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**A Comparative Study of Wellness Behaviours and
Body Mass Index among Adolescents**

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Moreover, for example, stationary quality, poor nourishing decisions and insufficient dozing put individuals in danger of diseases. Despite the fact that wellbeing and physical training programs are established to advance the improvement of different wellbeing and physical aptitudes, they are often faced with difficulties to their consistent presence. Thusly, issues identified with body mass index follow and show diversely crosswise over sex and race/ethnicity. This investigation focused on looking at the connections between numerous young hazard practices and body mass index. Moreover, sexual orientation and racial/ethnic contrasts among white and dark adolescent school understudies were inspected. Bi-variety and multi variety assessments of physical activity, dietary conduct, rest in connection to Body Mass Index (BMI) percentiles, was carried out by a correlation of two informational collections of the year 2017 (n=13, 363) and 2018 (n=13, 363). The outcomes uncovered a presence of sex contrasts seeing someone between physical activity, dietary conduct, rest term and BMI percentiles with noteworthy relationship in male adolescent school understudies yet not their female partners in the two informational collections. There were no racial contrasts in the quality of these connections. These discoveries point the requirement for sexual orientation based intercessions and further investigations to focus on non-emotional proportions of those wellbeing hazard practices, so as to completely understand the connections. Likewise, family, school and network based mediations to the physical activity, poor nourishment and poor rest propensities are justified, and ought to circle around higher from different partners.

Physical Activity, Dietary Behaviour, Sleep, Body Mass Index

Introduction

Various schools frequently ponder methods for managing budgetary difficulties particularly during troublesome monetary occasions. Wellbeing and physical training (PE) programs regularly become casualties of these unforeseeable budgetary deficits, prompting their decreases or terminations. Physical training ought to be stressed as a basic interest in the country's development, albeit financial leaders regularly disregard such venture. Despite the fact that rules for physical movement require significant every day physical action in youngsters and teenagers, numerous kids simply don't meet the necessities. Furthermore, numerous youngsters live in conditions that regularly do not have the capacity to give assets to a solid living. Frequently as well, the monetary hole among rich and poor, compounds the circumstance and consequently increasing outrageous wellbeing inconsistencies between poor people and their affluent partners. Of explicit significance however, are the wellbeing variations in physical movement and diet. Indeed, it is through wellbeing and physical instruction that numerous young people get significant degrees of physical movement and other wellbeing related abilities including endurance and in general prosperity. Numerous schools still fall behind the fundamental requirements for day by day moderate to energetic physical action for kids and young people.

In view of the fact that from the latest information, paces of overweight and heftiness in youngsters are levelling off, the truth of the matter is that, those rates are as yet extreme. Discussions around body synthesis ought to frequently require an assessment of school and out of school nourishment rehearses, with their unavoidable interrelationship with physical idleness. On the other hand, rather than just concentrating on sustenance and physical inertia, there is a need to examine the job of different factors outside schools, for example, inadequate diet and higher danger of heftiness among kids. This part of wellbeing and health could more profitably be tended to through family structures. Accessible proof proposes that, there is a speedily expanding reliance on ceaseless fractional rest from both epidemiological and clinical investigations demonstrating its connect to corpulence hazard and weight gain. An examination

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Additional information analyzed the relationship between self-revealed corpulence and self-reported rest length, and discovered outcomes to display sexual orientation contrasts, with young ladies having huge affiliation contrasted with their male partners, in spite of the fact that the proposals recommended alert on unexpected rest alteration works on, referring to the requirement for further investigations.

Physical movement, nourishment and rest propensities have gotten uplifted consideration in examining associations with body creation among all people. Past examinations directed to set up the connection between physical action and overweight kids in Taiwan proposed that the recommendation ought to be set on outward factors and how they sway overweight and corpulence in youngsters. These impacts are typically inside school, network and family control. A two-year longitudinal investigation revealed both eating routine related and physical movement indicators of weight in little youngsters somewhere in the range of 6 and 9 years of age. About 48% of these respondents were Latinos and their discoveries recommended that there was an entombment between the elements of diet, physical action and weight. Somewhere else, environmental designs, physical movement, rest, TV survey, and longer rest hours were related with utilization of cheap food, the absence of vegetables and natural product rich eating routine among Portuguese kids. TV seeing frequently expands the plunk down time, which is source to poor quality and sitting sickness disorder.

Materials and Methods

1.1. Location and Setting

Information from member reactions on the 2017 and 2018 Risk Behavior Survey were utilized to identify and inspect wellbeing hazard conduct things about physical movement, nourishment and rest. From ninth to twelfth class understudies. The two examples for the 2017 and 2018 were selected utilizing a three-organize group test. Members were from chosen private and government funded schools.

Table 1: Categories for Health and Wellness Risk Behaviours.

Physical Activity	Dietary Behaviours	Sleep Duration
Always (5-7 days)	Frequent Consumption (5-7 days)	Recommended (8-10+ hours)
Sometimes (3-4 days)	Moderate Consumption (3-4 days)	Close to Recommended (6 < 8 hours)
Rarely (<3 days)	Little/No Consumption (<3 days)	Less than Recommended (<6 hours)

3.1. Statistical Analysis

Univariate and multi-variate measures were used to determine the relationship between the three independent variables of physical activity, dietary behaviours and sleep and the dependent variable of body mass index. Due to the continuous nature of the variables, Spearman Rho correlation was applied to establish the relationship between each independent variable with the dependent variable. Correlation coefficient, r values range from -1 to +1. In addition, the relationship between these independent variables and the dependent variable was examined with multiple linear regressions using Statistical Program for Social Sciences (SPSS 23).

Multiple linear regression, an extension of simple linear regression, was used for this study based on the following equation:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_nX_n + \text{error}$$

In this analysis, the assumption for an error value of 0 is necessary. Therefore, the estimate of the dependent variable Y (BMI percentile), for this study was given by the following equation:

$$Y = \beta_0 + \beta_1PA + \beta_2DI + \beta_3S + \beta_4G$$

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where \hat{Y} is the predicted, expected or estimated dependent variable of BMI percentile, α is the constant, β_{pa} , β_{db} and β_s are regression coefficients for physical activity, dietary behaviour, sleep and gender respectively. A model that accounted for a higher percentage of the prediction was more reliable, and is more acceptable.

For both males and females, emphasis was placed on the two groups that were used as independent variables in this study. A multiple regression equation that related the dependent variable of Y (BMI Percentile) to each independent variable of Physical Activity (PA), Dietary Behaviour (DB) and Sleep (S) and their product, while checking for interaction and confounding for gender and ethnicity was estimated. The interactions were

Physical Activity (PA) and Ethnicity (E) = PA by RE Interaction Variable (PA. RE)

Dietary Behaviour (DB) and Ethnicity (E) = DB by RE Interaction (DB. RE)

Sleep and Ethnicity (E) = S by RE Interaction (S. RE).

Table 1: Bivariate Associations with Health Risk Behaviours.

		2017		2018	
		r	p-value	r	p-value
Physical Activity	All	-.31	.001	-.28	.020
	Boys	.74**	.000	-.56**	.000
	Girls	.01	.958	.03	.829
Dietary Behaviour	All	-.22	.015	-.10	.270
	Boys	-.32**	.014	-.45**	.001
	Girls	-.15	.167	.17	.200
Sleep	All	-.31	.001	-.09	.334

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Where \hat{Y} is the predicted, expected or estimated dependent variable of BMI percentile, α is the constant, β_{pa} , β_{db} and β_s , and β_g are regression coefficients for physical activity, dietary behaviour, sleep and gender respectively. A model that accounted for a higher R^2 in the prediction was more reliable, and is more acceptable.

For both males and females, emphasis was placed on the two groups that were used as independent variables in this study. A multiple regression equation that related the dependent variable of Y (BMI Percentile) to each independent variable of Physical Activity (PA), Dietary Behaviour (DB) and Sleep (S) and their product, while checking for confounding for gender and ethnicity was estimated. The interactions were

Physical Activity (PA) and Ethnicity (E) = PA by RE Interaction Variable (PA. RE)

Dietary Behaviour (DB) and Ethnicity (E) = DB by RE Interaction (DB. RE)

Sleep (S) and Ethnicity (E) = S by RE Interaction (S. RE).

Results

Table 1: All Associations with Health Risk Behaviours.

		2017		2018	
		<i>r</i>	<i>p-value</i>	<i>r</i>	<i>p-value</i>
Physical Activity	All	-.31	.001	-.28	.020
	Boys	.74**	.000	-.56**	.000
	Girls	.01	.958	.03	.829
Dietary Behaviour	All	-.22	.015	-.10	.270
	Boys	-.32**	.014	-.45**	.001
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	All	-.31	.001	-.09	.334

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Boys	-.47**	.000	-.21	.107
Girls	-.19	.148	-.04	.778

Significance = .005

3.1 Physical Activity and BMI Percentiles

Table 3.1.1: Bivariate analysis using Spearman's Rho yielded a significant, negative correlation between BMI percentile and physical activity score among high school students ($r = -.31, p = .001$). This indicates that the higher levels of physical activity among high school students, the lower the BMI percentiles. Spearman's Rho correlation between PA score and BMI percentile yielded a significant, negative correlation among high school boys from the 2013 data ($r = -.74, p = .000$) and a weak and non-significant correlation among high school girls ($r = .01, p = .958$).

Table 3.1.2: The correlations between BMI percentiles and physical activity also yielded a significant, negative correlations among high school students ($r = -.28, p = .020$). Among high school boys, the correlations were significant and negative ($r = -.56, p = .000$) and a non-significant correlation among high school girls ($r = .03, p = .829$). Consequently, higher levels of physical activity were found to be associated with significantly lower BMI percentiles in high school boys and not among high school girls.

3.2 Dietary Behaviours and BMI Percentiles

Table 3.2.1: Spearman's Rho yielded a weak negative correlation between dietary behaviour score and BMI percentiles from the 2013 data ($r = -.22, p = .015$). Spearman's Rho yielded a weak negative correlation between DB score and BMI percentiles among high school boys ($r = -.32, p = .001$). Spearman's Rho also yielded a weak negative correlation between dietary behaviour and BMI percentiles among high school girls ($r = -.15, p = .167$). However, this correlation was not significant at the set p value. These results suggest that, higher dietary behaviour scores were associated with lower BMI Percentiles in high school boys but not in high school girls.

Table 3.2.2: The bivariate correlations yielded indirect associations between dietary behaviours and BMI percentiles among all high school students. However, the correlations were not significant ($r = .10, p = .270$).

were different between males ($r = -.45, p = .001$) and females ($r = .17, p = .200$). The correlations between dietary behaviour and BMI percentiles among male high school students were both significant, negative and indirect in nature. Therefore, this suggests that higher dietary behaviour scores are associated with lower BMI percentiles in high school boys but not in girls.

3.3 Sleep and BMI Percentiles

For 2017 Spearman's Rho yielded a negative and weak correlation, but yet significant at the set p value for the 2017 data ($r = -.31, p = .001$). For boys, longer sleep durations were associated with lower BMI percentiles ($r = -.47, p = .000$). In girls, the results were not significant ($r = -.19, p = .148$). The differences in correlations between boys and girls were tested for significance of difference using a z-test ($p = .000$) and this result was significant at $p < .05$. The results implied that the longer the sleep duration by high school boys, the lower their BMI percentiles, unlike in their female counterparts.

For 2018 Analyses from the 2018 data, yielded non-significant correlation ($r = -.09, p = .334$) among high school students. The 2018 data also yielded negative but non-significant correlations between sleep duration and BMI percentiles ($r = -.21, p = .107$) among males. In addition, there were non-significant negative correlations in females ($r = -.04, p = .778$). This analysis didn't confirm the significance of the relationship between sleep duration and BMI percentiles among high school students overall or between boys and girls based on the 2018 data. The results of the 2017 and 2018 analyses for sleep duration differ in terms of significance.

Conclusion This study precedes any other in comparing two data sets in examining relationships between health risk behaviours of physical activity, dietary behaviour and sleep with BMI percentile. The health- risk behaviours used as variables in this study continue to receive attention in ways that they relate to overall health among individuals of this group, irrespective of gender or race. The results of this study encourage further examinations using quantitative measures of physical activity, dietary behaviour and sleep. Considerations for method questions or items that address specific behaviours, are necessary. From the results of this study, there are specific implications for each health-risk behaviour and body mass index, in relation to adolescent health. Gender differences in physical activity have been documented

in previous research. These were evident in physical activity and weight status associations among high school students surveyed. A previous study utilized a unique approach that characterized physical activity in different dichotomous variables.

With the persistence of the overweight and obesity problem, especially in children and adolescents, schools and communities at large are continuously implementing wellness policies that are intended to reduce childhood obesity, although they are often challenged by budgetary cuts. To this end, behaviours engaged in away from school, remain a challenge to boys and girls alike. From the results of this study, nutrition and weight status are remarkably important aspects of our daily lives. This study uncovered gender differences in dietary behaviours similar to those identified in a previous study of 878 adolescents aged between 11 and 15 years. These were studied for diet, physical activity and sedentary behaviours as risk factors for overweight. Though this revelation seems interesting in terms of comparisons, the studies did not use a similar approach to defining dietary behaviours, since the two studies differ in design and setting. Addressing dietary related problems requires a wider range of approaches that address the need for a cultural shift in nutrition, particularly for foods served in schools and community settings. Interestingly also, is the fact that plant based foods may not be widely appealing to many adolescents.

The current study also revealed noticeable gender differences in associations between sleep duration and BMI percentiles. There were significant indirect relationships between sleep duration and BMI percentiles among boys and non-significant indirect relationships in their female counterparts. The results are equivocal with an implication that further research on sleep duration within different weight status categories is indispensable. In addition, relationships between different weight status categories could possibly reveal valuable information to address sleep duration especially in categories that don't meet the recommended durations. In addition, the prevalence of early onset of metabolic syndrome, overweight and obesity, and a cluster of these abnormalities are becoming increasingly recognisable in adolescents. Other studies that have addressed the relationships between children's weight status and sleep have addressed other aspects of sleep such as sleep quality. Relationships between sleeping less than 8 hours with higher BMI in adolescents regardless of gender have been previously established. Significant associations

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Research sleep duration and BMI, have been detected in females, although ethnic differences in sleep durations didn't exacerbate the BMI disparities. The present study revealed and affirmed that longer sleep durations in boys were associated with lower BMI percentiles unlike in girls.

Conclusion

This report indicates the complexity of numerous health risk behaviours, and their impact on health status in adolescents. Although the results from the correlation analysis, indicated some significance, especially in males, cautionary interpretation is indispensable due to the influence of a number of factors that are not addressed by the survey. This study didn't reveal differences in the strengths of the associations between the three health-risk behaviours and BMI percentiles, suggesting that it is possible that the effects of physical inactivity, poor dietary habits, and lack of enough sleep affects high school students in similar ways. In addition, the factors exacerbating overweight and obesity are numerous and complex, thereby requiring a multi-level approach with various stakeholders.

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