

大学生の生活習慣に関する調査研究

— 日本、中国、スウェーデンの比較 —

A Study on College Students' Health-related Lifestyle

— A Comparison among Japanese, Chinese and Swedish students —

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【Abstract】 In this study a comparison of lifestyles among Swedish, Chinese and Japanese college students was conducted in order to reveal issues on health-related lifestyle in each country and common factors for improving lifestyle, and to promote future health by comparing the lifestyle of young people.

Included in the questionnaire survey were the respondents' lifestyle, health-promoting behaviour and self-reported symptoms. Chinese males and females displayed self-reported symptoms most frequently and the three countries differed to a great extent concerning depressed mood, tiredness, asthenopia and headaches. Swedish students' showed the most health promoting behaviour. Rest and recreation were recorded as the most frequent health promoting practices in China, in contrast to Sweden where exercise was most popular. A close relationship between health-promoting behaviour and an appropriate lifestyle was commonly recognized in all three countries.

The results of this study suggest the necessity of propagation of health education to young people to improve their awareness about health and make them understand the importance of a healthy lifestyle.

【Key words】 Healthy Lifestyle, Health practice, Health promoting behaviour,
International comparison, College students

INTRODUCTION

The quality of life has improved in Japan—that is, living standard has risen, and citizens can live a more satisfying private life, with economical security—through Westernization of the lifestyle since the end of the second world war.¹⁾ As a result, the average life expectancy of the Japanese was prolonged to 76.6 years for

males and 82.9 years for females, surpassing 74.8 years for males and 80.8 years for females in Sweden, and became the world's longest.²⁾ The figures for the Chinese are 71.4 years for males and 75.4 years for females.²⁾ However, the incidences of chronic degenerative diseases (adult diseases) have shown a remarkable increase, whereby malignant neoplasms, heart diseases, and cerebrovascular diseases are presently the

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three most frequent causes of death in Japan.¹⁾ Increases are observed also in diabetes mellitus and hypertension. In Sweden, also, ischemic heart diseases, malignant neoplasms, and cerebrovascular disorders have been primary causes of death.^{2, 3)} According to the newspaper "People's Daily",⁴⁾ chronic diseases have increased rapidly over the last 30 years also in China, and as they account for 40–50% of all deaths, the importance of improving the lifestyle has been publicized. In "industrialized" countries, the disease structure has been shifted from an infection-oriented pattern to an adult and senile disease-oriented pattern.

Complex interactions between the long-standing lifestyle and genetic factors are greatly involved in the pathogenesis of chronic diseases. Breslow et al. followed up randomly selected individuals to evaluate the relationships between the lifestyle and the physical health status, and furthermore, between health-related habits and the mortality rate.^{5, 6, 7)} As a result, they selected 7 health practices and reported that the physical health status was better, and the mortality rate lower, in individuals having more health practices. Morimoto⁸⁾ studied the relationship between individual lifestyle factors and chromosome aberrations, and observed that the frequency of chromosome aberration was higher in the poor lifestyle group than in the group that followed Breslow's seven health practices. In addition, they found that natural killer activity of lymphocytes was significantly lower in the poor lifestyle group than in the health concerned-group.

It is known that health-related lifestyles provide powerful and alternative explanations of social differences in chronic diseases.⁹⁾ This holds true for risk factors such as cigarette smoking, unhealthy diet, poor weight control, lack of physical exercise and heavy alcohol consumption which were all shown to be more prevalent in lower socio-economic groups.⁹⁾

Collective patterns of health-related behaviour that take shape as health-related lifestyles, and different lifestyles must be related to the social contexts in which they occur.

In health promotion, the focus is on the 'structure of lifestyle', that is complex forms of interaction such as individual behaviour, organizational behaviour, etc..¹⁰⁾ With regard to the structure of health lifestyles, interventions are oriented towards individuals, like the traditional health education programs, and those oriented toward social networks, e.g. family or community based programs, should be taken into account.¹⁰⁾

The incidence of chronic diseases are suggested to be reduced by early establishment of an appropriate lifestyle. Therefore, to study young people's lifestyle today, is one way to gain insight into future health promotion and find factors of importance involving health education.

In this study, we compared the lifestyle of young people in Japan, China, and Sweden. Different social and cultural backgrounds were represented throughout this comparative study.

There is a wide diversity when it comes to their socio-economical and cultural background between China—which is a communist country with strict social rules, Sweden—which has advanced medical and welfare systems, and where individual freedom is regarded as utterly important, and Japan—which is dominated by a strong group mentality.^{11, 12)} We revealed our own issues on health-related lifestyle in each country and common factors for improving lifestyle to promote future health by comparing the self-reported lifestyle of young people in the three countries.

METHOD

The lifestyle of young people was compared by a questionnaire survey. The same questions

were asked in the respective languages of the three countries. The questionnaire was translated as closely as possible among the three languages by evaluating the wording in consideration of the cultural background of each country by a Chinese postgraduate student, a Swedish associate professor, and the authors. Concerning the basic characteristics of the subjects, the questionnaire asked for their age, sex, height, body weight, past diseases, whether they had any symptoms or not, and what symptoms they had. The lifestyle of the subjects was evaluated, as follows, on the basis of Breslow's seven health practices,^{6, 13)} i.e., a desirable body weight, hours of sleep, having breakfast every day, no food between meals, physical activities, smoking and drinking habits. The desirable body weight was designated when the body mass index (BMI) was 20 or greater and less than 24, and when body weight changes during the past year were less than 5 kg. The lifestyle was considered to be appropriate, when the subject slept for 7 hours or longer and less than 9 hours, when they ate breakfast every morning, when they did not eat between meals, when they exercised 3 times or more per week, when they did not smoke, and when they drank alcohol not more than twice a week. The questionnaire asked whether the subjects maintained any health-promoting behaviour and what they were.

The survey was performed among physically, mentally and socially "healthy" Japanese, Chinese, and Swedish male and female college students in the first to third years of liberal arts courses in November to December, 1996. The questionnaire sheets were sent to China and Sweden, and were distributed and collected by the teaching staff at each college. In Japan, the questionnaire was distributed and collected by the authors. At each college, the questionnaire sheets were distributed 5–10 minutes before the end of a class, and answers were collected anonymously.

In order to improve the response rate, we decided to ask the teachers to conduct the questionnaire in their classes.

Statistical analyses were performed by Student *t*-test and chi-square test. Comparison among three countries was tested by a one-way ANOVA test or a Kruskal-Wallis test, and then multiple comparison was done between two countries at a time (Scheffe's method).

RESULTS

The number of students who answered the questionnaire was 123 in Japan, 188 in China, and 141 in Sweden, and the recovery rate were 100% in China and Sweden and 96% in Japan. The age of the subjects varied most widely in Sweden, i.e., 18–64 years. Therefore, those aged 18–30 years were selected for analysis (Table 1). There was no significant difference in the male-female ratio among the three countries, but the mean age of the subjects was significantly higher in Sweden (23.2 years) than in Japan (20.4 years) or China (20.1 years).

Figure 1 shows the number of health practices according to countries and sexes. All 7 items of health practices were observed in 0.8% of the Japanese, 6.7% of the Chinese, and 1.5% of the Swedes. The modal number for health practices was 4 in the Japanese but 5 in the Chinese and Swedes.

The lifestyle was designated to be good when the student had 5 or more health practices. The percentage of subjects with a good lifestyle was significantly lower ($p < 0.0001$) in the Japanese (28.9%) than in the Chinese (65.1%) or the Swedes (64.4%), as shown in table 2. No significant difference was observed between the Chinese and Swedes. Table 2 also shows the results concerning individual health practice. Significant differences in percentages were observed in hours of sleep, eating breakfast, not eating

between meals, physical activities, and non-smoking among the countries. The hours of sleep was between 7 or 9 in 38.8% of the Japanese males and 46.4% of the Japanese females, the percentages being lowest ($p < 0.001$) among the three countries. Most of the Japanese students had less than 7 hours of sleep. It was 70% or higher among Chinese and Swedish students. Breakfast was eaten nearly every day in 70~90% of all groups except the Japanese males, in whom the percentage

was 59.7% , and the differences in the males of the three countries were significant at $p < 0.001$. The percentage of those who rarely ate between meals was higher in males than in females. In females, 10.7% of the Japanese, 4.9% of the Chinese, and 4.9% of the Swedes answered that they rarely ate between meals, with no significant difference among the three countries. In males, 44.7% of the Chinese, 20.9% of the Japanese, and 11.9% of the Swedes answered that they rarely ate between meals, and significant differences were observed among the three countries. While 40.3% of the Japanese males and 27.3% of the Japanese females exercised regularly, the percentages were 83.3% and 59.4% respectively in the Chinese group, and 83.1% and 80.5%, respectively among the Swedes. The difference between males in the three countries was significant at $p < 0.001$. In males, 70~90% were non-smokers in all three countries. For females, the percentage of non-smokers was 100% in the Japanese and Chinese, but it was 70.7% in the Swedes, and the difference was significant at $p < 0.001$.

Table 1 . Charcterisics of subjects by countries.

Age	Japan		China		Sweden	
	Male	Female	Male	Female	Male	Female
18-19 years old	10	12	18	33	1	1
20-24 years old	57	43	67	70	43	58
25-29 years old	0	1	0	0	15	23
Total number	67	56	85	103	59	82
(persons)	123		188		141	
Age(mean±SD)	20.4±1.2		20.1±1.0		23.2±2.4*	

*Significant difference ($P < 0.001$) by one-way ANOVA (Scheffe method) as compared with other compared with other countries.

Table 3 shows the percentage of subjects with past history and self-reported symptoms. No significant difference was observed in the frequency of subjects with past history among the three countries either in males or females. Self-reported symptoms were present in 35.8%

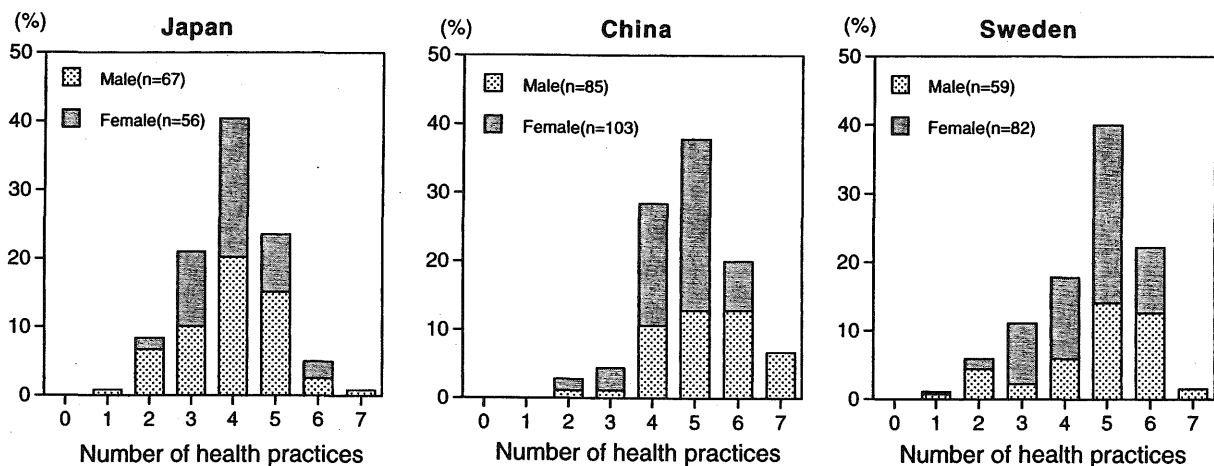


Figure 1 . Distribution of number for health practices by coutry and sex.

of males and 39.3% of females in Japan, 58.8% and 67.0%, respectively, in China, and 18.6% and 52.4%, respectively, in Sweden; the percentage was highest in the Chinese in both males and females. Among the Chinese students, the most frequent complaint was tiredness, followed by asthenopia, headaches, and depressed mood.

Table 4 shows the percentage of subjects who maintained health-promoting behaviour. Health promoting activities were practised by 40.0% of the Japanese, 73.6% of the Chinese, and 82.2% of the Swedes. Significant differences at $p < 0.001$ were observed among the three countries in both males and females. Concerning individual behaviour, significant differences were observed in physical activities or sports, healthy meals, rest, recreation, no smoking, and others among the three countries. The percentage of subjects who chose rest and recreation was highest among the Chinese, followed in order by the Swedes and Japanese. The percentages of subjects who exercised, and had stopped smoking, was the highest among the Swedes, followed in order by the Chinese and the Japanese. Healthy meals were mentioned most frequently by the Chinese, followed by the Swedes and Japanese in this order.

DISCUSSION

In this study, we surveyed college students on Breslow's seven health practices, self-reported symptoms, perceived health, and health promoting behaviour. The results were evaluated, and their relationship were examined in three countries. The subjects were college students majoring in liberal arts, so that they did not necessarily represent college students of their respective countries at large. However, we thought that students from the liberal arts course live a more common lifestyle without health knowledge than those from medical and nursing courses.

In China, various traditions have gradually been altered since the founding of the People's Republic in 1949, and the adoption of many contemporary western health care approaches proceeded swiftly with the passing of the cultural revolution in the mid 1970's.¹⁴⁾ Different from developed western countries that are highly individual centered, contemporary China is a collectivism-oriented society with greatly reduced privacy, emotional dependence on organizations and institutions, and a belief in the superiority of group over individual decisions. The Chinese students enrolled in this study all lived in dormitories. Most of them are financially supported

Table 2. Percentage (%) of subjects with individual health practices.

Health practices		Country			Sig. *
		Japan	China	Sweden	
Persons who have five or more health practices	Male	32.8	71.6	67.9	***
	Female	25.0	58.6	60.8	***
	Average	28.9	65.1	64.4	***
Desirable body weight	Male	52.2	46.3	45.6	
	Female	34.0	28.4	35.4	
Hours of sleep Should be between 7 or 9	Male	38.8	77.6	72.4	***
	Female	46.4	87.4	79.3	***
Eating breakfast almost everyday	Male	59.7	85.9	74.6	***
	Female	83.9	82.4	85.4	
Rarely eat between meals	Male	20.9	44.7	11.9	***
	Female	10.7	4.9	4.9	
Physical activity 3 times or more per week	Male	40.3	83.3	83.1	***
	Female	27.3	59.4	80.5	***
Never smoked or not smoking now	Male	85.1	77.6	89.8	
	Female	100.0	100.0	70.7	***
Not drinking everyday	Male	97.0	98.8	98.3	
	Female	98.2	100.0	97.6	

: Singificant difference among the countries by sex.

* : $p < 0.05$, ** : $p < 0.01$, *** : $p < 0.001$, by Kruskal-Wallis test.

by their parents, and a part of them, who have achieved excellently, can live on scholastic grants.

The Chinese students had the greatest number of health practices, but most frequently had self-reported symptoms among students of the three countries. Concerning self-reported symptoms, tiredness, asthenopia, and depressed mood were reported frequently, suggesting mental stress. Among health-promoting behaviour, rest and recreation were frequent. The Chinese students enrolled in this study all lived in dormitories. Therefore, they may have been obligated to maintain a good lifestyle partly because of the restrictions and codes of group living. Also, the high percentage of those having self-reported symptoms may be explained by psychological instability and stress caused by a lot of expectations by the nation and the society, and severe competition and friction among students, because they are estimated every year to win a scholarship. Among the Chinese students, also, those with self-reported symptoms tended to keep health-promoting behaviour, suggesting that such practices were made as a means of self-protection. Liu et al.¹⁵⁾ reported that in China, association between instrumental support received and health status is due to existence of the reversed causality: it is poorer health status that has caused more instrumental support received, inconsistent with the pattern observed in the developed western world. In this study, the reversed causality was also observed when Chinese students conducted more health-promoting behaviour, maybe to reduce their symptoms due to a stressful life. It is reported that stress from social life and the lifestyle affect each other.¹⁶⁾ Therefore, it is unknown how many health practices Chinese students can retain as habits in their individual lives, after graduation. To become a real lifestyle, habituation, the tendency for health behaviour to become habitual, must

be considered on three factors: persistence, repetition and self-maintenance.¹⁰⁾ A more detailed survey, especially on self-maintenance, could give further knowledge.

Table 3. Percentage (%) of subjects with past history and symptoms

	Sex	Japan	China	Sweden	Sig#
Have some past history of severe disease	Male	18.2	10.7	8.5	
	Female	3.6	8.7	3.7	
Have some subjective symptoms	Male	35.8	58.8	18.6	***
	Female	39.3	67.0	52.4	*
Sleepless	Male	7.5	11.8	3.4	
	Female	1.8	8.7	11.0	
Tiredness	Male	14.9	28.2	5.1	**
	Female	10.7	35.9	18.3	***
Headache	Male	13.0	31.6	12.8	
	Female	0.0	15.5	12.2	***
Neck stiffness	Male	9.0	4.7	0.0	
	Female	14.6	7.7	8.5	
Asthenopia	Male	13.4	23.5	6.8	*
	Female	8.9	25.2	7.3	**
Loss of appetite	Male	0.0	3.5	0.0	
	Female	3.6	4.9	4.9	
Diarrhea or constipation	Male	4.5	1.2	3.4	
	Female	7.1	2.9	9.8	
Palpitation	Male	1.5	3.5	0.0	
	Female	0.0	2.9	4.9	
Depressed mood	Male	6.0	18.8	5.1	**
	Female	10.7	22.3	6.1	**
Heavy hearted	Male	4.5	12.9	8.5	
	Female	7.1	16.5	7.3	

: Significant difference among the three countries by sex.

* : $p < 0.05$, ** : $p < 0.01$, *** : $p < 0.001$, by Kruskal-Wallis test.

Table 4 . Percentage (%) of subjects with health-promoting behaviors

	Sex	Japan	China	Sweden	Sig#
Have some health promoting behaviors	Male	38.8	81.2	81.4	***
	Female	41.1	66.0	82.9	***
	Average	40.0	73.6	82.2	***
Physical activity	Male	20.9	69.4	64.4	***
	Female	8.9	42.7	67.1	***
Healthy meal and balanced nutrition	Male	17.9	54.1	16.9	***
	Female	17.9	38.8	24.4	
Rest	Male	10.4	56.5	18.6	***
	Female	3.6	40.8	26.8	***
Measurement of blood pressure	Male	0.0	4.7	1.7	
	Female	0.0	1.0	0.0	
Recreation	Male	9.0	37.6	10.2	***
	Female	0.0	23.3	22.0	***
Measurement of body weight	Male	6.0	9.4	10.2	
	Female	12.2	11.2	9.9	
Has stopped smoking	Male	4.5	8.2	13.6	
	Female	0.0	0.0	7.3	**
Has stopped drinking alcohol	Male	3.0	4.7	3.4	
	Female	1.8	0.0	1.2	
Others	Male	1.5	3.5	18.6	***
	Female	8.9	4.9	9.8	

: Significant difference among the three countries by sex.
 * : $p < 0.05$, ** : $p < 0.01$, *** : $p < 0.001$, by Kruskal-Wallis test.

In Sweden, priority is put on individual gains and ethics are very important. As an expression of their independence from socio-economic and cultural circumstances, university students like other youngsters have for a long time preferred to live by themselves in apartments separated from their parents. Furthermore, establishment of self-consciousness for the individual is essential. Also, the spirit of self-reliance has

been fostered from childhood, and the Swedish youths begin to live independently from their parents in their own homes at the age of 17–18.¹⁷⁾ Therefore, they live in dormitories or apartment houses. Colleges charge no tuition, but students are obligated to pay a membership fee to the students' union.¹⁸⁾ They are not financially supported by their parents, and they live on scholastic grants, which must be refunded after graduation. The spirit of self-reliance permeates all members of the society whether young or old, male or female, and the medical and welfare policies are conducted on the bases of this spirit of self-reliance. During the 1930's the government launched a welfare system that provides all Swedish citizens with social and health security, which meant that all health care and education are free of charge, and therefore available to everybody, regardless of profession and social status.^{19, 20)} Generally speaking, European efforts are often directed toward structural changes.²¹⁾

Among the Swedish students, the health practices were as satisfactory as in the Chinese students, and the frequency of subjective symptoms was low. Eating between meals and smoking were the worst among the lifestyle items evaluated, especially in females. In Sweden, 2–3 coffee breaks in addition to 3 meals are part of the social custom, and they provide opportunities to relax both at home and in the office. According to the report by Naslund and Fredrikson,²²⁾ the dietary habits are better among females than among males, and they consume more fruit and dietary fiber. Concerning obesity, a significantly higher percentage of higher than desirable BMI was observed compared with Chinese and Japanese (data not shown). It is necessary to conduct a study on total calories including all meals and snacks. Concerning smoking, an antismoking campaign has been carried on, and 16 item warnings against smoking have been publicized,²³⁾

but smoking has recently spread among females. The increase in smoking among women is considered to be an important issue for health promotion in the Western society.^{24, 25)}

Moreover, the Swedish students were those who preferred exercise to the greatest extent among health-promoting behaviour. Lack of exercise is considered to be a risk factor in chronic diseases such as ischemic heart disease, hypertension, cerebrovascular disorders, obesity, and diabetes mellitus.²⁶⁾ Morimoto⁸⁾ reported that the natural killer activity was affected most notable by the exercise habit among various factors in the lifestyle. In Sweden, the awareness of the necessity for correction of exercise habits grew in the 1960's due to rapid increases in adult diseases, aging of the population, and a decline in the physical performance. For this reason, policies to promote health consisting primarily of campaigns to improve the diet and encourage sports activities have been taken.²⁷⁾ In Europe, sports are regarded today as an important pastime as well as a means to promote health, and health education has taken root in people's lives. This may explain the good results in the Swedish students.

In Japan, the priority is common ethics, where perfection of self is not so important. A strong western influence, both physically and spiritually, could be detected in the up-building of the post-war Japanese society, which has been developed further in modern days. Perseverance and dependence have been pointed out as cultural traits of Japan,¹¹⁾ and the attitude of self-reliance has not been established as much as in Sweden. Since education is of such tremendous importance for the professional life, an enormous emphasis is laid on gaining entrance to prestigious universities. Japanese college students are supported financially by their parents, therefore, they have no economic problems.

The number of health practices in Japan

was the lowest among the three countries. Iijima et al.²⁸⁾ also observed that the modal number of health practices was four in female college students, similar to our results. The percentage of subjects who felt that they were very healthy was also the lowest among the three countries. According to the investigation by Morimoto²⁹⁾ studying and hobbies were primary interests in males and females aged 20-29 years, and they didn't take much interests in their health. The hours of sleep was the shortest, and the frequency of exercise was the lowest. The diurnal rhythm of the Japanese today has shifted to a night-time pattern due to increase in facilities and means of transportation available at night as well as night-time TV programs,³⁰⁾ and the sleeping time is considered to have been shortened as a result. Also, during their junior and senior high school days they had to spend a lot of time on their entrance examinations for colleges and universities. Although sports were implemented as a means to increase the physical strength in Japan,²⁷⁾ sports are understood by many Japanese as a competitive activity, or a transient phenomenon stirred up by the fitness boom. The relatively low interest in exercise among the Japanese students may be the result of such a social situation. Health education to enhance the interest of young people in aerobic exercise is needed³¹⁾ also in Japan. The value of health was recognized by many subjects only when it was lost, and their consciousness about health appeared to be low. Katsura et al.,³²⁾ who studied the relationship between the life-style and mental health, observed that the awareness about disease prevention was weak in young subjects and that their understanding about the importance of a healthy lifestyle was poor. This study indicated that Japanese college students have fewer health practices and take fewer health-promoting actions. Therefore, this generation may suffer from a higher incidence of chronic

diseases, reduced physical fitness and return to a lower life expectancy in the future. The lifestyle is clearly closely related to customs and trends of individuals, families, communities, and the society. Especially, in Japan, the health boom is likely to be affected by commercial motives. Individuals must reconsider their concepts of health, and develop the attitude to protect their own health.

Concerning the concept of health Japanese and Chinese are in harmony with a psychosomatic view of relationship between the mental faculties, the spirit and the nature. It derives implicitly as well as explicitly from China. Concept or expression of perceived health may differ between the eastern countries and the western world. There were some reports^{33, 34)} that individuals with better health-related habits have less complaints, although there was no association between health practices and self-reported symptoms in any of the three countries in the present study.

This study showed that in all three countries, individuals who had better lifestyle were maintaining a more health-promoting behaviour. Näslund²²⁾ observed that health education is important to develop better health practices, and modifications of awareness and behaviour in individuals are of primary importance for this purpose. Therefore, we considered education of the importance of appropriate health practices to be needed. In Japan, various health education programs are provided as measures to prevent chronic diseases, by the Ministry of Health and Welfare and the Ministry of Labour. Together with these programs, political actions to improve the awareness about health in young people and, accordingly, to propagate relevant knowledge are considered to be needed. To establish appropriate health practices early in one's life, together with these programs, active public information about health education from authorities, as well as promotion of activity

health education through sympathetic family members is important. Japanese always think about common ethics, that is, harmony within the group, therefore everybody ought to try to establish their own identity. We must take care of our own health.

In order to summarize, we would like to make the following statement: political actions to improve the awareness of a healthy lifestyle among young people, and accordingly, to propagate relevant knowledge is essential. Furthermore, to establish appropriate health practices early in one's life is very important.

We surveyed college students in three countries concerning their health related lifestyle, but since the number of subjects was rather small, it is merely indicating a certain tendency in those countries. A more thoroughly conducted survey is necessary in the future. Further exchange of information, ideas, and new methods is absolutely essential in order to promote a healthy lifestyle.

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