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Happiness, perceived stress, psychological well-being, and health behaviors of Thai university students: preliminary results from a multinational study on well-being

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ABSTRACT

Objective: Describe and compare levels of happiness, psychological well-being, perceived stress, and health behaviors of university students.
Participants: Thai university students were selected (N = 478) during November 2016 using random cluster sampling.
Methods: A health and well-being questionnaire was constructed, translated from English to Thai, back-translated, and pilot tested. Descriptive and chi-square statistics were calculated for study variables.
Results: Thai male students had lower happiness and psychological well-being than Thai female students. Overall, Thai students had lower happiness and higher perceived stress than US/UK samples. Thai male students reported greater alcohol and tobacco use than Thai female students. Overall, Thai students reported inadequate diet (57%), poor sleep quantity/quality (67%) and depressive symptoms (40%).
Conclusions: These preliminary results identify specific areas of concern in the health and well-being of Thai university students. Further analyses are needed to shed light on the factors contributing to these increased health risks.

Worldwide, university students face significant emotional, mental, physical, and social challenges during their school years.[1,2] A student's ability to deal effectively with such challenges can influence whether a student will have positive or negative experiences as a result. Understanding the factors involved in these various challenges can help to steer students toward positive and constructive life experiences. Previous research on students from eastern and western countries has identified health factors that positively or negatively influence academic success, and mental and physical health outcomes.[3–6]

Some of the key positive and negative factors identified include alcohol, tobacco, and drug, exercise, well-being, stress management, and sleep behaviors. However, Naci and Ioannidis[7] point out that the majority of this research continues to focus on dysfunction and disease outcomes rather than health and well-being even though people are interested predominately in health and well-being. With the multiple health issues related to student populations, it is not difficult to see why attention is primarily placed on the determinants and correlates of biological and mental diseases. Nevertheless, placing excessive focus solely on the negative outcomes of

health behaviors will limit our understanding of optimal human experiences, functioning, and health.[8,9]

To better understand human experiences, functioning, and health, both western and eastern countries must include aspects of optimal health into research studies. Both sides of the health continuum (positive health factors, e.g., psychological and subjective well-being and negative health risk factors, e.g., stress, substance use, improper diet, sedentary behavior, sleep deprivation, and depression) should be included in research to provide a balanced research approach.

In regards to the negative spectrum of the health continuum, research from primarily western countries has identified stress as a critical factor in student health. Multiple studies have described the effects of stress on mental, physical, and emotional health in students.[10–12] Moreover, there are still unanswered questions to be addressed. One such area relates to questions about differences between students from eastern and western countries in the perception of stress, e.g., do male and female students from different countries/cultures interpret stressful events the same or differently? These and other related questions need to be

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The tables do not present any data for the analysis between Thai, US, and International samples. Sample means, N, and SD for US, International, and Thai samples were collected from other sources and used to calculate a two sample mean comparison test for each of the comparisons noted in the text.
This article has been republished with minor changes. These changes do not impact the academic content of the article.

clarified. Thus, further research can help answer and delineate possible stress perception gender differences that may exist from one country/culture to another.

Furthermore, research from western and to a lesser extent eastern countries have identified additional behaviors that have a significant impact on overall health and well-being across cultures. For example, risky (negative) behaviors pose health risks while healthy (positive) behaviors provide a protective role. Specifically, risky health behaviors, such as substance use,[13–17] unhealthy diet,[18,19] physical inactivity,[20] sleep deprivation,[10,21–24] and depression[1,25] have all been linked to increased morbidity and mortality across cultures. It is generally accepted that monitoring the effects of stress and risky health behaviors in students is crucial, yet it is not sufficient to provide a comprehensive picture of optimal health.

To provide a comprehensive picture of optimal health, the inclusion of well-being constructs must be incorporated into health research. Doing so will promote a greater balance in research focus and elucidate a broader range of knowledge concerning health and well-being. Ryan and Deci[8] have defined well-being as a complex construct concerned with understanding human experience and functioning. Although the area of well-being research is broad in scope, current well-being theories typically fall into one of two perspectives (eudaimonic or hedonic). The eudaimonic perspective centers on finding meaning in life and realizing one's potential. Eudaimonism involves the realization of one's true nature and developing self-actualization.[26] The hedonic perspective focuses on maximizing happiness and minimizing pain, i.e., choosing activities in life which are pleasurable and provide a sense of satisfaction.

Moreover, hedonism also identifies negative life experiences to be avoided, i.e., avoid decisions and actions that increase physical or mental pain or unpleasant outcomes. This perspective highlights the role of personal choices in life, and how those choices can influence life in either a positive or negative manner.[18] Current research in the eudaimonic and hedonic perspectives have operationalized these constructs as psychological well-being (PWB),[26] and subjective well-being (SWB),[11,27] respectively. Thus, including PWB and SWB constructs into health research could prove useful for developing a broader perspective and understanding of the health continuum of student health.[28]

Today, more is known about the health status of students from western countries than students from eastern countries. Research on student health and well-being has included mostly American and European populations. Knowledge of the associations between the health and well-being of Asian students is lacking.[29] Conducting more research that incorporates both the negative and positive spectrums of the health continuum will help to bridge the knowledge gap in health behaviors and well-being of Asian student populations. Thus, the primary objective of this study was to compare levels of and provide normative data for male and female Thai university students in (1) Psychological Well-being (PWB); (2) Subjective Well-being (SWB); (3) Perceived Stress (PS); and (4) Health Behaviors.

Methods

Research design

This research is part of a larger multinational research study on the health and well-being of Asian university students — included are the preliminary results for the data collected in Thailand. Additional analyses and papers will follow this initial paper.

For this study, a cross-sectional design was used to compare levels and provide normative data for PWB, SWB, PS, and risky health behaviors—diet, mental health, physical activity, sleep behavior, and substance use by gender.

Participants

This study included participants enrolled in a public university in northern Thailand. In 2016, the university was ranked as one of the top 25 universities of Thailand. Approximately 1,550 undergraduate students, representing different majors, were enrolled in 66 core courses (i.e., required courses all undergraduate students must complete before graduation) during the fall semester of 2016.

Twelve courses (class clusters) were randomly selected from the list of the 66 core courses, this randomized cluster sampling method provided a representative sample of students. Researchers met students in the selected courses, with the permission of the instructors, and described the study aims and invited the students to participate in the study. A total of 478 undergraduate students, representing different majors, ages, and class levels agreed to participate and completed the questionnaire.

Components of the questionnaire

The questionnaire was reviewed for cultural relevance and applicability to Asian students by researchers from the USA, Vietnam, and Thailand. The individual components are listed below.

Psychological Well-being (PWB) was measured with the 54-item Ryff Scales of Psychological Well-being (RSPWB). These scales are theoretically grounded and empirically validated.[30] The RSPWB, contains six subscales representing six dimensions of PWB: (1) Autonomy (self-determination and independence), (2) Environmental Mastery (a sense of mastery and competence in managing one's environment), (3) Personal Growth (a feeling of continued development), (4) Purpose in Life (having goals in life and a sense of direction), (5) Positive Relations with Others (having warm, satisfying, trusting relationships with others), and (6) Self-acceptance (possessing a positive attitude towards the self). Each subscale contains nine questions. Students responded using a six-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Responses to negatively scored items (-) were reversed in the final scoring procedures so that high scores indicated high self-ratings on the dimension assessed — previous reports of internal consistency range from .86 to .93.[31] Missing data in the scale scores ranged from 0% to 8%.

Subjective Well-being (SWB) was measured with the 4-item Subjective Happiness Scale (SHS).[32] The SHS is a validated 4-item scale of global subjective happiness a measure of subjective well-being. Test-retest and self-peer correlations have shown good to excellent reliability, and construct validation studies of convergent and discriminant validity have confirmed the use of this scale.

Perceived Stress (PS) was measured with the Perceived Stress Scale (PSS).[33] A 10-item Thai version of the PSS[34] was available, however, for this study, a 4-item version was used due to time and length of survey considerations. This scale has been widely used and measures the degree to which life situations are appraised as stressful. Questions on the scale are general thus are not content specific to any sub-population group.

Health Behaviors were measured with a 15-item health behavior questionnaire developed by the lead author of this study. The questionnaire entailed five components: (1) substance use (smoking and alcohol consumption) (7-items); (2) diet (amount of vegetables consumed daily and mindfulness when eating (2-items); (3) weekday and weekend sleep behavior (time to bed, hours of sleep, and quality of sleep) (5-items); (4) Physical activity (Body Mass Index (BMI) as a proxy) (1-items); and (5) mental health (feeling down and blue and losing interest in previously pleasurable activities) (2-items). These items are well-established, low burden, and standardized measures.[35]

Personal background information was collected. The students were asked to provide the following information: Age, height, weight, (BMI-calculated from height and weight) gender, residence status, working status, major, year in school, relationship status, and marital status.

Translation of questionnaire

Professional translators translated the English questionnaire into Thai. A back translation (Thai to English) confirmed sufficient accuracy and consistency of the English questionnaire.

The pilot of the questionnaire

A group of Thai students (N = 30) were selected to pilot the questionnaire. Alpha coefficients for the six subscales of the RSPWB, SHS, and PSS ranged from 0.200 (autonomy–subscale) to 0.764 (purpose in life–subscale). Test-retest coefficients ranged from 0.270 (PSS) to 0.829 (environmental mastery–subscale).

Data collection

During November 2016 data were collected through self-administered paper questionnaires. The survey took approximately 20-25 minutes to complete. The study variables were RSPWB, SHS, PSS, health behaviors (diet, mental health, physical activity, sleep behavior, and substance use) and background information.

Data analyses

Univariate data analyses were performed to describe and compare the participants' characteristics and study variables. Calculated variables included means, standard deviations, 95% confidence intervals, skewness, kurtosis, and percentiles. SPSS descriptive and Chi-Square statistics were used to analyze data.

Ethical considerations

Approval to conduct the study was granted by the University Research Committee. The first section of the questionnaire included informed consent.

Results

The demographic characteristics of study participants were as follows: (1) Most students were between 17 and 19 years of age (66.5%, n = 318); (2) were in the freshman class (57.9%, n = 276); (3) lived in student dormitories (69.5%, n = 331); (4) were female (71.2%, n = 338); (5) were single (92.2%, n = 439); (6) had a boyfriend/girlfriend (37.9%, n = 181); (7) were not working or looking for work 81%, (n = 385); and (8) represented 31 different majors, with Management having the largest number (21.7%, n = 98).

Presented in Table 1 are comparisons of RSPWB, SHS, and PSS levels by gender. Descriptive statistics included: N, Mean, SD, 95% CI, Skewness, Kurtosis, and P-values for Mean comparisons between male and female scores.

For RSPWB, females had a significantly higher mean sum score (M = 219.50, SD = 21.96 vs. M = 214.78, SD = 21.21, p = 0.042) and significantly higher mean scores in all subscales compared to males, except in autonomy and self-acceptance subscales. Skewness and Kurtosis coefficients for all subscales were < 2, which are within acceptable ranges. In general, females had higher RSPWB percentile scores, across the range of percentiles from the 5th percentile to 95th percentile for sum score and subscales.

For SHS, females had a significantly higher mean score compared to males (M = 4.72, SD = .90 vs. M = 4.51, SD = .89, p = 0.019). Skewness coefficient for females was highly negatively skewed (-34.0), and Kurtosis coefficients for males and females were < 1. Percentile scores were approximately the same for both genders.

For PSS, the total mean score was M = 7.47, SD = 2.04, with Skewness (-0.26) and Kurtosis (0.67), indicating a normal distribution, and a percentile range of 4 (5th percentile) to 10 (95th percentile). Compared to males, females had a lower mean PSS score (M = 7.41 vs. M = 7.59), but the difference was not statistically significant. Skewness and Kurtosis coefficients were < 1.

Table 2 shows the cross tabulations and the chi-square statistics for the health behavior variables with significant gender differences in alcohol consumption, physical activity (using BMI as a proxy variable), sleep behavior, and tobacco use. Results for variables with no significant gender

Table 1. Descriptive statistics and comparisons of Ryff Scales of psychological well-being, subjective happiness scale, and perceived stress scale scores by gender.

	N	Mean	SD	95% CI	Skewness	Kurtosis
Ryff Scales Psychological Well-being (RSPWB) Sum Score						
Total	439	218.19	21.83	216.2–220.2	0.28	0.08
Male	123	214.78	21.21	211.0–218.6	0.23	−0.37
Female	313	219.50	21.96	217.1–221.9	0.30	0.23
P Value		**0.042**				
Autonomy (subscale)						
Total	466	32.85	4.54	32.4–33.3	0.51	1.36
Male	133	33.17	4.39	32.4–33.9	0.61	1.80
Female	330	32.69	4.59	32.2–33.2	0.51	1.29
P Value		0.309				
Environmental Mastery (subscale)						
Total	474	36.71	4.97	36.3–37.2	−0.18	0.25
Male	134	35.73	4.98	34.9–36.6	−0.09	−0.60
Female	337	37.12	4.90	36.6–37.6	−0.20	0.69
P Value		**0.006**				
Personal Growth (subscale)						
Total	474	37.41	4.75	37.0–37.8	0.06	−0.02
Male	135	36.51	4.46	35.8–37.3	0.35	0.97
Female	336	37.77	4.83	37.3–38.3	−0.07	−0.21
P Value		**0.009**				
Purpose in Life (subscale)						
Total	470	37.98	5.78	37.5–38.5	0.11	−0.35
Male	133	36.94	6.25	35.9–38.0	0.30	−0.39
Female	334	38.37	5.55	37.8–39.0	0.08	−0.28
P Value		**0.016**				
Positive Relations with Others (subscale)						
Total	472	37.93	6.20	37.4–38.5	−0.27	−0.16
Male	135	36.35	6.14	35.3–37.4	−0.20	−0.42
Female	334	38.59	6.08	37.9–39.3	−0.29	−0.04
P Value		**0.001**				
Self Acceptance (subscale)						
Total	465	35.1	4.90	34.7–35.6	0.13	0.44
Male	130	34.97	4.75	34.1–35.8	0.14	0.11
Female	332	35.14	4.95	34.6–35.7	0.13	0.60
P Value		0.743				
Subjective Happiness Scale (SHS)						
Total	477	4.66	0.90	4.6–4.7	−0.09	0.36
Male	136	4.51	0.89	4.4–4.7	−0.20	0.87
Female	388	4.72	0.90	4.6–4.8	−34.00	0.17
P Value		**0.019**				
Perceived Stress Scale (PSS)						
Total	478	7.47	2.04	7.3–7.7	−0.26	0.67
Male	137	7.59	1.86	7.3–7.9	0.02	0.94
Female	338	7.41	2.11	7.2–7.6	−0.32	0.55
P Value		0.392				

differences are combined. However, Table 2 does not include this data.

For alcohol consumption variables, 84.2% (n = 403) of students reported that they had ever had an alcoholic drink, and 45.6% (n = 212) of students reported that they began drinking alcohol before the age of 18. There were significant differences between males and females who drank alcohol on five or more days during the past 30 days (39.2%, n = 40, vs. 18.9%, n = 43, p = 0.001) and in drinking five or more drinks on drinking days (22.9%, n = 31, vs. 13.7%, n = 45, p = 0.004).

The number of students who ate fewer than 4 to 5 vegetable servings per day (considered the minimum daily requirement) was approximately (47.5%, n = 227). When eating, 68.1% (n = 323) of the students said they spent 60% or less of their time eating mindfully, i.e., paying attention to their meal and feelings of satiety.

For mental health, 37.8% (n = 179) of students reported having felt sad, blue, or depressed for two weeks or more in a row in the past. Additionally, 41.1% (n = 195) of students reported having lost interest, in the past, for more than two weeks in a row in hobbies, work, or activities that usually gave them pleasure.

Concerning physical activity status, the proxy measure of Asian Body Mass Index (BMI) categories was used to approximate levels of physical activity.[36] Significant gender differences showed a higher percentage of females in the underweight category and a higher percentage of males in the increased and high-risk categories (p = 0.013). Overall, 47.6% (n = 221) of the students fell into either the underweight, increased risk (overweight), or high risk (obese) categories.

Regarding sleep behavior, only one of the five sleep variables showed significant gender differences, i.e., time to bed on weekends. A higher percent of females (68%, n = 230 vs. 54.1%, n = 74,) went to bed on weekends at the earlier time categories (before 1 AM), and a higher percent of males (45.9%, n = 62 vs. 31.3%. n = 104, p = 0.05) in the later time categories (after 1 AM). During weekdays, 53.3% (n = 249) of students reported going to bed after midnight.

Table 2. Cross Tabulations and Chi Square Statistics of Alcohol Consumption, Physical Activity, Sleep Behavior, and Tobacco Use by Gender (n = 478)

	Alcohol Consumption				
Question	During the past 30 days, on how many days did you drink one or more drinks of an alcoholic beverage?				
	0-1 days	2-4 days	5-7 days	8-10 days	>10 days
Male (n = 102)	25.5%	35.3%	11.8%	12.7%	14.7%
Female (n = 227)	49.3%	31.7%	7.5%	4.4%	7.0%
Total (n = 329)	41.9%	32.8%	8.8%	7.0%	9.4%
Chi Square	Value	df	P-value		
	22.66	4	0.001		
Question	On days you had drinks, how many drinks did you usually have each day?				
	0-1 drks	2-4 drks	5-7 drks	>7 drks	Never
Male (n = 135)	22.2%	28.9%	8.1%	14.8%	25.9%
Female (n = 329)	32.5%	20.7%	7.3%	6.4%	33.1%
Total (n = 464)	29.5%	23.1%	7.5%	8.8%	31.0%
Chi Square	Value	df	P-value		
	15.64	4	0.004		

	Physical Activity			
Question	Body Mass Index (BMI) Category (as proxy)			
	Under-weight (BMI < 18.5)	Acceptable Risk (BMI 18.5-22.9)	Increased Risk (BMI 23-27.5)	High Risk (BMI >27.5)
Male (n = 134)	14.9%	53.7%	20.1%	11.2%
Female (n = 332)	27.4%	51.8%	13.0%	7.8%
Total (n = 466)	23.8%	52.4%	15.0%	8.8%
Chi Square	Value	df	P-value	
	10.83	3	0.013	

	Sleep Behavior					
Question	Time to bed on weekends.					
	Before 22:00	22:00 - 23:00	23:00 - 24:00	24:00-1:00	1:00:2:00	After 2:00
Male (n = 137)	2.2%	9.5%	16.1%	26.3%	27.7%	18.2%
Female (n = 335)	2.4%	11.6%	24.8%	29.9%	21.2%	10.1%
Total (n = 472)	2.3%	11.0%	22.2%	28.8%	23.1%	12.5%
Chi Square	Value	df	P-value			
	11.08	5	0.05			

	Tobacco Use					
Question	Do you now smoke cigarettes every day, some days, or not at all?					
	Everyday		Somedays		Not at all	
Male (n = 133)	12.8%		9.0%		78.2%	
Female (n = 337)	0.0%		3.0%		97.0%	
Total (n = 470)	3.6%		4.7%		91.7%	
Chi Square	Value	df	P-value			
	54.24	2	0.001			
Question	How old were you the first time you smoked part or all of a cigarette?					
	<10 yrs. old	10-14 yrs. old	15-17 yrs. old	18-20 yrs. old	>20 yrs. old	Never
Male (n = 136)	1.5%	3.7%	14.7%	9.6%	1.5%	69.1%
Female (n = 335)	0.3%	0.6%	3.0%	3.0%	0.6%	92.5%
Total (n = 471)	0.6%	1.5%	6.4%	4.9%	0.8%	85.8%
Chi Square	Value	df	P-value			
	44.74	5	0.001			

Approximately 31.0% (n = 146) and 61.6% (n = 290) of students reported sleeping 6 hrs. or less per night on weekends and weekdays, respectively. When students were asked to rate on a 7 point Likert scale (1, not at all) to (7, a great deal) how refreshed and energized they felt upon waking in the morning 74.4% (n = 351) rated themselves to be a 4 or less, i.e., the distribution was skewed toward not feeling refreshed and energized upon waking.

Tobacco use variables had significant gender differences, with a higher percent of males smoking "everyday" and "somedays" than females (21.8%, n = 29 vs. 3%, n = 10, p = 0.001). Moreover, males had a higher percentage at each age category of the first time they smoked part or all of a cigarette compared to females (p = 0.001).

Comment

First of all, the results from this study provided baseline levels of PWB for Thai university students by describing, comparing, and producing normative data by gender. Consistent with previous research results,[30,37] this study showed significant PWB gender differences. Female students scored higher on the subscales of environmental mastery, personal growth, purpose in life, and positive relations with others, indicating a distinct strength in four of the six dimensions of PWB compared to their Thai counterparts. Additionally, the subscales with the highest scores on the RSPWB (i.e., rankings of strongest subscales) for Thai female and male students, were similar to the subscales with the highest rankings reported in the original RSPWB study for young adult women and men.[30] The present findings are significant because they confirm that gender differences in PWB persist across cultures and show support for the use of the RSPWB in Thai populations. Moreover, these data also demonstrated the PWB strengths of Thai students, which serves as a basis for asking additional questions about the significant factors that may positively or negatively influence well-being and health outcomes in Thai students.

Secondly, regarding gender happiness levels, Thai female students had significantly higher happiness scores than their Thai male counterparts. This difference could be due to multiple factors. A study by Tuntiwarodom[38] identified a host of socio-demographic determinants of happiness in a sample of Thai university students. The study indicated that female students enrolled in a traditional Thai university program reported higher levels of happiness compared to male students in the same program. However, female students, at the same university, enrolled in an English international university program showed no significant differences in happiness levels compared to male students in the same program. Tuntiwarodom[38] explained that students in the international program were more diverse in their backgrounds, e.g., many had attended international high schools, had studied abroad, had higher income, had higher IQ, and were from urban areas. Moreover, international school systems tend to promote diversity and uniqueness in each student, whereas traditional Thai school systems do not. This suggests that focusing on individualistic vs. collectivistic ideas and values may reduce happiness levels in Thai female students.

Furthermore, there were also group differences in the happiness variable. Specifically, Thai female and male students scored significantly lower than US high school, college, and community samples from the original SHS study.[32]* More recently, Peltzer et al.[6] reported that Southeast Asia students (including Thailand) had lower happiness scores than students from the Caribbean, South America, and sub-Saharan Africa. They attribute these group differences in happiness to (1) possible perceptual differences, i.e., Southeast Asian students may perceive their socioeconomic status and amount of social support as lower than that of students from other countries, thus affecting their subjective happiness, and (2) it could be that Southeast Asian students simply differ in the frequency, quantity, or quality of happy experiences. The explanations put forth above and the possible role of individualism and collectivism, with respect to the SWB of Thai students, warrants further study.

Third, concerning perceived stress, no significant gender differences were found. However, in another study, female Thai medical students showed higher stress levels compared to their male counterparts,[39] suggesting that gender differences in stress may differ according to the academic program of study. Moreover, cross-cultural comparisons also resulted in unexpected results*. Thai students had significantly higher PSS mean scores (M = 7.47, SD = 2.04) compared to subjects from the original PSS study (M = 4.45, SD = 2.95, $p = 0.0001$)[40] and a normative study from an English sample (M = 6.11, SD = 3.14, p = 0.0001).[41] Warttig et al.[41] suggested that the above stress results may be due to (1) differences in cultural contexts (e.g., different expectations about work and study), (2) socio-economic factors (e.g., female students may have greater difficulty financing their academic studies), (3) reporting behaviors (e.g., male students may be more hesitant to acknowledge stressful experiences), and (4) quantity of stressful experiences (e.g., female students may engage in less risky/less stressful behaviors).

A key point to remember is that stress can have deleterious effects on the physical and mental health of students, which can interfere with academic performance and student life in general.[12,21,39,42] Thus, university personnel should address the potential adverse effects of stress and promote stress reduction programs.[25,43]

Fourth, in regards to alcohol consumption, 84.2% of students reported having had an alcoholic drink in the past, and 45.6% of students reported drinking alcohol before the age of 18, indicating they had experimented with alcohol before entering university. Moreover, there were significant gender differences among students who drank alcohol, with 39.2% of male vs. 18.9% of female students reporting problem drinking (i.e., drinking alcohol on 5 or more days within the past month) and 22.9% of male vs. 13.7% of female students reporting binge drinking (i.e., drinking 5 or more alcoholic drinks in one day). These data are of concern because they are inconsistent with Thai policy and cultural expectations. Klainin-Yobas et al.[44] point out that the Thai government has a strict policy towards alcohol consumption. Mass media advertisement of liquor are not allowed before 10:00 pm and taxes on these products tend to be quite high. Also, most students live in university dormitories, which do not allow alcohol consumption. Despite these policies, it is apparent from these data that a significant percent of Thai students continue to have access to and consume alcohol on a regular basis. Finding ways to curb early exposure to alcohol and the motivations behind experimentation with alcohol would help Thai students reduce and avoid the many behavioral, cognitive, and health hazards associated with the use and abuse of alcohol. Of further interest would be to compare the drinking patterns of Thai students with students from other countries.

Fifth, for diet, surprisingly nearly half of all students (47.5%, n = 226) did not eat the minimum recommended amount of 4-5 vegetable servings per day and 68.1% (n = 323) reported spending 60% or less of their time eating mindfully, i.e., paying attention to their meal and feelings of satiety. These students may lack a fundamental understanding of nutritional needs and may be overly engaged in mobile devices during meals. For optimal health, it is essential to have a balanced diet and vegetables play a vital role in providing essential vitamins, minerals, and fiber.[45] Moreover, being mindful (aware, present, appreciating one's food) during meals may also play a role in better digestion and awareness of satiety. These findings suggest that a large percentage of students need help to establish healthier diets and better eating behaviors.

Sixth, as for mental health, approximately 40% (n = 190) of students indicated having felt depressed or having lost interest in hobbies, work, or activities that usually gave them pleasure. The 40% rate was lower than the 50% (n = 166) of Thai nursing students who reported feeling depressed as reported by Ross et al.[25] These findings are concerning for two reasons: (1) nearly half of Thai students reported having felt depressed, and (2) different academic

programs may be more stressful and thus contribute to a higher number of depressed students. Overall, these findings show that far too many students are experiencing symptoms of depression. Depression and its sequela are far too dangerous to ignore. As was noted earlier, Thai students reported higher levels of stress. Also well-known is the association between stress and depression. Thus it must be adequately addressed by school personnel. Based on these data it is advisable to provide students with access to mental health services for further diagnosis. Additionally, implementing stress reduction programs and systems to monitor the mental health status of students would be desirable.

Seventh, for physical fitness, BMI categories were used as a proxy measure. There were significant gender BMI differences in underweight, increased and high-risk categories. These gender differences were consistent with the findings of Thai medical students reported by Kongsomboon.[46] Additionally, a study of Thai nursing students found that students with higher BMI scores had worse physical fitness[44] and students who were less physically active had lower cardiovascular fitness.[19] These findings indicate that students with higher BMI scores tend to be less physically active and have lower physical fitness. Unhealthy diets probably also play a role in students categorized in the underweight and overweight categories. Students at risk may not be fully aware of the connection between diet and exercise and how both are important for improving and maintaining their physical fitness. Thus, additional efforts by school administrators and program directors should be made to encourage and promote more physical activity and healthier lifestyles.

Eight, in sleep behavior, male students went to bed later than female students on weekends but not during the weekday. Overall, more than 50% of students went to bed after midnight, and 61.6% (n = 290) reported sleeping 6 or fewer hours per night on weekdays. Moreover, approximately 74% (n = 351) of students reported not feeling refreshed and energized when they woke up in the morning. Other studies on Thai medical and nursing students have also found high levels of sleep deprivation and sleeping problems.[44,46] Linked to sleep problems are an array of emotional, cognitive, and behavioral impairments, thus are a cause for concern.[22]

Furthermore, an extensive national survey on adolescents across multiple countries revealed that reduced sleep hours were associated with emotional problems, anxiety, and suicidal ideation.[10] We can venture to say that students either enjoy staying up late or may be pressured to stay up late by friends and school work or cannot go to bed early because of noisy surroundings. This study did not assess reasons for going to bed late, but it seems worthwhile to do so in future investigations because of the range of health problems resulting from sleep deprivation.

Lastly, tobacco use was lower than alcohol use yet remains a concern. Male students reported higher levels of current smoking and experimentation before the age of 18. A global youth tobacco survey[13] found that a significant proportion of Thai youth currently smokes, had been exposed to secondhand smoke at home, could easily purchase cigarettes despite being underage, and had been offered free tobacco products by a tobacco company. These findings are of great concern because tobacco use often starts in adolescence and students who begin smoking at an earlier age tend to continue smoking as adults. Although the Thai government has strict smoking policies more needs to be done to protect young students from exposure, access, and enticements to begin smoking.

Limitations

There were several methodological limitations in this study. First, although a random cluster sampling method was used the method generated a relatively high percentage of female (71.2%) and low percent of 3rd year (14%) and 4th year (3%) students in the sample. However, this probably reflects the fact that more female students comprise the student body and that fewer upper division students were taking required core courses at the time. Still, the high percentage of females and a lower percentage of upper-division students in the sample may impede broad generalizability of research findings to other students. Second, alpha and test-retest coefficients for autonomy, and PSS, respectively, were lower than desired. These low coefficients may limit the interpretation of results from these scales. Third, this study included only Thai students. Thus, these health risk generalizations may not apply to Asian students from other Asian countries. Fourth, further validation of the PWB, SH, and PSS instruments is needed to understand the impact of cultural differences better. To this point, the author is currently conducting additional analyses to validate and investigate the cultural implications of the Thai research instruments.

Finally, a cross-sectional research design was used, which prevents drawing causal relationships among study variables.

Implications

According to the 2014 Open Doors report, Thailand now ranks 20th among countries sending university students to the United States. The states preferred by Thai students include California, New York, Massachusetts, Texas, and Illinois. The top receiving institutions for Thais doing undergraduate programs are the University of Washington (WA), Houston Community College System (TX), City College of San Francisco (CA), University of Illinois – Urbana-Champaign (IL) and Academy of Art University (CA).[47] Based on the findings presented in this study, professionals at these institutions and elsewhere should be aware that Thai students enrolled in their institutions may be at increased risk for health and well-being and take appropriate steps to assess and monitor these factors. Moreover, these findings also provide researchers with data for additional cross-cultural comparisons.

Conclusion

This study provides information to help fill current gaps in well-being and health status of Asian university students.

Additionally, the data on psychological and subjective well-being contributes much-needed data on the positive aspect of the health continuum concerning students. Specifically, this study provides information to better understand the levels of well-being (RSPWB, SHS, and PSS) and health behaviors of Thai university students (non-medical and non-nursing). Moreover, international gender and group differences indicated that Thai students, in particular, male students, may be at increased health risks. Additional research is warranted to clarify the relationships, processes, and causes of these differences.

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