and other symptoms detrimental to health. This study also shows that the youngest students sampled, 14 years old, had more positive dietary habits than older students. At the same time, it appears that those students who voluntarily participated in health promoting activities also acquired more positive dietary habits than those who did not participate in such activities at all or participated compulsorily or selectively according to their preference.

Regarding physical exercise habits, the study found that 20.3 % of the students never exercised due to lack of time. It could be that study time did not allow for exercise. On the other hand, 33.6 % of the students exercised regularly. The percentage found here is higher than that in a previous study which found that only 15 % of students in Bangkok schools had regular physical exercises.[9] Such a difference could reflect a number of explanations. There has been greater awareness and various agencies have campaigned for people to exercise more. More public parks and facilities where people can exercise have also been provided.

Regarding mental heath conditions, there were students who experienced unhappiness, insomnia or needed to use sleeping pills. There were also those who felt inferiority, easily angry or irritated as well as those who did not like working with friends. All these characteristics could cause stress in students. Most students indicated study as the source of their stress. The most used means to reduce stress were listening to music and singing. Many students also sought counsel from those close to them such as friends and parents. However, only 27.9% had confidence in their teachers even while the cause of their stress was study, about which teachers could provide good advice.

Certain factors had influence on the health promoting behavior of the students. Gender was related to differences in physical exercise habits and mental health condition. Male students exercised more than female students, whereas female students had better mental health than male students. Gender is a combination of physical and value differences.[10] Previous studies evaluating of health and self care in school-age children have found that male and female students have a different consciousness health and health practice with female students being more positive and more self – caving than boys.[11, 12] However, the correlation might be the contrary for other groups in the population.[13]

Age was associated with differences in dietary and physical exercise habits, but not with differences in mental health. The youngest students surveyed in this study were 14 years old and had more positive habits in both aspects than their seniors. Age is accepted as a basic indicator of differences in physical and intellectual development. Age is also

an indicator of maturity or an ability to manage the individual mental environment and perception. Age influences ability in self care.[10] In addition, the result might reflect greater compliance to parents' and teachers' advice among young students as compared to older students. However, the findings of Tinsley, B.J., et al. on how development, health, age and decision-making affect risk and preventive behavior of students found differently.[14] Tinsley's study, which was conducted on students in elementary and secondary schools, found that younger students ate more snacks than older students.

Different degrees of participation in heath-related activities at school affected dietary habits and mental health condition. Students who voluntarily participated in such activities had the highest level of behavior in all three aspects. The voluntary nature of participation may reflect their recognition of the usefulness of these activities as well as their interest in good health. Those who exercise often regard good health as a benefit while those who do not participate in such activities aim for short-term benefits. [15]

Concerning the persons with whom students live, living with both parents had an influence on dietary habits and mental health condition. Family atmosphere (ways in which children are cared for, taught, given resources and examples) was found to the affect self-caring behavior of elementary school children in Bangkok. Living with both parents enables attentive care of children's health and good behavioral examples to be set for them.[16] A family economic condition with sufficient income and savings also helped promote good dietary habits and mental health. The economic condition also influenced individuals' ability in self-care. Individuals in a good economic condition and with a high income are in a position to attain an adequate diet and health-related services as well as to acquire tools to promote their own health.[17] The findings were consistent with previous studies which found positive associations between income and health promoting behaviors.[13,17-20]

The different types of schools also affected dietary and physical exercise habits. This study found differences between public and private schools and between high schools and vocational schools. Public schools had more positive health promoting behaviors than private schools. Meanwhile, high schools had more positive heath-promoting behavior than vocational schools. Public high schools, private high schools, public vocational schools and private vocational schools also had differences, with public high schools having the best dietary and physical exercise habits. In addition, differences in levels of education also presented different effects on both these kinds of behavior. Grade 10 students showed better dietary and exercise habits than students of higher grades. Certain studies have examined levels of education showing that different levels of education had different effects on health behaviors of individuals. This is because education provides knowledge and information, including that concerning diseases and medical treatment plans. Individuals with high education are likely to have better health-related knowledge and practices than those with lower education.[21] More appropriate behaviors in diet, avoidance of addictive drugs and individual hygiene were found more among high-school graduates working in hospitals than among elementary school graduates working in factories or companies.[22] It seems that school environmental factors - teaching methods, courses, resources,

examples of teachers and friends, and health projects—might have influence on self-care behaviors, as suggested by a previous study in elementary school students.[16]

Conclusions

Students in high schools and vocational schools in Bangkok seemed to have favorable health promoting behaviors, despite certain concerns about their dietary and exercise habits, as well as about how they maintained their mental health. Special attention to promote health should be emphasized among certain groups of students. It would be advisable that school administrators pay greater attention to the dietary habits of older students and encourage more exercise among female students. The focus of health promoting campaigns might be more emphasized in private schools. To promote the health of students more effectively, teachers should be aware of students' family backgrounds They should persuade their students to recognize the importance of such health promoting activities as the schools organize so that students can see the usefulness of these activities and wish to participate willingly. In addition, teachers should create a better learning environment, conducive to a closer relationship between teachers and students. They could consider assigning fellow students to help those students with study-related problems so as to strengthen their mental health.

Acknowledgements

The authors would like to thank the Health Promotion Bureau and Health Education Division, Ministry of Pubic Health for information support. We are grateful to the Department of Education and Department of Vocational Education, Ministry of Education for their cooperative support in data collection. Appreciation is also given to teachers of all sampled schools in Bangkok for their cooperation and time to respond. Finally, we thank the Graduate School, Chulalongkorn University for funding the study.

References

1. Suwan P. Leksawadisuksa P. Health promotion and community actions for health. In: The 8th National Health Education Conference Proceeding. Chieng Mai: Department of Health Education Faculty of Public Health Mahidol University 1997.
2. Suwan P, Silapasuwan W, Keawkarnka B. Study of the situation of health promotion in Thailand and abroad. Bangkok: Faculty of Public Health, Mahidol University 1995.
3. Viputsiri O. Strategies for health promotion cross the century. In: Proceeding of Academic Seminar in Health Promotion: A New Step in Public Health. Department of Health, Ministry of Public Health. Nonthaburi. March 9-10, 1998: 12 - 23
4. World Health Organization. The World health report: life in the 21st century: a vision for all. Geneva: World Health Organization, 1998.
5. Public Health Development Planning Director Board. The public health development plan during the 8th National economic and social development plan (1997-2001). Bangkok: The Veteran Press. 1996.
6. Department of Academic Affairs, Ministry of Education. Ruam-Jai-Tan-ya-Sep-Tid. Bangkok:

Kansartsana Publisher. 1997.

7. Supanam A. Knowledge, attitude and behavior concerning blood donation of the youth in educational institutions in Bangkok. Master thesis in Master of Science Program. Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University. 1996.
8. Manohthai S. A study of dietary behaviors of secondary-school students in Bangkok. Master thesis in Master of Education Program. Faculty of Education, Chulalongkorn University. 1998.
9. Supanam A. Knowledge, attitude and behaviors concerning blood donation among youths from educational institutions in Bangkok. Master thesis in Community Medicine. Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University. 1996.
10. Orem D. Nursing: Concepts of Practice. 2nd ed. New York: McGraw Hill, 1980.
11. Praditsarn A. Value given to health and self care of students. Master thesis in Nursing. Faculty of Nursing, Mahidol University. 1992.
12. Kaewpumpuang R. Health behaviors among students in sports colleges. Master thesis in heatlh education. Srinakarin-tharavirote Prasarnmit University. 1992.
13. Hankittikul S. Factors influencing health promoting behaviors of the elderly in Lampang. Master thesis in health education. Faculty of Public Health, Mahidol University. 1996.
14. Tinsley BJ, Holtgrave DR, Reise SP, Erdley C, Cupp RG. Developmental status, gender, age, and self-reported decision-making influence on students' risky and preventive health behaviors. Health Educ Q 22; 1995 May; 22(2): 244 – 59
15. Pender, N.J. Health Promotion in Nursing Practice. 2nd ed. Norwalk: Connecticut, 1987.
16. Chintana-dilok N, Panchareonworakul K, Kumpalikit S, et al. Self-care behaviors among students in elementary schools owned by Bangkok Metropolitan Administration. J Pediatr Nurs Soc Thail 1987 May - Aug; 1(2): 45 – 50
17. Tantiwattanasathien K. Relationships between selective factors and health promoting behaviors among the elderly in the rural areas of the Northeast region. Master thesis in nursing administration. Faculty of Education, Chulalongkorn University. 1991.
18. Rattana-amornchia D. Relationships between personal factors, health perception, perception of health control and life style of the elderly in Ang-thong. Master thesis in public health nursing. Faculty of Public Health, Mahidol University. 1992.
19. Yaemchan W. 1995. Relationships between perceptions of self-competence, perception of health status, and health promoting behaviors of the elderly. Master thesis in adult nursing. Faculty of Nursing, Mahidol University. 1995.
20. Huntasarn S. Factors influencing health promoting behaviors among post-menopausal women in the rural area of Nonthaburi. Master thesis in health education. Faculty of Public Health, Mahidol University. 1996.
21. Suwan P. Attitude: Measurement of Changes in Health Behaviors. 2nd ed. Bangkok:

Peerapattana. 1983.

22. Liewwarin U. Implication of education on psychological characteristics and health behaviors of workers in Bangkok. Ph.D. dissertation in educational development. Srinakarin-tharavirote University. 1991.