# University Students' Physical Activity in the Context of Healthy School Construction: An Exploratory Mixed-methods Study of the Supportive School Environment

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**Abstract**

Objective: Framed by healthy school construction and health-promoting universities, this exploratory mixed-methods study examined the real-world pattern of university students' physical activity and clarified how a supportive school environment may shape behavior. Methods: The study was conducted in a comprehensive university setting where general education, professional education, residence life, and campus sport services are closely connected. The qualitative strand drew on 27 semi-structured interview cases selected to reflect variation in gender, grade, major, and physical activity participation. The quantitative strand analyzed 268 questionnaires covering supportive school environment, physical activity-related health literacy, exercise motivation, and physical activity behavior. Descriptive statistics, preliminary instrument-quality checks, and joint qualitative-quantitative displays were used for integration. Results: Students broadly endorsed the health value of physical activity, yet actual participation remained limited. Facility accessibility was the weakest environmental dimension (2.51±0.46), while no time (44.0%), inconvenient facilities (18.7%), and fatigue (11.9%) were the most frequently reported barriers. Interviews identified four profiles: knowing-doing gaps, peer-driven, high-motivation/sports-specialty, and passive compliance. Integrated findings suggest that school health climate and curriculum support mainly activate value recognition; facility accessibility creates or restricts opportunities for action; and peer climate and teacher support catalyze initiation through relational encouragement and affective activation. Conclusion: The findings should be interpreted as hypothesis-generating rather than causal. Universities should move from course-centered and advocacy-centered management toward everyday-life-centered physical activity support that is accessible, socially supported, and feedback-rich.

**Keywords**

Healthy school construction, University students, Physical activity behavior, Supportive school environment, Physical activity-related health literacy, Exercise motivation, Exploratory mixed-methods research

## Introduction

The university years are a critical period during which health behavior shifts from externally regulated participation to self-managed routine. The World Health Organization recommends that adults accumulate 150-300 minutes of moderate-intensity aerobic physical activity per week while reducing sedentary time as far as possible [1]. However, many university students struggle to meet this threshold because of academic demands, altered daily schedules, increased screen use, and weak continuity between intention and practice [2,3].

Within the broader agenda of healthy school construction, the key issue is no longer simply whether students know that physical activity is beneficial. Rather, the more substantive question is how universities can create a campus context in which active living becomes reachable, socially supported, and sustainable. From an ecological perspective, behavior is jointly shaped by personal cognition, social relationships, physical space, institutional arrangements, and broader policy signals [4]. The Okanagan Charter similarly argues that health should be embedded in campus culture, operations, and academic life instead of being treated as an optional add-on dependent solely on individual self-discipline [5].

The present study was situated in a large comprehensive

university context in China. Such institutions usually combine compulsory or elective physical education courses, student fitness testing, organized student associations, public sport facilities, dormitory-based daily life, and highly intensive academic schedules. This context is important because students' physical activity does not occur only inside physical education classes; it is negotiated across classrooms, dormitories, sport venues, online leisure time, peer networks, and institutional booking systems. Clarifying this context helps interpret why students may endorse health values while still failing to form stable physical activity routines.

Recent scholarship on university students' physical activity shows three notable shifts. First, the research focus has moved from participation prevalence to behavior formation and maintenance. Second, environmental and organizational conditions within universities are increasingly recognized as decisive. Evidence from Irish universities, for example, shows that institutional resources, space, and university infrastructure are associated with students' physical activity patterns [6]. Third, health literacy, social support, and exercise motivation are now widely considered crucial mechanisms linking context and behavior. Higher health literacy is generally associated with more favorable physical activity outcomes [7]. Social support - especially peer support - also shows a stable positive association with university students' physical activity participation, while self-determination theory further demonstrates that environments supporting autonomy, competence, and relatedness are more likely to foster durable behavioral engagement [8].

Despite these advances, two gaps remain. A large proportion of studies examine environment, health literacy, or motivation separately, rather than clarifying how these domains operate together within a supportive school environment. In addition, many quantitative studies apply pre-existing measures directly, but do not sufficiently anchor their models in students' lived campus experiences. As a result, statistically significant findings may not fully capture the practical barriers and catalytic conditions encountered in everyday university life.

Against this background, the present study combined qualitative and quantitative evidence to answer three questions: (1) Which components of the supportive school environment are most strongly perceived by university students and which are most constraining? (2) How do supportive school environments, physical activity-related health literacy, and exercise motivation interact in the formation of physical activity behavior? (3) What generative logic can be proposed for further testing in the present stage of healthy school construction?

## Theoretical background and analytical framework

### *Supportive school environment from an ecological perspective*

Ecological models propose that health behavior emerges from the interaction between individual factors, social networks, physical environments, and policy arrangements. In the university setting, a supportive school environment can be understood as a multi-layered structure composed of at least five dimensions: school health climate, curriculum support, facility accessibility, peer climate, and teacher support. School health climate reflects whether the institution consistently communicates that health and physical activity matter in everyday campus life. Curriculum support refers to the supply, quality, and temporal arrangement of physical education, health education, and extracurricular opportunities. Facility accessibility concerns the availability, convenience, and usability of spaces and equipment. Peer climate and teacher support refer to the encouragement, modeling, guidance, and feedback transmitted through social and instructional relationships. To avoid treating the ecological framework as a simple linear chain, this study considered these dimensions as mutually interacting conditions. For example, facility accessibility may determine whether a motivated student can act immediately; peer climate may convert an available venue into a socially attractive opportunity; and teacher support may influence whether course-based participation becomes a positive experience or merely a requirement. Thus, the ecological value of the framework lies not only in listing multiple layers, but also in explaining how individual, relational, physical, and organizational conditions jointly shape the transition from intention to action.

### *Physical activity-related health literacy and exercise motivation*

Health literacy entails more than passive exposure to information; it also involves the capacity to access,

understand, appraise, and apply health-related information in concrete decision making. In this study, health literacy was operationalized specifically in the context of physical activity rather than as general medical literacy. It referred to students' ability to obtain information about physical activity and health, understand and appraise exercise-related guidance, and apply this information to scheduling, intensity adjustment, recovery, injury prevention, and self-monitoring. This distinction is important because university students may be familiar with general health information while still lacking the practical skills needed to transform information into daily physical activity behavior.

At the same time, self-determination theory suggests that behavior becomes more persistent when individuals experience activity as meaningful, enjoyable, and relationally supported [9-11]. This broader campus-health orientation is consistent with recent scholarship extending the Okanagan Charter in higher education [12]. Recent research further indicates that eHealth literacy can influence university students' physical activity behavior through motivational and self-regulatory pathways [13]. Accordingly, the effect of a supportive school environment on physical activity is unlikely to be a simple direct effect. Rather, supportive environments may first activate value endorsement, practical knowledge, emotional engagement, and relational belonging, which then facilitate behavioral initiation and maintenance.

***Analytical framework and exploratory positioning***

Based on the above perspectives, this study conceptualized the supportive school environment as a composite structure formed by school health climate, curriculum support, facility accessibility, peer climate, and teacher support. Physical activity-related health literacy and exercise motivation were treated as intermediary domains that help explain why environmental support sometimes translates into behavior and sometimes does not. Because the present dataset was assembled for first-stage exploratory work, the analysis did not attempt confirmatory structural equation modeling or causal pathway estimation. Instead, qualitative coding generated a mechanism-oriented interpretation, and questionnaire data provided a behavioral portrait that clarified the relative strength of each dimension.

## Methods

***Study design and exploratory rationale***

This study adopted an exploratory mixed-methods design. The design was considered appropriate for three reasons. First, the study addressed a context-dependent problem - the gap between knowing that physical activity is healthy and actually maintaining it in university life - for which students' lived experience needed to be described before a confirmatory model could be specified. Second, several measures were adapted to the healthy school and campus physical activity context; therefore, descriptive and integrative analysis was more suitable than premature psychometric purification. Third, the purpose was to generate a practically meaningful mechanism and intervention direction for future testing rather than to establish a definitive causal model.

The qualitative strand was used to identify recurrent themes, perceived constraints, and typical pathways in students' narratives about health and physical activity. The quantitative strand was used to describe the distribution of supportive school environment, physical activity-related health literacy, exercise motivation, and physical activity behavior. The two strands were integrated into the results and discussion sections to produce a mechanism-oriented interpretation with direct practical relevance.

***University context, participants, and selection criteria***

Data were collected in a comprehensive university environment where physical education courses, sport associations, campus sport facilities, dormitory life, and digital information channels jointly constitute students' everyday physical activity context. The institution represents a typical large university setting rather than a specialized sport university; therefore, most students were non-sport majors and had heterogeneous physical activity backgrounds.

The qualitative material consisted of 27 semi-structured interview cases. Interviewees were selected through maximum-variation purposive sampling. Inclusion criteria were: (1) currently enrolled university students; (2) having lived on or near campus long enough to experience the campus sport environment; (3) being willing to describe physical activity experience, barriers, and support needs. Variation was sought by gender,

grade, major, and exercise participation level. Students with a professional athlete identity or those unable to complete the interview independently were not prioritized, because the study focused on ordinary university students' everyday physical activity behavior. The quantitative material consisted of 268 complete questionnaires. Survey respondents were eligible if they were enrolled in university and completed all core sections of the questionnaire. Questionnaires with large amounts of missing data, repeated patterned responses, or logically inconsistent answers were excluded before analysis. Of the survey participants, 123 were male (45.9%) and 145 were female (54.1%). Forty students (14.9%) were in sports-related majors and 228 (85.1%) in non-sports majors. Participants voluntarily provided information after being informed of the academic purpose of the study.

***Measures and instrument quality***

The interview guide focused on four themes: perceptions of health and physical activity; perceptions of school health climate, curriculum support, facility accessibility, peer climate, and teacher support; physical activity-related health information access, understanding, appraisal, and application; and exercise motivation, behavioral persistence, and perceived barriers.

The questionnaire included four sections: supportive school environment (25 items), physical activity-related health literacy (15 items), exercise motivation (12 items), and physical activity behavior (8 items). Plus, five supplementary items covering physical activity days in the past week, average duration of a single activity session, preferred activity form, sedentary time, and the major barrier to regular activity. In terminology, physical activity was used as the broader concept referring to all bodily movement involving energy expenditure, whereas exercise was used for structured, planned, or purposeful physical activity. This distinction was maintained during revision to improve conceptual consistency.

To enhance instrument quality, the item pool was developed from ecological health behavior theory, health literacy literature, self-determination theory, and campus physical activity studies. Items were reviewed for content relevance, clarity, and contextual fit before formal administration. A small pretest was used to identify ambiguous wording and response burden. After item-level recalculation using the uploaded questionnaire dataset (N=268), the Cronbach's alpha coefficients for the four main questionnaire sections were: supportive school environment alpha =-0.019; physical activity-related health literacy alpha =-0.084; exercise motivation alpha =0.065; physical activity behavior alpha =0.114. These coefficients do not support treating the questionnaire as a formally validated psychometric scale. Accordingly, the quantitative strand was retained as descriptive, first-stage evidence and was not used for psychometric purification, confirmatory factor analysis, structural equation modeling, or causal mediation testing. This clarification was added to avoid overstating measurement precision.

***Analytic procedures and mixed-methods integration***

The interview material was subjected to inductive coding centered on four axes: facilitators of behavior, barriers to behavior, the process of translating knowledge into action, and typical student profiles. Initial codes were compared and grouped into broader categories. The aim of qualitative analysis was not to quantify thematic frequency mechanically, but to identify recurring patterns that could explain why similar students responded differently to the campus environment.

The survey data were cleaned and summarized using frequencies, percentages, means, and standard deviations. Given the exploratory purpose, the quantitative analysis emphasized descriptive interpretation rather than confirmatory path modeling. Mixed-methods integration was conducted through a joint-display strategy. First, qualitative themes and quantitative dimensions were compared for convergence, complementarity, and divergence. Second, the integrated display linked numerical evidence with illustrative qualitative evidence. Third, the mechanism figure was derived only after cross-evidence comparison. This procedure strengthens transparency while preserving scholarly restraint: the integrated mechanism should be read as a plausible explanatory model for future testing, not as proof of causal mediation.

**Results**

***Behavioral profile: Overall activity was low and sedentary exposure was high***

As shown in Table 1, most participants rated their own health as fair or good rather than poor, indicating that students did not generally define themselves as an

overtly unhealthy group. Nevertheless, their behavioral profile was less favorable. When participants were asked about the frequency of moderate-to-vigorous physical activity (MVPA) during the past month, 45 students (16.8%) reported 0 times per week and 130 (48.5%) reported only 1-2 times per week. Thus, nearly two thirds of the sample (65.3%) remained below a pattern suggestive of regular participation.

The supplementary behavior items showed a similar pattern. In the previous 7 days, 38 students (14.2%) reported no days of physical activity and 128 (47.8%) reported only 1-2 days, yielding 62.0% in the lowest two activity categories combined. At the same time, leisure screen time of 4 hours or more per day was reported by 157 students (58.6%), and 211 students (78.7%) reported continuous sedentary time of at least 4 hours. Taken together, the data suggests that the central problem is not complete absence of movement, but rather insufficient frequency, weak continuity, and prolonged sedentary immersion in everyday campus life.

Table 1. Sample characteristics (n=268).

| Variable | Category | n | % |
|---|---|---|---|
| Gender | Male | 123 | 45.9 |
| | Female | 145 | 54.1 |
| Grade | Freshman | 62 | 23.1 |
| | Sophomore | 61 | 22.8 |
| | Junior | 54 | 20.1 |
| | Senior | 56 | 20.9 |
| | Postgraduate | 35 | 13.1 |
| Major | Sports-related major | 40 | 14.9 |
| | Non-sports major | 228 | 85.1 |
| Self-rated health* | Very poor | 9 | 3.4 |
| | Poor | 27 | 10.1 |
| | Fair | 112 | 41.8 |
| | Good | 97 | 36.2 |
| | Very good | 23 | 8.6 |
| Leisure screen time* | <2 h/day | 31 | 11.6 |
| | 2-4 h/day | 80 | 29.9 |
| | 4-6 h/day | 106 | 39.6 |
| | >6 h/day | 51 | 19.0 |
| MVPA frequency in the past month | 0 times/week | 45 | 16.8 |
| | 1-2 times/week | 130 | 48.5 |
| | 3-4 times/week | 70 | 26.1 |
| | >=5 times/week | 23 | 8.6 |

*Note: Percentages do not sum to 100% due to rounding.

As shown in Figure 1, the most frequently reported barrier to regular exercise among university students was perceived no time, cited by 44.0% of respondents. This was followed by inconvenient facilities (18.7%), feeling too tired to engage in physical activity (11.9%), and a lack of companions to exercise with (11.6%). Other less frequently mentioned barriers included no interest (4.5%), lack of guidance (4.1%), and various other unspecified factors (5.2%). These results suggest that barriers to physical activity are not merely attitudinal; they are also structured by competing academic and personal schedules, limited access to convenient facilities, and restricted opportunities for consistent and enjoyable participation in exercise.

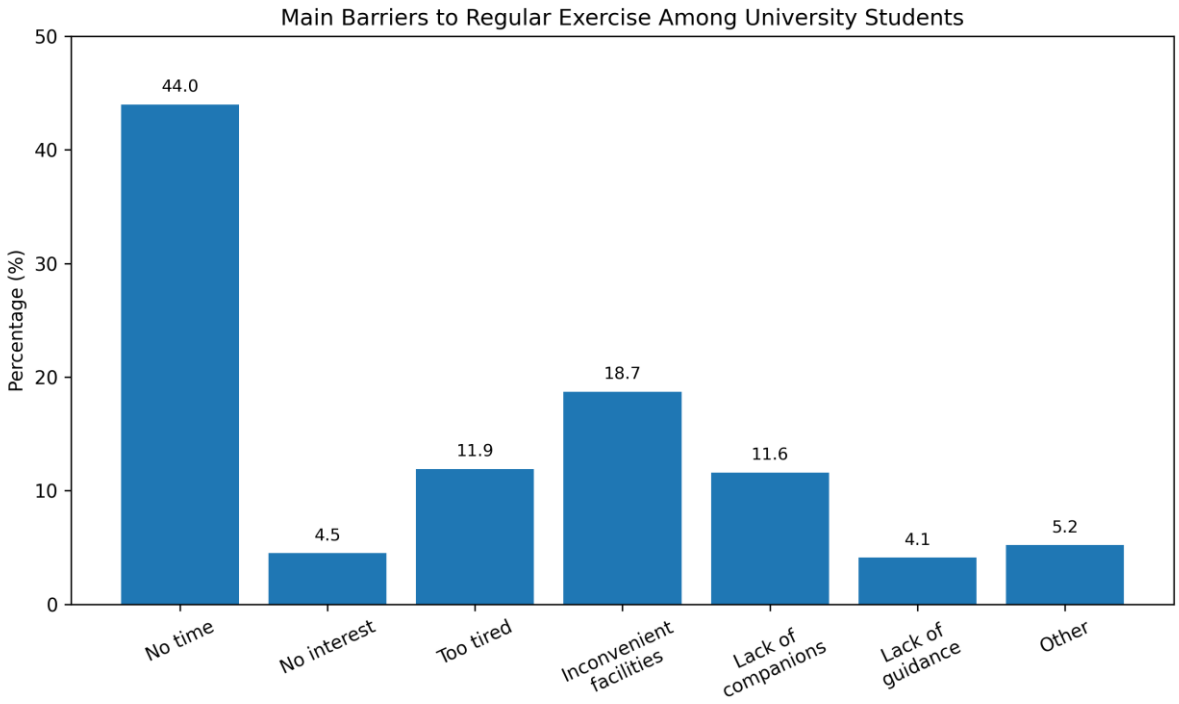


Figure 1. Main barriers to regular exercise among university students.

***Dimension-level findings: Internal asymmetry within the supportive school environment***

As shown in Table 2 and Figure 2, the supportive school environment was not perceived as a homogeneous structure. School health climate (3.46±0.45), peer climate (3.44±0.50), and teacher support (3.38±0.48) reached moderately favorable levels, suggesting that the university had established a certain degree of value-oriented messaging and interpersonal support.

However, facility accessibility was markedly lower (2.51±0.46) than all other environmental dimensions, indicating that limited availability, inconvenient access, and procedural burden remained the most tangible structural deficit.

The physical activity-related health literacy section showed a similar internal imbalance. Health information acquisition (3.51±0.44) and health information appraisal and understanding (3.45±0.46) were both above the midpoint, whereas knowledge application and improvement were much lower (2.87±0.43). This pattern implies that students were relatively capable of accessing and understanding health-related information but had greater difficulty converting that information into concrete schedule management, exercise adjustment, and self-monitoring practices.

The motivation section also displayed asymmetry. Health-value motivation (3.81±0.50) and social/growth motivation (3.80±0.50) were both relatively high, whereas interest/experience motivation was only 2.77±0.54. In other words, most students agreed that physical activity was meaningful and worthwhile, but many did not experience it as inherently enjoyable or immersive. This imbalance in cognition and affect was mirrored in the low score for physical activity behavior (2.62±0.39), suggesting that value endorsement alone did not guarantee stable practice.

Table 2. Mean scores by dimension.

| Dimension | Mean | SD |
|---|---|---|
| School health climate | 3.46 | 0.45 |
| Curriculum support | 3.36 | 0.49 |
| Facility accessibility | 2.51 | 0.46 |
| Peer climate | 3.44 | 0.50 |
| Teacher support | 3.38 | 0.48 |
| Health information acquisition | 3.51 | 0.44 |
| Health information appraisal and understanding | 3.45 | 0.46 |
| Knowledge application and improvement | 2.87 | 0.43 |

| Dimension | Mean | SD |
|---|---|---|
| Health-value motivation | 3.81 | 0.50 |
| Interest/experience motivation | 2.77 | 0.54 |
| Social/growth motivation | 3.80 | 0.50 |
| Physical activity behavior | 2.62 | 0.39 |

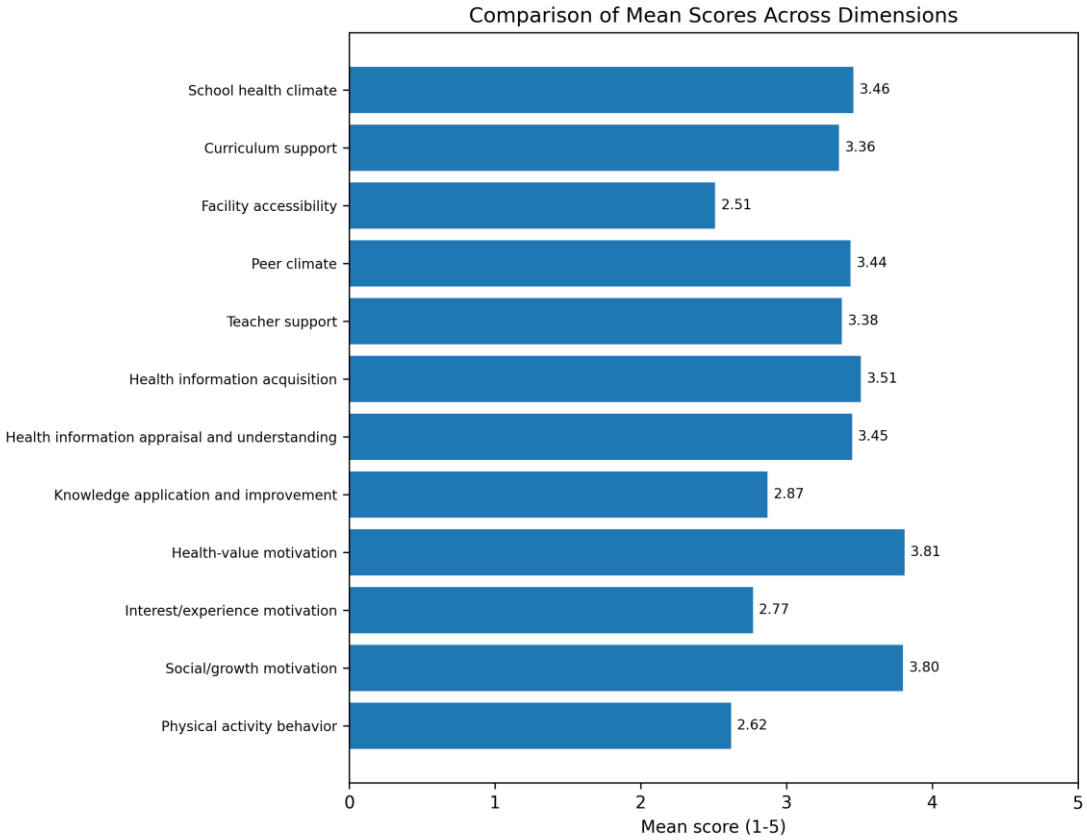


Figure 2. Comparison of mean scores across dimensions.

As shown in Tables 3 and 4, the highest-scoring items clustered around health value and personal growth, whereas the lowest-scoring items concentrated on facility convenience and behavioral persistence. This further supports the conclusion that value endorsement was not absent; rather, the main bottlenecks lay in opportunity structures and in the maintenance of repeated action.

Table 3. Highest-scoring items.

| Item | Statement | Mean |
|---|---|---|
| Mot._Q43 | Even without external requirements, I believe I should continue exercising. | 3.86 |
| Mot._Q41 | I participate in exercise mainly to promote my physical health. | 3.85 |
| Mot._Q52 | I am willing to become more positive and energetic through sustained exercise. | 3.84 |
| Mot._Q50 | I hope to improve self-discipline and willpower through exercise. | 3.83 |
| Mot._Q42 | I believe regular exercise is very important for maintaining a good condition. | 3.82 |

Table 4. Lowest-scoring items.

| Item | Statement | Mean |
|---|---|---|
| Env._Q12 | I can use the university's sports facilities conveniently. | 2.44 |
| Beh._Q56 | Even when academic work is busy, I try to maintain regular exercise. | 2.46 |
| Env._Q15 | Facility conditions influence whether I am willing to participate in exercise. | 2.47 |
| Beh._Q60 | Overall, I believe that my current level of physical activity is sufficient. | 2.51 |
| Env._Q11 | The university provides sufficient sports facilities and equipment for daily exercise. | 2.51 |

***Qualitative findings: Four typical experiential profiles***

As summarized in Table 5, the interview material indicated that university students' physical activity experience cannot be reduced to a simple dichotomy of active versus inactive. Instead, students were distributed across four recurring experiential profiles. The knowing-doing gap type made explicit the contradiction between high knowledge and low execution. These students often consumed substantial health-related content but still experienced physical activity as an additional task rather than a rewarding routine. The peer-driven type highlighted the importance of social triggers. For these students, companionship, invitations, and shared schedules often mattered more than official university advocacy. The high-motivation/sports-specialty type showed that prior exercise habits and self-efficacy can buffer environmental constraints. Finally, the passive compliance type revealed the limits of externally regulated participation: activity may occur when driven by credits or testing, but it is rarely sustained after the external requirement is removed.

Table 5. Four typical profiles identified from the interview material.

| Profile | Summary of features | Illustrative quotation |
|---|---|---|
| Knowing-doing gap type | These students were familiar with health knowledge and endorsed the value of physical activity, but failed to translate intention into repeated action because of time conflicts, fatigue, and competition from screen-based leisure. | "I know prolonged sitting is harmful, and I have saved many exercise routines, but coursework and short-video scrolling always interrupt actual implementation." |
| Peer-driven type | Their personal motivation was limited when alone, but physical activity became much more likely when prompted by roommates, friends, or student organizations. | "It is hard to persist by myself. When my roommate calls me to go running at the same time every evening, I am much more willing to leave the dormitory." |
| High-motivation / sports-specialty type | These students usually had a prior history of regular exercise and stronger self-efficacy. They were less sensitive to environmental constraints and more likely to improvise when facilities were unavailable. | "Even if there is no fixed venue, I will find a way to exercise because being active has already become part of my routine." |
| Passive compliance type | Physical activity was primarily triggered by fitness tests, course credits, or external requirements. Once those requirements ended, activity tended to disappear quickly. | "Without fitness testing or course requirements, I probably would not go to the field on my own." |

***Mixed-method integration: The generative logic of the supportive school environment***

As shown in Figure 3 and Table 6, when the qualitative and quantitative evidence were brought together, a coherent but non-deterministic process emerged. School health climate and curriculum support first helped students recognize that physical activity should be part of university life. Facility accessibility and scheduling convenience then influenced whether that recognition could be translated into a realistic opportunity for action. Peer climate and teacher support further influenced whether students initiated activity, mainly through companionship, affective activation, competence feedback, and relational encouragement. However, the same integrated evidence also showed that the pathway frequently fractured at three critical points. First, students often possessed knowledge but lacked self-regulatory strategies for implementing it effectively. Second, physical activity was commonly experienced as something one "ought to do" rather than something one "wanted to do" for its own sake. Third, once motivation had been activated, academic pressure, screen-based leisure, and fatigue often quickly reabsorbed students into sedentary routines. Therefore, the mechanism proposed here should be interpreted as a hypothesis-generating explanatory model grounded in cross-evidence integration, not as a directly tested causal pathway.

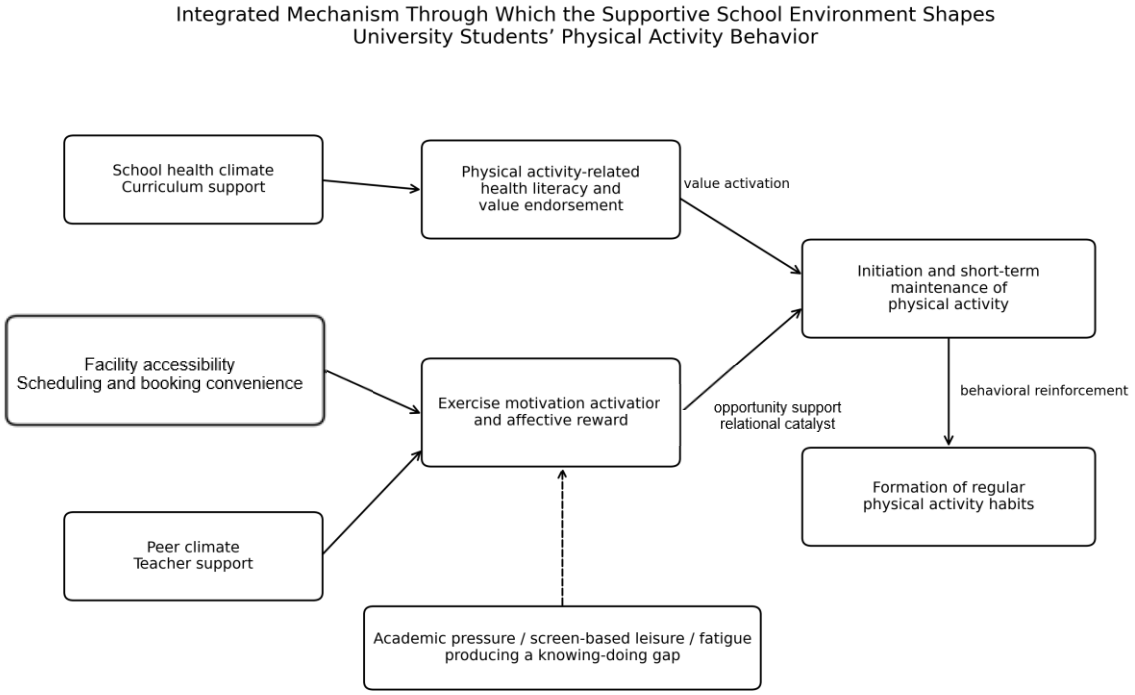


Figure 3. Integrated mechanism through which the supportive school environment shapes university students' physical activity behavior.

Table 6. Integrated interpretation of the qualitative and quantitative findings.

| Theme | Quantitative evidence | Qualitative evidence | Integrated interpretation |
|---|---|---|---|
| School health climate and curriculum support | School health climate =3.46; curriculum support =3.36 | Students generally perceived that the university advocated health, but felt that advocacy did not automatically convert into sustained practice. | These dimensions primarily served value activation and cognitive orientation functions. |
| Facility accessibility | Facility accessibility =2.51, the lowest environmental score | Booking difficulty, crowded spaces, and inconvenient opening hours were mentioned repeatedly. | This was the core structural bottleneck for initiating and maintaining physical activity. |
| Peer climate and teacher support | Peer climate =3.44; teacher support =3.38 | Peer invitations often triggered action directly, while teacher influence depended heavily on course quality and attractiveness. | These dimensions functioned as relational catalysts and confidence enhancers. |
| Health literacy and exercise motivation | Information acquisition and understanding scored relatively high, but application scored low; interest/experience motivation was the weakest motivation component. | Students often said they "knew they should exercise" but were too tired, distracted, or unable to derive enjoyment from activity. | The major breakpoints lay in knowledge-to-action translation and affective reward. |
| Physical activity behavior | Physical activity behavior =2.62; 44.0% reported no time as the main barrier | Students described physical activity as something easily interrupted by coursework, fatigue, and screen-based leisure. | Behavioral persistence was not supported strongly enough by the current environment. |

**Discussion**

The present findings suggest that promoting physical activity in universities is not simply about repeating that activity is important. Instead, the more urgent task is to transform supportive school environments into usable opportunity systems. In this study, school health climate was not poorly rated, but facility accessibility was substantially lower than all other environmental dimensions. This implies that many universities have achieved partial success at the discourse level, while remaining underdeveloped in daily usability. Brown et al. identified environmental resources and opportunities as a primary domain influencing university students' physical activity, and Murphy et al. likewise demonstrated that university infrastructure is meaningfully related to students' physical activity patterns. More recent evidence further indicates that university students' physical activity is shaped by environmental access, schedule compatibility, and the design of campus-based opportunities. Meanwhile intervention effects are stronger when programs reduce practical friction and support repeated action rather than relying on health messaging alone [14-17].

A second implication concerns the knowing-doing gap. The survey showed that students scored more favorably on accessing and understanding health information than on applying it in practice. This pattern is consistent with the review by Buja et al., which found that health literacy is associated with physical activity but exerts its influence most meaningfully when it enters practical decision making and behavioral execution. Many students are not wholly uninformed. Their difficulty lies in translating fragmented knowledge into prioritized action under conditions of academic overload and constant digital distraction. Recent studies among Chinese university students further show that motivation, exercise climate, self-efficacy, eHealth literacy, and physical literacy operate as linked mechanisms in this translation process [18-21]. Future interventions should therefore incorporate micro-goal setting, action planning, self-monitoring, prompts, and peer accountability mechanisms that make implementation easier and more immediate.

Third, peer climate and teacher support appeared to function less as distant background variables and more as relational and affective catalysts. The meta-analysis by Wang et al. showed a stable positive association between social support and physical activity in university students, with peer support often exerting strong effects. The interview material in the present study echoed this pattern: students repeatedly described roommates, friends, and organizational partners as proximal triggers that turned abstract intention into actual behavior. Similarly, teacher support was effective when activity experiences were engaging, competence-building, and affectively positive. Recent evidence also suggests that different types of exercise motivation do not operate equally: When activity becomes enjoyable, competence-affirming, and emotionally rewarding, students are more likely to persist rather than merely comply [22].

These relational findings can be interpreted through self-determination theory. According to Xu et al., motivation becomes more persistent when exercise contexts satisfy needs for autonomy, competence, and relatedness. Meta-analytic work has further shown that self-determination theory-informed health interventions can improve motivation, health behavior, and psychological outcomes. The present results suggest that many university students endorse the health value of physical activity, but do not sufficiently experience it as enjoyable, self-directed, or socially meaningful. When physical activity is framed only as a requirement linked to credit or fitness testing, students may comply temporarily but seldom internalize the behavior deeply enough for stable maintenance.

Finally, the results point toward a broader shift from course-centered physical education management to everyday-life-centered behavioral support. Traditional university physical activity promotion often concentrates on physical education classes, fitness tests, and occasional events. Yet students' behavior is shaped by the daily organization of time, space, information, and social relationships. A healthy school approach therefore needs to integrate venue scheduling, dormitory-based activity opportunities, peer-led groups, teacher feedback, digital prompts, and low-threshold activity spaces. This does not mean that physical education courses are unimportant; rather, it means that courses should be connected with the everyday ecology in which students actually make activity decisions.

It is important to state the inferential boundary of the study. The proposed mechanism is not a causal

mediation model. The data supports a coherent and theoretically plausible explanation, but the cross-sectional and exploratory nature of the quantitative strand prevents causal inference. The major contribution is therefore hypothesis-generating: The study identifies facility accessibility, application-oriented health literacy, affective motivation, and peer/teacher support as promising targets for future confirmatory testing and campus intervention design.

**Conclusion**

Based on 27 interview cases and 268 survey responses, this exploratory mixed-methods study describes the real-world pattern of university students' physical activity and clarified how the supportive school environment operates in the context of healthy school construction. Four main conclusions can be proposed. First, students generally recognize the health value of physical activity, but their actual participation is characterized by insufficient frequency, weak continuity, and prolonged sedentary exposure. Second, the supportive school environment is internally uneven: value-oriented climate and interpersonal support are relatively stronger, while facility accessibility is the weakest and most concrete bottleneck. Third, physical activity-related health literacy shows a gap between information acquisition and practical application. Fourth, peer climate and teacher support may act as relational catalysts, but their influence depends on whether activity becomes enjoyable, competence-building, and embedded in daily life.

These findings suggest several practical implications. Universities should shift from advocacy-centered health promotion to accessibility-centered system design by prioritizing extended opening hours, easier booking, and low-threshold activity spaces near student living areas. They should create more peer-led and group-based activity opportunities, not merely because companionship increases enjoyment, but because it reduces the psychological cost of starting. Physical education courses should be connected with after-class routines through feedback, personalized goals, and digital self-monitoring. Finally, health education should move from general knowledge transmission toward practical action planning, including how to arrange time, choose appropriate intensity, recover from fatigue, and maintain routines during academically busy periods.

This study should be interpreted in light of several limitations. First, the qualitative material was available in summarized interview form rather than as fully transcribed verbatim interviews, which limited the granularity of coding and the depth of narrative reconstruction. Second, the questionnaire was designed for exploratory descriptive use. Although content review and pretesting were conducted, the item-level reliability check did not reach acceptable psychometric standards: The alpha coefficients for supportive school environment, physical activity-related health literacy, exercise motivation, and physical activity behavior were -0.019, -0.084, 0.065, and 0.114, respectively. Therefore, the numerical findings should be interpreted as descriptive indicators rather than validated scale evidence. Future studies should refine item wording, verify reverse scoring where applicable, collect new item-level responses, and conduct internal consistency testing, factor analysis, and formal scale validation before stronger quantitative claims are made. Third, the study relied on self-reported physical activity and sedentary behavior. Students may over-report desirable activity behavior and under-report sedentary time, which can introduce social desirability and recall bias. Fourth, the cross-sectional and exploratory design prevents causal inference. The integrated mechanism should therefore be interpreted as a plausible hypothesis-generating explanation rather than as a confirmed causal pathway.

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**Conflicts of Interest**

The authors declare no conflict of interest.

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