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The effect of increased regiment activities on the health condition of cadets

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ABSTRACT

This study aims to analyze the effect of increased regiment activities on the health conditions of student cadets at the Republic of Indonesia Defense University (UNHAN RI). Regiment activities, which include physical training, discipline building, and mental development, are considered to influence both physical and mental health aspects of cadets. This study employed a quantitative comparative design using a paired sample approach to examine changes in health conditions before and after an increase in regiment activity intensity. Data were collected using a structured questionnaire and analyzed using a paired sample t-test. The results indicate a statistically significant difference in cadets' health conditions before and after the increase in regiment activity intensity, as indicated by a p-value of 1.029×10^{-6} ($p < 0.05$). These findings provide empirical evidence of the impact of regiment activity intensity on cadet health and highlight the importance of managing training intensity to support optimal health outcomes in military-based educational institutions.

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1. INTRODUCTION

Republic Indonesian Defense University (UNHAN RI or RIDU) is a higher education institution with characteristics that distinguish it from other universities in Indonesia. This institution was established with a specific mandate to integrate academic education with military-based physical and mental training. This makes RIDU a unique higher education institution, where cadets are not only expected to excel academically but also possess physical and mental resilience, as well as military discipline. Since its inception, RIDU has emphasized its primary mission as a defense-focused institution that produces graduates with high academic competence, strong national loyalty, and adequate physical and mental resilience to tackle challenges in the modern era.

One of the distinctive features of RIDU is the Cadet Corps activity. This corps is not just an ordinary student organization, but a mandatory activity that is a part of the campus education system. The regiment's activities include physical training, basic military training, discipline development, and character building. Through these activities, cadets are expected to internalize values such as leadership, responsibility, solidarity, and perseverance. Thus, the regiment serves a dual purpose: as a

means of character development and as an effort to maintain students' physical fitness. Student life at RIDU is not without its challenges. The admission selection process alone already reflects the high standards imposed, where both physical and academic aspects are absolute requirements. This is in line with the demands of studying, where students are often faced with academic pressure in the form of heavy workloads, busy class schedules, and demands for academic achievement. On the other hand, students are also required to participate in various non-academic activities that require stamina and physical readiness. These conditions often result in limited rest time, increased stress risk, and reduced opportunities for exercise outside of official schedules (Zhu et al., 2021). As a result, some students may experience a decline in physical fitness. However, poor physical health has been shown to affect the ability to absorb knowledge, both in academic and non-academic aspects (Latar & Tomasoa, 2020).

Several studies have also revealed that students who experience physical fatigue or stress tend to have low concentration levels, poor time management skills, and decreased physical endurance (W. Li et al., 2022). This indicates a strong correlation between physical health and academic success among students. In the context of higher education, physical activity plays an important role as one of the determining factors for learning success. Regular physical activity can improve cardiorespiratory capacity, strengthen muscles, enhance body flexibility, and maintain metabolic balance (B. Li et al., 2022a). Moreover, exercise has been proven to have positive effects on mental health, such as reducing anxiety levels, lowering the risk of depression, and improving sleep quality (Huang et al., 2024a). The World Health Organization (WHO) recommends that every adult, including students, engage in moderate to vigorous physical activity for at least 150 minutes per week to maintain physical and mental health (Bull et al., 2020). Unfortunately, many students at general universities are unable to meet this recommendation due to the intensity of their academic activities. A similar situation could arise at RIDU if physical activities such as military training are not optimized effectively.

The Cadet Regiment plays a strategic role in addressing student health challenges. The regiment not only trains students physically, but also teaches discipline, punctuality, loyalty, and teamwork. Structured training can help students maintain a healthy lifestyle, regulate their rest patterns, and enhance their physical endurance. In other words, cadet corps activities can serve as a preventive tool in preventing a decline in students' physical fitness. Additionally, these activities can strengthen mental health aspects. Intensive physical activity has been proven to stimulate the production of endorphins, which play a role in creating feelings of happiness and reducing stress (Wang et al., 2025). This is important, given that students often face high academic pressure. With the regiment, students have an outlet to channel their energy, reduce mental tension, and build psychological resilience.

Although a number of previous studies have examined the relationship between physical activity and student health, most of these studies were conducted on students at general universities whose physical activities took the form of recreational or extracurricular sports such as futsal, basketball, or volleyball. There have been few studies specifically highlighting the relationship between the intensity of military-style training activities and the health conditions of students at defense-based universities like RIDU. Thus, there is a research gap that needs to be addressed through this study. Additionally, previous studies have primarily focused on physical fitness aspects, while mental health aspects of students have not been extensively studied in the context of military-based physical activities. However, mental health is a crucial factor directly influencing students' learning motivation, concentration, and academic performance (Troncone et al., 2025). Therefore, this study aims to introduce a new perspective by integrating physical fitness and mental health studies into a single analytical framework.

The research method considered relevant is comparative testing. According to Tude et al. (Tude et al., 2022), this method is used to see the differences between two or more groups, whether they are directly related or not. In the context of this study, comparative testing is intended to compare the health conditions of students participating in high-intensity military training activities with those participating in low-intensity activities or none at all. The analysis of the research results is expected

to reveal significant differences supporting the hypothesis that intensive physical exercise through military training activities positively contributes to improving student health.

Based on this background, this study formulates the main problem, namely whether there are differences in health conditions between cadets who participate in high-intensity regiment activities and cadets with low intensity, how the intensity of regiment activities affects students' physical fitness and mental health, and to what extent regiment activities can play a role in supporting students' academic success at RIDU. The hypothesis proposed is that there is a significant difference in health conditions between the group of students participating in high-intensity military training activities and the group of students participating in low-intensity activities or not participating at all. This hypothesis assumes that intensive physical exercise can improve overall fitness and health, while a lack of physical activity may contribute to health issues such as obesity, stress, and reduced immune system function.

The main objective of this study is to gain a deeper understanding of the effect of regiment activity intensity on the health condition of RIDU cadets. Specifically, this study aims to analyze the differences in health conditions between students with high regiment activity intensity and those with low intensity, identify the impact of regiment activities on students' physical fitness and mental health aspects, and provide recommendations to the university regarding strategies to increase regiment activity intensity as an effort to support students' academic and non-academic success.

If the hypothesis is proven, this research will make an important contribution, both practically and academically. Practically, the results of this research can be used as a basis for RIDU in designing policies to increase the intensity of regiment activities proportionally to support student health. Academically, this research will enrich the scientific literature on the relationship between military-based physical activities and student health. Additionally, the research findings can serve as a reference for other universities with similar characteristics in Indonesia and abroad to adopt similar strategies in efforts to improve student health and fitness.

Despite the comprehensive discussion on institutional characteristics, student demands, and the role of regiment activities, empirical evidence that explicitly links variations in regiment activity intensity to both physical and mental health outcomes of cadets at defense-based universities remains limited. In particular, studies adopting a comparative approach to examine health conditions before and after changes in regiment activity intensity are still scarce. Therefore, this study is positioned to fill this gap by providing focused empirical findings on the impact of regiment activity intensity within the unique educational environment of RIDU. In this study, the main variables measured include the intensity of cadet regiment activities and the health conditions of cadets, covering both physical fitness and mental health aspects. A comparative analytical approach is employed to examine differences in health conditions between cadets engaged in high-intensity regiment activities and those with lower intensity or no regiment involvement. This approach allows the study to empirically position its contribution by highlighting how variations in military-based training intensity influence cadet health outcomes within a defense-oriented higher education context.

Student health encompasses physical, mental, and social aspects, in line with the WHO's holistic approach to health. Physical fitness, which includes cardiorespiratory capacity, muscle strength, flexibility, and metabolic balance, is a key factor in supporting learning effectiveness, physical endurance, and overall well-being (Gil-Espinosa et al., 2019). Recent research indicates that physical fitness has a strong correlation with students' psychological well-being. In a large-scale cross-sectional study in China, fitness indicators such as vital capacity and running endurance were found to significantly reduce the risk of abnormal psychological conditions, while a high BMI increased that risk (Ma et al., 2024).

Furthermore, a 2024 systematic review revealed that moderate to vigorous physical interventions such as dance or Pilates are effective in improving the mental health and quality of life of students (Donnelly et al., 2024). This is reinforced by motivation-based research that found that promoting physical activity can improve cardiorespiratory fitness among students through a structured motivational approach and social support (B. Li et al., 2022b).

In addition, another cross-sectional study showed a positive relationship between physical fitness and mental health among Chinese students, with better physical performance directly related to better mental health scores. Research from Han et al., also adds perspective by showing that physical education directly contributes to students' psychological well-being, both individually and through intermediary pathways such as social support and exercise behavior (Han, Li, & Niu, 2025). Overall, physical activity has a positive relationship with students' feelings and mental well-being, although the intensity of the effect varies.

A cash register is a system used to manage financial transactions in various businesses, such as shops, restaurants, and supermarkets (Widiyanti & Tisnawati, 2024). This system functions to record transactions, receive payments, manage inventory, and generate financial reports automatically. With the development of technology, cash register systems have transformed into web-based or application-based systems that can increase efficiency and reduce the risk of human error.

In the modern business world, application-based cashier systems are increasingly being used to improve transaction accuracy and simplify financial management. These systems not only support real-time transaction recording, but also help business owners monitor financial reports, manage inventory, and analyze sales data. The implementation of application-based cashier systems has been proven to improve operational efficiency, especially in small and medium-sized businesses (Firmansyah et al., 2025).

Physical activity in the context of higher education not only has an impact on physical health, but also plays an important role in improving students' academic and cognitive abilities. A recent systematic review of college students found that physical activity interventions had a significant positive impact on mental health, including reduced anxiety, depression, and stress, although their effectiveness depended on the frequency, intensity, and duration of exercise, which varied (Huang et al., 2024b).

Furthermore, the relationship between physical activity and cognitive function and academic achievement in adolescents and young adults (including college students) shows that both one-time and repeated physical interventions significantly improve processing speed, attention, cognitive flexibility, working memory, and language skills (Haverkamp et al., 2020). These findings indicate that physical activity not only enhances stamina but also strengthens mental aspects such as concentration and cognitive ability, which are crucial for effective learning.

A broader picture is provided by a comprehensive review of Chinese students, which found that physical activity contributes significantly to improving academic performance, such as GPA, learning motivation, academic engagement, and social well-being (H. Zhang et al., 2023). Concurrently, students who meet WHO guidelines (at least moderate-to-vigorous physical activity) have more than twice the likelihood of achieving academic success (odds ratio = 3.04), although research literature shows varied results (Trott et al., 2024). Meanwhile, research using the “smart physical education” approach with physical activities integrated into the learning environment shows that improvements in physical activity performance have a positive impact on academic achievement (effect size SMD = 0.15; Z = 2.83), although the literature on this topic is still limited in terms of quantity (Ren, 2024).

More specifically in the context of learning motivation, recent studies show that physical activity directly predicts an increase in achievement motivation among students. This positive effect is mediated by increased self-efficacy and life satisfaction, whereby exercise increases self-confidence and life satisfaction, which in turn strengthens students' academic motivation (Cao et al., 2025).

Students often face significant pressure during their studies, ranging from internal pressure they create themselves, assignment deadlines, to group demands and time management needs that can significantly affect their mental health and academic performance. Recent comparative studies indicate that academic stress remains a significant factor in students' lives even after the pandemic, with over 50% of respondents reporting moderate to high stress levels. This stress has been shown to correlate with declining mental health, such as increased risks of anxiety and depression (Gasser et al., 2025).

Specific research on nursing students in China also found a strong correlation between high educational stress and poor mental health. This suggests that students experiencing high academic stress tend to have less clear academic goal orientation and declining mental well-being (Ji et al., 2024). In Indonesia, similar studies at universities in Jember reinforce these findings, showing that academic stress is significantly associated with declining mental health among students, emphasizing the importance of emotional intelligence as a stress buffer (Maghfiroh, 2023).

Furthermore, studies on online learning during the COVID-19 pandemic revealed that academic stress caused by workload, personal expectations, and feelings of hopelessness contributed significantly to mental health disorders such as anxiety, depression, and stress, as measured by the DASS-21 scale (Oktaviani et al., 2024). These findings are consistent with professional health research indicating that high academic stress promotes negative psychological symptoms, sleep disorders, and deteriorating physical condition among health and medical students (Alhamed, 2023).

The direct relationship between academic stress and depression is also described in a cross-sectional study among Chinese students during the pandemic, which found that academic stress significantly affects the increase in depressive symptoms, as well as being influenced by sleep quality and interpersonal relationships (Chen et al., 2024). Another study (2025) adds a broader psychological dimension, explaining that uncertainty about the future and tolerance for uncertainty mediate the impact of academic stress on mental health, highlighting the complexity of psychosocial factors underlying the effects of stress (X. Li, 2025).

Comparative testing, commonly known as comparative hypothesis testing, is a statistical method used to compare a variable in groups of subjects with certain differences (Heriadi et al., 2022). The purpose of this test is to determine whether there is a significant difference between two conditions or groups, thereby enabling conclusions to be drawn regarding the presence or absence of a relationship between the conditions being compared (Siroj et al., 2024).

One technique that is often used in comparative testing is the t-test. This test is used to determine whether there is a significant difference in the mean between two groups of data. In research, the t-test plays an important role because it provides an objective picture of the differences that occur, whether in the fields of health, education, or social sciences (Lukitasari et al., 2021). The basic formula for the T-test is as follows:

$$t = \frac{\bar{d}}{s_d/\sqrt{n}} \quad (1)$$

Description:

$\bar{d}$: average difference
Sd : difference in standard deviation
n : sample size

The use of the T-test can help researchers test hypotheses more accurately, especially when they want to determine the effectiveness of a treatment, intervention, or differences between groups. Several recent studies have shown that this method is highly relevant in analyzing quantitative data because it is simple yet valid for testing differences between groups (van Witteloostuijn & van Hugten, 2022).

An actual example of its application by (Fitriasari & Umasugi, 2024) used a paired sample t-test to evaluate a health education intervention at STIKes Maluku Husada. The results showed that the average knowledge of students increased from 67.21 before the intervention to 75.81 after the intervention, with statistical significance ($p < 0.001$), proving the effectiveness of the intervention quantitatively.

In the realm of student mental health, a study by (Ahsan & Abualait, 2024) confirms that students who are physically active have lower levels of anxiety and depression. They used comparative analysis to find a positive relationship between physical activity and mental health. Additionally, compared

students who regularly attended Physical Education (PE) classes with those who did not, and found that the active group had better mental health, including social adaptation and emotional stability results that demonstrate the effectiveness of structured physical activity in the campus environment (Boraita et al., 2025).

Overall, comparative tests especially t-tests are objective, valid, and practical statistical tools in various research domains. Whether evaluating health interventions, educational methods, or student lifestyles, t-tests provide valid empirical evidence as a basis for data-driven policy and scientific practice.

Comparative testing, commonly known as comparative hypothesis testing, is an important approach in quantitative research that serves to determine whether there are differences between two or more groups based on specific variables. This method is often used because it provides an objective picture of the comparison of the phenomena being studied, whether in the social, economic, educational, or health fields. According to Siroj et al. (Siroj et al., 2024), comparative studies can confirm whether there are significant relationships or differences between the groups being compared, so that the research results can be used as a basis for more accurate decision making. The most commonly used test in this context is the t-test, because it can test the difference in the means of two groups relatively simply but still be statistically valid.

In practice, comparative testing can be applied to various fields of study. For example, research conducted by Maulidia and Ratnasari (Maulidia & Ratnasari, 2021) compared user preferences for online transportation between Gojek and Grab in Karawang Regency. This study provides a broader picture of how people assess service quality, price factors, comfort, and trust in transportation service providers. The results of the study show significant differences between Grab and Gojek users, where some people prefer Grab because it is considered more consistent in terms of price and promotions, while Gojek users tend to be loyal due to habit and wider service coverage. Thus, comparative testing not only provides answers about whether or not there are differences, but also opens up space for deeper analysis of the factors behind these differences.

Another study was conducted by Mariyati et al (Mariyati et al., 2024).,which compared the income of farmers in Jombang Regency who used liquid organic fertilizer with farmers who did not use it. In this study, the variables compared included production levels, crop selling prices, revenue, total costs incurred, and net income earned by farmers. The results of the study showed that there was a significant difference between the two groups, with farmers who used liquid organic fertilizer having higher incomes than those who did not. This can be explained by the fact that liquid organic fertilizer can increase soil fertility, reduce production costs in the long term, and improve the quality of agricultural products. This analysis shows that comparative testing can be used as an important tool in assessing the effectiveness of agricultural innovations and providing policy input to improve farmers' welfare.

In addition, comparative studies were also conducted in the context of student health and physical fitness. One such study compared the cardiovascular endurance of students participating in the Taekwondo Student Activity Unit (UKM) at Malang State University between smokers and non-smokers (Surya et al., 2022). This study used a t-test to determine whether smoking habits affect physical endurance, particularly aerobic capacity. The results showed a significant difference, with non-smoking students having better cardiovascular endurance than smoking students. These findings reinforce scientific evidence regarding the adverse effects of smoking on the respiratory system and organ performance. Furthermore, this study emphasizes the importance of a healthy lifestyle for students, especially those who are active in physical activities or sports. Using comparative tests, this study successfully confirmed the negative relationship between smoking behavior and physical performance, which ultimately has implications for students' quality of life.

In addition to domestic research, comparative studies have also been conducted internationally. One such study was conducted by (Gawanmeh et al., 2023), which compared the mental health challenges of students in the context of online and on-campus learning. The results of the study show that students who participate in online learning tend to experience higher levels of stress and mental

health disorders compared to students who participate in face-to-face learning. This is associated with limited social interaction, increased workload, and reduced physical activity that can generally be done on campus. This study illustrates that differences in learning models can also affect students' psychological conditions, thus requiring serious attention in designing a higher education system that balances academic and mental health aspects.

Thus, various examples of comparative studies, both at the national and international levels, demonstrate the importance of this method in revealing significant differences in various fields. From digital transportation, the agricultural sector, student lifestyles, to education systems, the comparative approach allows researchers to gain a deeper understanding of the factors that influence a phenomenon. Furthermore, this method can also be used as a basis for policy-making or practical recommendations relevant to the needs of society and the world of education.

2. RESEARCH METHOD

This study uses a quantitative research design with a comparative approach. A quantitative approach was chosen because the study focuses on numerical measurement and statistical data processing to draw objective conclusions. Quantitative research allows researchers to obtain an empirical picture of the phenomenon being studied by utilizing measurable instruments and statistical analysis.

In the context of this study, a comparative approach was used to determine the differences in the health conditions of undergraduate cadets at the Republic Indonesian Defense University (RIDU) before and after an increase in the intensity of regimental activities. In other words, the research design aimed to see whether there were significant changes in health aspects after the intervention in the form of an increase in the intensity of cadet regimental training.

The comparative hypothesis test used is the paired sample t-test, because the research subjects being compared come from the same group, but under different conditions and treatments. This test is commonly used in education, health, and sports research to determine the effectiveness of a treatment or intervention.

The population in this study was all cadet students enrolled in the Bachelor's degree program at the Republic Indonesian Defense University who actively participated in cadet regiment activities. The population was selected because cadet students have high levels of structured physical activity, making it possible to clearly observe differences in health conditions resulting from increased activity intensity. The research sample was taken using purposive sampling, which is a sampling technique with specific considerations. The sample criteria were: cadets who were actively enrolled in the current semester; directly involved in cadet regiment activities at both normal and increased intensity; and willing to be research respondents by completing the questionnaire.

The minimum sample size is adjusted to the t-test analysis requirements, where the number of respondents is considered adequate if it can represent the population and produce normally distributed data. The sample size in this study is targeted to reach dozens of respondents so that the results are more valid and generalizations can be made carefully. The minimum sample size was determined based on the requirements of the paired sample t-test. A sample size of more than 30 respondents was considered sufficient to meet the normality assumption according to the Central Limit Theorem and to provide adequate statistical power. Only respondents who completed both pre-test and post-test questionnaires were included in the final analysis.

The main instrument used in this study was a structured quantitative questionnaire. The questionnaire was designed to measure the physical health and fitness of cadet students, covering several key indicators such as:

1. Study program
2. Health status before intensive Military Training
3. Frequency of visits to the clinic
4. Frequency of medication intake
5. Health status (fit or unfit)
6. Sleep patterns (adequate or inadequate)

7. Frequency of illness
8. Health status after increasing the intensity of regiment activities
9. Frequency of visits to the clinic after increasing the intensity of regiment activities
10. Frequency of taking medication after increasing the intensity of regiment activities
11. Health status (fit or unfit) after increasing the intensity of regiment activities
12. Sleep patterns (adequate or inadequate) after increasing the intensity of regiment activities
13. Frequency of illness after increasing the intensity of regiment activities

Prior to data analysis, the questionnaire instrument was tested for validity and reliability. Content validity was assessed through expert judgment involving academics and practitioners in health, physical training, and military education. Construct validity was examined using item–total correlation analysis. Instrument reliability was evaluated using Cronbach's alpha coefficient, where values above 0.70 indicated acceptable internal consistency.

The questionnaire uses a 1–5 Likert scale, where respondents provide subjective assessments of their perceived conditions. The data collection process was conducted in two stages. First, questionnaires were filled out before the increase in the intensity of regimental activities (pre-test). Second, questionnaires were filled out again after cadets underwent an increase in the intensity of regimental activities for a certain period of time (post-test).

The questionnaire was distributed via Google Forms to facilitate distribution and data collection, given that cadet students have busy schedules. This online method allowed respondents to fill out the questionnaire flexibly and made it easier for researchers to compile the data. The data collection steps are as follows:

1. The researcher explains the purpose of the study and the mechanism for completing the questionnaire.
2. Respondents complete the pre-test questionnaire before the intensity of the regiment activities is increased.
3. The intensity of the regiment activities is increased for a certain period.
4. Respondents complete the post-test questionnaire after the intervention is carried out.
5. The collected data is summarized and processed using statistical software.

Before conducting the paired sample t-test, the normality of the difference scores between pre-test and post-test measurements was examined using the Shapiro–Wilk test. A significance value greater than 0.05 indicated that the data were normally distributed and suitable for parametric testing. The data obtained from the questionnaire was analyzed using a paired sample t-test with the help of R Studio software. This analysis was used to determine whether there was a significant difference between the health conditions of cadets before and after the increase in the intensity of regimental activities.

The testing criteria were set at a significance level (α) of 0.05. If the p-value was < 0.05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_1) was accepted, which meant that there was a significant difference between the health conditions of cadets before and after the increase in the intensity of regimental activities.

In addition, descriptive analysis was used to provide an overview of the characteristics of the respondents and the distribution of responses for each indicator. The descriptive statistics used included the mean, median, standard deviation, and frequency distribution. In this study, two hypotheses were tested, namely:

H_0 (Null Hypothesis) : $\mu d = 0$. There was no difference in the health condition of UNHAN RI cadets before and after the increase in the intensity of regimental activities.

H_1 (Alternative hypothesis): $\mu d \neq 0$. There is a difference in the health condition of UNHAN RI cadets before and after the increase in the intensity of regimental activities.

This hypothesis was tested under the assumption that the data was normally distributed. If the test results show that H_0 is rejected, it can be concluded that the increase in the intensity of regimental activities has a real impact on the health of cadets.

In this study, ethical aspects were a major concern because it involved human participation, namely cadets from the Republic Indonesian Defense University. Research ethics are not only related to administrative procedures, but also include protecting the rights of respondents, maintaining the confidentiality of personal data, and ensuring that the research process does not cause physical or psychological harm.

Before filling out the questionnaire, the researcher first provided a comprehensive explanation (informed consent) to the respondents. This explanation included the purpose of the research, the benefits to be gained, the data collection methods, the possible risks, and the respondents' rights to participate or refuse without coercion. Thus, each respondent who agreed to fill out the questionnaire understood the consequences and voluntarily agreed to participate.

Data confidentiality is also a major concern. Respondents' personal identities will not be published or disclosed to third parties. The data obtained will be analyzed in aggregate, so that no individual can be specifically identified. The Google Form system used in data collection is equipped with security settings, and the data results are downloaded and stored in encrypted form to prevent information leaks.

Furthermore, this study ensures that there are no significant risks to respondents. The activities involved only consist of filling out questionnaires related to health and physical fitness, so there are no physical or mental dangers. However, if respondents feel uncomfortable, they are free to stop participating at any time without any consequences.

The study also emphasizes fairness by treating all respondents equally without discrimination based on social, academic, or physical background. This principle is in line with internationally accepted codes of ethics for social and health research. The benefits of this research are expected to outweigh the potential risks. The results of the research have the potential to provide valuable input for the Indonesian Defense University in developing strategies for the health and fitness training of cadets in a more effective and measurable manner. Thus, this research is not only academically beneficial but also has a real contribution to improving the quality of education and training in the defense environment.

Overall, this research methodology was systematically designed to answer the research questions and test the established hypotheses. The study used a comparative quantitative approach with a paired sample t-test as the main method of analysis. This method was chosen based on the need to determine the significant differences between the health conditions of cadets before and after the increase in the intensity of regimental activities.

The research population consisted of all undergraduate cadets at the Republic Indonesian National Defense University, with samples selected through purposive sampling based on specific criteria. The questionnaire instrument was developed with reference to valid physical fitness indicators, tested for reliability, and then used in two measurement stages (pre-test and post-test).

Data collection was conducted online using Google Forms to accommodate the cadets' busy schedules. This facilitated access, accelerated collection, and ensured that data was well documented. The collected data was then processed using R Studio software, which has powerful and accurate statistical analysis capabilities.

The analysis used was not only inferential testing, but also accompanied by descriptive analysis to provide an overview of the respondents' conditions. Thus, the research results not only presented conclusions on whether there were significant differences, but also provided an in-depth understanding of the data distribution and respondent trends.

Ethical aspects of research are an important foundation in the implementation of this methodology. The principles of informed consent, confidentiality, non-maleficence (not causing harm), and fairness have been consistently applied to protect the rights of respondents. With good ethical practices, this research is expected to not only produce academically valid findings, but also be morally and socially acceptable.

Ultimately, this methodology is expected to provide a comprehensive picture of the impact of increased regiment activity intensity on the health of RIDU cadets. The research findings are expected

to form the basis for the formulation of internal campus policies, improvements in physical training quality, and references for further research in the fields of military education, sports health, and student fitness management.

With a robust, transparent, and ethical methodology, this research is expected to make a tangible contribution both academically (in terms of scientific development) and practically (in terms of cadet training in the defense sector).

3. RESULTS AND DISCUSSIONS

This study involved cadets from the Republic Indonesian Defense University (RIDU) as the main respondents. Respondents were selected because they actively participated in regiment activities that required high physical and mental training intensity, with varying demographic backgrounds in terms of age, study program, region of origin, and experience in participating in regiment activities.

From the initial data collection results, the majority of respondents were between 18 and 22 years old, which is the productive age range for students. This age group generally has relatively good physical condition, but remains vulnerable to physical and mental stress when the intensity of activities increases significantly. Most respondents had participated in regiment activities for at least one semester, enabling them to provide a more objective assessment of changes in their health condition before and after the increase in activity intensity.

The comparative hypothesis used in this study aims to determine the differences in the health conditions of cadets at the Republic Indonesian Defense University (RIDU) before and after an increase in the intensity of regimental activities. Research data was obtained through the distribution of a Google Form-based questionnaire with a Likert scale that measured various aspects of physical and mental health. Data analysis was performed using a paired t-test using R Studio software with a significance level of 0.05.

The questionnaire used contained key indicators covering general health conditions, frequency of visits to the polyclinic, consumption of certain medications, and cadet students' sleeping patterns. Response scores were measured on a scale of 1 to 5, where 1 indicated the poorest condition and 5 indicated the best condition. The complete review can be seen as follows:

1 = not good
2 = not very good
3 = fairly good
4 = good
5 = very good

An example of the instrument can be seen in Figure 1.

Figure 1. Sample Questionnaire Form

An example of a completed questionnaire is shown in Figure 2. To maintain the confidentiality of personal data, the identities of respondents in the questionnaire biodata have been obscured.

NAMA	PRODI	1. Kondisi Nilai Keseh	2. Seberapa Sering kc	3. Seberapa sering mi	4. Apakah saat ini anc	5. apakah pola tidur a	6. seberapa sering
	TM	5	1	1	5	4	
	FK	5	1	1	5	4	
	KIM	5	2	2	5	3	
	TE	5	1	1	4	3	
	FIS	5	1	1	5	4	
	MAT	3	1	1	4	4	
	FK	5	1	1	5	5	
	INF	3	1	1	4	4	
	TE	5	1	1	5	5	
	FK	5	1	1	5	5	
	FK	5	1	1	5	4	
	TM	5	1	1	5	5	
	FARMASI	3	1	1	3	4	
	FK	5	1	1	5	4	
	FK	5	2	3	4	5	
	FARMASI	4	1	1	4	4	
	FK	5	1	1	4	4	
	FARMASI	5	1	1	5	3	

Figure 2. Completed Questionnaire Form

This research instrument was developed based on adaptations from several previous studies. Questions related to physical health conditions were adapted from (Fathurohman, 2021). Questions regarding the frequency of visits to the polyclinic referred to (Ratnasari, 2023). The variable of frequency of consumption of certain drugs refers to (Asseggaf & Ulfah, 2022), while the variable regarding cadets' sleep patterns was compiled with reference to the study by (Ikawati et al., 2021). With reference to the literature, it is hoped that the instruments used in this study have adequate validity.

Before testing the hypothesis, the data obtained from the questionnaire underwent preprocessing. Several steps were taken, including:

- Checking for missing values to ensure that no data was lost.
- Checking the suitability of the scale and consistency of the answers.
- Simple normalization to ensure that the data distribution was close to normal, in accordance with the t-test assumption.

After preprocessing, a paired t-test was conducted to compare the health conditions of cadets before and after the increase in the intensity of regimental activities. The test results are shown in Figure 3. Further statistical analysis showed a measurable difference in cadets' health condition scores before and after the increase in regimental activity intensity. The paired sample t-test revealed a mean difference of 0.58, with a 95% confidence interval ranging from 0.35 to 0.80, indicating that the post-test health scores were consistently higher than the pre-test scores. The inferential test results demonstrated a statistically significant difference between pre-test and post-test measurements, $t = 5.06$, $p = 1.029 \times 10^{-6}$ ($p < 0.05$). This result confirms that the increase in regimental activity intensity had a significant effect on cadets' health conditions.

```
t.test(data$sebelum, data$sesudah, data=data, paired= TRUE, conf.level=0.95,
       alternative= "two.sided" )
```

Hasil Eksekusi Coding:

```
        Paired t-test

data:  data$sebelum and data$sesudah
t = 5.0589, p-value = 1.029e-06
alternative hypothesis: true mean difference is not equal to 0
95 percent confidence interval:
 0.3519021 0.8019441
sample estimates:
mean difference
      0.5769231
```

Based on the analysis results in Figure 3, a p-value of 1.029×10^{-6} was obtained. When compared to the significance level $\alpha = 0.05$, this value is much smaller than α. Thus, the null hypothesis (H_0), which states that there is no difference in health conditions before and after increasing the intensity of regiment activities, is rejected. Conversely, the alternative hypothesis (H_1) is accepted, which means that there is a significant difference in the health conditions of UNHAN RI cadets. These findings indicate that increasing the intensity of regiment activities does have an impact on the health conditions of cadets, both physically and mentally. The magnitude of the mean difference and the narrow confidence interval indicate that the observed effect is not only statistically significant but also practically meaningful. In the institutional context of the Republic of Indonesia Defense University (RIDU), where cadets undergo structured military-style training alongside academic responsibilities, these findings are particularly relevant.

Unlike civilian universities, RIDU integrates regiment activities as a core component of character building, discipline formation, and physical readiness. Consequently, the health impacts observed in this study should be interpreted within a dual-demand environment, where cadets are exposed to both physical and psychological stressors. While increased training intensity contributes positively to physical fitness, insufficient recovery and support mechanisms may increase fatigue, minor illnesses, and sleep disturbances.

From a theoretical perspective, these results are consistent with training adaptation theory, which emphasizes the importance of balancing training load with adequate recovery. Excessive training intensity without sufficient recovery may lead to maladaptation and health complaints, especially in military-based educational institutions such as RIDU.

The majority of cadets reported an increase in physical fitness after participating in higher-intensity regiment activities. This is in line with previous research stating that intensive physical training can improve endurance, muscle strength, and cardiovascular fitness (Fathurohman, 2021).

However, not all respondents felt the positive effects. A small number of cadets admitted to experiencing excessive fatigue, muscle pain, and even potential injuries due to the overly intense training. These results indicate that although high-intensity training programs are beneficial for improving physical health, balanced training load management is still necessary to prevent overtraining.

The data on the frequency of visits to the polyclinic shows an increase in the number of cadet visits to the polyclinic after the intensity of activities increased. This was due to minor health complaints such as flu, headaches, and digestive disorders. Although most cases were not serious, this increase in visits indicated a need for more adequate health services to support regimental activities. These findings support (Ratnasari, 2023)research, which states that increased physical activity among students often correlates with an increase in the need for health services.

Regarding medication consumption, some cadets reported an increase in medication consumption, particularly muscle pain relievers and vitamins. This phenomenon is common among individuals who engage in intense physical activity. However, increased medication consumption needs to be closely monitored to prevent dependence. Research by (Asseggaf & Ulfah, 2022) also found that students who engage in high levels of physical activity tend to consume more pain relievers, especially to overcome muscle fatigue.

One important finding in this study was the presence of sleep pattern disturbances in some cadets. The high intensity of regimental activities resulted in reduced sleep time and decreased sleep quality. Several cadets reported difficulty sleeping soundly and frequent waking during the night. These results are consistent with the research by (Ikawati et al., 2021), which confirms that excessive physical activity can disrupt an individual's circadian rhythm and sleep quality. These sleep disturbances have the potential to reduce cadets' concentration and academic performance.

The results of this study reinforce the findings of previous studies that increased physical activity intensity has two sides: it improves fitness but also increases the risk of fatigue and health problems. A study by (G. Zhang et al., 2024) published in Scientific Reports shows that higher physical activity is positively associated with mental health, but this relationship is mediated by stress management skills and self-efficacy. This means that without good stress management strategies, intensive physical activity can actually cause excessive psychological stress. Meanwhile, a recent study also emphasizes that active participation in Physical Education (PE) classes directly and indirectly improves students' mental health. This effect works through increased physical activity and students' social adaptation in the campus environment (Han, Li, Xiao, et al., 2025).

Overall, the findings indicate that increased regimental activity intensity at RIDU produces both beneficial and adverse effects on cadets' health. Therefore, policy-level interventions are required to ensure that training effectiveness is achieved without compromising cadet well-being. These interventions include structured training periodization, strengthened preventive healthcare services at the campus polyclinic, integrated health education and stress management programs, and accessible psychological counseling services. Such measures are essential to support sustainable cadet performance and long-term institutional readiness.

4. CONCLUSION

Based on the results of this study, it can be concluded that increasing the intensity of regimental activities at the Republic of Indonesia Defense University (UNHAN RI) has a statistically significant impact on cadets' health conditions. This finding is supported by a p-value of 1.029×10^{-6}, which is lower than the significance level ($\alpha = 0.05$), indicating a clear difference between health conditions before and after the increase in training intensity. The results demonstrate both positive effects, such as improvements in physical fitness, endurance, and adaptability to physical demands, as well as negative effects, including increased fatigue, sleep disturbances, minor injuries, and greater utilization of health services. These findings confirm that intensive regimental activities produce both beneficial and adverse health outcomes. This study provides a scientific contribution by offering empirical quantitative evidence on the health impacts of intensified regimental training within a military-based

higher education institution. Unlike studies conducted in civilian university settings, this research highlights the unique dual demands faced by cadets, who must balance academic responsibilities with structured military-style training. By employing a paired comparative design, this study strengthens the understanding of how changes in training intensity directly affect cadets' health and enriches the literature in the fields of military education, physical training, and student health management. However, this study has several limitations. The use of self-reported questionnaire data may introduce subjective bias in respondents' perceptions of their health conditions. In addition, the study involved a limited sample size from a single institution, and the health indicators measured were relatively general. These factors may limit the generalizability of the findings to other military academies or broader student populations. Future research is therefore recommended to involve larger and more diverse samples, incorporate objective physiological measurements such as fitness tests or biometric indicators, and apply longitudinal research designs to examine long-term health effects. Further studies should also explore moderating factors such as recovery strategies, nutritional intake, stress management, and psychological resilience to support intensive regimental training while maintaining cadet well-being and institutional sustainability.

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