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Research on Physical Assessment Criteria for Students of Class 49, Faculty of National Defense Education, Ho Chi Minh City University of Education, Vietnam

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ABSTRACT: Physical fitness assessment is a crucial basis for monitoring student development and improving the quality of training. However, to date, there is no specific system of physical fitness assessment criteria for students majoring in National Defense and Security Education. This research aims to develop a suitable system of physical fitness assessment criteria for students of the 49th cohort, Faculty of National Defense Education, Ho Chi Minh City University of Education. The research utilizes methods including literature review, expert interviews, anthropometry, biomedical testing, pedagogical testing, and statistical mathematics. Based on a synthesis of domestic and international research, this study developed a system of 28 initial physical fitness indicators and tests. Through expert interviews and reliability testing, the study selected a system of 10 criteria encompassing three components of physical fitness: morphology, function, and fitness. The established criteria system is scientifically sound, reliable, and appropriate to the training characteristics of students majoring in National Defense and Security Education. The research results serve as a basis for evaluating, monitoring, and improving the quality of physical development for students and can also be used as a reference for application at training institutions with similar conditions.

KEYWORDS: Physical fitness, evaluation criteria, National Defense, Security Education; students, Department of National Defense Education, Ho Chi Minh City University of Education, Vietnam.

1. INTRODUCTION

Physical development is an important part of human development, manifested through changes in morphology, bodily function, and physical capacity under the combined influence of genetic factors, living environment, nutrition, education, and physical activity (Nguyen Toan & Pham Danh Ton, 2002). In particular, organized, scientific, and regular physical exercise is one of the important means contributing to improving health, perfecting bodily functions, and developing motor skills (Nguyen Toan & Pham Danh Ton, 2002; Bull et al., 2020). For university students, maintaining regular physical activity is not only significant for health but also contributes to improving physical fitness and adaptability to the demands of studying, training, and life (Bull et al., 2020; WHO, 2020).

In Vietnam, physical development for students is identified as an important component of comprehensive education. The 2019 Education Law emphasizes the goal of education to comprehensively develop Vietnamese people in terms of ethics, knowledge, culture, health, aesthetics, and professional skills (National Assembly, 2019). Decision No. 1076/QD-TTg dated June 17, 2016, of the Prime Minister on the overall plan for the development of physical education and school sports also sets out the requirement to improve the quality of physical education and develop the physical fitness and stature of students (Prime Minister, 2016). These orientations are further emphasized in Conclusion No. 70-KL/TW dated January 31, 2024, on the development of physical education and sports in the new period and the Strategy for the Development of Physical Education and Sports in Vietnam to 2030, with a vision to 2045 (Political Bureau, 2024; Prime Minister, 2024). This necessitates not only organizing activities to develop physical fitness but also establishing appropriate criteria for objectively assessing the current state and level of physical development of learners.

National Defense and Security Education (NDSE) plays a crucial role in educating the younger generation, contributing to raising the awareness and responsibility of students towards the task of building and protecting the Fatherland. The Party's viewpoint on NDSE has been gradually supplemented and developed, from the requirement to strengthen national defense education for the younger generation (Communist Party of Vietnam, 1981) to identifying national defense and security education as an important and regular task in the new situation (Political Bureau, 2001, 2007). These viewpoints are institutionalized in the 2013 Law on National Defense and Security Education and regulations on the national defense and security education program in educational institutions, thereby affirming the role of national defense and security education

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in equipping students with knowledge, skills, and fostering awareness and responsibility for protecting the Fatherland (National Assembly, 2013; Ministry of Education and Training, 2020).

Students majoring in National Defense and Security Education have unique training characteristics compared to students in other majors who only participate in the National Defense and Security Education module as part of the university education program. Students in this major receive systematic training in educational science, specialized knowledge, and practical skills to meet the professional requirements in the field of teaching National Defense and Security Education. During this process, students regularly participate in practical exercises, military skills training, and activities requiring specific physical activity. Therefore, appropriate physical fitness is one of the foundations supporting students in carrying out specialized training content and preparing for professional activities after graduation.

The learning and training characteristics of students majoring in National Defense and Security Education require the coordinated participation of many physical elements. Contents such as drill and formation, military movement, armed running, grenade throwing, and other practical activities place different demands on speed, strength, endurance, and motor coordination. Studies in the field of National Defense and Security Education show that endurance plays a significant role in the ability to perform armed running (Cao Manh Cuong & Pham Thuy Yen, 2025), while the use of exercises to develop strength and motor coordination can contribute to improving the effectiveness of grenade throwing techniques (Nguyen Huy Bao Hoang & Nguyen Thanh Hung, 2025). This indicates that the assessment of the physical fitness of students majoring in National Defense and Security Education needs to be considered from multiple perspectives while also being appropriate to the characteristics of the target group and the training requirements.

International studies on subjects trained in military environments also show that physical assessment is often approached from multiple perspectives and linked to specific operational requirements. Vantarakis et al. (2022), in their study of Greek naval cadets, used body composition indices in combination with tests assessing muscle endurance and aerobic capacity to determine changes in physical condition after basic military training. Cannon et al. (2024) used the Army Combat Fitness Test system and body composition indices to assess the effectiveness of the training program for ROTC trainees. Jalowska and Prokopczyk (2022) also used a fitness test system for reserve military personnel to assess the fitness of students oriented to serve in uniformed forces. Although the subjects above are not entirely identical to students majoring in National Defense and Security Education in Vietnam, these studies show that physical assessment for learners with specific movement requirements should be based on a scientifically grounded system of criteria that reflects the necessary physical components and is appropriate to the characteristics of the subjects' activities (Cannon et al., 2024; Jalowska & Prokopczyk, 2022; Vantarakis et al., 2022).

From a scientific perspective, physical assessment serves as a basis for determining the current state, identifying the strengths and weaknesses of learners, and providing information for developing content, organizing training, and monitoring progress during the training process. However, assessment criteria are only truly valuable when they ensure scientific accuracy, feasibility, and suitability to the characteristics of the target group. Using general assessment criteria for students or applying a model assessment system designed for military personnel and military trainees may not fully reflect the physical characteristics of students majoring in National Defense and Security Education, as there are differences between these groups in terms of training objectives, operating environments, and professional requirements.

A synthesis of related studies shows that international research has developed and used various index systems and tests to assess the physical fitness and stamina of military personnel, military cadets, Naval Cadets, and ROTC Cadets (Jalowska & Prokopczyk, 2022; Vantarakis et al., 2022; Cannon et al., 2024). Meanwhile, domestic research in the field of national defense education mainly focuses on assessing or developing individual physical qualities and abilities associated with activities such as armed running and grenade throwing (Cao Manh Cuong & Pham Thuy Yen, 2025; Nguyen Huy Bao Hoang & Nguyen Thanh Hung, 2025). Systematic research on physical fitness assessment criteria specifically for students majoring in National Defense and Security Education, ensuring that they reflect the basic elements of physical fitness while also being suitable for the learning, training, and professional requirements of the target group, has not yet received sufficient attention.

For students of the 49th cohort of the Faculty of National Defense Education, Ho Chi Minh City University of Education, identifying appropriate physical fitness assessment criteria is of practical significance. The system of criteria not only helps objectively assess the students' physical condition but also provides a basis for monitoring their development, identifying weaknesses, and supplying scientific data for organizing physical training and development. At the same time, it can serve as a reference for developing appropriate training methods and programs tailored to the characteristics of students majoring in National Defense Education.

Based on the above theoretical and practical foundations, the research "Research on physical assessment criteria for students of class 49, Faculty of National Defense Education, Ho Chi Minh City University of Education, Vietnam" was conducted to select and determine criteria that are scientifically sound, feasible, and appropriate for evaluating students' physical fitness, thereby contributing to improving the quality of assessment, monitoring, and development of physical fitness in the training of students majoring in National Defense and Security Education.

2. RESEARCH MATERIALS AND METHODS

Methods

Literature review method: Used to collect, analyze, and synthesize scientific documents, legal texts, and research works, both domestic and international, related to the development and assessment of physical fitness, physical characteristics of students, and other subjects with specific exercise requirements. The results of the literature review will serve as the basis for building the initial criteria system and guiding the process of selecting criteria for assessing physical fitness for students of the 49th cohort, Faculty of National Defense Education, Ho Chi Minh City University of Education.

Interview method: Used to consult with experts, lecturers, and experienced staff in the fields of physical education, national defense and security education, and physical fitness assessment. The interview content focuses on the necessity and suitability of the indicators and tests to be used.

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Anthropometric methods: Used to measure basic morphological indicators reflecting the physical development characteristics of students.

Biomedical testing methods: Used to assess several bodily function indicators related to the physical condition and performance of students. The indicators are tested using appropriate methods and equipment, under relatively uniform conditions, thereby providing data on bodily function and supplementing the assessment of the physical fitness of the research subjects.

Pedagogical testing method: Used to test and assess the physical fitness components of students through a selected testing system. The test results serve as the basis for determining physical fitness characteristics and verifying the usability of criteria in the physical assessment of students in the 49th cohort, Faculty of National Defense Education.

Statistical methods: Used to process and analyze data collected during the research. The collected data was processed with the support of SPSS 22.0 software.

Participants

+ Interview subjects: 31 experts, professionals, and physical education instructors.

+ Survey subjects: 30 students from the 49th cohort of the Faculty of National Defense Education, Ho Chi Minh City University of Education.

3. RESULTS

To study the criteria for evaluating physical fitness for students of the 49th cohort, the Faculty of National Defense Education, Ho Chi Minh City University of Education, conducted the research in 3 steps:

Step 1: Synthesize physical fitness evaluation criteria for students from research works by domestic and foreign authors.

Step 2: Interview experts, professionals, and lecturers.

Step 3: Check the reliability of the test.

3.1. Synthesizing physical fitness assessment criteria for students from research works by domestic and foreign authors.

This study synthesizes physical fitness assessment tests for students based on research by authors such as: Decision No. 53/2008/QD-BGDĐT (Ministry of Education and Training, 2008), "Physical fitness of Vietnamese people aged 6 to 60 in the early 21st century" (Duong Nghiep Chi, 2013), Standards for physical training in the military (Ministry of National Defense, 2009), Physical fitness of students at Ho Chi Minh City National University (Hoang Ha, 2016); Students from the University of Electrical Engineering (Cao Manh Cuong & Pham Thuy Yen, 2025); University of Electrical Engineering (Vu Ngoc Minh, 2024); Students from Quy Nhon University (Nguyen Huy Bao Hoang & Nguyen Thanh Hung, 2025); Students from An Giang University (Dao Chanh Thuc, 2020); Students from Da Nang University (Vo Dinh Hop, 2022); Canadian Society for Exercise Physiology (CSEP) (CSEP, 2003); US University of Physical Education Test (Morrow Jr, J. R. et al, 2009); Chinese University of Physical Education Test (Liu X., et al, 2017), (Keating X. D., et al, 2019)….

Through the process of researching, collecting, synthesizing, and analyzing documents related to the thesis, and based on the objectives and tasks of the National Defense Education program, especially based on the specific characteristics of the National Defense Education subject, the thesis has selected 28 tests and indicators to assess physical development for students of the 49th cohort of the National Defense Education Department at Ho Chi Minh City University of Education, suitable for their level, gender, and practical application. These include 14 morphological indicators, 3 functional indicators, and 11 physical fitness tests.

3.2. Interview for selection of physical development tests

This study involved interviewing teachers and lecturers teaching National Defense Education in Long An province, Ho Chi Minh City, and several other provinces and cities. Two interviews were conducted using the same questionnaire, evaluation method, and criteria, along with the same tests. The purpose of the interview questions was to select the necessary indicators to assess the physical development of students in the 49th cohort of the National Defense Education Department at Ho Chi Minh City University of Education. Interviewees chose one of two levels: Agree or Disagree. The difference between the two interviews was tested using the chi-square test, yielding the results shown in Table 1.

Table 3.1: Results of the first interview on the level of use of physical development assessment tests among students of the 49th cohort of the National Defense Education Department, Ho Chi Minh City University of Education, academic year 2023-2024

	Index, test	First interview (n = 31)		Second interview (n = 31)		Inspection	
		Agree	%	Agree	%	χ^2	Sig
I. Morphology							
1	Standing height (cm)	31	100.00	30	96.77	1.02	0.31
2	Weight (kg)	29	93.55	29	93.55	0.00	1.00
3	BMI Index (kg/m^2)	20	64.52	20	64.52	0.00	1.00
4	Queletet Index (g/cm)	30	96.77	30	96.77	0.00	1.00
5	Sleeve length (cm)	22	70.97	22	70.97	0.00	1.00
6	Leg length (cm)	22	70.97	22	70.97	0.00	1.00

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	Index, test	First interview (n = 31)		Second interview (n = 31)		Inspection	
		Agree	%	Agree	%	χ^2	Sig
7	Average chest circumference (cm)	15	48.39	15	48.39	0.00	1.00
8	Shoulder width (cm)	20	64.52	20	64.52	0.00	1.00
9	Seat height (cm)	21	67.74	21	67.74	0.00	1.00
10	Neck circumference (cm)	20	64.52	20	64.52	0.00	1.00
11	Chest circumference (cm)	18	58.06	18	58.06	0.00	1.00
12	Arm circumference (cm)	22	70.97	22	70.97	0.00	1.00
13	Circumference of the calf (cm)	21	67.74	21	67.74	0.00	1.00
14	Length of the limbs (cm)	16	51.61	16	51.61	0.00	1.00
II. Function							
15	Cardiac function index (Hw)	30	96.77	30	96.77	0.00	1.00
16	Respiratory rate (beats/minute)	30	96.77	29	93.55	0.35	0.55
17	Breathing rate (beats/minute)	17	54.84	17	54.84	0.00	1.00
III. Physical fitness							
18	Dominant hand grip strength (kg)	29	93.55	28	90.32	0.22	0.64
19	30-second sit-ups (repeat)	19	61.29	19	61.29	0.00	1.00
20	Standing long jump (cm)	29	93.55	29	93.55	0.00	1.00
21	30m sprint with high start (seconds)	20	64.52	22	70.97	1.02	0.31
22	100m sprint with low start (seconds)	20	64.52	19	61.29	0.07	0.79
23	4 x 10m Shuttle run (seconds)	22	70.97	22	70.97	0.00	1.00
24	Long jump (m)	30	96.77	30	96.77	0.00	1.00
25	Jump three steps with feet together (m)	25	80.65	25	80.65	0.00	1.00
26	5-minute endurance run (m)	26	83.87	25	80.65	0.06	0.81
27	Overcoming obstacles 100m + 100m (s)	18	58.06	19	61.29	0.07	0.79
28	3000-meter armed run (s)	22	70.97	21	67.74	0.08	0.78

The interview results in Table 1 show that all indicators tested across two interviews have a value of the chi-square test < tabulated chi-square = 3.84. Therefore, the difference between the two interviews is not statistically significant at a probability level of P > 0.05. Therefore, the results of the two interviews with experts and lecturers showed a high degree of consistency in their responses. The study identified 10 indicators and tests for physical development, specifically as follows:

- For physical characteristics: (1) Standing height (cm), (2) Weight (kg), (3) BMI index (kg/m²)
- For function: (4) Respiratory rate (beats/minute), (5) Cardiac function index (Hw)
- For physical fitness: (6) 100m low start run (seconds), (7) 30-second sit-ups (number of repetitions), (8) Long jump (m), (9) 3-step jump with feet together (m), and (10) 5-minute endurance run (m).

3.3. Assess the reliability of indicators and tests.

To test the reliability of the test, we conducted a test on 15 male and 15 female students from the 49th cohort of the National Defense Education Department at Ho Chi Minh City University of Education. The test was conducted in two phases, with a 7-day interval between phases. Tests were sequentially designed for the subjects, with identical durations and conditions (time, test sequence, procedure, location, testing area, testing equipment, etc.). The correlation coefficient (r) of the test between the two trials was then calculated (Do Vinh & Trinh Huu Loc, 2010; Duong Nghiep Chi, 2004). According to the convention:

+ If $r \geq 0.8$ and $P < 0.05$, then the test is recognized as reliable..
+ If $r < 0.8$, then the test is not reliable enough.

The pairwise correlation coefficients are calculated and presented in Tables 2 and 3 below:

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Table 2. Results of reliability assessment of physical development tests for male students of cohort 49, Department of National Defense Education, Ho Chi Minh City University of Education (n = 15)

	TEST NAME	First time		After 7 days		r	p
		$\bar{X}_1$	S_1	$\bar{X}_2$	S_2		
I. Morphology							
1	Standing height (cm)	170.40	5.28	170.40	5.28	1	<0.05
2	Weight (kg)	64.67	8.25	64.60	8.32	0.99	<0.05
3	BMI Index (kg/m^2)	22.29	2.72	22.26	2.73	0.99	<0.05
II. Function							
4	Respiratory rate (beats/minute)	17.13	1.36	17.33	1.29	0.87	<0.05
5	Cardiac function index (Hw)	7.14	0.34	7.09	0.35	0.88	<0.05
III. Physical fitness							
6	100m low start run (seconds)	14.81	0.34	14.81	0.34	0.95	<0.05
7	30-second sit-ups (number of repetitions)	17.8	1.70	18.27	1.67	0.90	<0.05
8	Long jump (m)	4.33	0.12	4.50	0.13	0.87	<0.05
9	3-step jump with feet together (m)	7.02	0.13	7.25	0.13	0.81	<0.05
10	5-minute endurance run (m)	957.67	31.33	966.00	29.23	0.89	<0.05

Table 3. Results of reliability assessment of physical development tests for female students of cohort 49, Department of National Defense Education, Ho Chi Minh City University of Education (n = 15)

TT	TEST NAME	First time		After 7 days		r	p
		$\bar{X}_1$	S_1	$\bar{X}_2$	S_2		
I. Morphology							
1	Standing height (cm)	157.67	4.67	157.67	4.67	1	<0.05
2	Weight (kg)	51.93	4.15	51.87	4.00	0.99	<0.05
3	BMI Index (kg/m2)	20.90	1.53	20.87	1.48	0.99	<0.05
II. Function							
4	Respiratory rate (beats/minute)	18.00	1.36	17.60	1.24	0.93	<0.05
5	Cardiac function index (Hw)	7.13	0.34	7.03	0.34	0.94	<0.05
III. Physical fitness							
6	100m low start run (seconds)	17.11	0.40	17.08	0.36	0.95	<0.05
7	30-second sit-ups (number of repetitions)	17.93	0.88	18.07	1.03	0.87	<0.05
8	Long jump (m)	4.19	0.08	4.20	0.07	0.92	<0.05
9	3-step jump with feet together (m)	6.89	0.11	6.91	0.09	0.94	<0.05
10	5-minute endurance run (m)	886.00	18.82	889.33	18.70	0.91	<0.05

Tables 2 and 3 show that out of the 10 tested indicators, 10 were selected: standing height (cm), weight (kg), BMI index (kg/m²), respiratory rate (beats/minute), cardiac function index (Hw), 100 m low start run (seconds), 30-second sit-ups (number of repetitions), Long jump (m), 3-step jump with feet together (m), and 5-minute endurance run (m), which have sufficient reliability (r > 0.8) and meet the conditions to continue the experiment.

1. Standing height (cm)
2. Weight (kg)
3. BMI Index (kg/m²)

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4. Respiratory rate (beats/minute)
5. Cardiac function index (Hw)
6. 100m low start run (seconds)
7. 30-second sit-ups (number of repetitions)
8. Long jump (m)
9. 3-step jump with feet together (m)
10. 5-minute endurance run (m)

4. DISCUSSION

The literature review reveals that both domestic and international studies have developed numerous systems of criteria for assessing physical fitness for various target groups such as high school students, university students, military personnel, military trainees, and athletes. However, these systems of criteria are primarily developed according to the specific objectives of each field or research group. For example, Decision No. 53/2008/QD-BGDĐT and studies by Duong Nghiep Chi (2013), Hoang Ha (2016), Dao Chanh Thuc (2020), and Vo Dinh Hop (2022) focus on evaluating the physical fitness of students in general; while the physical training standards in the Army (Ministry of National Defense, 2009) aim at the training requirements of military personnel. Recent studies by Cao Manh Cuong and Pham Thuy Yen (2025), Vu Ngoc Minh (2024), and Nguyen Huy Bao Hoang and Nguyen Thanh Hung (2025) mainly evaluate specific content of the National Defense and Security Education subject such as armed running or grenade throwing. Therefore, no study has yet developed a system of physical assessment criteria specifically for students trained in National Defense and Security Education.

The novelty of this research lies not in proposing entirely new tests, but in the process of selecting and developing a specialized evaluation system for students of the Faculty of National Defense Education. The study synthesized 28 index and test studies from domestic and international research works and standards from the education and military sectors; then, it proceeded with a screening process using the action expert method and further reliability testing using the test-retest method. This process ensures that the selected standard system is scientifically sound, practical, and appropriate to the training characteristics of the research subjects.

Compared to previous studies, the selected system of 10 indicators and tests is more balanced, fully reflecting the three components of physical fitness: morphology, function, and fitness. Using only fitness tests, as in many previous studies, makes it difficult to comprehensively assess the physical development of students. Combining morphological indicators (height, weight, BMI), functional indicators (respiratory rate, cardiac function index), and fitness tests (100m low-start run, 30-second sit-up, long jump, triple jump with feet together, and 5-minute endurance run) allows for a relatively complete reflection of the physical development characteristics of students majoring in National Defense and Security Education.

Another highlight of the criteria system is its suitability to the training requirements of students in the Faculty of National Defense Education. The learning and training content for students in this specialization not only requires general health but also the ability to regularly perform military exercises, drills, military movements, practical teaching, and organize post-graduation training. Therefore, the selected tests all reflect basic motor skills that directly serve the learning process and professional activities. Specifically, the 100m run assesses speed; the 30-second sit-ups assess abdominal strength and endurance; the long jump and triple jump with feet together reflect the explosive strength of the lower limbs; the 5-minute endurance run assesses general stamina; while the morphological and functional indicators provide information on the level of physical development and the adaptability of the circulatory and respiratory systems.

The interview results showed that the 10 indicators and tests received high consensus from experts across two surveys, and there was no statistically significant difference between the two interviews ($P > 0.05$). This demonstrates that the selected criteria are stable and consistent with the professional understanding of lecturers and experts in the field of national defense and security education. This is an important basis for further testing the reliability of the tests in practice.

The test-retest results further confirm the scientific validity of the criteria system, as all 10 indicators and the test have correlation coefficients ranging from $r = 0.81$ to $r = 1.00$ in both males and females ($P < 0.05$). According to Safrit and Wood (1995), a correlation coefficient of 0.80 or higher indicates that the test has high reliability and can be used in physical assessment. This shows that the selected criteria are not only theoretically appropriate but also ensure stability when applied in practice to students of the 49th cohort, Faculty of National Defense Education, Ho Chi Minh City University of Education.

Overall, the study has developed a system of 10 scientifically sound, objective, and highly applicable criteria for evaluating physical fitness. This serves as a basis for assessing the physical condition and monitoring the development of students during their training and can also be used as a reference for training institutions specializing in National Defense and Security Education with similar conditions.

5. CONCLUSIONS

The study developed an initial system of 28 physical fitness assessment indicators and tests based on a synthesis of domestic and international research. Through expert interviews and reliability testing, 10 indicators and tests were selected, including 3 morphological indicators, 2 functional indicators, and 5 fitness tests. This system of criteria has a scientific basis, high reliability, and is suitable for assessing the physical fitness of students in the 49th cohort of the Faculty of National Defense Education, Ho Chi Minh City University of Education.

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