Education for Sustainable Development: Lifestyle Behaviors of Applied Science Private University Students and Correlate them with Academic Achievement

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Abstract: - Background: High academic achievement is an important indicator of future success, which is affected by lifestyle behaviors. A healthy lifestyle is associated with higher cumulative averages among college students. Objectives of the current study: To explore the dietary habits of university students, the effect of sleep and physical activity, and the associations with students' academic achievement. Method: An electronic survey was used to conduct a cross-sectional study of applied science university students. We studied the effect of the family's income level and parents' educational attainment and evaluated students' diet, sleep, and physical activity on their academic achievement. Result: A total of 164 students were female 59.8% and male 40.2%. Respondents were affiliated with the divisions of humanities faculties (58/164, 35.4%) and scientific faculties (106/164, 64.6%). The percentage of students over 20 years old was 57.3%. 34.1% of the total sample had a cumulative average of 68-75.9, and 30.5% had a cumulative average of greater than or equal to 84, 47.6% of students had a family income between 500-1000. Males favor consuming 6-8 glasses of water daily, eating three times fast food weekly, consuming energy drinks, sleeping in the dark, sticking to one type of sport, and meeting new friends in the gym. Females fight stress by eating, taking a daily nap, and taking vitamins and nutritional supplements. Students whose cumulative averages are greater than 84 drink caffeinated beverages. Students whose cumulative averages are from 68 – 75.9 intake energy drinks daily. Conclusion: Findings indicate that a healthy lifestyle is associated with a quality of life and higher cumulative averages among college students. Students followed quality dietary habits, good sleep quality, and physical behaviors and activity.

Key-Words: - Academic achievement, Lifestyle behaviors, Dietary habits, Sleep, Physical activit, Education for sustainable development, Academic performance.

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1 Introduction

Education for sustainable development (ESD) gives learners the knowledge, skills, values, and intervention to address interconnected future challenges, including making informed decisions and taking individual and collective action to change society and care for the world. ESD is a lifelong learning process for quality education and a healthy lifestyle. It enhances the cognitive, socio-emotional,

and behavioral dimensions of learning and learning encompasses content and outcomes, pedagogy, and the learning environment itself. Lifestyle behaviors are daily practices that result from a person's values, knowledge, and norms shaped by social, cultural, and economic factors. Lifestyle behaviors can affect personal success, overall health, and social characteristics, [1]. Lifestyle behaviors include eating habits, sleeping patterns, and physical

activity. World Health Organization (WHO) has recognized unhealthy lifestyles as a chief cause of illness, non-communicable diseases, and death [2], [3]. Monitoring lifestyles and implementing healthy behaviors in students is the path to transition toward quality of life, [4]. Fortunately, the behavioral patterns we establish as young adults are carried through life, which makes university students a model of interest. University marks a time of critical changes, where students must adapt to a new environment and handle newfound responsibilities, [5]. Although, some students tend to engage in unhealthy behaviors such as physical inactivity, skipping breakfast, malnutrition, and sleep deprivation, [6]. Lifestyle behaviors are known to be influenced by many sociodemographic factors. Previous studies investigated the relationship between gender and behavioral patterns, [5]. Moreover, lifestyle behaviors were reported to vary between people of numerous economic statuses, in which those of lower income were shown to be engaged in unhealthier lifestyles, [7]. Additionally, parents' education level contributes to forming students' lifestyles, [8]. The environment where students grow up has impacted their personalities and achievements. Educated mothers are good sources to raise positive qualities and polish them. Universities are interested in 'academic performance' to achieve 'academic success, which is calculated by the grades earned and a grade point average (GPA), used as a measure of academic success. Looking into factors that may impact college students' academic success positively or negatively is essential because the information gained can be used to educate students about these factors to enable them to make choices that minimize negative choices and make the most of positive choices. However, acquiring healthy habits can help increase student concentration and improve the desired academic performance. However, many unhealthy behaviors affect the quality of life and decline in academic performance, such as following unhealthy diets, smoking, alcohol, and lack of sleep, [9]. A healthy lifestyle is a manner of life that reduces the chances of being seriously ill or dying prematurely. However, maintaining a healthy life has a significant positive impact on lifestyle behaviors. The quality of students' diets has a foremost role in enhancing academic performance. They found that students with decreased overall diet quality were significantly more likely to perform poorly on structured assessments. For example, consuming fewer than three meals per day and lower vegetables

and fruit, eating fried foods at least 3-5 times a week, and consuming fast foods, [10]. These foods are notorious for their poor nutrient quality and contain high concentrations of sodium and trans fat. The frequent skipping of breakfast is another dietary habit that may have detrimental effects, and students show enhanced short-term memory after eating breakfast [11], probably due to the facilitated blood glucose response following a meal. Also, a healthy diet improves cognitive functioning and academic performance. Not all studies, however, agree on which habits specifically have a positive effect on academic performance, [10]. Physical activity is associated with a decreased risk of heart disease, stroke, type-2 diabetes, metabolic syndrome, and a lower mortality rate, [12]. There is significant evidence documenting the decline in activity levels through adolescence, and this trend continues with increasing age throughout adulthood, [13]. This decline in activity can be related to a variety of factors. As students transition from high school to university, they gain greater autonomy relative to their daily lives, [14]. Overweight students had lower reading comprehension scores, and aerobic endurance levels were positively correlated with academic achievement. The relationship between physical activity and academic achievement among college students is less clear. Based on previous research, there was a positive relationship between fitness and academic achievement for university students, [15]. A previous study examined the relationship between fitness, physical activity, and academic achievement, [16]. Hours of studying and social media use were positively associated with body fat. The study was negatively associated with cardiovascular diseases, and a higher GPA was associated with a higher BMI, [17]. Sleep is important for biological functioning, memory consolidation, decision-making, and learning in general, and a vital component for maintaining cognitive roles, [7]. Sleep quality and quantity are among the most researched health behaviors in connection with the academic performance of university students [18], and there is a consensus that both can affect students' grades and that sleep deprivation, in general, was associated with a lower GPA, [2]. Because of the rising costs of attending university and covering basic expenses while enrolled, there has been an increase in students relying on income from working while in college. Previous studies reported that students who worked more than ten hours were linked with lower GPAs. [19], [20]. This study explored differences in lifestyle

habits, such as dietary habits, physical activity, and sleeping behavior between ASU students, with students' academic achievement.

2 Materials and methods

A cross-sectional online study was performed by approaching Applied Science Private University students using the Microsoft Teams platform. The questionnaire was composed of several parts. One part focused on the sociodemographic status by including questions on gender, Age, Level of study, faculty, their parent education level, and Family income level. In addition, their Cumulative average is the most common measure of academic achievement. Another part focused on the lifestyle behaviors of students and included questions about Dietary habits (12 questions), sleeping habits (7 questions), and physical activity (7 questions). The results were compared according to demographic characteristics using the Chi-square test. Data analysis was performed using SPSS, version 22. The level of statistical significance was set at p < 0.05 (two-sided).

3 Results

3.1 Participants

A total of 164 students were female students: 98/164, 59.8%; male students: 66/164, 40.2%. Respondents were affiliated with the divisions of humanities faculties (58/164, 35.4%) and scientific faculties (106/164, 64.6%), including the College of Engineering, Information Technology, Pharmacy, and Nursing. The humanities colleges were the College of Arts, Sciences, Business, Law, and Sharia. The percentage of students over 20 years old was 57.3%. 34.1% of the total sample had a cumulative average of 68-75.9, and 30.5% with a cumulative average of greater than or equal to 84.54.9% of the students were at the first-year level. Undergraduate, 65.9% of students whose parents have an academic university level, 47.6% of students had a family income between 500 and 1000, and 31.7% had greater than 1000 (Table 1, Appendix).

3.2 Dietary Habits

Table 2 (Appendix) shows statistically significant differences in favor of males regarding intake of 6-8 glasses of water daily, three times of fast food weekly,

and the consumption of energy drinks daily. However, the differences were statistically significant in favor of females regarding increased meals consumed during stress and the intake of vitamins and nutritional supplements.

Table 2 (Appendix) shows that there are statistically significant differences in favor of students whose averages are from 68-75.9 about their eating more than three junk-food meals per week and intake of energy drinks daily, while the statistically significant differences were in favor of students whose cumulative average were greater than 84 about caffeinated beverages.

Table 3 (Appendix) shows statistically significant differences in favor of students who live in a family with an income of 500-1000 about eating breakfast continuously, interest in eating vegetables and fruits daily, and getting medical for eating disorders from specialists. No statistically significant differences in age, type of faculty, parents' academic level, and Dietary habits were found.

3.3 Sleep

Table 4 (Appendix) shows the relationship between different types of sleep habits among university students and gender and age. There are statistically significant differences in favor of females concerning taking a daily nap, while male students favor sleeping in the dark. Students over the age of 20 prefer sleeping in the dark more than their younger classmates. Students who used their mobile phones at bedtime had a cumulative average of 68-75.9 more than the other students, with a statistically significant difference. No statistically significant differences in age, type of faculty, parents' academic level, and family income level between sleep habits were found.

3.4 Physical Activity

Table 5 (Appendix) shows statistically significant differences in favor of male students who stick to one type of sport and are committed to going to the gym and making new friends. No statistically significant differences between the physical activities were found for age, type of faculty, parents' academic level, Cumulative average, and family income level.

3.5 Discussion

The findings of this study reveal the lifestyles of the students of the ASU and how they impact their academic achievement and distinguish health behaviors, whether it is diet, sleep, or physical activity

followed by students. However, lifestyle behaviors and habits vary according to region and culture and from university to university. The economic and technological development was paralleled with a drastic change in many lifestyle behaviors in a way that occur in developed countries. Students recognize future health benefits that they could gain from following healthier lifestyle behaviors, including a good diet, good sleeping patterns, and physical exercise. The evidence indicated a mainly positive effect of breakfast in the classroom. There was suggestive evidence that eating breakfast and drinking water increase students' academic performance and enhance working memory in students, [21], [22]. Increased frequency of eating breakfast was consistently positively associated with academic performance. Some evidence suggested that providing a variety of food groups containing carbohydrates, proteins, and fats, consumption of colored vegetables and fruits, and adequate energy were positively related to academic performance and good learning. However, Takoradi Technical University (TTU) females have lower odds of regular breakfast consumption. Barriers to regular breakfast intake included negative mood, insufficient funds, health conditions, weight management, limited time, unfavorable academic schedules, and the cost of food on campus, [2]. The present study reported the Prevalence of energy drink consumption and eating junk food three times weekly among male students. Our results were consistent with a previous study among governmental university students in Rivadh analysis revealed that the percentage of energy drink consumers in the cohort was 29.3%. Moreover, the study found a significant association between energy drink consumption and fast-food intake, [23]. Recently, many students consumed energy drinks or beverages containing caffeine as a source of energy, improving academic performance, participating in social events, and staying awake, [15]. The present study showed the prevalence of the use of vitamins and nutritional supplements among female students, which was supported by a previous study, which reported that the most used supplements were multivitamins (10.4%), and the reason for using the supplements as treatment, [23], [24]. Our results are also consistent with a previous study showing that female participants showed worse levels of general perception of health, quality of life, depressive symptoms, anxiety, stress, experiential avoidance, psychological inflexibility, sleep quality, and

loneliness, [5]. Therefore, the interpretation of the students' tendency to eat large quantities of food was as a reward, in response to boredom, or to reduce stress or regulate emotions. Although previous studies have found income to be a determinant of diet. Alvssa Hicks does not find income to be a significant predictor of student nutrition, [13]. Even Our result reported students who live in a family with an income between 500-1000 about eating breakfast continuously, interest in eating vegetables and fruits daily, and getting medical for eating disorders from specialists, but also reported no statistically significant differences for other diet habits, sleep, or physical activity. According to previous study, the attitudes and behavior of low-income consumers towards affordable fruits and vegetables in the quantities they usually buy five or more portions of fruit and vegetable servings daily were sufficient. While the difficulties were in accessing fruits and vegetables. The low consumption of fruits and vegetables was due to the lack of motivation to eat fruits and vegetables and knowledge of their benefits, [11]. Sleep is an essential part of keeping students healthy. It is wellknown university students find it hard to sleep early because they follow unhealthy behaviors. Our results showed that students follow many behaviors, such as drinking caffeinated drinks before bed, relying on studying all night, not sticking to a schedule, and not maintaining similar sleep times. Many students confessed that they often drink coffee when they must wake up all night for study examinations. 38.3% of the students feel more active and fresher after drinking coffee. The female students in our study prefer taking a daily nap to fill up energy and gain better mood, attentiveness, and cognitive performance. In addition, our study showed that female students prefer taking a daily nap to fill up power and get a better mood, focus, and academic performance. According to previous study, (55%) of students had a fixed schedule and a lot of anxiety. 48.3% of the students claimed that when they took a nap in the afternoon for a few minutes, they felt a decrease in tension slightly, [25]. The students believed that naps recharge their energy, release tension, and increase their alertness during physical fitness. Our findings revealed the male students practiced at least one type of sport and committed to going to the gym and meeting new friends during gym. No correlation between age, parents' academic level, cumulative average, and family income level with physical activities. However, several studies clarified the association between

increased physical activities and enhanced academic achievement. Sleep is an essential part of keeping students healthy. It is well-known university students find it hard to sleep early because they follow unhealthy behaviors. Our results showed that students follow many behaviors, such as drinking some studies revealed that physical activities affect the nervous system, causing improved cognition, memory, and attention. Other studies have indicated that physical activities positively affect psychological parameters such as self-esteem, inspiration, social engagement, and communication, [23]. Reports also showed an association between higher levels of general feeling, attention, and attention in the classroom and academic achievement, [21]. Studies have reported a gradual decrease in physical activity since college enrollment, showing levels below the minimum recommended by the World Health Organization [26], associated with prolonged periods of sitting, and having higher body mass index, [27]. In conclusion, we found a relevant correlation between academic achievement and lifestyle behavior among ASU students. First, there are statistically significant differences in favor of students whose cumulative averages are greater than 84 drinking large amounts of caffeinated beverages. Second, the statistically significant differences were in favor of students whose cumulative average was 68 -75.9 the students used their mobile phones at bedtime, ate more than three junk-food meals per week, and intake energy drinks daily.

4 Conclusion

Findings indicate that a healthy lifestyle is associated with higher cumulative averages among college students. Students follow quality dietary habits such as eating breakfast, drinking 6-8 glasses of water daily, eating vegetables and fruits daily, and knowing proper portion size and variety in meals. Improving sleep and physical activity among students should include an education component to emphasize the importance of sleep quality and physical behaviors like not using their mobile phones at bedtime, establishing a specific bedtime routine, and sticking to regular physical activity. Food, potable water, and soft drinks are available at the ASU campus. These are subject to hygienic control and direct supervision by the university administration. The university cares about selecting hygienic raw materials for cooking according to standard specifications. Food is offered to students and employees at low prices. The priority

of ASU is also to provide its students with indoor playgrounds for different activities. For instance, there is a hall to practice basketball, volleyball, handball, tennis, badminton, fitness, gymnastics, self-defense games, ping pong, football, and other indoor sports. This study presents findings about students' health behaviors and university satisfaction and provides impetus for continuing research in this area of inquiry from a person-centered perspective. Our positively accepted results are the result of a cohesive fabric of family commitment and the active participation of educational institutions, which have created young people who are aware of the value of wellbeing. This is consistent with our previous research, [28], [29], [30].

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The authors have no conflicts of interest to declare.

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Demographic characteristics	Number (%)	
Gender	Male	66 (40.2%)
	Female	98 (59.8%)
Age	<20	70 (42.7%)
	≥20	94 (57.3%)
Cumulative average	60-67.9	18 (11%)
-	68-75.9	56 (34.1%)
	76-83.9	40 (24.4%)
	≥ 84	50 (30.5%)
Level of study	First	90 (54.9%)
	Second	27 (16.5%)
	Third	29 (17.7%)
	Fourth	13 (7.9%)
	Others	5 (3%)
Faculty	Humanities faculties	58 (35.4%)
	Scientific faculties	106 (64.6%)
The mother's academic level	Secondary school	68 (41.5%)
	University	96 (58.5%)
The father's academic level	Secondary school	56 (34.1%)
	University	108 (65.9%)
Family income level	< 500	34 (20.7%)
	500 - 1000	78 (47.6%)
	>1000	52 (31.7%)

APPENDIX

Table 1. Demographic characteristics

Done by researcher

 Table 2. Relationship between different types of Dietary habits among university students and self-reported current

 Cumulative average and gender

Dietary habits	Total	Gender n (%)		Chi- Cumulative average n (%)					Chi-
	number	Male	Female	square	≥ 84	76-	68-	60-	square
				Sig		83.9	75.9	67.9	Sig
Do you usually eat breakfast?	96	35	61	0.240	28	23	36	9	0.693
		(53.8%)	(62.2%)		(57.1%)	(57.5%)	(64.3%)	(50.0%)	
Do you drink 6-8 glasses of	78	38	40	0.035	23	19	29	7	0.803
water daily?		(58.5%)	(40.8%)		(46.9%)	(47.5%)	(51.8%)	(38.9%)	
Do you eat more than you need	58	23	35	0.909	16	12	24	6	0.540
in one meal (Learn proper		(35.4%)	(35.7%)		(32.7%)	(30.0%)	(42.9%)	(33.3%)	
portion size)?									
Do you diversify your meals	112	40	72	0.083	39	29	34	10	0.149
(contains carbohydrates,		(61.5%)	(73.5%)		(79.6%)	(72.5%)	(60.7%)	(55.6%)	
proteins, and fats)?									
Do you eat vegetables and fruits	76	31	45	0.895	25	18	27	6	0.659
daily?		(47.7%)	(45.9%)		(51.0%)	(45.0%)	(48.2%)	(33.3%)	
Do you eat junk food more than	44	26	18	0.003	9	7	23	5	0.023
3 times a week?		(40.0%)	(18.4%)		(18.4%)	(17.5%)	(41.1%)	(27.8%)	
Do you eat sugar and sweets a	69	26	43	0.568	28	14	21	6	0.119
lot?		(40.0%)	(43.9%)		(57.1%)	(35.0%)	(37.5%)	(33.3%)	
Do you drink caffeinated	103	39	64	0.419	37	22	40	4	0.000
beverages daily (Nescafe coffee		(60.0%)	(65.3%)		(75.5%)	(55.0%)	(71.4%)	(22.2%)	
or tea)?									
Do you drink soft drinks or	40	22	18	0.029	10	4	24	2	0.001
energy drinks daily?		(33.8%)	(18.4%)		(20.4%)	(10.0%)	(42.9%)	(11.1%)	
Do you fight stress by eating?	48	12	36	0.010	17	10	14	7	0.534
		(18.5%)	(36.7%)		(34.7%)	(25.0%)	(25.0%)	(38.9%)	
Do you take vitamins and	51	12	39	0.003	17	12	18	4	0.823
nutritional supplements?		(18.5%)	(39.8%)		(34.7%)	(30.0%)	(32.1%)	(22.2%)	
Do you get medical help for	44	14	30	0.183	9	12	20	3	0.145
eating disorders?		(21.5%)	(30.6%)		(18.4%)	(30.0%)	(35.7%)	(16.7%)	

Table 3. Relationship between different types of Dietary habits among university students and family income level

Dietary habits	Total	Fami	Chi-square			
	number	less than 500	500-1000	greater than 1000	Sig	
Do you usually eat breakfast?	96	13 (38.2%)	53 (67.9%)	30 (58.8%)	0.013	
Do you eat vegetables and fruits daily?	76	11 (32.4%)	44 (56.4%)	21 (41.2%)	0.037	
Do you get medical help for eating disorders?	44	3 (8.8%)	25 (32.1%)	16 (31.4%)	0.029	

Done by researcher

Table 4. The relationship between different types of sleep habits among university students and gender and age

	Total	Gender		Chi-	Ag	je Chi-	
Sleep habits	numb	Male n	Female n	square	< 20 n (%)	>20 n (%)	squar
	er	(%)	(%)	Sig	< 20 II (70)	≥20 II (70)	e Sig
Do you sleep 6-8 hours a day?	106	40 (60.6%)	66 (67.3%)	0.376	48 (68.6%)	58 (61.7%)	0.363
Do you take a nap daily?	55	16 (24.2%)	39 (39.8%)	0.039	28 (40.0%)	27 (28.7%)	0.130
Do you use your mobile at bedtime?	146	57 (86.4%)	89 (90.8%)	0.371	65 (92.9%)	81 (86.2%)	0.175
Do you study in bed?	98	34 (51.5%)	64 (65.3%)	0.077	43 (61.4%)	55 (58.5%)	0.706
Do you drink caffeinated beverages before bed?	96	38 (57.6%)	58 (59.2%)	0.838	40 (57.1%)	56 (59.6%)	0.755
Do you have a set bedtime?	40	13 (19.7%)	27 (27.6%)	0.251	21 (30.0%)	19 (20.2%)	0.149
Do you keep your room dark and quiet?	148	64 (97.0%)	84 (85.7%)	0.017	59 (84.3%)	89 (94.7%)	0.026

Done by researcher

Table 5. The relationship between different types of Physical activity habits among university students and gender

Physical activity	Total	(Chi-square Sig	
	number	Male n (%)	Female n (%)	
Do you have regular physical activity?	39	17 (25.8%)	22 (22.9%)	0.626
Do you play a particular sport?	46	28 (42.4%)	18 (18.8%)	0.001
Do you walk during university hours?	156	62 (93.9%)	94 (97.9%)	0.564
Do you use the elevator without stairs, if any?	93	36 (54.5%)	57 (59.4%)	0.647
Are you committed to going to the gym?	21	15 (22.7%)	6 (6.3%)	0.002
Did you meet new friends in the gym?	30	20 (30.3%)	10 (10.4%)	0.001
Do you enjoy going to the gym or doing sports?	96	43 (65.2%)	53 (55.2%)	0.158

Done by researcher