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THE RELATIONSHIP BETWEEN LIFESTYLE AND WEIGHT STATUS AMONG SENIOR HIGH SCHOOL STUDENTS IN INDONESIA: A CASE STUDY IN LAMPIHONG

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ABSTRACT

Peningkatan prevalensi Penyakit Tidak Menular (PTM) menjadi tantangan kesehatan global yang didorong oleh faktor risiko gaya hidup tidak sehat. Fenomena ini kini meluas di kalangan remaja dan berpotensi memengaruhi status berat badan mereka. Penelitian ini bertujuan untuk menganalisis hubungan antara gaya hidup dengan status berat badan remaja di SMAN 1 Lampihong. Penelitian kuantitatif ini menggunakan desain korelasional dengan pendekatan cross-sectional. Sebanyak 68 siswa dipilih sebagai sampel melalui teknik purposive sampling. Data dianalisis secara univariat untuk distribusi frekuensi dan bivariat menggunakan uji korelasi Spearman rank. Hasil menunjukkan mayoritas responden (58,8%) memiliki gaya hidup tidak sehat dan 41,2% memiliki status berat badan tidak normal (berdasarkan Indeks Massa Tubuh/IMT). Meskipun demikian, uji korelasi tidak menunjukkan adanya hubungan yang signifikan secara statistik antara kedua variabel (p=0.219; α=0.05). Disimpulkan bahwa pada populasi studi ini, tidak terdapat hubungan yang signifikan antara gaya hidup dengan status berat badan remaja.

The increasing prevalence of Non-Communicable Diseases (NCDs) constitutes a global health challenge driven by unhealthy lifestyle risk factors. This phenomenon is now increasingly widespread among adolescents, potentially affecting their weight status. This study aimed to analyze the relationship between lifestyle and weight status among adolescents at SMAN 1 Lampihong. This quantitative study employed a correlational design with a cross-sectional approach. A sample of 68 students was selected via purposive sampling. Data were analyzed using univariate analysis for frequency distribution and bivariate analysis using the Spearman rank correlation test. The results indicated that a majority of respondents (58.8%) had an unhealthy lifestyle, and 41.2% had an abnormal weight status based on Body Mass Index (BMI). However, the correlation test revealed no statistically significant relationship between the two variables ($p = 0.219$; $\alpha = 0.05$). It was concluded that within this study population, no significant relationship exists between lifestyle and adolescent weight status.

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Introduction

Non-communicable diseases (NCDs) have emerged as a pressing global health challenge, characterized by an annual increase in cases. Data from the World Health Organization (WHO, 2016) indicate that approximately 40 million people worldwide suffer from NCDs, making them the leading cause of mortality globally (Rachman et al., 2024). This alarming trend is also reflected in Indonesia, where the 2018 Basic Health Research (Riskesdas) confirmed a significant rise in NCD prevalence, including chronic kidney disease (0.38%), heart disease (1.5%), diabetes mellitus (2.0%), stroke (10.9%), and hypertension, which affected 34.11% of the adult population (Ministry of Health, 2019). These figures underscore the urgency of addressing NCDs as a national health priority.

The primary risk factor behind this escalation of NCDs is an unhealthy lifestyle, which encompasses poor dietary patterns, insufficient physical activity, and inadequate stress management. A healthy lifestyle, defined as a pattern of living that minimizes the risk of serious illness (Suharjo & Harianto, 2019), is the foremost recommendation for NCD prevention. However, data from Indonesia's Ministry of Health (2017) reveal that the lifestyle of the majority of the population is far from ideal: 93.5% consume insufficient amounts of fruits and vegetables, 53.1% frequently consume sugary foods, and 26.1% have low levels of physical activity.

This trend of unhealthy lifestyles is of particular concern among the adolescent population. Various studies across Indonesia have consistently shown a disturbing pattern: from the habitual consumption of fast food and sugary drinks in Denpasar (Zuhdy et al., 2015) and incomplete dietary patterns in Bolaang Regency (Mokoginta et al., 2016), to low fruit and vegetable intake in Yogyakarta (Yuningrum et al., 2021). This situation is exacerbated by a decline in physical activity in the digital-centric Society 5.0 era (Dayini et al., 2022), coupled with challenges in managing stress, which can trigger disturbances in adolescent eating and sleeping patterns (Hapsari, 2019).

The direct impact of this cumulative unhealthy lifestyle is an alteration in weight status. A high-calorie dietary pattern, uncompensated by adequate physical activity, leads to an energy imbalance that culminates in fat accumulation and weight gain, potentially leading to obesity (Irwan, 2017; Lin & Li, 2021). Weight gain and obesity are, in themselves, major risk factors for various NCDs, including diabetes, heart disease, and hypertension (Lin & Li, 2021).

The context of this issue is highly relevant at SMAN 1 Lampihong. Preliminary data from the Lampihong Community Health Center (Puskesmas) indicate the presence of nutritional problems among its students, where 11 were identified as severely underweight, 12 as underweight, 15 as overweight, and 4 as obese. Furthermore, 25 students were found to have hypertension, reinforcing the indication of NCD risk within the school environment. This profile was substantiated by the researcher's preliminary study, which involved random interviews with 10 students and revealed high consumption of instant noodles, snacks, and sweet packaged drinks, alongside minimal physical activity outside of formal school sports classes.

Adolescents represent a strategic asset and a key determinant of the nation's future; thus, their health must be a priority (UNICEF, 2020). Given the global and national urgency of the NCD problem, the prevalence of unhealthy lifestyles among adolescents, and the specific, alarming data from SMAN 1 Lampihong, the researcher was prompted to conduct a study aimed at analyzing the relationship between lifestyle and weight status among adolescents at this location.

Methods

Research Design

This study employed a quantitative research design with a correlational approach to investigate the relationship between lifestyle (independent variable) and weight status (dependent variable). A cross-sectional design was utilized, whereby all data were collected at a single point in time.

Study Setting and Period
The research was conducted at SMAN 1 Lampihong, a public senior high school located in Lampihong District, South Kalimantan, Indonesia. Data collection was carried out over a four-week period from January to February 2025.

Population and Sample
The target population (N) for this study comprised all active students enrolled at SMAN 1 Lampihong during the research period, totaling 215 students. The sample size (n) was calculated using Slovin's formula with a 10% margin of error, resulting in a required sample of 68 participants.

Sampling Technique and Criteria
A purposive sampling technique was used to select participants based on predefined inclusion and exclusion criteria to ensure the homogeneity of the sample.

Inclusion Criteria: 1)Registered as an active student at SMAN 1 Lampihong., 2)Present at the school premises during the data collection period, 3)Voluntarily agreed to participate by signing the informed consent form. Exclusion Criteria: 1)Students with diagnosed chronic illnesses (e.g., metabolic disorders, type 1 diabetes) that could directly affect their lifestyle and weight status; 2)Students who were absent during the scheduled data collection, and 3)Students who returned incomplete questionnaires.

Instruments
Two primary instruments were used for data collection: a lifestyle questionnaire and anthropometric measurements.

1. Lifestyle Questionnaire: This study adapted a lifestyle questionnaire from a previous study by Natasya Ulfa (2022). The instrument consists of 14 items assessing dietary habits, physical activity, and stress management. It uses a 5-point Likert scale, with scoring reversed for negative statements.
   - *Positive items:* Always (5), Often (4), Sometimes (3), Rarely (2), Never (1).
   - *Negative items:* Always (1), Often (2), Sometimes (3), Rarely (4), Never (5). The total score ranges from 14 to 70. Lifestyle was categorized as Healthy (score > 35) or Unhealthy (score ≤ 35). The instrument's validity was confirmed, with all item-total correlation coefficients (r_calculated) exceeding the critical value (r_table = 0.239 for n=68 at α=0.05). The instrument demonstrated acceptable internal consistency with a Cronbach's Alpha coefficient of 0.632.
2. Anthropometric Measurements: Weight status was determined using the Body Mass Index (BMI). Standardized procedures were followed for all measurements.

   a. Weight: Measured to the nearest 0.1 kg using a calibrated digital scale (SECA®), with participants wearing light clothing and no footwear.
   b. Height: Measured to the nearest 0.1 cm using a portable stadiometer, with participants standing erect on a flat surface and their head positioned in the Frankfurt horizontal plane.
   c. BMI Calculation: BMI was calculated using the standard formula: BMI=Weight (kg)/Height (m)2
   d. Categorization: Weight status was categorized based on the WHO Asia-Pacific standards for BMI: Underweight (<18.5 kg/m²), Normal (18.5–22.9 kg/m²), Overweight (23.0–24.9 kg/m²), and Obese (≥25.0 kg/m²). These categories were then re-grouped into Normal and Abnormal (Underweight, Overweight, Obese) for bivariate analysis.

Data Analysis

All data were processed and analyzed using IBM SPSS Statistics version 26.0. The analysis involved two stages:

1. Univariate Analysis: Descriptive statistics (frequency distributions and percentages) were used to summarize respondent demographics (gender, age), lifestyle categories, and weight status categories.

2. Bivariate Analysis: The hypothesis was tested using the Spearman rank correlation test due to the ordinal nature of both the lifestyle and weight status variables. The level of statistical significance (α) was set at 0.05. A p-value (Sig. 2-tailed) of less than 0.05 was considered indicative of a statistically significant relationship.

Ethical Considerations

This research adhered to all ethical principles for research involving human subjects. Ethical clearance was obtained from the Research Ethics Committee of the Institute for Research and Community Service, Universitas Sari Mulia (Approval No. 022/Kep-UNISM/I/2025). Prior to data collection, all potential participants received a detailed explanation of the study's objectives, procedures, and potential risks. Written informed consent was secured from each participant. Participation was entirely voluntary, and respondents had the right to withdraw at any time without consequence. Anonymity and confidentiality were ensured by using numerical codes instead of names on all research documents.

Results

This section presents the research findings obtained from data analysis, including the demographic characteristics of the respondents, a description of the research variables, and the results of the hypothesis testing.

Univariate Analysis

Univariate analysis was conducted to describe the frequency distribution of respondent characteristics and research variables.

Demographic Characteristics of Respondents

The demographic characteristics analyzed included gender and age group. A summary of this data is presented in Table 1.

Table 1. Frequency Distribution of Respondent Characteristics (N=68)

	Characteristic	Frequency (f)	Percentage (%)
Gender	Male	24	35.3
	Female	44	64.7
Age	Early Adolescence (10-14 Years)	3	4.4
	Middle Adolescence (15-16 Years)	43	63.2
	Late Adolescence (17-20 Years)	22	32.4

Source: Primary Data, 2025

Based on Table 1, of the 68 total respondents, the majority were female (n=44; 64.7%). By age group, most respondents were in the middle adolescence category (15-16 years) (n=43; 63.2%), followed by late adolescence (17-20 years) (n=22; 32.4%), with a small portion in early adolescence (10-14 years) (n=3; 4.4%).

Description of Research Variables

A description of the research variables, namely lifestyle and weight status, is presented as a frequency distribution in Table 2.

Table 2. Frequency Distribution of Lifestyle and Weight Status Variables (N=68)

	Category |	Frequency (f)	Percentage (%)
Lifestyle	Healthy	28	41.2
	Unhealthy	40	58.8
Weight Status	Underweight (BMI <18.5)	28	41.2
	Normal (BMI 18.5 – 22.9)	28	41.2
	Overweight (BMI 23.0–24.9)	2	2.9
	Obese (BMI ≥25.0)	8	11.8

Source: Primary Data, 2025

Table 2 shows that more than half of the respondents (n=40; 58.8%) had a lifestyle categorized as unhealthy. Regarding weight status, an equal proportion of respondents fell into the underweight (n=28; 41.2%) and normal weight (n=28; 41.2%) categories. Meanwhile, 17.6% (n=12) of respondents were classified as either overweight or obese.

Bivariate Analysis

Bivariate analysis was performed to test the hypothesis regarding the relationship between lifestyle and weight status variables using the Spearman rank correlation test.

Table 3. Results of the Correlation Analysis between Lifestyle and Weight Status

		Lifestyle	Weight Status
Lifestyle	Correlation Coefficient	1.000	0.151
	Sig. (2-tailed)	.	0.219
	N	68	68
Weight Status	Correlation Coefficient	0.151	1.000
	Sig. (2-tailed)	0.219	.
	N	68	68

Sumber: Data Primer (2025)

Table 3 presents the results of the bivariate analysis testing the relationship between lifestyle and weight status. The Spearman rank correlation test yielded a correlation coefficient (r) of 0.151 and a significance value (p) of 0.219.

Discussion

This section presents an in-depth analysis of the research findings, interpreting them within a broader theoretical framework and in the context of previous studies. The primary focus is to deconstruct the seemingly paradoxical result, namely, the absence of a statistical relationship between lifestyle and weight status, while emphasizing the clinical and public health significance of the descriptive findings.

Deconstructing the Absence of a Statistical Relationship

The most prominent finding of this study is the lack of a statistically significant relationship between the lifestyle variable and weight status among adolescents at SMAN 1 Lampihong ($p = 0.219$). This result directly challenges common assumptions and most established health theories, such as the Health Belief Model or Social Cognitive

Theory, which posit that behavior (lifestyle) is a primary determinant of health outcomes (weight status). This contradiction compels us to look beyond simple correlations and consider the complexity of factors at play in adolescent physiology and behavior.

Several explanations can be put forth for this unexpected result. First, the relationship was likely obscured by powerful confounding factors that were not dominantly measured in this study. The majority of respondents were female, a demographic fact with significant physiological implications. A woman's basal metabolic rate is inherently lower, and hormonal fluctuations during the menstrual cycle can substantially affect appetite, fluid retention, and metabolism, factors that directly impact body weight but are not typically associated with general "lifestyle" (Suha & Rosyada, 2022). Furthermore, sociocultural pressures related to body image are far more intense for female adolescents, which can drive extreme restrictive eating behaviors to achieve thinness, resulting in an underweight status even if other aspects of their lifestyle are unhealthy (Rasmaniar et al., 2023).

Second, the "lifestyle" construct itself, although measured with a validated instrument, is a simplification of a complex reality. The questionnaire may not be sufficiently sensitive to capture the nuances of behavior. For instance, the knowledge, attitude, and practice (KAP) gap is highly common among adolescents. A student may possess good nutritional knowledge and be aware of the impact of fast food, yet peer pressure or convenience still drives consumption. This knowledge might lead to undetected compensatory behaviors (e.g., skipping breakfast after a heavy dinner), thereby stabilizing weight even if the overall dietary pattern is irregular (Anggraini & Dewi, 2022; Hanum, 2023).

Finally, this finding aligns with several contextual studies, such as those conducted during the COVID-19 pandemic, which showed that the focus of a "healthy lifestyle" can shift to other domains like hygiene, thereby weakening its relationship with metabolic variables like weight status (Prasetyo & Nurhayati Faridha, 2022). This suggests that the relationship between lifestyle and weight status is not static, but rather dynamic and highly dependent on the prevailing environmental and psychological context.

Significance of Descriptive Findings: The Hidden Health Crisis

Although a statistical relationship was not established, the descriptive data paint a concerning picture and highlight a tangible public health crisis at SMAN 1 Lampihong. This study identified a double burden of malnutrition, a paradox where a high prevalence of underweight adolescents (41.2%) coexists with a significant prevalence of overweight and obese adolescents (a combined 17.6%). This phenomenon is characteristic of nations undergoing a nutritional transition, where traditional, fiber-rich diets are replaced by energy-dense, processed foods high in fat and sugar (Hartanti et al., 2024).

The high rate of underweight status, particularly among adolescent girls, poses serious long-term risks, including stunted growth, impaired cognitive function, compromised immune systems, and an increased risk of osteoporosis later in life. On the other hand, the 17.6% of students on the overweight spectrum face an accelerated pathway toward non-communicable diseases in adulthood, such as type 2 diabetes mellitus, hypertension, and cardiovascular disease.

This situation is exacerbated by the finding that the majority of students (58.8%) lead an unhealthy lifestyle. This is no longer merely a matter of individual choice but a reflection of the modern obesogenic environment. The digital era has drastically reduced spontaneous physical activity through increased screen time (Warjiman et al., 2024), while the digital ecosystem aggressively promotes unhealthy foods through social media marketing and food delivery applications that offer unparalleled convenience (Purba et al., 2023; Oktovin et al., 2024).

Study Limitations

This study has several methodological limitations that are important to consider when interpreting and generalizing the findings. Acknowledging these limitations does not diminish the value of the research but rather provides critical context and direction for future studies.

First, a primary limitation stems from the research design. The use of a cross-sectional design only permits the identification of associations or relationships at a single point in time. This design inherently cannot establish causality, meaning it is not possible to conclude whether lifestyle influences weight status or vice versa. Furthermore, the study's limited scope, focused on a single school (SMAN 1 Lampihong) and employing a purposive sampling technique, restricts the generalizability of the findings. The results may not be fully representative of adolescent populations with different demographic, geographic, or socioeconomic backgrounds.

Second, there are limitations related to the measurement methods. The measurement of the lifestyle variable, which relied on self-report questionnaires, is susceptible to systematic bias. Respondents may have been influenced by recall bias, the difficulty of accurately remembering past behaviors, or social desirability bias, the tendency to provide answers that are perceived as more socially acceptable. Moreover, the use of the Body Mass Index (BMI) as a proxy for weight status is limited by its inability to differentiate between fat mass and muscle mass, a factor that can be particularly relevant in athletic populations.

Finally, this study did not fully control for all potential confounding variables that could influence the relationship between lifestyle and weight status. Factors such as genetic predisposition, hormonal status (especially in female adolescents), level of nutritional knowledge, family socioeconomic status, and psychological factors (such as stress or body image) could independently affect both variables. The absence of control for these variables may have obscured the true relationship between lifestyle and weight status in the statistical analysis.

Conclusion

No statistically significant relationship ($p = 0.219$; $\alpha = 0.05$) was found between the lifestyle variable and the weight status variable among adolescent students at SMAN 1 Lampihong. Although a majority of the respondents in this study were identified as having a predominantly unhealthy lifestyle (58.8%), and a substantial proportion exhibited an abnormal weight status (notably underweight at 41.2%, as well as overweight/obese categories), the correlation analysis did not indicate a strong statistical association between these two variables within this study population.

Future researchers could enhance this line of inquiry by employing a longitudinal design to examine causal relationships and observe changes in variables over time. It is also recommended to expand the sample scope to include multiple schools or regions using more representative sampling techniques (e.g., probability sampling). Furthermore, future studies should utilize lifestyle measurement instruments with established validity and reliability or more objective methods. Consideration should also be given to analyzing lifestyle components more specifically (e.g., detailed dietary patterns, types of physical activity) and to controlling for other potential confounding variables.

From a practical standpoint, although a significant relationship was not found in this study, the high prevalence of unhealthy lifestyles and abnormal nutritional statuses (both underweight and overweight) at SMAN 1 Lampihong remains a significant concern. Therefore, it is recommended that the school and the Lampihong Community Health Center (UPTD Puskesmas) continue to enhance educational and interventional programs for adolescent health. These programs should focus on the promotion of balanced nutrition and adequate physical activity.

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Conflict of Interest

The authors state that they have no competing interests in relation to the research, writing, or publication of this scientific paper.

Credit Author Statement

Khoiriyati: Conceptualization, methodology**,** Formal Analysis, validation, Project administration, writing-original draft. **Mohammad Basit:** Investigation, resources, funding acquisition**. Onieqie Ayu Dhea M:** Validation, software, data curation**. Latifah:** Writing-review & editing.

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