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Characteristics of regular exercise habits among people in the northern mountainous regions of Vietnam

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ABSTRACT

This study aimed to analyze and compare the characteristics of sports participation behavior among mountainous populations in the Northern, Central, and Southern regions of Vietnam. A sociological survey method was employed to examine and compare physical exercise habits across these regions, focusing on exercise level, temporal characteristics (time and frequency), types and forms of physical activity, as well as participants' awareness of the meaning and benefits of physical exercise. The total sample comprised 3,429 participants, including 1,842 males and 1,587 females. The research results indicated that the proportion of mountainous populations regularly engaging in physical exercise was relatively similar across the three regions. Participants in all regions tended to practice both modern and traditional sports. However, the content of physical exercise showed statistically significant differences among the regions ($p<0.05$). In addition, the majority of respondents demonstrated positive and stable motivations for engaging in physical activity. Their perceptions of the meaning and benefits of physical exercise also varied significantly across regions. These findings highlight important considerations for the development and promotion of physical activity programs among mountainous populations in Vietnam.

KEYWORDS

Sports; Mass Sports; Exercise Habits; Exercise Behavior; Regular Physical Activity

1. INTRODUCTION

The Party and State of Vietnam always identify investment in physical education and sports as investment in people and in the development of the country (Central Executive Committee of the Party, 2011). Physical education and sports play an important role in improving the physical and mental health and quality of life of the people (General Department of Sports and Physical Training, 2008).

In the context of Vietnam promoting a sustainable and comprehensive strategy for the development of physical education and sports for the entire population, it is extremely necessary to study the characteristics of physical education and sports practice behavior of population groups, especially people in mountainous areas (General Department of Sports and Physical Training, 2008). The mountainous regions of Vietnam - stretching from North to South - are mainly inhabited by ethnic minorities, with economic, social, cultural and natural environmental conditions significantly different from those in the plains, where the majority of the Kinh people are concentrated (Nguyen, 2013). This difference affects the type of sport that is favored, popular folk games as well as the form of organization and level of participation in physical education and sports in the community concentrated (Nguyen, 2013). Therefore, the development of mass physical education and sports movements in mountainous areas needs to be approached in a separate way, suitable to the ethnic, cultural, geographical and living conditions of each region.

Current studies on mass sports development in Vietnam mainly focus on urban areas (Prime Minister, 2024), deltas (Pham, 2012; Tran, 2009) and some studies on sports development in coastal areas (Dang, 2006), while data on sports practice behavior in mountainous areas are still limited. Therefore, this study aims to analyze and compare the characteristics of sports practice behavior of mountainous people in the three regions of North, Central and South Vietnam, thereby providing a practical basis for the development of sports development policies and programs suitable to the characteristics of each region.

2. METHODS

2.1. Design and Participants

The study applied a combination of research methods, including document analysis and synthesis, pedagogical observation, sociological investigation, mathematical statistics. The total sample consisted of 3,429 participants, including 1,842 men and 1,587 women. Participants were

selected using a stratified random sampling method, with random selection conducted in mountainous communes within the chosen provinces.

2.2. Study Setting

The assessment was based on field survey data collected in mountainous areas across seven provinces, representing three regions (Table 1):

- **Northern region:** Ha Giang Province, Son La Province
- **Central region:** Nghe An Province, Quang Ngai Province, Dak Lak Province
- **Southern region:** Tay Ninh Province, Binh Phuoc Province

Table 1. Gender distribution of survey participants across provinces

Gender structure	Ha Giang	Son La	Nghe An	Quang Ngai	Dak Lak	Tay Ninh	Binh Phuoc	Total
Male	255	327	327	303	318	116	196	1842
Female	237	267	258	288	270	103	164	1587
Total	492	594	585	591	588	219	360	3429

2.3. Procedure

The sociological survey was conducted by a team of trained collaborators, who were local officers responsible for sports development at the commune level. All survey team members received detailed training on:

- Survey methodology
- Data collection procedures

Data were collected using standardized survey forms to ensure completeness and consistency, minimizing contradictions in responses.

2.4. Statistical Analyses

The data were analyzed using descriptive statistics to present frequencies and percentages of responses, providing an overview of the distribution of physical exercise levels among participants. In addition, inferential statistical analysis was conducted using the chi-square (χ^2) test to examine differences in proportions across regions. The significance level was set at $p < 0.05$. All data were processed using SPSS software.

3. RESULTS AND DISCUSSION

3.1. Proportion of people regularly engaging in physical exercise in mountainous areas

A detailed survey was conducted to assess the level of physical exercise among the population, categorized into three levels (Table 2):

- **Regular physical exercise:** engaging in physical activity at least 3 sessions per week, with each session lasting 30 minutes or more, maintained continuously for at least 6 months
- **Occasional exercise:** engaging in physical activity at least once per week, with each session lasting a minimum of 20 minutes
- **No exercise:** engaging in physical activity less frequently than the occasional level

Table 2. Proportion of people regularly engaging in physical exercise in mountainous areas (n=3429)

Classification	North (1) (n=1086)		Central region (2) (n=1764)		South (3) (n=579)		Comparison		
	m_i	%	m_i	%	m_i	%	χ^2_{1-2}	χ^2_{1-3}	χ^2_{2-3}
Exercise regularly	248	22.84	435	24.66	135	23.32			
Sometimes	418	38.49	664	37.64	217	37.48	1.20*	0.59*	0.18*
No practice	419	38.58	665	37.70	227	39.21			

Note. ** $p > 0.05$*

From Table 2, it can be observed that the proportion of individuals engaging in physical activity in the Northern, Central, and Southern regions shows some variation in descriptive values. However, when comparing these proportions using the chi-square (χ^2) test, no statistically significant difference was found at the significance level of $p > 0.05$.

Accordingly, it can be concluded that the proportion of people who regularly engage in physical exercise in mountainous areas is relatively similar across all regions of Vietnam. In other words, regular physical activity in these areas does not appear to be influenced by regional characteristics (Northern, Central, and Southern regions).

3.2. Characteristics of time and place of exercise of people who regularly practice sports in mountainous areas

Statistical results on the characteristics of time and place of exercise of people who regularly practice sports in mountainous areas by region are presented in Table 3.

Table 3. Characteristics of time and place of physical exercise of people who regularly practice physical exercise in mountainous areas by region

Characteristics	Classification	North (1) (n= 248)		Central region (2) (n= 435)		South (3) (n= 135)		Comparison		
		m_i	%	m_i	%	m_i	%	χ^2_{1-2}	χ^2_{1-3}	χ^2_{2-3}
Average time per session	<30 minutes	26	10.48	36	8.28	12	8.89	6.16*	1.41*	7.16*
	30-45 minutes	24	9.68	44	10.11	16	11.85			
	45-60 minutes	69	27.82	109	25.06	37	27.41			
	60-120 minutes	96	38.71	157	36.09	56	41.48			
	> 120 minutes	33	13.31	89	20.46	14	10.37			
Time to practice	Before 7am	61	24.60	120	27.59	33	24.44	2.78*	2.11*	1.22*
	From 7am to 5pm	29	11.69	46	10.57	18	13.33			
	From 5pm to 8pm	89	35.89	170	39.08	55	40.74			
	After 20h	69	27.82	99	22.76	29	21.48			
Practice location (Multiple answers allowed)	Field for rent	57	22.98	102	23.45	36	26.67	7.93*	2.66*	0.41*
	Sidewalk, empty street	76	30.65	98	22.53	33	24.44			
	Training grounds of agencies and schools	79	31.85	122	28.05	44	32.59			
	Park/ square/ cultural house yard	114	45.97	190	43.68	69	51.11			
	Residential practice field	93	37.50	157	36.09	55	40.74			
	Other	23	9.27	16	3.68	8	5.93			
Workout instructor	Usually have	26	10.48	47	10.80	13	9.63	3.60*	2.71*	0.23*
	Sometimes	53	21.37	68	15.63	20	14.81			
	Unprecedented	169	68.15	320	73.56	102	75.56			

Note. ** $p > 0.05$*

Regarding the average time per session: Nearly 36.09-41.48% of people who regularly practice sports practice from 60-120 minutes/session; from 10.37-20.46% of people practice more than 120 minutes/session and from 25.06-27.82% of people practice from 45-60 minutes/session. Thus, the average time of practicing sports of people in mountainous areas is much higher than the standard of calculating a regular sports session with at least 30 minutes/session. When comparing the difference in practice time of people who regularly practice sports in the Northern, Central and Southern regions, there is no statistically significant difference ($p>0.05$).

Regarding training time: The main training time is after 5:00 p.m. (ie the end of administrative working hours), equivalent to 35.89-40.74% of the total number of people who regularly practice sports, before 7:00 a.m. (morning exercise) with 24.44-27.59% of people who regularly practice sports and training after 8:00 p.m. with 21.48-27.82% of the total number of people who regularly practice sports. This is also the common training time of Vietnamese people in related research works (Nguyen, 2013; Pham, 2021). When comparing the training time of people who

regularly practice sports in the Northern, Central and Southern regions, there was no statistically significant difference ($p>0.05$).

Regarding training locations: Public training grounds such as: Parks/squares/cultural houses; Training grounds of residential areas and Training grounds of agencies and schools are places where many people participate in training. These training places are often associated with spontaneous training and without instructors. The proportion of people training in rented training grounds accounts for 22.98 - 26.67% of the total number of people in mountainous areas who regularly practice sports. When comparing the regular training places in the North, Central and South regions, there is no statistically significant difference ($p>0.05$).

Regarding the nature of training: Most people have never participated in training with an instructor. This statistical result is similar to the fact that people often practice in public places and often practice sports spontaneously. When comparing the proportion of people practicing with, occasionally and never having an instructor in the Northern, Central and Southern regions, there is no statistically significant difference ($p>0.05$).

Thus, it can be seen that the characteristics of time and timing of physical exercise of people who regularly practice physical exercise in mountainous areas do not depend on the characteristics of the region. The time and timing of physical exercise of people in mountainous areas are also similar to many research works on mass physical exercise in Vietnam.

3.3. Current status of motivation and effects of physical exercise of people who regularly practice physical exercise in mountainous areas

The statistical results of the characteristics of the form and content of physical training of people who regularly practice physical training in mountainous areas by region are presented in Table 4. The sports that are widely practiced by people in mountainous areas in the North, Central and South have statistically significant differences according to each region. The sports that are widely practiced by the people in the mountainous areas of the North include modern sports for example football, volleyball (including leather volleyball and inflatable volleyball...), and ethnic sports (shuttlecock kicking, stick pushing, tug of war, archery, crossbow shooting...). This is a special feature in the regular physical training of the people in the mountainous areas of the North compared to other regions (Nguyen, 2013; General Department of Sports and Physical Training, 2008). The proportion of ethnic sports that are loved and practiced is higher than that of modern sports. This is completely consistent with the characteristics of ethnic minorities in the mountainous areas with a

variety of ethnic sports, ethnic minority sports festivals... and typical sports such as archery, crossbow shooting, tug of war... For the people in the mountainous areas of the North, the regional characteristics are clearly shown through the content of practicing ethnic sports.

Table 4. Characteristics of form and content of physical training of people who regularly practice physical training in mountainous areas by region

Characteristics	Classification	North (1) (n= 248)		Central region (2) (n= 435)		South (3) (n= 135)		Comparison		
		m_i	%	m_i	%	m_i	%	χ^2_{1-2}	χ^2_{1-3}	χ^2_{2-3}
Training content	Athletics (walking, running…)	29	11.69	59	13.56	19	14.07	107.5	37.45	73.18
	Gym (Gym, dance sport, aerobics, aerobics...)	23	9.27	43	9.89	13	9.63			
	Swimming	17	6.85	33	7.59	21	15.56			
	Cycling	17	6.85	47	10.80	16	11.85			
	Football	48	19.35	70	16.09	20	14.81			
	Basketball	13	5.24	46	10.57	7	5.19			
	Volleyball (and volleyball)	35	14.11	71	16.32	22	16:30			
	Badminton	47	18.95	69	15.86	25	18.52			
	Ping pong	29	11.69	42	9.66	18	13.33			
	Shuttlecock kicking	41	16.53	61	14.02	12	8.89			
	Boating	24	9.68	35	8.05	2	1.48			
	Object	14	5.65	45	10.34	8	5.93			
	Crossbow, archery	30	12.10	34	7.82	2	1.48			
	Tug of War	43	17.34	44	10.11	6	4.44			
	Tung con	28	11.29	0	0.00	0	0.00			
	Stilt walking	17	6.85	61	14.02	18	13.33			
	Push the stick	48	19.35	24	5.52	12	8.89			
	Chinese chess	28	11.29	51	11.72	17	12.59			
	Other sports	17	6.85	43	9.89	15	11.11			
Training form	Self-practice	180	72.58	253	58.16	91	67.41	4.93*	2.49*	6.09*
	Join paid sports clubs	34	13.71	62	14.25	22	16:30			
	Join sports clubs for free	61	24.60	79	18.16	24	17.78			
	Join social organizations (neighborhood groups, trade unions, youth unions...)	39	15.73	78	17.93	32	23.70			
	Practice with friends	74	29.84	113	25.98	37	27.41			
	Practice by agency	51	20.56	67	15.40	31	22.96			
	Other forms	13	5.24	16	3.68	6	4.44			

Note. ** $p > 0.05$*

Unlike the Northern mountainous region, the sports that are practiced by the majority of people in the Central mountainous region are mainly modern sports (including leather volleyball and air volleyball), badminton, table tennis, etc.). Ethnic sports (stick pushing, tug of war, archery, crossbow shooting, etc.) have a lower practice rate. If considered separately by province, in Quang Ngai province, the most practiced ethnic sports among the Central provinces are ethnic sports. The popular ethnic sports that people in the mountainous region of Quang Ngai province love to practice are boating, crossbow shooting, archery, tug of war, stilt walking, wrestling, etc. This is also a difference in the content of physical training of people in the Central mountainous region, and is a feature that is greatly influenced by the culture and regional characteristics of the local people in Central Vietnam.

In the mountainous areas of the South, the sports that are widely practiced include both modern sports (including leather volleyball and air volleyball), badminton, table tennis, etc.) and traditional sports such as (stick pushing, shuttlecock kicking, chess, etc.). It is easy to see that in the South of Vietnam, the mountainous people practice and love to practice modern sports more than traditional sports. This is completely consistent with the geographical characteristics of the South of Vietnam with few hills and mountains, the mountainous area accounts for a very small proportion and is close to the plains, the sea, etc., creating a very clear intersection. The number of ethnic minorities living in the mountainous areas of the South of Vietnam is also much less diverse than in the North and Central of Vietnam.

People in the mountainous areas of the North, Central and South still mainly practice by themselves, in groups of friends and in sports clubs without fees, and have not participated much in paid and organized forms of exercise. This characteristic is similar to the characteristics of the regular physical exercise form of Vietnamese people according to relevant research authors (Pham, 2012; General Department of Sports and Physical Training, 2008). When comparing the form of exercise of people who regularly practice physical exercise in the North, Central and South regions, there is no statistically significant difference ($p>0.05$). Thus, it can be seen that the form of physical exercise of people in the mountainous areas of Vietnam do not depend much on the geographical characteristics, climate, and regions of the North - Central - South.

3.4. Current status of motivation and effects of physical exercise of people who regularly practice physical exercise in mountainous areas

Comparison of motivational characteristics and effects of regular physical exercise in each region. The results are presented in Table 5.

Table 5. Characteristics of motivation and effects of physical exercise of people who regularly practice physical exercise in mountainous areas by region

Characteristics	Classification	North (1) (n= 248)		Central region (2) (n= 435)		South (3) (n= 135)		Comparison		
		m_i	%	m_i	%	m_i	%	χ^2_{1-2}	χ^2_{1-3}	χ^2_{2-3}
Exercise motivation	Improve health	165	66.53	178	40.92	84	62.22	85.06	91.38	2.60*
	Entertainment	144	58.06	187	42.99	79	58.52			
	Communication	133	53.63	193	44.37	84	62.22			
	Training the will	93	37.50	182	41.84	88	65.19			
	Love sports	201	81.05	182	41.84	76	56.30			
	Due to other people's drag	3	1.21	53	12.18	27	20.00			
	Forced to practice	1	0.40	34	7.82	21	15.56			
	Other causes	44	17.74	44	10.11	19	14.07			
Effects of exercise	Improve health	125	50.40	199	45.75	79	58.52	7.07*	5.87*	6.56*
	less sick	61	24.60	116	26.67	35	25.93			
	Good night	82	33.06	109	25.06	39	28.89			
	Losing weight	69	27.82	107	24.60	38	28.15			
	Increase communication with friends	103	41.53	171	39.31	47	34.81			
	Improve memory	18	7.26	36	8.28	9	6.67			
	Help to be optimistic and love life	89	35.89	146	33.56	41	30.37			
	Waste of time and money	48	19.35	71	16.32	21	15.56			
	Causes fatigue, mental depression	8	3.23	8	1.84	4	2.96			
	Causing injury, adverse health effects	7	2.82	15	3.45	4	2.96			
	Other opinions	4	1.61	2	0.46	0	0.00			

Note. ** $p > 0.05$*

Most of the exercise motivations of the surveyed subjects are positive and sustainable motivations such as: Exercising because of love for sports, practicing to improve health, entertainment, communication... These positive reasons help people participate in regular physical exercise. However, when comparing the exercise motivations of people who regularly practice physical exercise in the Northern mountainous region with the Central mountainous region and the Northern mountainous region with the Southern mountainous region, there is a statistically significant difference ($p<0.05$). If the Northern mountainous region only has about 2% of people practicing with negative exercise motivations such as being dragged by others and being forced to practice, the survey results of negative motivations of people who regularly practice physical exercise in the Central region reached nearly 20% of people practicing with negative motivations and in the South this number should be approximately 35%. When comparing the rate of exercise motivation of

people in the Central and Southern mountainous regions, there was no statistically significant difference ($p>0.05$). Thus, it can be seen that the motivation for exercise of people in the Northern mountainous region is the most correct. This shows that the motivation for regular physical exercise of the people in the mountainous areas of Vietnam depends on the cultural characteristics of the region. When developing mass physical exercise in the mountainous areas of Vietnam, special attention should be paid to this factor.

Corresponding to the motivations for exercise, people who regularly practice physical exercise in the mountainous areas of the North, Central and South have a very correct perception of the effects of physical exercise on health such as: improving health, increasing communication with friends, helping to be optimistic, love life... Few people evaluate the negative effects of physical exercise. When comparing the difference in perception of the effects of physical exercise of people who regularly practice physical exercise in the North, Central and South regions, there is no statistically significant difference ($p>0.05$). Thus, it can be seen that people who regularly practice physical exercise in the mountainous areas of Vietnam have a correct perception of the effects of physical exercise on health.

4. CONCLUSIONS

Research on the regular physical exercise behavior of people in mountainous areas in the North - Central - South of Vietnam shows that: people practice physical exercise for a long time each session, mainly in the early morning and late afternoon at public training grounds, often without instructors; the time and timing of practice do not differ between regions. However, the popular sport has a clear difference between the North, Central and South due to the influence of regional culture. People in mountainous areas have positive motivation to practice, correct awareness of the benefits of physical exercise, in which people in the North have more correct motivation with a statistically significant difference compared to the remaining regions. These are advantages that need to be impacted when developing the mass physical exercise movement in mountainous areas. At the same time, when developing mass physical exercise in mountainous areas of Vietnam, it is necessary to pay special attention to the orientation of developing sports, especially ethnic sports according to the regional culture.

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All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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