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CORRELATION AMONG EXERCISE HABITS, STUDY HABITS, AND AVERAGE GRADE POINTS AMONG SENIOR HIGH SCHOOL AND COLLEGE STUDENTS[i]

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Abstract:
The present study is a quantitative, cross-sectional, synchronic, and descriptive research based on the hypothesis that sports and related physical activities help students' academic performance. The study also investigated the correlation among students' exercise habits (exercise, sports, physical activity), study habits, and their average grade points. For the present study, data were collected from 253 senior high school and college students who were studying at two vocational high schools, one non-vocational high school, and one university in New Taipei City areas, Taiwan. Results of exercise habits: Out of 253 students, 77 (30%) students did exercise 3 and above times per week, 136 (54%) students did sports and related physical activities 1-2 times per week, the remaining 40 (16%) students never did sports and physical activities. Regarding study habits, out of 253 students, 30% of students reviewed or studied 3 times and above at home. While 121 (48%) students reviewed or studied 1-2 times per week, 77 (30%) of students never studied at home. Another interesting finding was the difference in study habits between those students who did regular exercise (exercise, sports, related physical activities) and those who never did. Out of 253 students, 77 of them did regular exercise (3 times and above per week) and another 40 students never did any kind of exercise. Results of study habits: Among the 77 students who did regular sports or physical activities, 39% of students reviewed or studied above 3 times per week compared to only 10% who reviewed or studied 3-4 times per week among the 40 students. Another 39% of students among the 77 students reviewed or studied 1-2 times per week compared to 30% of students reviewing or studying among the 40 non-exercise students. Among the 77 exercise groups, the remaining 22% of them never reviewed or studied at home compared to a big 60% of students who never reviewed or studied among the non-exercise group.

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The present study found that there was a positive correlation among the three variables - students exercise habits, study habits, and average grade points. The present study also found that exercise habits played an important role in students' study habits and academic performance.

Keywords: exercise habits; study habits; average grade points; correlation; overall personal development

摘要
本研究是一項定量的、横向的、同步的描述研究。基於的假設是：運動競賽（sports）和運動相關活動對於學生的在校成績會有幫助。本研究同時也調查學生運動習慣（包含訓練，任何型態的運動，或體能活動），唸書習慣，和他們學期平均成績三者之間的相關程度。關於本次研究的數據資料蒐集來自於台灣新北地區 253 名高中生與大學生，涵蓋 2 所技職學校，1 所普通高中，以及 1 所大學。從運動習慣的結果顯示：253 名學生中，77 名（30%）學生每週鍛煉 3 次及以上，136 名（54%）學生每週進行 1-2 次體育及相關體育活動，其餘 40 名（16%）學生們從未參加過體育運動和體育活動。在讀書習慣方面：253 名學生中，30%的學生在家複習或讀書 3 次及以上。雖然 121 名 (48%) 學生每周復習或讀書 1-2 次，但 77 名 (30%) 學生從未在家學習。另一個有趣的發現是那些經常運動（鍛煉、運動、相關體育活動）的學生和那些從不運動的學生之間的有念書習慣的差異。在 253 名學生中，77 名定期運動的學生（每週 3 次及以上），另外 40 名學生從未進行任何鍛煉。比較兩組學生之間學習習慣的結果發現：在經常參加體育活動的 77 名學生中，39% 的學生每周復習或學習 3 次以上，而在 40 名學生中，只有 10% 的學生每周復習或學習 3-4 次。77 名學生中有 39% 的學生每周復習或學習 1-2 次，而 40 名不運動學生中這一比例為 30%。在 77 名運動組中，剩下 22%的人從未在家複習或學習過，相比之下，非運動組中有 60% 的學生從未在家複習或學習過

關鍵詞：運動習慣；讀書習慣;學期平均成績；相關性;個人整體發展

1. Introduction

1.1 Literature reviews

In the last sixty years or so, many researchers, scholars, physical educationists and educational psychologists, and other experts have done researches, investigated, and published many research papers, articles, theses, and dissertations about the benefits of sports and related physical activities on the health, academic performance, and overall personal development among the student community. However, in spite of all these research findings and benefits offered, the number of students involved in sports and physical activities is far below the expectation. One study published in The Lancet Child & Adolescent Health journal produced by researchers from the World Health Organization, finds that more than 80% of school-going adolescents globally did not meet current recommendations of at least one hour of physical activity per day. This finding was based on the study conducted during 2001-2016, and reported by 1.6 million 11 to

17-year-old students across 146 countries around the world (The Lancet Child & Adolescent Health, 2021).

There are countless benefits regular exercise, sports, and sports-related physical activities offer to student communities. According to Michael J. Gorton (2010) study, since the publication of James Coleman's classic *The Adolescent Society* (1961), a large number of researchers like Eidsmoe (1961), Edwards (1967), Rehberg & Schaefer (1968), Schafer & Armer (1968), Spady (1970), Hanks & Eckland (1976), Otto & Duane (1977), Landers & Landers (1978) have been inspired and many further researches have been done and published on the importance of regular exercise and sports on students' study habits and academic achievement.

The inspiring train continued. Tomporowski, P. D. et al (2008) research review found that systematic exercise programs may actually enhance the development of specific types of mental processing known to be important for meeting challenges encountered both in academics and throughout the lifespan.

In their study using a structured questionnaire with 15 statements on a three-points Likert scale "ranging from disagree to agree", Mohammad Younis K. et al. (2012), found that there was a positive link between participation in sports and academic performance. They found sports activities have a positive influence by enhancing memory, academic focus, concentration, grades, and the ability of the students to succeed academically.

In his study for Master's thesis, Vibha V. Prasad (2012) compared two groups of students from two deciles - decile 1 and decile 2 schools. It was found that students who participated in sports generally did better than those who did not. His support for this statement lies in the number of students who reported playing a sport compared with those who reported with no sport involvement. Vibha stated that in school 1, of the 52 students who participated in the study, 83% of the students were sports participants compared to school 2's 68% of 34 students.

Michael, S. L., Merlo, C. L., Basch, C. E., Wentzel, K. R., & Wechsler, H's (2015) study summarizes the literature on the connection between health and academic achievement. It highlights the critical connection between health and academic achievement.

Donnelly, J. E. et al. (2016), in their systematic literature review, found evidence to suggest that there are positive associations among physical education, fitness, cognition, and academic achievement. Based on the evidence available, they concluded that physical education has a positive influence on cognition as well as brain structure and function.

Not only physical activities improve academic achievement, Andersen, M. P. et al's. (2017) study revealed that there is a positive effect of physical fitness on attendance in post-compulsory education by establishing the relationship between physical fitness, academic achievement, and post-compulsory education commencement. Kyan, A. et al. (2018), Zhang, Y., Ma, X., Zhao, J., Shen, H., & Jiang, F. (2019), Vasilopoulos, F., & Ellefson, M. R. (2021).

Not only sports and physical activities improve students' physical health and mental health, but it also directly influences social cognition, the processes by which people draw inferences about other people's belief and intentions, and how people weigh social situational factors in making these inferences (Catalina Quintero Lopez, Victor Daniel Gil Vera, Carolina Vasquez Lopez, Jennifer Cristina Álzate Jaramillo, 2020).

Studies also consistently show that physical activity declines sharply during adolescence. Declines are reported with both self-report and objective measures of physical activity. Similarly, declines are documented in cross-sectional, and longitudinal studies. According to Kenneth R. Allison et al., (2007), age-related declines in physical activity are also reported in several countries, including the USA, Canada, Finland, and in Amsterdam.

Considering the declining trend, in their research article, Christine A. et al. (2019) even talked about the importance of instilling a habit of doing physical activities during childhood. They said that as physical activity and sedentary behaviors are developed during the early childhood period (ages 0 to 5 years), this stage represents a unique opportunity, at the family level. For physical activity to occur in children, parents should also be engaged in and model the physical activity behaviors, increasing the likelihood of young children learning to be physically active. Increasing the physical activity levels of children may require parents to increase their physical activity levels as well. It means whether children, adolescents, or adults, students need parental guidance, support, and guidance.

Hao Liu and Xia Dai (2017) in their study of the "Correlation between physical activity and self-efficacy in Chinese university students" found that self-efficacy plays an important role in influencing Chinese university students to be involved in physical activities. Self-efficacy refers to a person's belief in his/her ability to execute behaviors necessary to achieve desired outcomes. It is associated with many health behaviors such as smoking cessation and physical activity. It determines whether health behavior change will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and failures.

In a two-year, with three-time points longitudinal study of five public junior high schools in two suburban municipalities in Okinawa prefecture, Japan from April 2015 to July 2017, Kyan et al. (2018) detected a possibility that an increase in physical fitness leading to good academic achievement among junior high school boys, regardless of between-person differences of physical level.

In a two-semester study in a Shanghai high school to examine the effect of a strengthened physical education pilot program consisting of specialized sports training on students' academic performance in the high school context, Zhang et al. (2019) found that strengthened physical education had a significantly positive effect on overall academic performance among the high school students, especially in Chinese language and English language scores.

Doing sports and related physical activities also influences students in their self-esteem, behaviors, self-confidence, and discipline in a positive way. They also learn

interpersonal relationships and team spirit. In their study on participation in sports and games as well as extracurricular activities and the development of personal and interpersonal skills in adolescents, Ivaniushina and Zapletina (2015) revealed that students who participated in sports and games activities offer a wide variety for developing various aspects of personality such as social skills, interpersonal skills, goal setting skills, self-identity, and competencies.

In their study, Lazaro and Anney (2016) found that students who participate in co-curricular activities such as sports and games are more advantageous to developing talents, including enriching students' language skills and self-confidence.

Massoni (2011), in his study, found that students who participated in extracurricular activities reduced behaviors problems. Students who participate in these activities take pride in their accomplishments, hence they gain better self-respect, self-esteem, and self-confidence. Elavsky (2010) states that, regardless of weight, size, gender, or age, exercise can quickly elevate a person's perception of his or her attractiveness, that is, self-worth.

Based on their study of 34 male and female high school students divided as - experimented (15) and control groups (19), Soyturk and Ozturk (2020) revealed that among the high school students' behaviors, sports-based games are effective activities that can be used in reducing high school students' behavior problems.

In their study "Extra-curricular activities and youth risky behaviors in South Africa" including a sample of 10,502,705 including both male and female youths aged between 12-22, Muloiwa and Odimegwu (2018) it was revealed that participation in sports and games as well as extracurricular activities were found to be beneficial to youth self-esteem and discipline.

Recently, in their longitudinal study of 7, 11, and 14-year-old students, Vasilopoulos and Ellefson (2021) examined the relationship between physical activity, self-regulation in a multi-dimensional approach, and educational outcomes. They found out that emotional regulation was linked to physical activity in early childhood to subsequently affect academic achievement.

Doing sports and physical activities is not just about regularity, it is also about intensity. In their study, Joca Zurc and Jurij Planinšec (2022) found that children engaged in physical activity most days a week, with moderate-intensity and unorganized activities showed significant associations with above-average academic competence. Higher frequency and intensity of physical activity, the absence of digital games, and attending sports clubs seem to have the most beneficial effects in terms of academic competence in school children.

Aerts et al. (1997) stated that while physical activities appear to be a natural part of children's everyday life, they declined during adolescence period. This finding was supported by Kimm et al. (2002) study of 1213 black girls and 1166 white girls from the ages of 9 or 10 to the ages of 18 or 19 years. They found that these girls' physical activity levels declined during adolescence. Casey et al. also (2009) reported that participation in sport and physical activity declined during adolescence.

To create physical activity habits among adolescents, parents' role is important. Crumbley et al. (2019) talked about the importance of instilling a habit of doing physical activities during childhood. They stated that as physical activity and sedentary behaviors are developed during the early childhood period, for physical activity to occur in children, parents should also be engaged in and model the physical activity behaviors, increasing the likelihood of young children learning to be physically active.

In nine and half years of a longitudinal case study of a single case study subject, Ngangbam (2023) found that there was a strong link between his case study subject's involvement level, frequency of sports activities, and his academic performance. Ngangbam found that doing sports and physical activities regularly not only helped the case study subject to be active, energetic, and healthy but also helped him to outperform academically those physically non-active students. Besides, Ngangbam found that not only his case study subject improved physically, academically, but the case study subject also became more disciplined, self-confident, responsible, and more confident in social skills.

In spite of all the benefits and positive impacts, sports and related physical activities contribute, time for physical activity classes has been limited to less than 2 hours per week in Taiwan region. And few students, even their parents and teachers give less thoughts and importance of these activities to the student community. This negative attitude has kept many young students away from the good and beneficial habits of doing sports and physical activities, especially in Taiwan region. According to Ngangbam's study (2021), in Taiwan, 82% of students knew doing physical activities could keep them physically and mentally fit and healthy, but only 28% of them did enough exercise. It's a pity.

Based on these studies mentioned above, it can be considered that sports and physical activities are not only for physical fitness but also help students' all-around personal development. Thus, sports and related physical activities can be considered as the backbones for every student community. Not only for children and students, sports and physical activities are important to everyone of all ages for mental and physical fitness, and for overall personal happiness.

1.2 Why This Research

The present study liked to investigate the exercise habits and study habits of students 253 students, and the correlation among their exercise habits (exercise, sports, related physical activities), study habits, and their average grade points. The study also liked to investigate the role of exercise habits on students' study habits and their average grade points. The study also investigated how many students did enough exercise or sports per week and how many didn't. The present study also liked to investigate if there are any differences in students' study habits, and average grade points among those students who did regular exercise and those who didn't do any kind of exercise, sports, or related physical activities.

2. Research Methodology

2.1. Participants and Sample

The present paper is a quantitative, cross-sectional, synchronic, and descriptive research, which investigated students' exercise habits, study habits, and their average grade points. The study also investigates the correlation among students' exercise habits (exercise, sports, related physical activities), study habits, and their semester average grade points. The quantitative data of the present study were collected during the months of April and May 2023 before the summer vacation was commenced. The necessary data was collected from 253 students who were studying senior high school and college at two vocational high schools and one university in New Taipei City, Taiwan area. A questionnaire with three relevant questions was formulated and distributed among those 253 high school and college students. The three questions in the survey questionnaire were as given here:

Questions:

1) How many times do you do exercise or sports per week?
2) How many times per week do you review or study at home?
3) What are your normal semester average grade points?

2.2. Data Analysis and Results

The raw data collected from 253 students through survey questionnaires were entered into Microsoft Excel and converted into numerical values. Then the numerical values were converted into charts to see the frequencies of different variables. The following tables and charts display the results of the data analysis.

Question 1: How many times do you do exercise or sports per week?

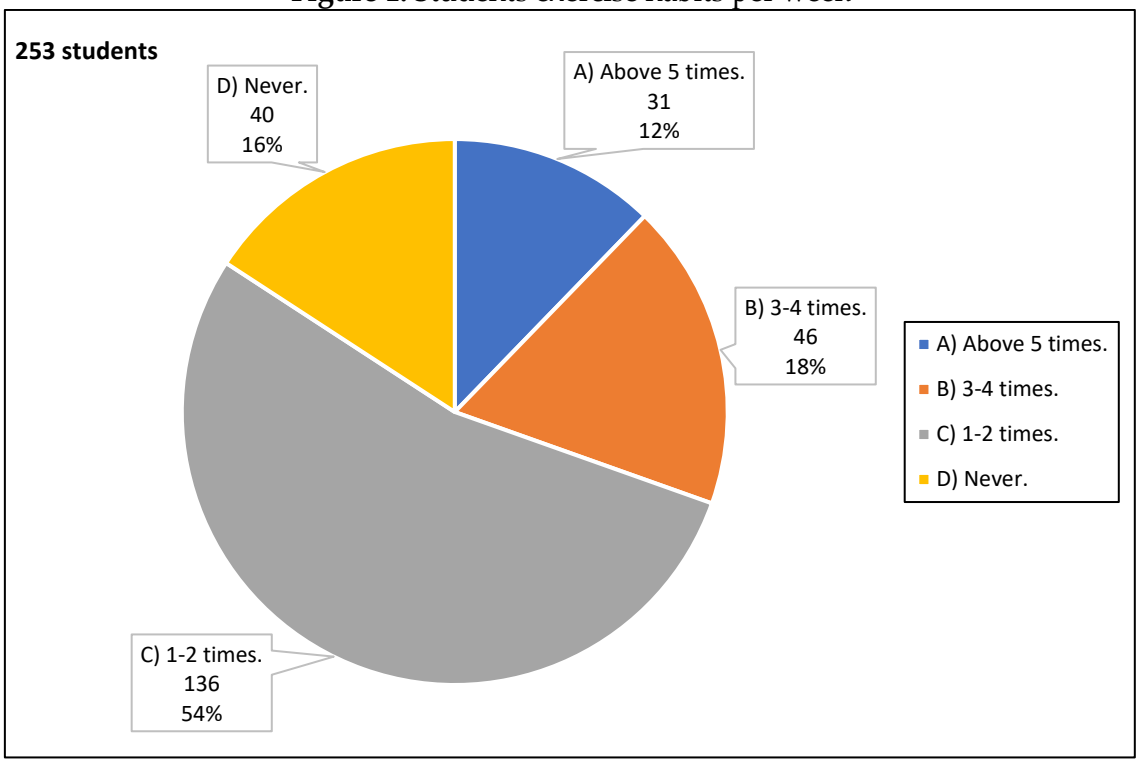
A) Above 5 times a week;
B) 3-4 times a week;
C) 1-2 times a week;
D) Never.

Table 1: Students exercise habits per week

Row Labels	Q1: How many times do you do exercise or sports per week?
A) Above 5 times	31
B) 3-4 times	46
C) 1-2 times	136
D) Never	40

For Question 1, out of 253 high school and college students, 31 (12%) students exercise more than 5 times per week. In fact, only 10 students do above 5 times a week, the other 21 students are sports students who have to practice 6 to 7 times a week. Another 46 (18%) students do 3-4 times a week. While out of 253, 136 (54%) students do exercise and sports 1-2 times, the remaining 40 (16%) students never do exercise or sports as can be seen below in Figure 1.

Figure 1: Students exercise habits per week



Question 2: How many times do you review or study at home?

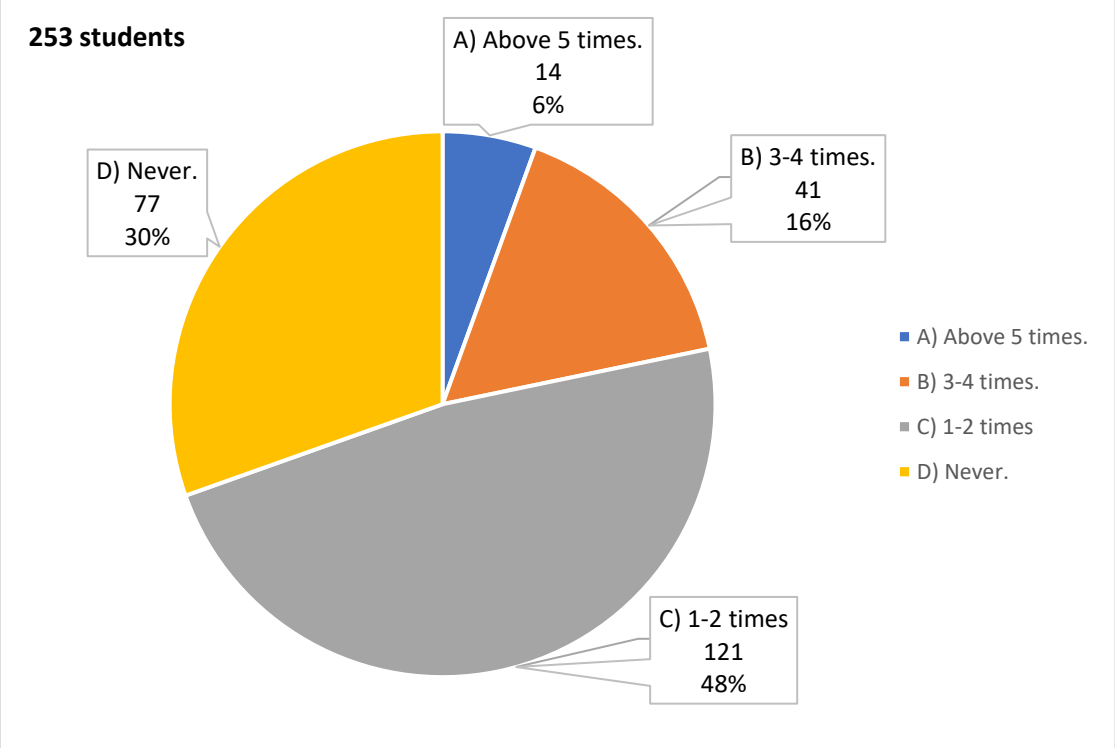
A) Above 5 times;
B) 3-4 times;
C) 1-2 times;
D) Never.

Table 2: Students exercise habits per week

Row Labels	**Q2: How many times per week do you review or study at home?**
A) Above 5 times	14
B) 3-4 times	41
C) 1-2 times	121
D) Never	77
Grand Total	**253**

For Question 2, out of 253 students, 14 (6%) students reviewed or studied above 5 times per week at home, while 41 (16%) of them reviewed or studied 3-4 times at home. While 121 (48%) students reviewed or studied 1-2 times per week, 77 (30%) of students never studied at home as can be seen from the pie chart in Figure 2 below.

Figure 2: Students' study habits per week



Question 3: What is your normal semester average grade points?

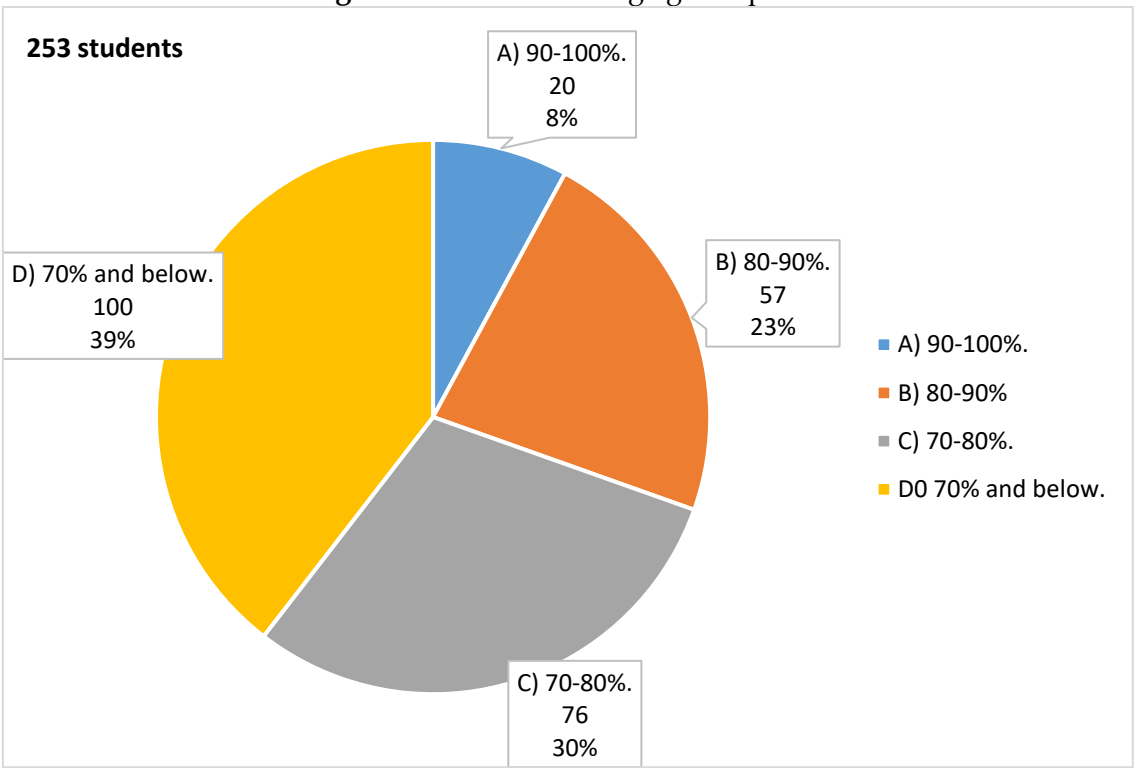
A) 90-100%;
B) 80-90%;
C) 70-80%;
D) 70% and below.

Table 3: Semester average grade points

Row Labels	Q3: What is your normal semester average grade points?
A) 90-100%	20
B) 80-89%	57
C) 71-79%	76
D) 70% and below	100
Grand Total	**253**

Regarding students' semester average grade points in Question 3, out of 253 students, 20 (8%) students got 90-100%, while 57 (23%) of them got 80-90%, 76 (30%) of them got 70-80% and 100 (39%) of them got below 70% respectively as can be seen clearly from the pie chart in Figure 3 below.

Figure 3: Semester average grade points



Further, to investigate if there exist any differences in their study habits between students who do regular (enough) sports or related physical activities and those who never do, out of those 253 students, the researcher extracted two groups of students - students who do enough exercise or sports and those who never do.

Out of the 253 students, 77 of them do enough exercise – 3 times and above, and another 40 students never do. The above pie chart in Figure 4 displays the study habits of those students who do enough sports and physical activities per week. The following charts - 4 and 5 display the study habits of those two groups of students.

Study habits of the first group of students numbering 77 can be seen in the pie chart in Figure 4. Out of 77 students, 30 (8+22 = 39%) students reviewed or studied above 3 times per week, another 30 (39%) students reviewed or studied 1-2 times per week, while the remaining 17 (22%) never reviewed or studied at home.

Figure 4: Study habits of 77 students who did sports or physical activities above 3 times per week

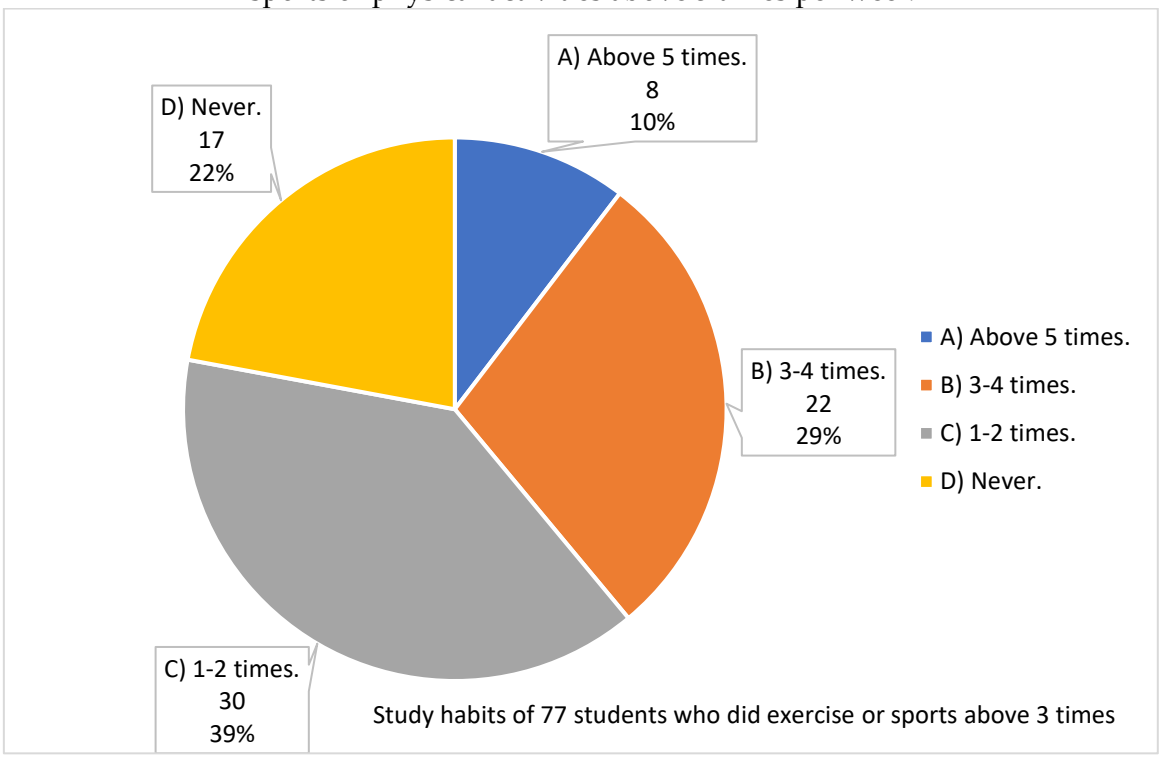
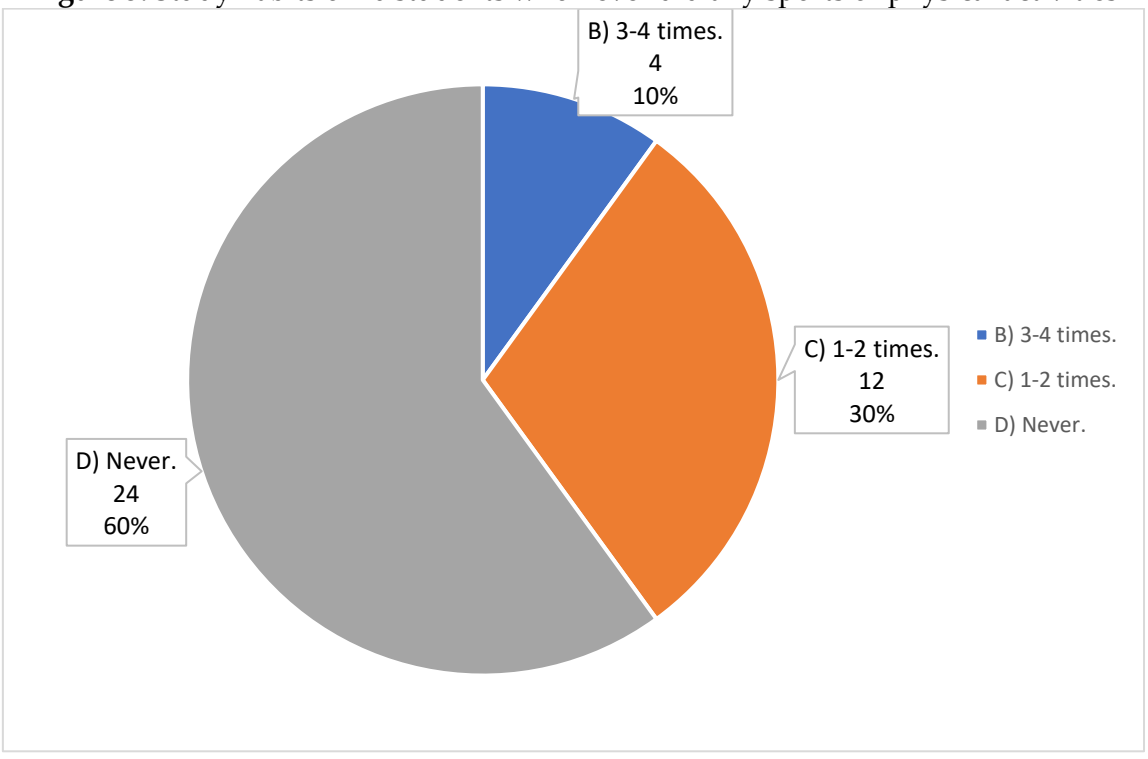


Figure 5: Study habits of 40 students who never did any sports or physical activities

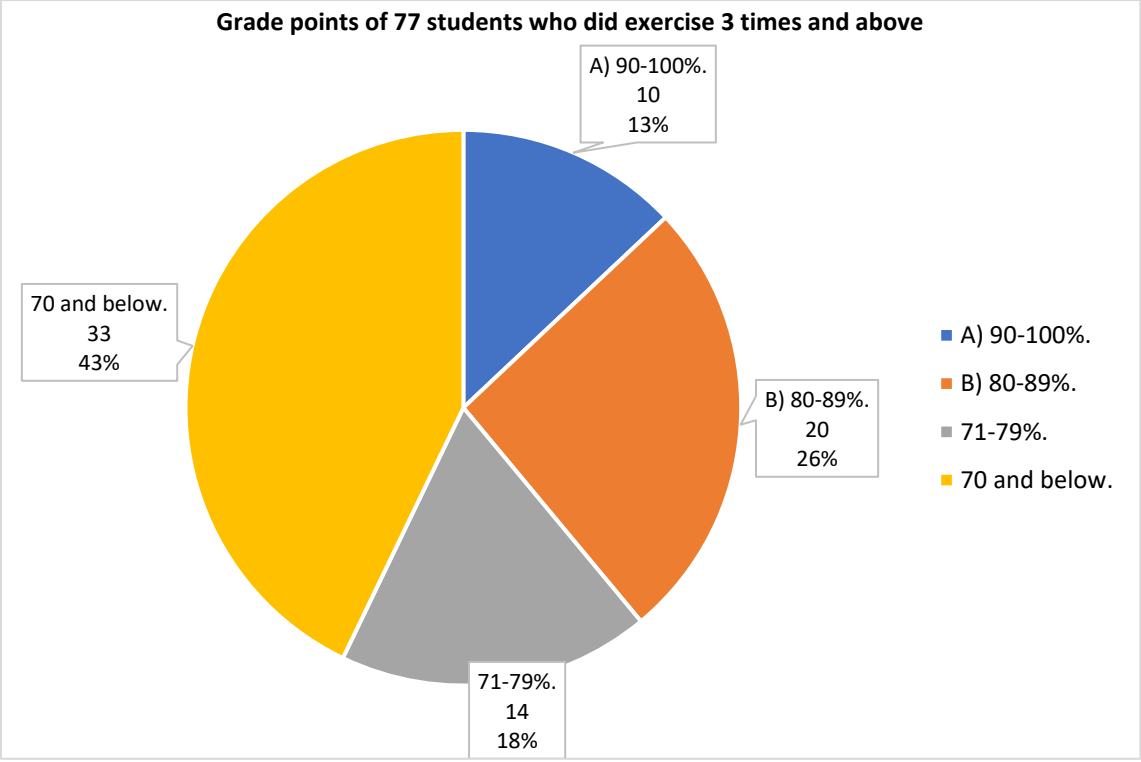


On the contrary, among those 40 students who never did any kind of exercise, sports, or physical activities, 4 (10%) students studied 3-4 times per week, while 12 (30%)

reviewed or studied 1-2 times per week. The remaining 24 (60%) students never reviewed or studied after school which can be seen from the pie chart in Figure 5 above.

The researcher also investigated if there were any differences in average grade points between those students who did regular exercise and those students who never did. The following charts in Figures 6 and 7 display the results.

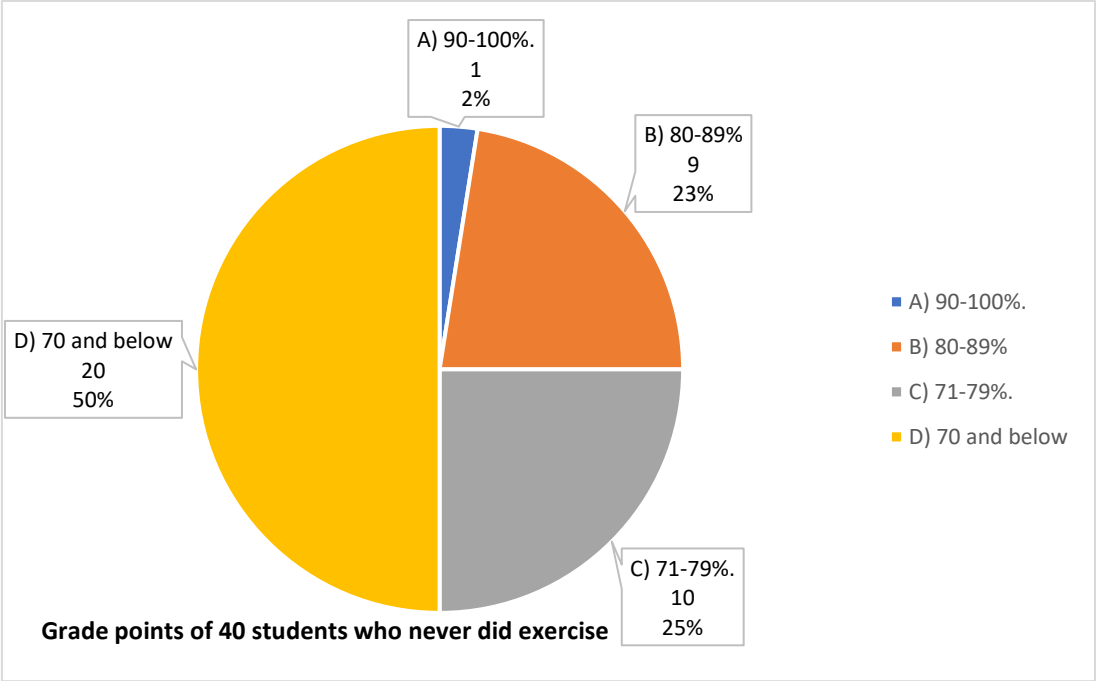
Figure 6: Average grade points of 77 students who do regular exercise



The above chart in Figure 6 displays the average semester grades of 77 students who did regular sports and physical activities per week. Out of 77 students, 30 students (39%) got above 80%, while 14 students (18%) and 33 students (43%) got 71-79% and 70% and below respectively.

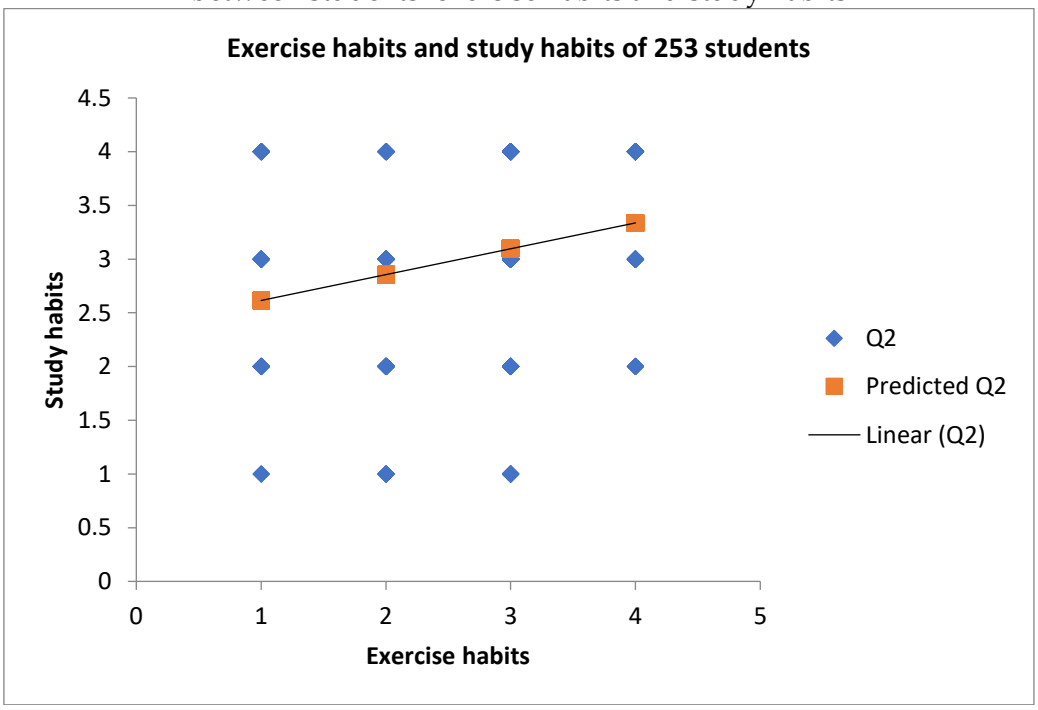
Regarding the 40 students who never did sports or related physical activities, 10 students (25%) got 80% and above, while the remaining 10 (25%) and 20 (50%) students got 71-79% and 70% and below average grade points.

Figure 7: Average grade points of 40 students who never did exercise



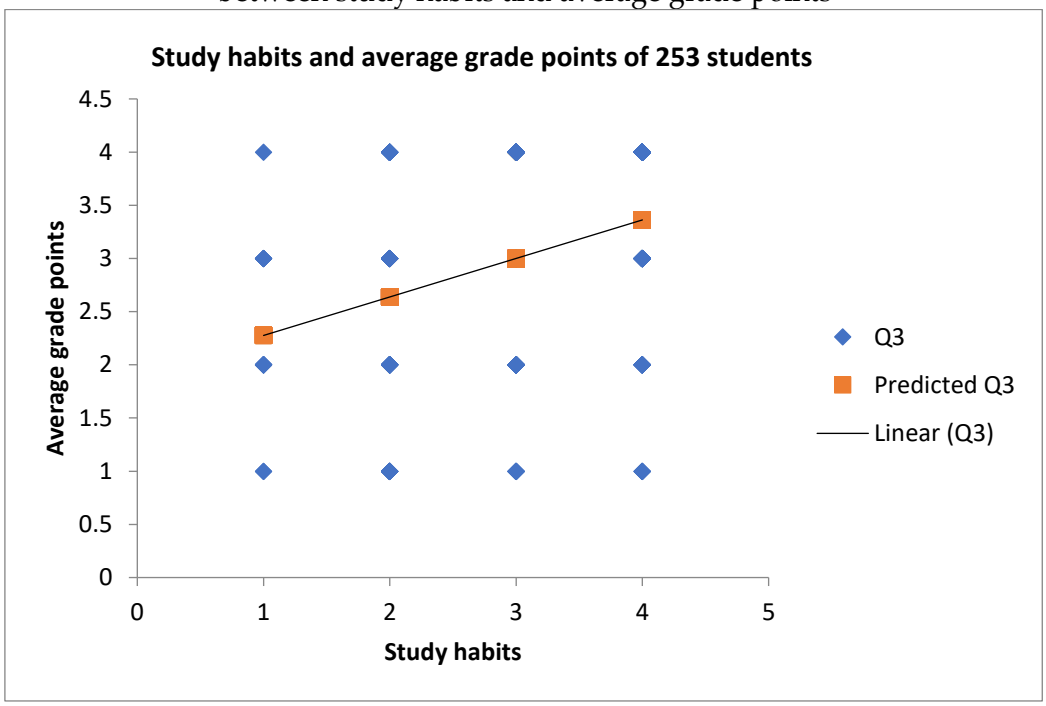
Further, to find if there is any correlation among these three variables – students' exercise habits, study habits, and semester average grade points, the collected data from 253 students was analyzed through regression analysis. The charts in Figures 8 and 9 display the results.

Figure 8: Regression chart displaying the correlation between students' exercise habits and study habits



From the chart in Figure 8 above, it can be seen that when the frequency of exercise and sports activities increase frequency of study also increases as can be seen from the regression line. The detail about correlation will be explained in detail in the discussion section below.

Figure 9: Regression chart displaying the correlation between study habits and average grade points



The above regression chart shows the correlation between study habits and average grade points. When the frequency of study increases the average grade points also increase as can be seen clearly from the chart in Figure 9 above. The details about the correlation between study habits and average grade points will be explained in the following discussion section.

3. Discussions

The present paper investigates students' exercise habits, study habits, and their average grade points. The study also investigates the correlation between these said three variables. For the said purpose, data was collected from 253 high school and college students from three different educational institutes in New Taipei City areas, Taiwan. Through the data analysis regarding students' exercise habits, it was found that out of 253 students investigated, only 31 (12%) students do exercise more than 5 times per week. In fact, it can also be considered that only 10 students did exercise (exercise, sports, or related physical activities) above 5 times a week, the other 21 students were students from sports class who had to practice 6 to 7 times per week whether they liked it or not. Another 46 (18%) students did 3-4 times a week. Out of 253, 136 (54%) students did

exercise, sports, or related physical activities 1-2 times. The remaining 40 (16%) students never did any exercise (sports or any related physical activities) as can be seen from Figure 1 above.

From these study results, it can be seen that, in spite of all the benefits offered by regular exercise, sports, and related physical activities as mentioned above by researchers like Gorton M.J. (2010), Tomporowski et al. (2008), Mohammad et al. (2012), Prasad (2012), Merlo, Basch, Wentzel, Wechsler (2015), Donnelly, J. E. et al. (2016), Andersen, M. P. et al.'s (2017), Kyan, A. et al. (2018), Zhang, Y., Ma, X., Zhao, J., Shen, H., & Jiang, F. (2019), Vasilopoulos, F., & Ellefson, M. R. (2021), among the 253 students, 30% and fewer students did enough exercise (3 times and above per week). While the remaining 54% of students did 1-2 times per week, which is far behind the recommendation suggested by the World Health Organization. The remaining 16% of students never did any kind of exercise or sports. These findings of students' exercise habits are very much in line with Ngangbam (2021), where 82% of students knew the benefits of exercise and sports, however, only 28% of them did enough exercise (3 exercise sessions and above per week). From these findings, it can be considered that more than 70% of students in Taiwan are away from these good habits of doing regular exercise, sports, and related physical activities.

On the other hand, regarding study habits, out of 253 students, 55 (22%) students reviewed or studied 3 times and above after school per week. 121 (48%) them reviewed or studied 1-2 times per week. The remaining 77 (30%) never reviewed or studied after school. From these findings, it can be seen that 68% of students investigated didn't have the study habits after school. This habit is very much linked with their exercise habits as could be seen in the regression charts in Figure 8 above.

In both exercise habits and study habits, the percentage of students who did regular exercise and regular study was low, below 30% or so. It was found that most of the students investigated did exercise and study between 1-2 sessions per week. Out of 253 students 136 (54%) students did 1-2 sessions per week and 121 (48%) students reviewed or studied 1-2 times per week, which is far below the recommended sessions given by WHO (2019).

To see if there were links between students' exercise habits and their study habits, and also to investigate if there were differences in study habits between students who did regular exercise and those who never did, the researcher extracted all the students (77) who did regular exercise and another 40 students who never did and compared their study habits. The pie charts in Figures 4 and 5 show the differences in their study habits clearly. Among the 77 students (Figure 4) who did regular exercise, 39% (Figure 4) of them reviewed or studied 3 times and above compared to only 10% (Figure 5) of students who reviewed or studied 3-4 times per week among the 40 students who never did any exercise. Among the 77 students, another 39% (Figure 4) of students reviewed or studied 1-2 times per week compared to 30% (Figure 5) among the 40 students (non-exercise group). While only 22% (Figure 4) never reviewed or studied among the 77 students, a big 60% (Figure 5) never reviewed or studied among the 40 students who never did

exercise. This clearly shows that there were close links between students' exercise habits and study habits. The findings also show the differences in study habits between those students who did regular exercise and those who never exercised. From the findings, it can be seen that those students who had good exercise habits also had good study habits. This indicates that when students have a good habit of doing exercise, they will also have good habits of study.

Regarding students' average grade points, differences also could be found between the two groups of students - students who did regular exercise and those who didn't do any kind of exercise. The exercise group got better grades than the group of students who never exercised as could be seen in Figures 6 and 7. Out of the 77 students who did regular exercise, 39% (Figure 6) of students got 80% and above compared to only 25% (Figure 7) of students in the no-exercise group. Higher percentage (39%) of students got more than 80% and above among the 77 students who did regular exercise compared to no-exercise group of students (25%). On the contrary, among the no-exercise group, higher percentage of students got less than 80%. While 75% of students among the 40 students got less than 80%, 61% of students got less than 80% among the 77 students who did regular exercise. From these findings, it can be seen that those students who did regular sports and physical activities had better study habits and got better average grade points than those students who never did any kind of sports or physical activities.

Besides these findings, to see the correlation clearly among the three variables – exercise habits, study habits, and average grade points of 253 students, the researcher analyzed the collected data and checked using regression analysis in Figures 8 and 9. Through regression analysis, it was found that there were positive correlations between students' exercise habits and study habits. In the regression chart in Figure 8, it can be seen that when students' exercise habits went up, their study habits also went up. On the contrary, when students' exercise habits were low, their study habits also went low. It clearly shows the positive correlation between exercise habits and study habits among the 253 students.

Regarding the correlation between students' study habits and average grade points, the regression chart in Figure 9 clearly shows the correlation between students' study habits and average grade points. In the regression chart, when students' study habits increased, the average grade points also increased. On the contrary, when their study habits went low, their average grade points also went low. These findings show that there were positive correlations among the three variables – students' exercise habits, study habits, and average grade points, either directly or indirectly.

Thus, from these findings, it is clear that the good and healthy habits of doing sports and physical activities regularly can influence students' study habits and average grade points positively. Due to these good habits of doing regular sports and related physical activities, good habits of reviewing and studying are formed, which in turn can help students get better grades than those students who do not have these good habits of doing sports or physical activities.

Doing regular exercise, sports, and related physical activities not only helps students to be fit, healthy, and active, and create better study habits, but doing these physical activities will develop personal, interpersonal skills, goal-setting skills, self-identity, and competency among students (Ivaniushina & Zapletina, 2015), enrich language skills and self-confidence (Lazaro & Anney, 2016), help reduce behavior problems (Massoni (2011, Soyturk & Ozturk, 2020), develop self-esteem and discipline (Muloiwa & Odimegwu, 2018, Ngangbam, 2023), help emotional regulation (Vasilopoulos & Ellefson, 2021), and of course, these activities will help them to perform better in academic fields. Overall, being involved in regular exercise, sports, and related physical activities not only help students to be fit, healthy, and better students, but doing these activities regularly will make them more successful, and better person.

Unfortunately, in Taiwan, students lack the motivation to do regular exercise. Besides this, most parents and teachers have indifferent attitudes towards sports and related physical activities. Besides these, in Taiwan, the hour of physical education is less than 2 hours per week. Another natural phenomenon that keeps students away from sports and physical activities is that physical activities decline as children become adolescents. While physical activities appear to be a natural part of children's everyday lives, they decline during adolescence period (Aerts et al, 1997).

Christine A. et al. (2019) talk about the importance of instilling a habit of doing physical activities during childhood. Parents and teachers should instill the habits of doing sports and related physical activities in children. As children grow up as adolescents and physical activities decline naturally, parents and teachers need to constantly encourage their grown-up children/ students to do regular exercise, sports, and related physical activities by becoming role models themselves.

4. Limitations

The present study has its own limitations. The study samples are confined to New Taipei City areas only. It would be even better, and more reliable if cross-sections of the population all over Taiwan are included. The other limitation is the number of samples studied. As a quantitative, cross-section, and descriptive study, bigger data would be more reliable. It is advisable to have bigger data and cover more population from different areas.

5. Conclusion

The present study is a quantitative, cross-sectional, synchronic, and descriptive study that investigated students' exercise habits (sports and other related physical activities), study habits and their average grade points, and the correlations among these 3 variables. The study is based on the hypothesis that there is a correlation among students' exercise habits, study habits, and average grade points. For this purpose, data were collected though a survey from 253 senior high school and college students who were studying at

two vocational high schools, one non-vocational high school, and one university in New Taipei City area. Through data analysis, it was found that there were correlations among the three variables – students' exercise habits, study habits, and average grade points.

Out of 253 high school and college students, 31 (12%) students did exercise more than 5 times per week. In fact, only 10 students did above 5 times a week, the other 21 students were sports students who had to practice 6 to 7 times a week. Another 46 (18%) students did 3-4 times per week. While out of 253, 136 (54%) students did exercise and sports 1-2 times, the remaining 40 (16%) students never did exercise or sports. These findings on exercise habits are very much in line with Ngangbam's (2021) earlier study where he talks about the lack of regular exercise among Taiwanese students. Regarding study habits, out of 253 students, 14 (6%) students reviewed or studied above 5 times per week at home, while 41 (16%) of them reviewed or studied 3-4 times at home. While 121 (48%) students reviewed or studied 1-2 times per week, 77 (30%) of students never studied at home.

Another interesting finding was the difference in study habits between those students who did regular sports or physical activities 3 times and above and those students who never did any kind of exercise. Out of the 253 students, among the 77 who did regular sports or physical activities, 39% of them reviewed or studied above 3 times per week compared to only 10% among the 40 non-exercise students. Another 39% of students among the 77 students reviewed or studied 1-2 times per week compared to 30% among the non-exercise students. While the remaining 22% of students among the 77 students never reviewed or studied at home, a big 60% of students among the 40 non-exercise students never reviewed or studied after school. Thus, it was found that there were sharp differences in study habits between the students who did regular sports or physical activities and those who didn't.

Regarding students' average grade points, differences also could be found between the two groups of students. The exercise group did better than the group of students who never did exercise. Out of the 77 students who did regular exercise, 39% got 80% compared to only 25% of students in the non-exercise group. A higher percentage of students got more than 80% and above among the 77 students (39%) compared to 40 students (25%). On the contrary, among the 40 non-exercise students, more percentage of students got less than 80%. Among the 40 non-exercise students, 75% of students got less than 80% compared to 61% among the 77 students. From these findings, it can be seen that those students who did regular sports and physical activities had better study habits and got better grades than those students who never did any kind of sports or physical activities.

Through correlation and regression analysis, the present study also proves that there was a positive or significant relationship among exercise habits (sports and physical activities), study habits, and average grade points. The correlation between exercise habits and study habits can be seen clearly from the chart in Figure 8. In these regression charts, when the exercise habits increase the study habits also increase. From the chart in

Figure 8, it can be seen that there is a statistically positive relationship between students' exercise habits and study habits.

Regarding the relationship between study habits and average grade points, it can be seen that there is a statistically significant positive relationship between students' study habits and average grade points. In the regression chart in Figure 9, when the study habits increased, students' average grade points also increased. Thus, the correlation between study habits and average grade points is significant, and the three variables are correlated.

Thus, from these findings, it is clear that there is a positive correlation between students' exercise habits, study habits, and their average grade points. The study also shows that exercise habits can influence students' study habits and average grade points directly or indirectly.

Exercise and sports are not only for physical fitness but also good for study habits, academic performance, and self-discipline as mentioned by many experts in the literature section. In the absence of these good habits, it is easier for young students to waste their valuable time in unproductive activities like spending too much time on screens, social media, or just being couch potatoes. Exercise and sports also can give students more self-confidence, self-esteem, and more happiness as found by many researchers.

Unfortunately, in Taiwan, the percentage of students who are involved in regular exercise, sports, or related physical activities is very low. Parents, guardians, teachers, and educationists need to change their indifferent attitudes and views toward the benefits of exercise, sports, and other related physical activities. They should encourage their children and students to do regular exercise, sports, and other related physical activities for physical and mental health benefits, academic achievements as well and for overall personal development.

Conflict of Interest Statement

The author of this research paper, Dr. Ngangbam, Shantikumar Meetei has no conflict of interest to disclose/declare.

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