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The Relationship Between Stress Levels And Nutritional Status Among Inmates at Rutan Kelas IIB Trenggalek

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Abstract: Stress is a psychological factor that may be associated with physical health, including nutritional status. However, the relationship between stress levels and nutritional status among inmates remains insufficiently explored, particularly in Indonesian correctional settings. **Objective:** This study aimed to analyze the relationship between stress levels and nutritional status among inmates at Rutan Kelas IIB Trenggalek. **Methods:** This study employed a quantitative analytical observational design with a cross-sectional approach involving 56 respondents. Stress levels were assessed using the Perceived Stress Scale-10 (PSS-10), while nutritional status was determined based on body mass index (BMI). Data were analyzed using univariate analysis and Spearman's rank correlation test. **Findings:** Most respondents experienced moderate stress (64.3%), while normal nutritional status was the most common category (33.9%). The correlation analysis yielded a coefficient of −0.023 and a p-value of 0.869, indicating that no statistically significant relationship was found between stress levels and nutritional status. **Implications:** These findings suggest that stress levels alone may not adequately characterize the nutritional status of inmates. Healthcare services in correctional settings should consider psychological well-being and nutritional status as complementary aspects of comprehensive health monitoring. **Originality:** This study provides empirical evidence on the relationship between stress levels and nutritional status among inmates at Rutan Kelas IIB Trenggalek. By examining these psychological and physical health dimensions simultaneously, the study contributes context-specific evidence that may inform the development of integrated healthcare services in correctional settings.

Keywords: body mass index; mental health; nutritional status; stress; inmates

INTRODUCTION

Stress is a psychological response that may arise when individuals face demands or pressures perceived to exceed their coping abilities (Sun, 2024). This condition not only affects psychological health but may also trigger physiological and behavioral changes related to health (Ridho, 2024). Stress responses can influence sleep patterns, daily activities, eating behaviors, and appetite, which may ultimately be associated with an individual's physical condition (Gomes, 2023). Therefore, stress is an important health

aspect to investigate because its potential associations extend beyond psychological well-being to various indicators of physical health.

One population that warrants particular attention in stress-related research is inmates. Inmates live in an environment characterized by conditions that differ from those experienced by the general population. Loss of freedom, separation from family, restricted mobility, changes in social roles, and the need to adapt to the correctional environment may constitute sources of psychological stress (Christy & Ridho, 2026). These circumstances may affect individuals' ability to adapt and maintain their health throughout their period of rehabilitation (Abdulkadir, 2022). Therefore, mental health is an important component of healthcare services for inmates, as psychological conditions may interact with various other aspects of health (Holt-Lunstad, 2024).

In addition to psychological well-being, nutritional status is an important indicator for assessing an individual's health condition (Fernandez, 2023). Nutritional status is influenced by various factors, including food intake, physical activity, metabolic conditions, age, and psychological factors (Marinkovic, 2024). Body mass index (BMI) is a commonly used anthropometric indicator for assessing nutritional status in adults (Wu, 2024). In Asian populations, BMI assessment should consider body composition characteristics and metabolic risks; therefore, the Asia-Pacific classification can be used to identify weight categories and associated health risks (Okawa, 2025). In addition to BMI, waist circumference provides supplementary information regarding abdominal fat distribution, which is associated with metabolic health risks (Lee, 2022).

The relationship between stress and nutritional status may be explained by behavioral changes and physiological responses that occur when individuals experience psychological pressure. Stress can affect eating behaviors differently across individuals. In some individuals, stress may reduce appetite and potentially decrease energy intake, whereas in others, it may increase food consumption as a form of emotional coping (Tristanti, 2026). In addition to changes in eating behaviors, the stress response may involve activation of neuroendocrine systems associated with appetite regulation, energy metabolism, and fat storage (Kuckuck, 2023). These differences in individual responses suggest that stress may be associated with nutritional status in either direction, potentially contributing to both underweight and overweight conditions.

This relationship is particularly relevant when examined among inmates because their daily lives take place within a relatively structured system. Food provision, meal schedules,

daily activities, opportunities for physical activity, and the detention center environment may interact with psychological conditions and health status (Christy & Ridho, 2026). In the context of Rutan Kelas IIB Trenggalek, these factors warrant attention because the nutritional status of inmates may be associated not only with individual characteristics but also with the living conditions experienced throughout their period of rehabilitation. Therefore, examining stress levels and nutritional status simultaneously may provide a more comprehensive picture of the health conditions of inmates.

Several studies have examined the relationships among stress, eating behaviors, and nutritional status in the general population. Quantitative research has indicated that stress may be associated with changes in eating behaviors and anthropometric indicators, although the direction and strength of these associations may vary across individual (Nwosu, 2023; Rog, 2024). For some individuals, stress may increase food consumption, whereas for others, it may reduce appetite and food intake (Tristanti, 2026). These differences may be influenced by coping mechanisms, dietary patterns, physical activity, individual characteristics, and environmental conditions. These findings suggest that the relationship between stress and nutritional status is complex and warrants investigation across populations with different characteristics.

Evidence from systematic reviews and meta-analyses also indicates that stress is associated with changes in eating behaviors, although findings have not been entirely consistent (Hill, 2022). Stress may influence food choices, the amount of food consumed, eating frequency, and appetite (Hyldelund, 2022). These findings suggest that responses to stress vary across individuals and do not necessarily result in nutritional changes in the same direction. Therefore, studies involving populations with specific social and environmental characteristics are needed to clarify the relationship between stress levels and nutritional status.

Among inmates, psychological health and nutritional status have been investigated, but these aspects have often been examined separately (Aharon, 2023; Christy & Ridho, 2026). Research on the mental health of inmates indicates that psychological conditions may be associated with individual characteristics and the environment in which they undergo rehabilitation. Meanwhile, studies of nutritional status in correctional settings highlight the importance of monitoring anthropometric conditions and factors related to health during incarceration. These findings indicate that psychological and physical health

are both important aspects of healthcare for inmates. However, the relationship between stress levels and nutritional status requires more specific empirical evidence.

In the context of Rutan Kelas IIB Trenggalek, previous research involving inmates examined the relationship between sentence duration and levels of anxiety and depression. The findings indicated that sentence duration was not significantly associated with either anxiety or depression (Christy & Ridho, 2026). These findings suggest that the psychological conditions of inmates are complex and cannot be explained solely by sentencing characteristics. Nevertheless, the previous study did not examine stress levels or their relationship with a physical health indicator such as nutritional status. Therefore, there remains an opportunity to expand research on the health of inmates at Rutan Kelas IIB Trenggalek by integrating psychological and physical health aspects.

Based on the literature reviewed, a research gap remains regarding empirical evidence on the relationship between stress levels and nutritional status among inmates, particularly in Indonesian detention centers. Studies involving the general population suggest that stress may be associated with changes in eating behaviors and nutritional status, but the findings remain inconsistent. Research involving inmates has also examined psychological health and nutritional status, although these aspects have rarely been integrated into a single analysis. At the local level, previous research at Rutan Kelas IIB Trenggalek focused on anxiety and depression in relation to sentence duration, whereas the relationship between stress levels and nutritional status has not been investigated. This gap provides the rationale for the present study.

This study aimed to analyze the relationship between stress levels and nutritional status among inmates at Rutan Kelas IIB Trenggalek. Specifically, the study aimed to identify stress levels among inmates, assess nutritional status based on body mass index (BMI) using the Asia-Pacific classification, and analyze the relationship between stress levels and nutritional status in this population.

The novelty of this study lies in integrating the psychological dimension of stress with the physical health indicator of nutritional status among inmates at Rutan Kelas IIB Trenggalek. Unlike previous research that focused on the relationship between sentence duration and anxiety and depression, this study examines stress levels and nutritional status simultaneously. Nutritional status is assessed using BMI, while waist circumference is included as supplementary anthropometric data to provide information about abdominal fat distribution among respondents. This study is expected to provide empirical evidence

regarding the association between psychological conditions and the physical health status of inmates, as well as inform the development of healthcare services that address psychological well-being and nutritional status together.

Based on the theoretical framework and findings of previous studies, the hypothesis of this study is that there is a relationship between stress levels and nutritional status among inmates at Rutan Kelas IIB Trenggalek.

RESEARCH METHOD

This study employed a quantitative analytical observational design with a cross-sectional approach to analyze the relationship between stress levels and nutritional status among inmates at Rutan Kelas IIB Trenggalek. The study included 56 respondents who met the inclusion criteria and agreed to participate. The independent variable was stress level, while the dependent variable was nutritional status.

Primary data were collected through the administration of the Perceived Stress Scale-10 (PSS-10) questionnaire and anthropometric measurements. The respondents' characteristics included age, gender, and educational attainment. Anthropometric measurements comprised height, body weight, and waist circumference. Body mass index (BMI) was calculated by dividing body weight in kilograms by the square of height in meters, using the formula BMI = body weight (kg)/[height (m)]^2. BMI values were subsequently classified according to the Asia-Pacific BMI classification to determine the respondents' nutritional status. Waist circumference was used as an additional anthropometric indicator.

Stress levels were assessed using the PSS-10 based on the respondents' scores. The scores were subsequently categorized as low stress (0–13), moderate stress (14–26), and high stress (27–40). Univariate analysis was performed to describe respondents' characteristics, stress levels, nutritional status, and waist circumference using frequency distributions and percentages. Bivariate analysis was conducted using Spearman's rank correlation test to examine the relationship between PSS-10 scores and BMI values. Statistical significance was set at $\alpha = 0.05$.

This study received ethical approval from the Health Research Ethics Committee of Dr. Soedomo hospital under approval number 000.9/477/406.010.001/18.00/2026. The study was conducted after obtaining permission from the relevant authorities and informed

consent from the respondents. Respondents' identities were kept confidential, and all data were used solely for scientific purposes.

RESULT

Table 1 presents the characteristics of inmates at Rutan Kelas IIB Trenggalek. Most respondents were aged 26–44 years (53.6%), the vast majority were male (92.9%), and the largest educational group had completed junior high school (35.7%).

Table 1. Characteristics of Inmates at Rutan Kelas IIB Trenggalek

Characteristics	n	%
Age (Years)		
18-25	9	16.1
26-44	30	53.6
45-59	9	16.1
>60	8	14.3
Gender		
Male	52	92.9
Female	4	7.1
Educational		
Elementary school	16	28.6
Junior high school	20	35.7
Senior high school	18	32.1
Higher education	2	3.6

Table 2 shows the distribution of stress levels among inmates at Rutan Kelas IIB Trenggalek based on the PSS-10. Most respondents experienced moderate stress (64.3%).

Table 2. Distribution of Stress Levels Based on PSS-10 Scores

Stress Level	n	%
Low	18	32.1
Moderate	36	64.3
High	2	3.6
Total	**56**	**100**

Table 3 shows the distribution of nutritional status among inmates at Rutan Kelas IIB Trenggalek based on body mass index (BMI). The most common nutritional status category was normal (33.9%).

Table 3. Distribution of Nutritional Status Based on Body Mass Index (BMI)

Nutritional Status	n	%
Underweight	4	7.1
Normal	19	33.9
Overweight	12	21.4
Obesity class I	16	28.6
Obesity class II	5	8.9
Total	**56**	**100**

Table 4 presents the distribution of waist circumference among inmates at Rutan Kelas IIB Trenggalek. Most respondents had waist circumference values classified as normal (60.7%).

Table 4. Distribution of Waist Circumference

Waist circumference	n	%
Normal	34	60.7
Elevated	22	39.3
Total	**56**	**100**

Table 5 presents the cross-tabulation of stress levels and nutritional status. Among respondents with low stress, the most common nutritional status category was obesity class I, accounting for 7 respondents (38.9%). Among those with moderate stress, the most common category was normal nutritional status, comprising 16 respondents (44.4%). All respondents with high stress were classified as having obesity class I (2 respondents; 100%).

Table 5. Cross-Tabulation of Stress Levels and Nutritional Status

Stress Level	Nutritional Status					Total
	Underweight	Normal	Overweight	Obesity class I	Obesity class II	
Low	2 (11.1%)	3 (16.7%)	4 (22.2%)	7 (38.9%)	2 (11.1%)	18 (100%)
Moderate	2 (5.6%)	16 (44.4%)	8 (22.2%)	7 (19.4%)	3 (8.3%)	36 (100%)
High	0 (0%)	0 (0%)	0 (0%)	2 (100%)	0 (0%)	2 (100%)
Total	**4**	**19**	**12**	**16**	**5**	**56**

Table 6 presents the results of the Spearman rank correlation analysis examining the relationship between stress levels and nutritional status among 56 respondents. The analysis yielded a correlation coefficient of (r_s = -0.023) and p-value of 0.869. These findings indicate that no statistically significant relationship was found between stress levels and nutritional status among inmates at Rutan Kelas IIB Trenggalek.

Table 6. Relationship Between Stress Levels and Nutritional Status

Variables	Spearman's rho	p value
Stress level and nutritional status	-0,023	0,869

DISCUSSION

The findings showed that most inmates at Rutan Kelas IIB Trenggalek experienced moderate stress, comprising 36 respondents (64.3%). Stress is a psychological response

that may occur when individuals face demands or pressures perceived to exceed their ability to cope (Sun, 2024). In correctional settings, changes in daily routines, restrictions on freedom, and the need to adapt to the environment may present challenges to psychological well-being. The World Health Organization (World Health, 2023) emphasizes the importance of addressing mental health among populations living in correctional settings. In the researchers' view, the predominance of moderate stress indicates that inmates' psychological well-being requires attention within healthcare services. Psychological conditions should also be considered alongside physical health indicators, including nutritional status, to obtain a more comprehensive understanding of respondents' health.

Consistent with the importance of physical health, the findings showed that normal nutritional status was the most common category, comprising 19 respondents (33.9%). Nevertheless, 33 respondents (58.9%) were classified as overweight or having obesity class I or II. Nutritional status reflects the condition of the body in relation to the balance between nutrient intake and bodily requirements. BMI assessment can help identify weight categories based on body weight relative to the square of height (Wu, 2024). In the researchers' view, the high proportion of respondents classified as overweight or having obesity highlights the need for nutritional monitoring and education regarding balanced diets and physical activity. However, dietary intake and physical activity were not specifically measured in this study; therefore, these factors cannot be established as causes of the respondents' nutritional status. Additional anthropometric measurements, such as waist circumference, may therefore help provide a more comprehensive picture of respondents' physical health.

Waist circumference measurements showed that most respondents were classified as having normal waist circumference, accounting for 34 individuals (60.7%), while 22 respondents (39.3%) were classified as having elevated waist circumference. Waist circumference is an anthropometric indicator that can provide information about abdominal fat accumulation, whereas BMI is used to classify body weight relative to height (Lee, 2022) These two indicators provide different but complementary information for anthropometric assessment. In the researchers' view, the proportion of respondents with elevated waist circumference highlights the importance of regular anthropometric monitoring as part of healthcare services for inmates. Nevertheless, waist circumference was included only as supplementary data in this study and was not the primary variable in

the analysis of the relationship between stress levels and nutritional status. To determine whether psychological conditions, as reflected by stress levels, were associated with respondents' nutritional status, an analysis of the relationship between these two variables was conducted.

The Spearman rank correlation analysis yielded a correlation coefficient of (r_s = -0.023) and a significance value of ($p = 0.869$) among the 56 respondents. These findings indicate that no statistically significant relationship was found between stress levels and nutritional status among inmates at Rutan Kelas IIB Trenggalek. The correlation coefficient, which was close to zero, indicates a very weak monotonic association between stress scores and BMI in this sample. Theoretically, stress may be associated with changes in appetite and eating behaviors, although individual responses vary (Gomes, 2023; Hill, 2022). examined the relationship between stress and eating behaviors in adults and indicated that this relationship may vary across individuals. Thus, the possibility of mechanisms linking stress to eating behaviors does not necessarily mean that a statistically significant relationship between stress scores and nutritional status will be observed in every population. In the researchers' view, the nonsignificant finding in this study may be related to the multiple factors that influence nutritional status, including dietary patterns, physical activity, metabolism, and health conditions that were not all assessed. Furthermore, only two respondents (3.6%) were classified as having high stress, meaning that the uneven distribution of stress categories should be considered when interpreting the results. Therefore, these findings do not establish that stress is entirely unrelated to nutritional status; rather, they indicate that a statistically significant relationship was not found in the sample studied.

Overall, the findings indicate that the health of inmates at Rutan Kelas IIB Trenggalek warrants attention from both psychological and physical perspectives. Most respondents experienced moderate stress, while more than half were classified as overweight or having obesity. Although the statistical analysis did not reveal a significant relationship between stress levels and nutritional status, both aspects remain important considerations in healthcare services. In the researchers' view, health monitoring for inmates should include psychological assessment, anthropometric measurements, nutritional education, and support for physical activity according to individual health conditions. Future research should involve a larger sample and consider additional factors, such as dietary patterns,

physical activity, and health conditions, to provide a more comprehensive understanding of the relationship between stress levels and nutritional status.

CONCLUSION

This study found no statistically significant relationship between stress levels and nutritional status among inmates at Rutan Kelas IIB Trenggalek. These findings provide empirical insight into the relationship between the two variables in this population and serve as preliminary information for the development of healthcare services in correctional settings. Although no statistically significant relationship was identified, psychological well-being and nutritional status should continue to be monitored in an integrated manner. This study was limited by its relatively small sample size, the uneven distribution of stress levels, and the lack of analysis of other factors that may be associated with nutritional status, such as dietary intake, physical activity, and health conditions. Furthermore, the cross-sectional design does not allow causal relationships to be established. Future research should therefore involve a larger sample and consider these factors to develop a more comprehensive understanding of the relationship between stress levels and nutritional status among inmates.

DECLARATIONS

Artificial Intelligence (AI) Use Statement

The authors acknowledge the use of ChatGPT (OpenAI) solely for language refinement, grammar checking, spelling correction, and stylistic editing of the manuscript. The AI tool was not used to generate or fabricate research data, perform statistical analyses, interpret research findings, or independently formulate scientific conclusions. All AI-assisted revisions were critically reviewed and verified by the authors, who retain full responsibility for the accuracy, originality, integrity, and final content of the manuscript.

Author Contributions Statement

[Yohana Christy] : Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Writing – original draft.

[Noveria Susita Ginting] : Conceptualization, Methodology, Validation, Supervision, Writing – review & editing.

[Yohana Patricia Raharjo] : Validation, Visualization, Supervision, Writing – review & editing.

[Arthessy Febnatio]: Validation, Supervision, Writing – review & editing.

All authors have read and approved the final version of the manuscript and agree to be accountable for their respective contributions and the integrity of the published work.

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Conflict of Interest Statement

The authors declare that they have no financial, professional, institutional, or personal conflicts of interest that could have influenced the design, conduct, analysis, interpretation, or reporting of this study.

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