Journal of Depression and Anxiety
ISSN: 2167-1044

Kim and Yim, J Depress Anxiety 2015, S1:009
DOI: 10.4172/2167-1044.S1-009

Research Article Open Access

Comparison between Physical Health and Mental Status of Korea High School Boarding Students

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Rec Date: Feb 26, 2015; **Acc Date:** May 29, 2105; **Pub Date:** June 1, 2015

Abstract

Background: In Korea, most of students want to live in prestigious high school dormitories to study hard. These renowned high schools are divided into general and international high schools. Because of strict school life and massive amount of study students do, students have huge physical and mental problems. Our study provides a comparison between physical health and mental status at a dormitory in both schools.

Methods: Between October and November 2014, 213 students (KIS; 123, SHS; 90) were enrolled. The study included the following: (1) individual school life (2) physical health (3) Zung self-rating depression scale (ZSDS) and Zung self-rating anxiety scale (ZSAS). Descriptive statistics presented. The Statistical Package for Social Sciences Software (SPSS-version 21) was used to analyze the data.

Results: There was no statistical difference between students from the two schools on individual school life, mean ZSDS and ZSAS (P>0.05). But, in KIS students, a positive and statistically significant association was observed in several positive symptoms items scale. Depression and anxiety scale showed mild depressed students (44.7%/40%) and mild to moderate anxiety students (17.8%/16,6%) in KIS and SHS respectively. But for physical symptoms, KIS students were more significantly troubled than SHS students: tremor (16.3%/1.1%), tinnitus (36.6%/10%), loss of hearing function (10.6%/2.2%), coughing (54.5%/40%), sputum (45.5%/31.1%), hoarseness (25.4%/11.1%), chest pain (21.1%/7.8%), edema (8.1%/1.1%), epigastric pain (20.3%/8.9%), vomiting (24.4%/8.9%), skin eruption (15.4%/6.7%) (P<0.05).

Conclusions: Our study showed that there are more positive mental symptoms in KIS where they are more focused on an American curriculum than at SHS where they are more focused on a Korean academic curriculum. But like psychosomatic symptoms, physical symptoms were more prevalent in KIS students. This result could indicate that KIS students are more troubled in terms of physical symptoms due to geographic isolated situation, separated duration with family, and strict school life at KIS.

Keywords: Physical health; Mental status; Self-rating depression scale; Self-rating anxiety scale

Introduction

High school students have a lot of stress applying to universities. Graduation from a famous university has always been considered to be very helpful to their future lives. According to national statistics Korea index, the number of graduates is 557, 236 in 2014 whereas the employment rate variation for graduates was 68.2% in 2009 and, 54.8% in 2014. This means that 45% of graduates are unemployed after college. However, a special study of graduates shows high employment rate in certain majors; major in medicine (88.0%), dental (86.7%), Korean medicine (78.0%), education (82.9%) [1]. Because of the low employment rate of graduates in general and the high employment rate found in the special major study, students long for acceptance at prestigious universities more. So, in order to have good college admissions results, high school students want to live in famous high school dormitories to study hard. But because of strict school life and massive amount of studying students do, students have huge physical and mental problems. This stress results in depressive and anxiety disorders. In a previous study of psychological health of the typical resident student, anxiety and depression were common psychological problems [2]. Also, most boarding schools are located far away from student's house. There could be various problems because students have to adjust to a new environment. These stressors, such as family disconnection, community dysfunction, social disadvantage can impact mental health [3]. Migration to a new country or sociocultural context can cause stress due to cultural acclimatization. Such stress tends to increase levels of anxiety and depression, loneliness, psychosomatic symptoms [4]. A previous review showed that acute stress responses in young healthy individuals may be adaptive and do not impose a health burden. However, longstanding heightened stress conditions may lead to permanent health damage [5]. In spite of this situation, the status of high school boarding students was not investigated. Two of the most well-known private high school in Korea, KIS and SHS, have different curriculum missions. SHS focuses more on a Korean academic curriculum. In contrast, the mission of KIS is to provide a challenging American curriculum, promote responsibility to our community and world, and prepare students for learning in university and life [6]. The aim of our study provides a

comparison between physical health and mental status of high school dormitory students within the same generation.

Methods

This research was conducted by a cross-sectional study. The population in the study consists of the 10th and 11th grade residential students in Korea International High School (KIS) students and Sang San High School (SHS) students in Korea. Between October and November 2014, 213 students (KIS; 123, SHS; 90) were enrolled in this study. After the presentation of written informed consent, students were asked to complete a questionnaire. This questionnaire comprised posed of questions covering individual school life style, physical status, and mental status. The study included the following: (1) individual school life (breakfast, snack, school class time, self-studying time, exercising time, sleeping time), (2) physical health (neurologic, ophthalmic, auditory, respiratory, cardiovascular, gastrointestinal, urologic, dermatologic), (3) Zung self-rating depression and anxiety scales.

We developed individual school life style items [7] and, a physical symptom checklist based on a previous research study [8]. The Zung depression and anxiety scales are used as a prevalent method to evaluate depression and anxiety disorders among different nationalities. The Zung Self- rating Depression Scales (ZSDS) and Zung Self-rating Anxiety Scales (ZSAS) are a self- reported 20- item measure of the symptoms of depression and anxiety. Items are ranked from 1-4, with higher scores corresponding to more frequent symptoms. Depression and anxiety items score were scored as follows; 1=a little of the time, 2=some of the time, 3=good part of the time, 4=most of the time [9,10]. The worst psychological condition is defined to have the highest score of 80 and the best condition is interpreted as the lowest score of 20. Total scores on the Zung scale indicated the level of depressive and anxiety symptoms that may be of clinical relevance. The ZSDS is categorized as by the following ranges; 20-44: normal range, 45-59: mildly depressed, 60-69: moderately depressed, 70 and above: severely depressed. The ZSDS score ≥50 was considered indicative of clinical depression. The ZSAS is categorized by the following ranges; 20-44: normal range, 45-59: mild to moderate anxiety, 60-74: marked to severe anxiety, 75-80: extreme anxiety [11].

Descriptive statistics presented. The Statistical Package for Social Sciences Software (SPSS-version 21), chi-square test, paired T-test was used to analyze the data. Means and standard deviations were calculated for sub-scale scores of each group. The p-value of <0.05 were considered the level of statistical significance difference.

Results

A total of 123 KIS students and 90 SHS students completed the study survey. The ratio of males to females from KIS and SHS who completed the study survey was 74 (60.2%)/49 (39.8%), 43 (47.8%)/47 (52.2%) KIS students had better eating habits, daily sleeping times and exercise times than SHS students; breakfast (92.7%/88.9%), snack (87%/78.9%), daily sleeping times (390.53 ± 68.19/364.78 ± 43.73 minute), daily exercise times (73.29 ± 50.45/25.24 ± 23.99 minute), respectively. SHS students were more daily class study times (7.12 ± 1.14/7.52 ± 1.06 hour) and daily self-study times (3.04 ± 1.39/4.72 ± 1.20 hour) than KIS students, respectively. This data concludes that KIS, which has an American curriculum, focuses on the importance of both study and physical activity whereas SHS focuses mostly on only studying.

	KIS students ; N (%)	SHS students; N (%)	P value
Neurologic symptoms			
headache	49 (39.8%)	26 (28.9%)	0.098
dizziness	37 (30.1%)	22 (24.4%)	0.364
tremor	20 (16.3%)	1 (1.1%)	0.000*
abnormal body sensation	5 (4.1%)	6 (6.7%)	0.399
Ophthalmic symptoms			
blurred vision	34 (27.6%)	21 (23.3%)	0.478
eyeball pain	26 (21.1%)	20 (22.2%)	0.849
decreased visual acuity	45 (36.6%)	39 (43.3%)	0.320
eyeball strain	68 (55.3%)	51 (56.7%)	0.841
Auditory symptoms			
tinnitus	45 (36.6%)	9 (10.0%)	0.000*
decreased auditory function	18 (14.6%)	11 (12.2%)	0.612
deafness	31 (25.4%)	10 (11.1%)	0.019

Table 1: Prevalence of physical symptoms in head and neck. KIS : Korea International High School, SHS: Sang-san High School,<.005*: Statistical Significance by the Chi-square test.

The prevalence of physical symptoms in both school groups are shown in Tables 1 and 2. Both schools have very strict academic and physical entrance tests. Therefore, the students from both schools should have similar states of physical condition. However, their states

after admission could change due to the school environmental differences.

	KIS students ; N (%)	SHS students; N (%)	P value
Cardio-pulmonary symptoms			
chest pain	26 (21.1%)	7 (7.8%)	0.008*
palpitation	32 (26.0%)	17 (18.9%)	0.222
arrhythmia	5 (4.1%)	1 (1.1%)	0.198
tachycardia	7 (5.7%)	1 (1.1%)	0.082
edema	10 (8.1%)	1 (1.1%)	0.023*
common cold	67 (54.5%)	44 (48.9%)	0.420
coughing	67 (54.5%)	36 (40.0%)	0.037*
sputum	56 (45.5%)	28 (31.1%)	0.033*
dyspnea	11 (8.9%)	9 (10.0%)	0.794
hoarseness	31 (25.4%)	10 (11.1%)	0.009*
Gastrointestinal symptoms			
epigastric pain	25 (20.3%)	8 (8.9%)	0.023*
dyspepsia	8 (6.5%)	3 (3.3%)	0.302
difficulty swallowing	45 (36.6%)	34 (37.8%)	0.859
nausea, vomitting	30 (24.4%)	8 (8.9%)	0.004*
diarrhea	35 (28.5%)	15 (16.7%)	0.045*
abdominal pain	31 (25.2%)	12 (13.3%)	0.033*
melena	7 (5.7%)	5 (5.6%)	0.966
constipation	27 (22.0%)	17 (18.9%)	0.586
frequent loose stool	16 (13.0%)	16 (18.0%)	0.319
Voiding and skin symptoms			
painful urination	5 (4.1%)	3 (3.3%)	0.781
tenesmus	8 (6.5%)	7 (7.8%)	0.720
frequent urination	12 (9.8%)	6 (6.7%)	0.423
diminished urine stream	6 (4.9%)	5 (5.6%)	0.825
itching sensation	32 (26.0%)	17 (18.9%)	0.222
skin eruption	19 (15.4%)	6 (6.7%)	0.049*
Skeletal symptoms			
joint pain	33 (26.8%)	20 (22.2%)	0.442
joint stiffness and motion limit	11 (8.9%)	11 (12.4%)	0.437
back pain	60 (48.4%)	37 (41.6%)	0.299

Table 2: Prevalence of physical symptoms in body and extremity. KIS : Korea Inernational High School, SHS: Sang-san High School,<.005*: Statistical Significance by the Chi-square test.

We found that KIS students had significantly more physical symptoms than SHS students; tremor (16.3%/1.1%), tinnitus (36.6%/10.0%), chest pain (21.1%/7.8%), edema (8.1%/1.1%), coughing (54.5%/40.0%), sputum (45.5%/31.1%), hoarseness (25.4%/11.1%),

skin eruption (15.4%/6.7%), back pain (48.4%/41.6%), respectively ($p<0.05$). The students from KIS might have more respiratory tract problems because they are located on an Island, which has more fluctuation in terms of weather.

Table 3 and Figure 1 display the ZSDS score in both schools. The mean the ZSDS score in KIS and SHS were 44.04 ± 7.90, 42.23 ± 6.99, respectively. Mildly depressed range ZSDS students in KIS and SHS were 55 (44.7%), 36 (40.0%) and moderately depressed range ZSDS students in KIS and SHS were 2 (1.6%), 0 (0%), respectively.

	KIS	SHS	P value
I feel down hearted and blue	1.83 ± 0.91	1.68 ± 0.79	0.207
Morning is when I feel the best	3.41 ± 0.78	2.93 ± 1.00	0.000*
I have crying spells or feel like it	1.41±0.66	1.71 ± 0.83	0.006*
I have trouble sleeping at night	1.73±0.92	1.53 ± 0.84	0.102
I eat as much as I used to	2.49±1.02	2.27 ± 1.12	0.137
I still enjoy sex	3.15±1.09	3.71 ± 0.78	0.000*
I notice that I am losing weight	1.63±0.83	1.79 ± 1.02	0.202
I have trouble with constipation	1.50±0.80	1.53 ± 0.87	0.747
My heart beats faster than usual	1.43±0.75	1.42 ± 0.71	0.933
I get tired for no reason	2.24±1.04	2.36 ± 0.92	0.389
My mind is as clear as it used to be	2.87±0.96	2.24 ± 1.03	0.000*
I find it easy to do the things I used to	2.60 ± 0.95	2.50 ± 0.96	0.446
I am restless and can't keep still	1.80 ± 0.78	1.72 ± 0.80	0.454
I feel hopeful about the future	2.67 ± 1.04	2.31 ± 0.94	0.011*
I am more irritable than usual	1.85 ± 0.89	2.04 ± 0.95	0.137
I find it easy to make decisions	2.85 ± 0.90	2.79 ± 1.01	0.668
I feel that I am useful and needed	2.54 ± 0.98	2.07 ± 0.93	0.000*
My life is pretty full	2.50 ± 0.95	2.20 ± 0.97	0.031*
I feel that others would be better off if I were dead	1.37 ± 0.60	1.28 ± 0.71	0.292
I still enjoy the things I used to do	2.17 ± 0.95	2.20 ± 0.87	0.819
Mean scale (sum)	44.04 ± 7.90	42.23 ± 6.99	0.087
Frequency of depression scale range	**Number (%)**		
normal range[1]	66 (53.6%)	54 (60.0%)	
mildly depressed range[2]	55 (44.7%)	36 (40.0%)	
moderately depressed range[3]	2 (1.6%)	0 (0%)	

Table 3: Comparison of the Zung self-rating depression scale score in both schools. KIS: Korea International High School, SHS: Sang-san High School,<.005*: Statistical Significance by the Chi-square test.

In the following to mean and standard variation results of ZSDS, both KIS and SHS students had the same high ZSDS score on these items; "Morning is when I feel the best" (3.41 ± 0.78, 2.93 ± 1.00) and, "I still enjoy sex" (3.15 ± 1.09, 3.71 ± 0.78), respectively. Otherwise, both KIS and SHS students had same low ZSDS score on these items; "My heart beats faster than usual" (1.43 ± 0.75, 1.42 ± 0.71) and, "I feel that others would be better off if I were dead" (1.37 ± 0.60, 1.28 ± 0.71), respectively. No significant the mean ZSDS score differences were found between both school students ($P>0.05$). But, the students from KIS showed 6 items significant differences out of 10 positive items score in the ZSDS. ($p<0.05$); "morning is when I feel the best", "I still enjoy sex", "My mind is as clear as it used to be", "I feel hopeful about the future", "I feel that I am useful and needed", "My life is pretty full". This proved the students from KIS have more mature and positive psychological state due to the academic curriculum as well as a variety of extra-curricular options. Table 4 and Figure 2 display the ZSAS score in both schools. The mean ZSAS score in KIS and SHS were 36.98 ± 8.04, 36.16 ± 8.81, respectively.

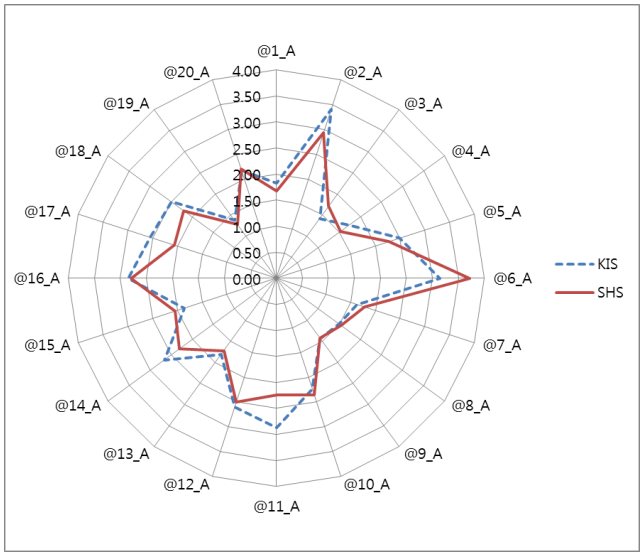

Figure 1: Items score distribution of the Zung self-rating depression scale.

Mild to moderate ZSAS students in KIS and SHS were 22 (17.8%), 15 (16.6%) and marked to severe students in KIS and SHS were 0 (0%), 2 (2.2%), respectively. In the following to mean and standard variation results of ZSDS, both KIS and SHS students had the same high ZSAS score on these items; I feel that everything is all right and nothing bad will happen (2.97 ± 0.96, 2.62 ± 1.04) and, My hands are usually dry and warm (3.03 ± 1.04, 3.06 ± 1.02), respectively. Otherwise, both KIS and SHS students had the same low ZSAS score on these items; "My arms and legs shake and tremble" (1.30 ± 0.58, 1.50 ± 0.76), "I have to empty my bladder often" (1.37 ± 0.61, 1.64 ± 1.02), respectively. No significant the mean ZSAS score differences were found between both school students (P>0.05). But, the students from KIS showed all positive significant differences out of 5 positive ZSAS items. (p<0.05); " I feel that everything is all right and nothing bad will happen", "I feel calm and can sit still easily", "I can breathe in and out easily", "I have to empty my bladder often", "I fall asleep easily and get a good night's rest".

As mentioned in the above results, both groups showed high and similar depression rates even though they have different academic and education systems. Also the results showed that there were higher rates of depression than anxiety. This is because the special circumstance of being in dormitories, the stress from the school, and all the changes due to puberty could be factors to emotional depression.

Discussion

In Korea, most people have believed that graduation from a famous university was very helpful to their future lives. In the past, Korean high schools could choose their students on the basis of student' scores on entrance examinations administered by individual high schools, resulting in apparent clustering by family background and substantial between-school differences in students' academic performances. The current educational system of Korea has the unique feature of random assignment of students into the schools [12]. However, nowadays, by National educational reform called the Equalization Policy, middle school graduates were randomly assigned to the high schools within their school geographical districts [13].

	KIS	SHS	P value
I feel more nervous and anxious than usual	1.59 ± 0.85	1.80 ± 0.84	0.079
I feel afraid for no reason at all	1.51 ± 0.87	1.61 ± 0.85	0.411
I get upset easily or feel panicky	1.55 ± 0.87	1.78 ± 0.90	0.069
I feel like I'm falling apart and going to pieces	1.55 ± 0.81	1.50 ± 0.70	0.621
I feel that everything is all right and nothing bad will happen	2.97 ± 0.96	2.62 ± 1.04	0.014*
My arms and legs shake and tremble	1.30 ± 0.58	1.50 ± 0.76	0.041*
I am bothered by headache neck and back pain	1.85 ± 1.02	1.78 ± 0.96	0.626
I feel weak and get tired easily	1.90 ± 0.94	2.04 ± 0.94	0.28
I feel calm and can sit still easily	2.80 ± 1.03	2.49 ± 0.93	0.023*
I can feel my heart beating fast	1.45 ± 0.74	1.61 ± 0.81	0.13
I am bothered by dizzy spells	1.44 ± 0.72	1.73 ± 0.87	0.010*
I have fainting spells or feel like it	1.40 ± 0.77	1.26 ± 0.62	0.14
I can breathe in and out easily	2.19 ± 1.18	1.61 ± 0.98	0.000*
I get feelings of numbness and tingling in my fingers and toes	1.40 ± 0.63	1.47 ± 0.85	0.503
I am bothered by stomach aches or indigestion	1.67 ± 0.88	1.70 ± 0.87	0.838
I have to empty my bladder often	1.37 ± 0.61	1.64 ± 1.02	0.027*
My hands are usually dry and warm	3.03 ± 1.04	3.06 ± 1.02	0.872
My face gets hot and blushes	1.76 ± 0.96	1.64 ± 0.92	0.365
I fall asleep easily and get a good night's rest	2.78 ± 1.06	2.02 ± 1.09	0.000*
I have nightmares	1.46 ± 0.85	1.33 ± 0.71	0.229
Mean scale (sum)	36.98 ± 8.04	36.16 ± 8.81	0.477
Frequency of anxiety scale range (sum)	**Number (%)**		
normal range	101(82.1%)	73(81.1%)	
mild to moderate anxiety levels	22 (17.8%)	15(16.6%)	
marked to severe anxiety levels	0 (0%)	2 (2.2%)	

Table 4: Comparison of the Zung self-rating anxiety scale score in both schools.

Within this educational policy, high honor students want to enter better schools. Several schools select their students according to the policy of equal entrance. Also, because students long for admission into a famous university, they want to live in a famous high school dormitory to study hard. This renowned high school is divided into a

general and an international high school. Typical examples are KIS having a American educational curriculum and SHS having a Korean educational curriculum. KIS is located in Jejuiland, where students can be close to nature, while SHS is located in an urban setting in an inland area of Korea. This research has started to compare the difference in physical and mental status among boarding students of two schools having different educational curricula and geographical locations.

Depression can be manifested as a combination of variable symptoms. These symptoms were loss of diet, depressed mood, psychic anxiety, somatic anxiety, altered appetite, altered sleeping, painful symptoms, psychosomatic symptoms, etc. [14]. The lifetime prevalence of depression is 16% with a female to male ration of about 5:2 [15].

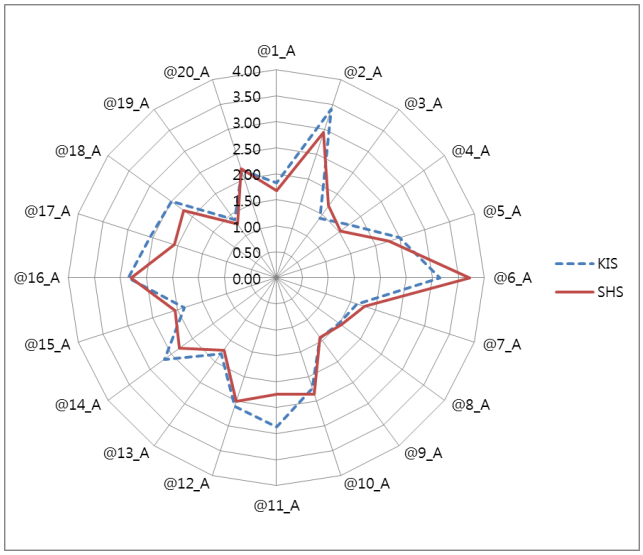

Figure 2: Items score distribution of the Zung self-rating anxiety scale.

Anxiety disorder is characterized by fluctuating levels of persistent, uncontrollable worry associated with fatigue, insomnia, muscle tension, poor concentration, and irritability [16,17]. And, anxiety disorder is one of the most common psychological problems among teenagers [18]. Anxiety disorders are the most common psychiatric diagnosis in school aged children worldwide with an estimated overall prevalence rate of 8% [19]. The age around puberty is considered to be a sensitive period of development which is vulnerable to anxiety [20].

According to an investigation conducted by the Ministry of Health and Welfare in Korea in 2007, the depression rate (when defined to be depression influencing daily life for more than two weeks in one year) of middle school students and high school students increased from 29.9% in 2005 to 41.3% in 2007 [21]. The studies about the increase in depression of Korean teenagers demonstrate that academic stress from study, prospect and future, school life based on education systems that only focus on college entrance exams is the main factor of depression besides developmental features during the adolescent period [22,23]. According to research conducted by National Youth Commission, Korean students have the most stress from their academic performance, with 57.1% of academic stress in 1998 increasing to 67% in 2006 [24]. The mental problems among boarding students separated from their home may be greater with several environmental factors.

In our study, the depression and anxiety scales showed mildly depressed students (44.7%/40%) and mild to moderate anxiety students (17.8%/16.6%) in KIS and SHS respectively. There was no statistical difference between students from the two schools in individual school life, self-rating depression and anxiety scales ($P>0.05$). Furthermore, KIS students had more minor physical symptoms than SHS students did; tremor, tinnitus, loss of hearing function, coughing, sputum, hoarseness, chest pain, edema, epigastric pain, vomiting, skin eruption ($P<0.05$). This data can infer various elements. The biggest reason is disconnection from their parents. Family function has a great influence on junior school students' subjective well-being. Junior high school students who have healthy family functioning are more likely to have higher life satisfaction, and tend to experience higher subjective well-being [25]. It was reported that low parental care was associated with having a lifetime history of depression and poor parental interaction was found to increase somatic complaints in Japanese school children [26,27]. Russek and Schwartz claimed that parents were the most meaningful source of social support in early life, and the perception of parental love and caring have important effects on biological and psychological health and illness throughout life [28].

The second biggest reason is probably the stress from school life. The stressful situation here is physical entrapment in the dormitory, geographical isolation and good Grade-Point Average (GPA) achievement. For entrance into a distinguished university, great GPA achievement is most important. That is a big and serious problem to senior high school students. This stressful condition cannot be solved until students are accepted into a university. Stress, a mental experience caused by demand and failure, may cause negative emotions, such as depression and anxiety, and may even hinder normal personality and behavior development of a person if not properly controlled and responded to [29]. It was reported that the negative relationship between GPA and depressive symptoms was confirmed. Field et al. [30] found high school seniors with high levels of depressive symptoms had lower GPAs as compared with students with lower levels of depressive symptoms. Depressive symptoms include physical changes (like insomnia, hypersomnia) and emotional variations (like loss of interest or pleasure, fatigue or loss of energy, feelings of worthlessness). These changes could directly and adversely impact negative academic achievement and adverse personality, likely self-criticism [31,32].

The location of schools can be another factor of stressful conditions. It was reported that boarding students with continuous and long duration in dormitories had more medical problems than weekly boarders or day students. This is due to the school itself (choice of school, climate), extra care (feeding, bullying), and home life (parental and the head of school roles) [7]. The reason why KIS students have more psychical symptoms is because KIS is located in an island where students are isolated in nature whereas SHS is located at urban area. The students may go through difficulty when adapting to rapidly changing weather in an island. Also, the lack of medical facilities may contribute to this result.

Conclusions

Our study showed that a lot of both dormitory students had depressive symptoms. But the students from KIS, which consider both academic and extracurriculars to be important, had more positive mental symptoms. With psychosomatic symptoms, physical symptoms were more frequent prevalence in KIS students. This result can be

construed that KIS students are more troubled in terms of physical symptoms due to their geographic isolated situation, separation from family, and strict school life in KIS. This conclusion draws the fact that more interest and detailed care in school life will be necessary. And to prevent dormitory students bothersome physical symptoms and depression, relevant social support, like parents, teacher, and administrators, should provide adequate social support and optimize the dormitory environment. I am planning to research differences in physical and mental problems between boarding students and day students.

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This article was originally published in a special issue, entitled: **"Depression & Aging",** Edited by Shailesh Bobby Jain, Texas University, United States