Interdisciplinary Academic and Research Journal, 6 (6), November-December 2026
Old ISSN 2774-0374: New ISSN 2985-2749
Website: https://so03.tci-thaijo.org/index.php/IARJ/index
Article ID: e301759

Designing a Dongba Wushu Training Program to Improve the Physical Fitness of Minority Students in Yunnan Province

Liu Guanlin[1], Sukol Ariyasajskul[2] and Prakit Hongsaenyatham[3]
[1-3]Faculty of Sports Science and Technology, Bangkokthonburi University, Thailand
[1]E-mail: 761026213@qq.com, ORCID ID: https://orcid.org/0009-0000-0669-3870
[2]E-mail: sukolariya@gmail.com, ORCID ID: https://orcid.org/0009-0007-0203-9581
[3]E-mail: prakitsport@gmail.com, ORCID ID: https://orcid.org/0009-0009-2196-0258
Received 07/05/2026 Revised 29/05/2026 Accepted 30/07/2026

Abstract

Background and Aims: Dongba Wushu is a traditional martial art of the Naxi ethnic group that combines jumping, rotation, stance transition, balance control, coordinated hand-foot actions, and rhythmic movement. These characteristics correspond to power, speed, agility, balance, reaction time, and coordination. This study aimed to examine the physical fitness problems of minority students in Yunnan Province, develop a Dongba Wushu training program, and evaluate its effects.

Methodology: A mixed-method design was adopted. The program was developed through literature review, expert interviews, focus group discussion, content validation, and pilot testing. Thirty students with the lowest overall fitness rankings were selected from 60 volunteers among 526 minority students and assigned to an experimental group and a control group. The experimental group completed an eight-week Dongba Wushu program, while the control group followed regular physical education. Six standardized fitness tests were analyzed using descriptive statistics, independent-samples t-tests, repeated-measures ANOVA, and Bonferroni post hoc tests.

Results: Baseline comparisons showed no significant differences between groups in all six fitness indicators ($p > .05$). At post-test, the experimental group showed better performance than the control group in standing long jump (201.46 ± 10.91 vs. 185.73 ± 9.19 cm), 50-meter sprint (7.30 ± 0.31 vs. 7.74 ± 0.41 s), shuttle run (11.38 ± 0.68 vs. 12.36 ± 0.78 s), single-leg stance (51.53 ± 10.27 vs. 32.60 ± 7.84 s), ruler drop (12.60 ± 2.69 vs. 17.46 ± 4.17 cm), and ball toss (33.40 ± 6.32 vs. 24.13 ± 4.61 times), with all post-test comparisons reported as $p < .001$. Repeated-measures ANOVA in the experimental group also showed significant progressive changes from pre-test to mid-test and post-test in all six indicators ($p < .001$).

Conclusion: The developed Dongba Wushu training program effectively improved the skill-related physical fitness of minority middle school students and provides a culturally meaningful model for school physical education in Yunnan Province.

Keywords: Dongba Wushu Training Program; Physical Fitness; Minority Students

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Introduction

Physical fitness is an important foundation for adolescent health, learning, and participation in physical activity. Skill-related physical fitness, including power, speed, agility, balance, reaction time, and coordination, is especially important in middle school because this stage is a sensitive period for neuromuscular development and motor learning. Previous studies have emphasized that physical fitness during childhood and adolescence is related to health status, motor competence, confidence, and lifelong physical activity participation (Chen et al., 2022; Ortega et al., 2021; Tomkinson et al., 2021; Tremblay et al., 2022; World Health Organization, 2020). Therefore, school-based physical education should not only provide general activity time but also offer structured and progressive training opportunities.

Yunnan Province is a multi-ethnic region with mountainous geography and uneven access to school sports resources. Research on students in Yunnan indicates that many rural and minority students show weaknesses in explosive power, agility, coordination, and flexibility, partly because of insufficient physical education time, limited facilities, academic pressure, and increased sedentary behavior (Chen & Zhou, 2022; Li & Xu, 2021; Luo & Han, 2022; Zhao & Tang, 2023). These problems are not only physical health issues but also educational equity issues, because students in minority regions often have fewer opportunities to receive systematic and culturally suitable physical training.

Dongba Wushu is a traditional martial art rooted in Naxi culture. Unlike general martial arts programs that are often presented mainly as sport techniques or performance routines, Dongba Wushu integrates ritual symbolism, rhythmic breathing, stance transitions, turning actions, coordinated hand-foot movement, and cultural narratives from Dongba traditions (He & Chen, 2020; Li & Wang, 2021; Liu & Wang, 2021; Luo & Zhao, 2021; Zhang & Li, 2022). Its distinctive value lies in the combination of movement training and ethnic cultural meaning. Jump kicks and stance transitions may train power and speed; turning, shifting, and shuttle-like footwork may train agility; single-leg and low-stance movements may develop balance; partner signal drills and rhythm changes may train reaction time; and hand-foot sequences may strengthen coordination.

However, previous studies have mainly described the cultural inheritance, educational value, or general fitness benefits of traditional martial arts. Fewer studies have transformed Dongba Wushu into a standardized, progressive, school-based training program with clear training load, movement progression, testing procedures, and empirical evaluation among minority middle school students. This gap is important because cultural value alone cannot ensure fitness improvement unless the program is organized according to scientific training principles and adapted to the students' physical condition.

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Therefore, this study developed and evaluated an eight-week Dongba Wushu training program based on literature review, expert interviews, focus group discussion, and standardized physical fitness testing. The study contributes a practical model that integrates ethnic traditional sports with modern physical education and provides evidence for improving the skill-related physical fitness of minority students in Yunnan Province.

Objectives

1. To examine the current situation and problems related to the physical fitness of minority students in Yunnan Province.
2. To develop a Dongba Wushu training program to improve the physical fitness of minority students in Yunnan Province.
3. To evaluate the effects of the Dongba Wushu training program on students' physical fitness.

Literature Review

1. Dongba Wushu and its distinctive training value

Dongba Wushu is a traditional martial art originating from the Naxi ethnic group in Yunnan Province. It integrates physical training with cultural rituals, symbolic movement, and spiritual practices, making it a holistic form of exercise that promotes both physical and cultural development. The movements emphasize coordination, balance, strength, flexibility, rhythm, and body control, all of which are relevant to students' physical fitness (Luo & Zhao, 2021; Zhang & Li, 2022).

A critical feature of Dongba Wushu is that its movements are not isolated fitness drills. They are embedded in local cultural meanings and often imitate natural images, ceremonial gestures, and coordinated body rhythms. This makes Dongba Wushu different from some modernized Wushu or general school fitness activities. Modern Wushu teaching may emphasize standardized competition routines or performance aesthetics, while general physical activity may emphasize broad participation. Dongba Wushu combines local cultural identity with repeated stance, jump, turn, rhythm, and coordination patterns. This combination may increase student motivation and provide multi-component physical stimuli within one training system (He & Chen, 2020; Li & Wang, 2021; Wang & Zhang, 2022).

2. Skill-related physical fitness of adolescents

Physical fitness refers to the ability of an individual to perform physical activities effectively and efficiently. For this study, the focus is skill-related physical fitness, including power, speed, agility, balance, reaction time, and coordination. These components are important for adolescent

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motor competence because they support efficient movement, sport participation, injury prevention, and confidence in physical activity (Logan et al., 2021; Ortega et al., 2021).

In Yunnan Province, minority students have been reported to show relatively weak performance in several fitness components, especially explosive power, agility, coordination, and flexibility (Chen & Zhou, 2022; Luo & Han, 2022). These weaknesses may result from limited physical education resources, insufficient systematic training, environmental restrictions in mountainous areas, and sedentary behavior (Li & Xu, 2021; Zhao & Tang, 2023). This evidence suggests that improvement requires more than occasional exercise; it requires a program that is structured, progressive, and responsive to the local school context.

3. Theoretical basis of the training program

The theoretical foundation of this study is based on the principles of specificity, overload, progression, and recovery. Specificity means that training activities should correspond to the physical components being improved. Overload and progression require students to experience gradually increasing movement difficulty, intensity, or complexity, while recovery prevents excessive fatigue and supports adaptation (Baechle & Earle, 2022; Bompa & Buzzichelli, 2021; Kenney et al., 2021).

From a neuromuscular perspective, skill-related fitness improves when students repeatedly practice coordinated movement under appropriate physical and perceptual demands. Dongba Wushu provides these demands through stance control, multidirectional footwork, rhythmic changes, rapid responses to cues, and repeated upper-lower limb coordination. Therefore, the program is not only a cultural activity but also a mechanism-based training model that may stimulate lower-limb force production, postural control, sensorimotor processing, and movement integration (García-Pinillos et al., 2020; Li et al., 2022; Liu et al., 2022; Park & Lee, 2021).

4. Development of a Dongba Wushu training program

The development of a structured training program should include clear objectives, appropriate content, progressive load, safety control, and assessment methods. For minority students in Yunnan Province, the program also needs cultural relevance because familiar ethnic traditional sports may reduce psychological distance and improve participation. Studies on traditional martial arts and youth physical training indicate that structured martial-arts-based programs can support motor skill development and physical fitness when intensity, progression, and feedback are properly arranged (Faigenbaum et al., 2020; Hu & Yang, 2023; Huang, 2024; Ma & Liu, 2021).

In this study, Dongba Wushu movements were converted into an eight-week school-based program. The training began with basic stances, coordination, and balance control, then progressed toward jumping, turning, faster rhythm, partner reaction drills, and integrated routines.

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Standardized tests, including standing long jump, 50-meter sprint, shuttle run, single-leg stance, ruler drop, and ball toss, were selected to match the six target components and to provide measurable evidence of training effectiveness (Raya-González et al., 2020).

5. Summary of research gap

The literature supports the potential of Dongba Wushu as both cultural education and physical training. Nevertheless, existing studies remain limited in three aspects. First, many studies describe Dongba Wushu from a cultural perspective but provide insufficient empirical evidence for its fitness effects. Second, the mechanism by which its movement features may influence specific fitness components is not always explained. Third, standardized intervention procedures for minority middle school students remain underdeveloped. This study addresses these gaps by designing a progressive Dongba Wushu training program and testing its effects on six skill-related physical fitness indicators.

Conceptual Framework

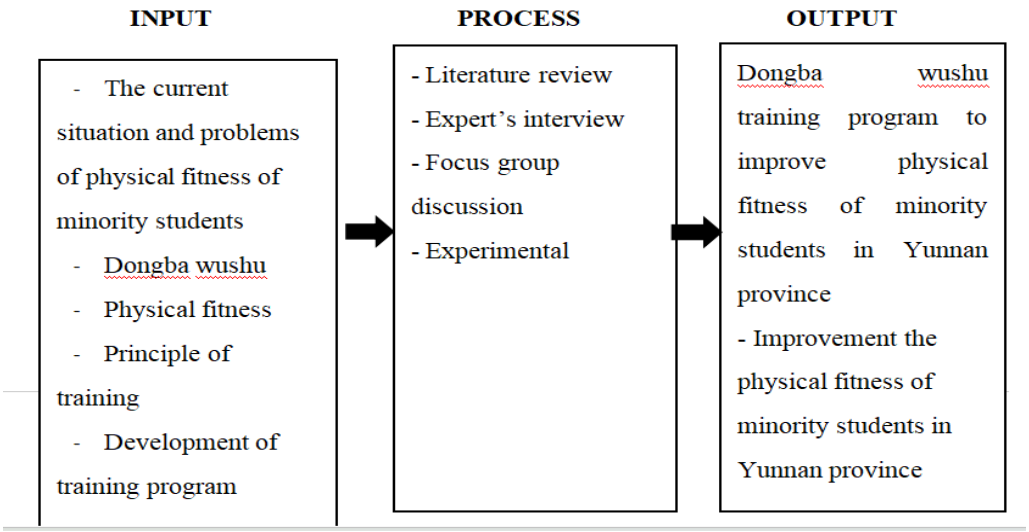


Figure 1 Conceptual Framework

Figure 1 explains the logical relationship among the input, process, and output of the study. The input includes the current physical fitness problems of minority students, the cultural and movement characteristics of Dongba Wushu, and the training principles used to guide program design. The process consists of literature review, expert interviews, focus group discussions, program development, and experimental testing. The expected output is a validated Dongba

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Wushu training program that improves six components of skill-related physical fitness and provides a culturally meaningful model for school physical education in Yunnan Province.

Methodology

This study employed a mixed-method research design. The qualitative phase collected expert opinions to develop the Dongba Wushu training program, and the quantitative phase examined the effects of the eight-week program on skill-related physical fitness. Ethical approval was granted by the Bangkokthonburi University Ethics Committee, certificate no. 2569/141(7), issued on February 8, 2026.

1. Research Instruments

The research instruments included an expert interview questionnaire, a focus group discussion outline, the Dongba Wushu training program, and six standardized physical fitness tests. The expert interview questionnaire explored students' fitness problems and important program components. The focus group outlines guided expert discussion on training content, progression, safety, intensity, and cultural appropriateness.

The Dongba Wushu program was an eight-week intervention conducted five days per week, 60 minutes per session. Three experts assessed content validity using the Index of Item-Objective Congruence (IOC), and the IOC value of the expert interview questionnaire was 0.92. The program was also piloted with 10 minority students who were not included in the main experiment to confirm feasibility, timing, and safety.

The six physical fitness tests were the standing long jump for power, 50-meter sprint for speed, shuttle run for agility, single-leg stance for balance, ruler drop for reaction time, and ball toss for hand-eye coordination. Each test was conducted using standardized procedures, and the best valid trial was recorded for analysis.

2. Population and Sample

The population consisted of 526 minority students aged 13-15 years from Lijiang No. 2 Middle School, Yunnan Province, in the academic year 2025. The target minority groups were Naxi, Yi, and Bai students. Sixty volunteers completed initial physical fitness testing. Based on the overall ranking of the six tests, the 30 students with the lowest physical fitness levels were selected as the sample and matched by pre-test results into an experimental group and a control group, with 15 students in each group. Students were required to be medically suitable for moderate-to-intense activity and willing to participate in the testing and training schedule.

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Table 1 Sample group and measurement schedule

Item	Experimental group	Control group
Sample size	15 minority students	15 minority students
Age/occupation	Aged 13-15; middle school students	Aged 13-15; middle school students
Ethnic groups	Naxi, Yi, and Bai	Naxi, Yi, and Bai
Sex distribution	Not reported in the available study data; sex was not analyzed	Not reported in the available study data; sex was not analyzed
Sampling/assignment	Selected from the 30 lowest overall fitness rankings; matched by pre-test scores	Selected from the 30 lowest overall fitness rankings; matched by pre-test scores
Measurement time points	Pre-test, mid-test after four weeks, post-test after eight weeks	Pre-test and post-test

3. Data Collection

Data collection was conducted in four stages. First, documents and previous studies on Dongba Wushu, physical fitness, training principles, and program development were reviewed. Second, seven experts were interviewed to identify key problems and training components. Third, nine experts participated in a focus group to refine the program, and a pilot try-out was conducted with 10 students outside the main sample. Fourth, the main experiment was implemented for eight weeks. The experimental group trained Monday to Friday for 60 minutes per session using the Dongba Wushu program, while the control group followed regular physical education activities. Both groups completed pre-test and post-test measurements, and the experimental group also completed a mid-test after four weeks.

4. Data Analysis

Qualitative data from expert interviews and focus group discussions were analyzed using content analysis. Quantitative data were analyzed using mean (M), standard deviation (SD), independent-samples t-tests for between-group comparisons, one-way repeated-measures ANOVA for the experimental group across pre-test, mid-test, and post-test, and Bonferroni post

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hoc tests. Statistical significance was set at $p < .05$. Values originally reported as $p = 0.00$ were corrected to $p < .001$.

Results

Symbols used in data analysis were as follows: M = mean, SD = standard deviation, n = number of students, t = independent-samples t-test value, F = repeated-measures ANOVA value, and p = statistical significance level. The results are presented according to the three research objectives.

Part 1: Current situation and problems of physical fitness

The literature review and expert interviews showed that minority middle school students in Yunnan Province commonly face limitations in power, speed, agility, coordination, and reaction time. Experts identified four main themes: limited physical education resources in rural and minority areas, insufficient structured skill-related fitness training, lack of trained instructors for Dongba Wushu, and low student motivation when training lacks cultural relevance. Experts also agreed that Dongba Wushu could address these problems because its jumping, turning, stance, rhythm, balance, and hand-foot coordination patterns directly match the tested fitness components.

Part 2: Development of the Dongba Wushu training program

Based on the expert interviews and focus group discussion, the program was organized into four progressive phases. Each session included warm-up, fundamental skills, Dongba Wushu practice, physical fitness training, and cool-down. The program used progressive overload by moving from basic stances and coordination drills to more complex routines, faster movement sequences, jump kicks, rotational movements, and integrated skill-related circuits.

Table 2 Framework of the Dongba Wushu training program

Phase	Objective	Main contents and training load
Weeks 1-2: Adaptation and Foundation	Develop basic movement patterns and neuromuscular coordination.	Horse stance and bow stance; basic hand-foot sequences; short acceleration runs; jump squats and jump kicks; low-intensity agility, balance, reaction, and coordination drills.

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Phase	Objective	Main contents and training load
Weeks 3-4: Skill Development	Improve agility and coordination and introduce Dongba Wushu sequences.	Basic Dongba Wushu combinations at slow-to-moderate tempo; shuttle patterns; direction-change drills; partner signal reactions; ball toss and hand-foot combinations.
Weeks 5-6: Enhancement	Increase intensity and develop power and speed.	Jump kicks, rotational movements, short sprints, explosive exercises, complex coordination drills, and faster Wushu sequences with planned recovery between drills.
Weeks 7-8: Consolidation and Performance	Improve fluency and integrate skill-related fitness.	Full Dongba Wushu routines; speed-agility-coordination circuits; reaction-based movement sequences; group performance practice; training load stabilized before post-test.

Note. The framework followed specificity, overload, progression, and recovery principles; statistical significance was set at $p < .05$ for inferential analyses.

Table 3 Structure of each 60-minute Dongba Wushu training session

Component	Time	Description
Warm-up	10 min	Jogging, dynamic stretching, mobility exercises, and light footwork.

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Component	Time	Description
Fundamental skills	10 min	Basic stances, stepping, posture control, and coordination drills.
Dongba Wushu practice	15 min	Technique learning, movement combinations, and cultural movement sequences.
Physical fitness training	20 min	Targeted exercises for power, speed, agility, balance, reaction time, and coordination.
Cool-down	5 min	Walking, static stretching, breathing, and recovery activities.

Note. Each session lasted 60 minutes; statistical significance was set at $p < .05$ for inferential analyses.

Part 3: Experimental effects of the Dongba Wushu training program

The experimental intervention was conducted over eight weeks. The experimental group was tested at pre-test, mid-test, and post-test, while the control group was tested at pre-test and post-test. At baseline, independent samples t-tests showed no significant difference between groups in standing long jump, 50-meter sprint, shuttle run, single-leg stance, ruler drop, or ball toss ($p > .05$), indicating comparable starting levels.

Table 4 Descriptive results of physical fitness tests

Variables	Exp. Pre M ± SD	Exp. Mid M ± SD	Exp. Post M ± SD	Ctrl. Pre M ± SD	Ctrl. Post M ± SD
Standing long jump (cm)	180.00 ± 9.57	190.13 ± 10.07	201.46 ± 10.91	179.40 ± 10.20	185.73 ± 9.19

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Variables	Exp. Pre M ± SD	Exp. Mid M ± SD	Exp. Post M ± SD	Ctrl. Pre M ± SD	Ctrl. Post M ± SD
50-meter sprint (s)	7.94 ± 0.41	7.60 ± 0.31	7.30 ± 0.31	7.95 ± 0.50	7.74 ± 0.41
Shuttle run (s)	12.76 ± 0.98	12.04 ± 0.72	11.38 ± 0.68	12.84 ± 0.92	12.36 ± 0.78
Single-leg stance (s)	26.53 ± 6.95	38.60 ± 8.62	51.53 ± 10.27	26.26 ± 7.78	32.60 ± 7.84
Ruler drop (cm)	19.46 ± 4.17	16.13 ± 3.11	12.60 ± 2.69	19.60 ± 5.03	17.46 ± 4.17
Ball toss (times)	20.53 ± 4.17	27.20 ± 5.50	33.40 ± 6.32	20.60 ± 4.99	24.13 ± 4.61

Note. Exp. = experimental group; Ctrl. = control group; M = mean; SD = standard deviation. For 50-meter sprint, shuttle run, and ruler drop, lower values indicate better performance. Statistical significance was set at $p < .05$; this table presents descriptive statistics only.

Table 4 shows that the experimental group improved continuously from pre-test to mid-test and post-test in all six indicators. The control group also improved slightly after regular physical education, but the magnitude was smaller.

Table 5 Post-test comparison between the experimental and control groups

Variables	Experimental M ± SD	Control M ± SD	t	p
Standing long jump (cm)	201.46 ± 10.91	185.73 ± 9.19	25.34	< .001*
50-meter sprint (s)	7.30 ± 0.31	7.74 ± 0.41	-13.12	< .001*
Shuttle run (s)	11.38 ± 0.68	12.36 ± 0.78	-29.45	< .001*
Single-leg stance (s)	51.53 ± 10.27	32.60 ± 7.84	27.31	< .001*
Ruler drop (cm)	12.60 ± 2.69	17.46 ± 4.17	-11.48	< .001*

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Variables	Experimental M ± SD	Control M ± SD	t	p
Ball toss (times)	33.40 ± 6.32	24.13 ± 4.61	20.03	< .001*

Note. Statistical significance was set at $p < .05$. Asterisk (*) indicates statistically significant differences. For 50-meter sprint, shuttle run, and ruler drop, lower values indicate better performance.

Table 5 shows significant post-test differences between groups in all six indicators. The experimental group achieved higher scores in standing long jump, single-leg stance, and ball toss, and lower times/distances in 50-meter sprint, shuttle run, and ruler drop.

Table 6 Repeated-measures ANOVA results within the experimental group

Variables	F	p	Bonferroni post hoc result
Standing long jump	2278.08	< .001*	Pre-test < Mid-test < Post-test
50-meter sprint	7347.46	< .001*	Pre-test > Mid-test > Post-test
Shuttle run	3493.38	< .001*	Pre-test > Mid-test > Post-test
Single-leg stance	306.58	< .001*	Pre-test < Mid-test < Post-test
Ruler drop	353.43	< .001*	Pre-test > Mid-test > Post-test
Ball toss	387.03	< .001*	Pre-test < Mid-test < Post-test

Note. Statistical significance was set at $p < .05$. Asterisk (*) indicates statistically significant differences. The direction of the post hoc result depends on whether higher or lower scores represent better performance.

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Table 6 shows significant changes across the three testing stages for the experimental group. The Bonferroni post hoc results indicate progressive improvement from pre-test to mid-test and from mid-test to post-test in all six fitness components.

Conclusion

1. The study confirmed that minority students in Yunnan Province need structured and culturally relevant physical fitness training, especially for power, speed, agility, balance, reaction time, and coordination.

2. The Dongba Wushu training program was developed through literature review, expert interviews, focus group discussions, IOC validation, and a pilot try-out. The final program lasted eight weeks, five days per week, and 60 minutes per session.

3. Before the intervention, the experimental and control groups had no significant differences in all six physical fitness indicators, indicating that the baseline levels were comparable.

4. After the intervention, the experimental group performed significantly better than the control group at the post-test in all six indicators. The experimental group also improved progressively from pre-test to mid-test and post-test.

5. The developed Dongba Wushu training program can be concluded to be an effective and culturally relevant approach for improving the skill-related physical fitness of minority middle school students in Yunnan Province.

Discussion

The findings support the rationale and design of the intervention. Experts identified that minority students in Yunnan Province had weaknesses in skill-related physical fitness and that ordinary school physical education did not provide enough structured, progressive, and culturally meaningful training. These findings directly guided the program structure, which combined Dongba Wushu skills with targeted exercises for power, speed, agility, balance, reaction time, and coordination.

The significant improvement in standing long jump, 50-meter sprint, and shuttle run can be explained by the lower-limb and change-of-direction mechanisms of the program. Stance transitions, short acceleration runs, jump kicks, rotational movements, and direction-change drills required repeated force production, rapid acceleration and deceleration, and efficient body alignment. Such activities likely stimulated neuromuscular recruitment, stretch-shortening actions, and movement economy, which are directly related to power, speed, and agility. This interpretation is consistent with training principles of specificity, overload, progression, and

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recovery (Baechle & Earle, 2022; Bompa & Buzzichelli, 2021; Kenney et al., 2021) and with evidence that martial-arts-based or multidirectional training can improve adolescent motor performance (Cao, 2025; Faigenbaum et al., 2020; Huang, 2024; Zhang et al., 2022).

The improvement in single-leg stance reflects the balance-control demands of Dongba Wushu. Low stances, single-leg postures, turning movements, and controlled transitions require continuous adjustment of the center of gravity and activation of stabilizing muscles. Repeated practice may enhance proprioceptive feedback, postural control, and core stability. This mechanism explains why Dongba Wushu may improve balance more effectively than general physical activities that do not systematically challenge static and dynamic postural control (García-Pinillos et al., 2020; Liu et al., 2022; Park & Lee, 2021).

The improvements in ruler drop and ball toss suggest that Dongba Wushu also trains sensorimotor processing and coordination. Reaction time may improve because students repeatedly responded to rhythm changes, partner cues, and rapid movement transitions. Coordination may improve because Dongba Wushu requires synchronized upper- and lower-limb actions, precise timing, spatial control, and continuous rhythm. Compared with isolated running or calisthenics, these routines place higher demands on perception-action coupling and hand-foot integration, which may explain the broader gains in reaction time and coordination (Chen et al., 2023; Li et al., 2022; Wang & Li, 2021).

Compared with regular physical education, the Dongba Wushu program had three advantages. First, it provided specificity by matching training content with the six tested fitness components. Second, it provided progression by increasing movement complexity and intensity across eight weeks. Third, it offered cultural relevance because the content was connected with Naxi traditional culture. This cultural connection may increase interest, effort, and attendance among minority students, which can strengthen the practical effect of the program. Compared with single-component training programs such as resistance-only, sprint-only, or agility-only training, Dongba Wushu offers an integrated model that simultaneously trains power, speed, agility, balance, reaction time, and coordination.

The findings also have educational and cultural significance. Because Dongba Wushu is rooted in Naxi cultural heritage, the program does not treat physical fitness as separate from local identity. It shows that ethnic traditional sports can be transformed into evidence-based physical education content without losing cultural meaning. This supports the integration of cultural heritage preservation and student health promotion in minority schools.

Limitations should be noted. The sample size was small; only students with the lowest initial fitness rankings were selected, and the study came from one middle school, which limits generalization. The available study data did not report sex distribution or sex-based analysis, so

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possible sex differences could not be discussed. The available results also did not provide raw paired scores or formal normality and sphericity tests for repeated-measures ANOVA. Future studies should include larger samples, report male and female distributions clearly, analyze change scores when raw data are available, and report statistical assumptions more completely.

Recommendation for this research

1. Schools in minority regions should consider integrating Dongba Wushu into regular physical education or extracurricular activities. The program can improve power, speed, agility, balance, reaction time, and coordination while also strengthening cultural identity.

2. Physical education teachers should receive professional training before implementation. Teachers need to understand Dongba Wushu techniques, safety control, training load, sets, repetitions, rest intervals, weekly progression, and proper testing procedures. Video resources and digital archives may support consistent teaching and cultural preservation (Tang & Liu, 2022).

3. School administrators should provide basic space, safe surfaces, simple equipment, and stable class time so that the eight-week program can be completed continuously.

4. The program should be implemented progressively. Students should first master basic stances, coordination, and balance before moving to faster sequences, jump kicks, rotational movements, and integrated circuits.

5. Student safety should be prioritized through warm-up, cool-down, medical clearance, attendance monitoring, and timely adjustment of training intensity when fatigue or discomfort appears.

Recommendation for further research

1. Future studies should use larger samples from different schools and different minority groups to improve generalizability.

2. Future studies should report demographic characteristics more completely, especially sex distribution, age distribution, and ethnic group composition.

3. Long-term follow-up should be conducted to examine whether improvements remain after the program ends.

4. Researchers should compare Dongba Wushu with other traditional and modern physical training programs to identify its unique advantages.

5. Future analyses should include raw-score change comparisons, paired samples t-tests where appropriate, and complete assumption testing for repeated-measures ANOVA.

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