PATH ANALYSIS ON ACADEMIC STRESS, PHYSICAL ACTIVITY, SLEEP QUALITY AND MENTAL HEALTH OF PUBLIC SCHOOL STUDENTS

IRENE O. BAJENTING[1] and **DR. VICTOR G. QUIAMBAO, JR.**[2]
[1]Central Mindanao Colleges, Kidapawan City, Philippines.
Corresponding email: ibajenting@cmc.edu.ph

ABSTRACT

The purpose of the study was to identify the level of physical activity, Sleep Quality, Mental Health, and Academic Stress of students, To Examine the significant relationship of the variables, The variable that best predicts Academic Stress and What Model Best fits Academic Stress at selected public secondary schools of Makilala, Cotabato. The Path analysis was evaluated through an adapted and modified questionnaire, using a stratified random sampling. The research utilized descriptive statistics particularly mean and frequency count and simple regression and Pearson R correlation, Structural Equation Modeling. This study explores the intricate relationships between academic stress, physical activity, sleep quality, and mental health among public secondary students. Utilizing survey data, the study reveals moderate levels of academic stress attributed primarily to workload and perceived pressure. While students demonstrate modest engagement in physical activity and maintain healthy sleep habits, their mental health appears robust, with high levels of emotional well-being and coping mechanisms. However, individual levels of physical activity, sleep quality, or mental health do not directly impact academic stress within the group under study. Further research is recommended to delve into the complex interactions among these variables and refine the model's fit to the data. Collaboration among researchers, educators, and stakeholders is essential to validate findings and inform evidence-based interventions promoting student well-being.

Keywords: *Path Analysis, Academic Stress, Physical Activity, Sleep Quality, Mental health, Public Secondary Students, Municipality of Makilala, Philippine*

INTRODUCTION

People believed for a very long time that students were the group least impacted by stress or issues of any kind. Stress is generally recognized as a lifestyle dilemma that impacts people at any level of development. (Reddy et al., 2018). Students frequently experience academic stress, especially those who attend public schools. Stress can be increased by the need to perform well academically, live up to expectations, and deal with the difficulties of coursework. This stress can manifest in various ways, including anxiety, burnout, and emotional exhaustion, all of which can have detrimental effects on students' mental health. Pariat (2014).

Improving one's physical and emotional well-being requires physical activity. Numerous studies have shown that regular physical activity is associated with less

stress, higher moods, and improved cognitive function. However, public school students may have challenges in obtaining adequate physical activity due to their sedentary lifestyles, limited access to sports facilities, and academic obligations. (Hasan et al., 2020). For emotional control, cognitive performance, and general wellness, getting enough sleep is crucial. Students in public schools frequently have sleep disturbances as a result of their heavy workloads in the classroom, extracurricular activities, and screen time. Teenagers who have poor sleep quality are more likely to experience stress, anxiety, and depression, underscoring the complex connection between sleep and mental health. Mauss & Associates, 2013

One major area of concern is pupils' mental health in public schools. Stress related to school, insufficient exercise, and poor sleep quality can all have a negative effect on students' mental health, which can result in a variety of problems like anxiety disorders, depression, and a general decline in life satisfaction. Developing focused treatments to enhance students' psychological resilience and well-being requires an understanding of the pathways via which these factors influence mental health (Wu et al., 2015). Recent research has demonstrated a direct correlation between academic stress and poor sleep quality, anxiety, and depression. Furthermore, among high school students, the quality of their sleep has been linked to both academic and mental health (Sano et al., 2015).

The study could aid in the development of efficient interventions to enhance the general health of public school pupils by offering insightful information on the variables influencing both their physical and mental well-being. Furthermore, studies have shown that physical activity improves sleep quality, wellbeing, and mood during times of academic stress.

FRAMEWORK

The foundation of this research is Albert Bandura's social cognitive theory, which highlights the importance of self-efficacy, self-regulation, and observational learning in behavior modification.

This idea can be used to comprehend how students' mental health is impacted by stress related to their academic work, physical exercise, and sleep quality. It implies that people pick up knowledge from watching others and that self-efficacy beliefs are a major factor in influencing the actions people choose to do. By using this theory, we may gain a better understanding of how students' beliefs about our capacity to cope with stress related to school, stay physically active, and get enough sleep, affect the outcomes that pertain to their mental health.

An individual's health-related behavior is influenced by their beliefs of the threat posed by a health problem, the advantages of avoiding the threat, and the barriers to acting, according to The Health Belief Model, which is another theory that best captures the situation. With regard to their mental health, students' perceptions of sleep quality, physical exercise, and academic stress may all be understood using this approach. It can provide light on the variables influencing students' choices to participate in activities that support the development of their mental health.

These theoretical frameworks, in addition to the one discussed before, can offer a thorough comprehension of the intricate connections between kids in public schools' academic stress, physical activity, sleep quality, and mental health. Researchers can

create successful interventions to support positive mental health outcomes and obtain a more comprehensive understanding of the elements impacting students' well-being by taking into account a variety of theoretical viewpoints.

METHODS

Research Design

This study utilized the path analysis research design. In this design the quantitative data were collected. The fields of quantitative research are logic, statistics, and objective position. Its main focus is on quantitative, static data as well as thorough, convergent reasoning and the production of several hypotheses for a given research subject. Its primary features are as follows: the data is typically collected using structured research instruments; the results are based on larger sample sizes that accurately reflect the population; due to the study's high reliability, it can typically be repeated; and the researcher uses research instruments, like computer software or questionnaires, to collect numerical data (Babbie at al. 2010).

Research Respondents

Three hundred public high school students in Makilala, North Cotabato made up the study's respondents. During the study's execution, only those public secondary pupils were included. Since public secondary school students are the primary target respondents for this survey, the researcher made this choice.

Research Instruments

To collect data from respondents and determine its reliability, sets of survey questionnaires will be employed in the quantitative component. The participants' academic stress was measured using the 16-item Educational Stress Scale for Adolescents (ESSA). The physical activity scale is adapted from International Physical Activity Questionnaire. Moreover, the Pittsburgh Sleep Quality Index intended to assess clinical populations' sleep quality. Lastly, the Mental Health Quality of Life questionnaire is used to assess the mental health issues.

Statistical Tools

The study utilized descriptive statistics particularly mean and frequency count and simple regression and Pearson R correlation. Mean and frequency were used to provide interpretations on the data on describing the respondents' responses on academic stress, physical activity, sleep quality and mental health. On the other hand, multiple regression was used to find relationships between academic stress, physical activity, sleep quality, and mental health, in that order. A multivariate statistical analytic method called structural equation modeling is used to examine structural relationships between the variables.

RESULTS AND DISCUSSION

Academic Stress of Public-School students

The overall mean of Academic Stress is 3.18 which can be described as moderate. This means that academic stress of public-school students exhibits a moderate level.

Perceived Pressure. The statement "I feel that there is too much pressure to achieve higher grades in my subjects" had the highest mean of 2.95 among the three statements on the indicator of perceived pressure, making it classified as moderate. In contrast, the statement "There is too much competition among classmates which brings me a lot of Academic stress" had the lowest mean of 2.69. The indicator felt pressure's overall mean is 2.84, which is a moderate value. This aligns with Zhang and McGrath's (2015) that internalized expectations to perform well academically might lead to academic pressure, which in turn causes psychological suffering in students.

Workload. The findings of the survey on academic load indicate that students are under a moderate but noticeable amount of stress. Firstly, despite the fact that students (mean score of 2.55) indicate a minor level of worry regarding the quantity of tests and exams, this nevertheless indicates a major source of pressure in the classroom. This is in line with research demonstrating the impact of test frequency on pupils' stress levels as Putwain et al. (2018) study reported that too much testing might lead to increased anxiety and decreased wellbeing in students, which can eventually harm their academic performance. The comparatively low standard deviation of 0.501 highlights the respondents' consistent impression of pressure connected to tests and highlights its pervasive influence on students' lives.

Coping Strategies. According to the poll, students in public schools experience a moderate level of academic stress, which is indicated by worries about workload, coping mechanisms, and perceived pressure. The overall mean of 3.18 indicates a moderate level. This aligns with Suldo et al. (2011) that the dependence on coping mechanisms, especially asking for help from friends and family, emphasizes the necessity of strong support networks in communities and schools for kids to properly manage their stress.

Physical Activity of Public-School students

The Overall mean of 2.63 indicates that, on average, the selected public secondary students are moderately engaged in physical activities, there may be a room for improvement in certain areas.

Frequency. The mean scores for indications such as actively looking for opportunities to engage in physical activity during daily routines (2.49), combining a variety of physical activities in daily routines (2.55), and regularly engaging in physical activity (2.31) reflect the "Low" interpretation category. This suggests that a significant portion of students enrolled in public schools would not be meeting the daily recommended allotment for physical activity, which typically entails engaging in moderate to vigorous physical activity for at least 60 minutes. According to Janssen and LeBlanc's (2010) research, children and adolescents benefit greatly from regular physical activity since it fosters healthy growth and development and lowers their risk of

developing chronic diseases in later life. Higher levels of physical activity are positively correlated with a number of health outcomes, such as cardiovascular fitness, musculoskeletal health, and mental well-being, as shown by their comprehensive review and meta-analysis. Furthermore, a Trost et al. (2002) study highlights the value of mixing up regular activities with a range of physical activities, as this can assist boost overall activity levels and avoid boredom or burnout related to repetitive tasks. As a result, the low frequency of physical activity among students in public schools emphasizes the necessity of focused interventions meant to encourage consistent and diverse physical activity practices.

Duration. The findings about how long students in public schools spent engaging in physical activity show a modest degree of pleasure and adherence to suggested durations. The "Moderate" interpretation category is reflected in the mean scores for indicators such as satisfaction with current physical activity duration (2.79), perceived sufficiency for maintaining good health (2.59), and consistency in participating in physical activities for at least 30 minutes per session (2.76). This shows that although students engage in physical activity to some extent, there is still opportunity for growth in terms of regularity and length. The idea that regularity and duration of physical activity are essential for obtaining its health benefits—especially for adolescents—is bolstered by Dumith et al. (2011). Longer periods of physical exercise are positively correlated with a number of health outcomes, such as mental, musculoskeletal, and cardiovascular health, according to their study. Additionally, a study by Telama et al. (2014) emphasizes the need of keeping up a regular schedule of physical exercise during adolescence in order to form lifelong habits and prevent chronic diseases later on.

Therefore, it appears that even while students may understand the value of physical activity and make an attempt to participate, longer and more consistent participation is still required. This is supported by the moderate scores seen in the duration indicators.

Intensity. The findings regarding kids' levels of physical activity intensity in public schools point to a modest degree of engagement and perceived efficacy. The "Moderate" interpretation group is indicated by the mean scores for indications like feeling energetic and refreshed after physical activity sessions (2.69), finding the intensity difficult and doable (2.66), and aligning with suggested health criteria (2.85). This suggests that most students believe their exercise regimens are appropriate in terms of intensity, and they enjoy benefits like more energy and compliance with health recommendations. This aligns with Warburton et al. (2006) who emphasize that physical exercise must be performed at a high enough intensity in order to have the desired health effects. The significance of moderate-to-intense physical exercise in lowering the risk of chronic illnesses like diabetes, cardiovascular disease, and several types of cancer is highlighted by their meta-analysis.

Sleep Quality of Public-School students

The overall quality of sleep is 3.66 which is considered high. This indicates that students have very good quality sleep.

Sleep Duration. The data supplied indicates that the person consistently achieves a high degree of sleep duration and quality based on the survey replies. The person's average score of 3.75 out of 5 for obtaining adequate sleep each night is the first characteristic that jumps out. This suggests that they think the amount of sleep they receive each night is adequate for their requirements. This is consistent with studies conducted by Ohayon et al. (2017), who highlighted the significance of getting enough sleep for general health and cognitive performance. Short sleep duration has been associated with a number of detrimental health effects, such as mood swings, worse cognitive function, and an elevated risk of chronic illnesses.

Sleep Efficiency. A person's overall sleep quality can be inferred from the assessment of their sleep efficiency, which is influenced by a number of factors. Here, the data point to a mediocre degree of sleep quality, with certain factors impacting the final score. First off, with a score of 3.84, which is noticeably higher than usual, the person's sleeping environment seems to be quite favorable to restful sleep. This finding suggests that their bedroom arrangement, which includes features like lighting, noise reduction, and comfort, is in line with encouraging restful sleep. This conforms with Hume et al. (2017) that comfortable bedding and a suitable room temperature are important components of an ideal sleep environment that can improve both the quality of one's sleep and general well-being.

Overall Sleep Satisfaction. This study on public secondary school students' overall sleep satisfaction of 3.87 which show that although though students emphasize how important getting enough sleep is to their general health, they also express a great deal of happiness with the quality of their sleep and how rested they feel when they wake up. This conforms with Owens, Belon, and Moss (2014) who expressed how important getting enough sleep is for adolescent health, mood regulation, and cognitive function. Furthermore, Wahlstrom, Dretzke, Gordon, Peterson, and Edwards (2014) propose that programs supporting sleep education and healthy sleep habits in schools may be a factor in the high levels of sleep satisfaction among public secondary students that have

Mental Health of public secondary students

The results show an overall mean of 4.14, mental well-being is considered to be high. This indicates that kids have a high degree of mental health.

Emotional Well-Being. The mean of 4.04 for emotional well-being among secondary public students present a favorable image, showing that students typically enjoy high levels of emotional well-being in their daily lives. This finding support a paradigm of "complete mental health" put out by Keyes (2005), which includes social, psychological, and emotional well-being. In line with the study's findings, this model posits that people with high emotional well-being exhibit good feelings, life engagement, and a sense of purpose in addition to the lack of mental illness.

Coping Mechanism

The findings about coping strategies has a mean of 3.98 indicate a respectable degree of self-assurance and effectiveness in managing stressors and difficulties. Students appear to have robust coping mechanisms based on their high scores in all areas examined, including engagement in mental and emotional health-promoting activities, good stress management techniques, and confidence in one's own coping skills. This conforms with Masten and Obradović's (2006) research highlights the role resilience plays as a buffer against the negative impacts of adversity and stress. Additionally, the proactive attitude to stress management that public secondary students take is further evidenced by their enthusiastic involvement in mental and emotional health support programs. Fredrickson's (2001) study on the broaden-and-build hypothesis of happy emotions suggests that engaging in positive emotion-promoting activities can enhance resilience and coping abilities.

Psychological Functioning

The findings about psychological markers of mental health has a mean of 4.41 which present a positive image of their general wellbeing. Strong psychological resilience and good mental health are suggested by high scores on all the characteristics examined, including having a supportive social network, feeling in control of life, and being receptive to getting mental health care. This conforms with Reblin and Uchino's (2008) research that emphasized the critical role that social support plays in fostering psychological resilience and acting as a buffer against the negative consequences of stress.

Relationship between the variables

Table 1 presents the correlation between Academic Stress and Physical Activity, Sleep Quality, and Mental Health among Secondary Public Students. The findings demonstrated that there are no meaningful connections between students' academic stress and their levels of physical activity, good sleep, or mental health.

The correlation coefficient (R) is -0.042, and the p-value is 0.469. A nearly zero correlation and a high p-value suggest that there is no statistically significant relationship between academic stress and physical activity. Stated differently, there doesn't appear to be a relationship between an individual's degree of academic stress and their amount of physical exercise.

The correlation coefficient (R) is 0.038, and the p-value is 0.510. Consistent with the previous relationship, these results suggest that there is no significant correlation between academic stress and sleep quality. This suggests that there is no connection at all between a person's degree of stress at school and how well they sleep.

The correlation coefficient (R) is -0.105, and the p-value is 0.070. In this instance, the correlation coefficient is marginally bigger than in the other relationships, although it is still rather close to zero. However, the 0.05 conventional significance criterion is just marginally exceeded by the p-value of 0.070. It is also vital to remember that there may be a trend suggesting that a little lower level of academic stress may be associated to greater mental health, even when the relationship is not deemed significant by traditional metrics.

After being evaluated in relation to one another, it was shown that there was no statistically significant correlation between academic stress in the population under

research and physical activity, sleep quality, mental health, and academic stress. The correlation coefficients for physical activity, sleep quality, and mental health are all close to zero, indicating that the observed connections are not statistically significant, with p-values greater than 0.05.

These findings suggest that within the study group, individual differences in physical activity, sleep hygiene, or mental health may not have a substantial effect on academic stress. It is important to keep in mind that these relationships may still exist but be hidden by other factors that the research did not account for, even if they are not statistically significant in this particular study.

The intricate and varied character of academic stress is one reason why there may not be any meaningful relationships. Even though stress levels and general well-being are known to be impacted by physical exercise, sleep hygiene, and mental health, other factors like workloads in the classroom, social pressures, or personal situations may have a greater overall impact. This supports the study of Vaez et al. (2015) which highlights the complex interplay of multiple components in generating stress experiences by indicating that academic demands, peer relationships, and coping methods influence academic stress among teenagers.

Table 1. Relationship between the variables

VARIABLES	R	p-value	Remarks
Physical Activity and Academic stress	-.042	.469	Not Significant
Sleep Quality and Academic Stress	.038	.510	Not Significant
Mental Health and Academic Stress	-.105	.070	Not Significant

*Significant at .05 level

Influence of Physical Activity, Sleep Quality, and Mental Health on Academic Stress

The results of the relationship between academic stress and physical activity, sleep quality, and mental health are shown in Table 2. The study's non-significant coefficients and overall model statistics support the findings that there is no connection between academic stress and physical activity, sleep hygiene, or mental health. It is imperative to evaluate these results in light of the body of existing knowledge and take into account plausible explanations for the observed outcomes.

Physical activity, sleep quality, and mental health are the only factors that did not exhibit a statistically significant link with academic stress among the group under research. Upon individual analysis, the unstandardized coefficients pertaining to mental health, physical activity, and sleep quality exhibit values close to zero and p-values greater than 0.05, indicating a lack of meaningful correlation between these variables and academic stress. Although there may be a negative association between academic stress and mental health, the unstandardized coefficient for mental health is relatively negative (-0.102), meaning that the correlation does not approach statistical significance at the conventional criterion of $p < 0.05$. These findings imply that individual levels of

physical activity, sleep hygiene, or other variables might not directly affect the population being study's experience with academic stress.This is in contrast with the research by Hysing et al. (2016), teenage academic stress is influenced by a wide range of variables, such as social interactions, psychological health, and academic success.

Table 2. Influence of Physical Activity, Sleep Quality, and Mental Health on Academic Stress

Variables	Unstandardized Coefficients		Standardized Coefficient	T	p-value	Remarks
	B	Std. Error	Beta			
(Constant)	3.653	.367		9.956	.000	Not Significant
Physical Activity	-.064	.085	-.044	-.760	.448	Not Significant
Sleep Quality	.033	.050	.039	.669	.504	Not Significant
Mental Health	-.102	.057	-.103	-1.782	.076	Not Significant

Structural Fit Model

Although the results are not having significant in the correlation and regression analysis, the conceptual model was still tested to determine its goodness of fit.The direct correlations between exogenous and endogenous variables are shown in Figure 1. The findings show that the combined effects of mental health, physical activity, and sleep quality on academic stress account for 13% of the variation in stress.

However, based on the indices it reveal that only the CMIN/DF and NFI passed the criteria of goodness of fit with a value of .037 and .994, respectively. Other fit indices poor fit which indicates that the model does not fit the data.

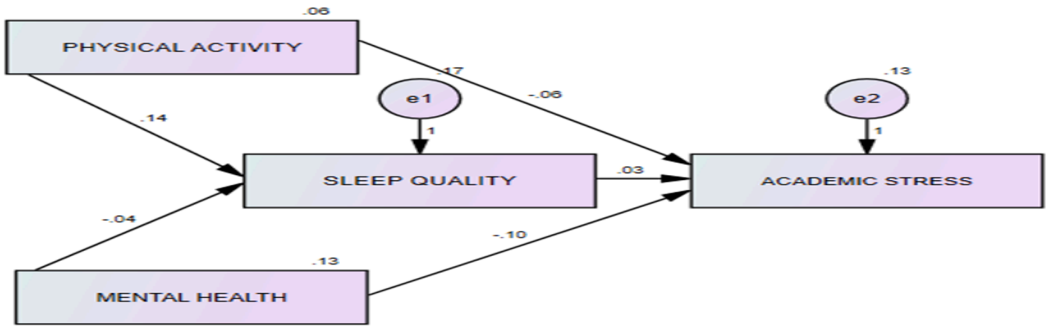

Figure 1. Conceptual Model

MODEL FIT VALUES

INDEX	CRITERION	MODEL FIT VALUES
CMIN/DF	<3.0	.037
P-value	>.05	.848
NFI	>.95	.994
TLI	>.95	9.906

CFI	>.95	1.000
GFI	>.95	.100
RMSEA	<.05	.000
PCLOSE	>.05	.895

CONCLUSION

1. The survey's overall findings indicate that public secondary students suffer from moderate levels of academic stress, which are mostly caused by issues relating to workload and the perception of pressure to perform well academically.
2. Students at public schools often engage in modest levels of physical activity, per the poll. Students incorporate a range of activities into their daily routines, despite the fact that total physical activity levels are believed to be low. Nonetheless, they don't appear to be actively searching for opportunities to be physically active throughout their everyday routines.
3. According to these results, children in public schools typically have healthy sleeping habits and have a positive perception of the quality of their sleep, which benefits their general wellbeing and ability to operate.
4. The survey's findings show that pupils in public schools typically have excellent mental health and wellbeing. They claim to be able to express and control their emotions in a healthy way, to feel purposeful and fulfilled in their everyday activities, and to experience emotional well-being in their daily lives.
5. Results indicate that individual levels of physical activity, sleep quality, or mental health may not have a significant impact on academic stress within the group under study.
6. The results suggest that while Physical Activity, Sleep Quality, and Mental Health collectively account for 13% of the variance in Academic Stress among public secondary students, they do not exert direct effects on Academic Stress individually. This underscores the complexity of factors influencing Academic Stress and highlights the need for further exploration of mediating or moderating mechanisms within this relationship.
7. The model does not fit the data which indicates a poor fitting model to explain academic stress.

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