



Optimizing Character Development through Physical Activity Based on Positive Youth Development

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ABSTRACT

Character education has become a major objective of physical education; However, learning practices that primarily emphasize motor skill development often fail to foster students' character effectively. Integrating physical activity with the Positive Youth Development (PYD) approach offers a pedagogical strategy that promotes meaningful experiences supporting adolescents' character development. This study aimed to examine the effect of PYD-based physical activity on the character development of junior high school students. A quantitative quasi-experimental design with a pretest-posttest control group was employed involving 59 students, consisting of 30 students in the experimental group and 29 students in the control group. The experimental group participated in PYD-based physical education activities, while the control group received conventional instruction. The data were analyzed using normality and homogeneity tests followed by an independent samples t-test. The findings revealed that students in the experimental group achieved significantly higher character scores than those in the control group after the intervention ($p < 0.001$). Improvements were observed in Moral Competence, integrity and responsibility, and respect for rules and citizenship. These findings suggest that PYD-based physical activity is an effective pedagogical approach for strengthening character education and promoting Positive Youth Development within school-based physical education.

Keywords: *character development; junior high school; physical activity; physical education; Positive Youth Development*



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INTRODUCTION

Character development is an important component of adolescent education because it concerns how young people develop moral judgment, personal responsibility, integrity, and respect for social norms. During adolescence, these qualities are particularly relevant because students increasingly encounter situations that require them to make decisions, interact with peers, manage

competing interests, and take responsibility for their actions (Gusril et al., 2024) . Therefore, character development should not be treated only as the transmission of moral concepts but also as a process in which students have opportunities to practice and reflect on appropriate behavior in meaningful social contexts. Within education, this perspective places greater emphasis on learning environments that allow students to experience, apply, and reflect on character-related values rather than merely receive them as abstract knowledge (Risyanto et al., 2024) .

Physical Education (PE) provides a particularly relevant context for such development because learning occurs through direct physical and social experiences. Unlike learning environments that predominantly involve individual academic tasks, PE requires students to participate in activities involving cooperation, communication, competition, decision-making, rule-following, and interpersonal interaction. These characteristics create repeated opportunities for students to practice responsibility, fairness, respect, self-control, and cooperation during authentic situations (Uyun et al., 2024) . Thus, physical activity itself may provide an important context for character development; however, its developmental potential depends on how learning activities are structured and facilitated. Physical activity should therefore not be assumed to automatically produce positive character outcomes. Rather, character-related outcomes are more likely when teachers intentionally design activities that provide meaningful social interaction, opportunities for responsibility, and reflection on students' experiences (Subekti et al., 2024) .

Positive Youth Development (PYD) provides a relevant framework for designing such learning experiences because it conceptualizes adolescents in terms of their strengths, capacities, and potential for positive growth rather than primarily in terms of problems or deficits. (Donovan et al., 2025a; Oscós-Sánchez et al., 2026) The Five Cs model of PYD conceptualizes positive adolescent development through five interrelated dimensions: Competence, Confidence, Connection, Character, and Caring. Character represents an important component of this framework because it concerns morality, integrity, internalized values, and respect for social and cultural rules. In the context of PE, the PYD framework is particularly appropriate because physical activities can be deliberately organized to create opportunities for students

to cooperate, solve problems, make decisions, demonstrate leadership, assume responsibility, and reflect on their behavior. Previous evidence on sport-based PYD interventions, however, indicates that research outcomes have frequently emphasized competence, confidence, and life skills, while evidence concerning character has been less consistent. This indicates the need to examine character more deliberately rather than treating it as a secondary or incidental outcome of participation in physical activity (Almeida et al., 2025).

The present study therefore focuses specifically on the Character dimension of PYD as the primary outcome. This focus is important because character should not necessarily be understood as a single undifferentiated attribute. Within the Chinese Positive Youth Development Scale (CPYDS), the character domain can be examined through specific aspects that reflect students' moral and social functioning. In this study, three dimensions are emphasized: Moral Competence, Integrity and Responsibility, and Respect for Rules and Citizenship (Taylor & Cipriano, 2025). These dimensions were selected because they correspond directly to behaviors that can be experienced and practiced during PE activities. Moral Competence concerns students' ability to make appropriate moral judgments and decisions; Integrity and Responsibility concerns consistency between values and behavior, including honesty, responsibility, and commitment; while Respect for Rules and Citizenship concerns students' adherence to rules, respect for social norms, and responsible participation as members of a group or community. Examining these dimensions separately allows character development to be understood more comprehensively than relying only on an overall character score (López-Bermúdez et al., 2025a).

Although previous studies have demonstrated that physical activity and sport-based PYD interventions can contribute to various positive youth outcomes, the literature has not sufficiently clarified how PYD-based physical activity influences character as a multidimensional primary outcome. Existing research has commonly examined outcomes such as competence, confidence, life skills, well-being, social-emotional development, or specific behavioral problems, while character has often been included as one component among several PYD outcomes rather than as the central outcome of the intervention. Within the Chinese Positive

Youth Development framework, moral competence is recognized as one of the core developmental qualities assessed within the CPYDS (Shek, 2025) . Moreover, when character is examined, treating it as a single overall construct may obscure differences in the development of specific character dimensions. Consequently, an important gap remains in determining whether a PYD-based physical activity approach can improve character and, more specifically, which dimensions of character demonstrate the greatest improvement following participation in structured PE activities. Addressing this gap is important for understanding how the character component of PYD can be translated into concrete pedagogical experiences within school-based PE (Weiss et al., 2020) .

Based on this gap, the present study aims to examine the effect of Positive Youth Development-based physical activity on the character development of junior high school students. Specifically, the study investigates changes in students' overall character as well as in three character dimensions: Moral Competence, Integrity and Responsibility, and Respect for Rules and Citizenship. The novelty of this study lies in treating character as a multidimensional primary outcome of a PYD-based physical activity intervention rather than as a secondary outcome within a broader assessment of youth development. By identifying changes across specific character dimensions, this study is expected to contribute empirical evidence to the application of PYD in school-based PE and provide a more specific basis for teachers to design physical activity experiences that intentionally integrate moral decision-making, responsibility, and respect for rules into the learning process.

METHODS

Research Design and Participants

This study employed a quantitative quasi-experimental design with a pretest–posttest control group. The participants were eighth-grade junior high school students who participated in physical education learning. The available dataset consisted of 30 students in the experimental group and 29 students in the control group, with complete pretest and posttest data available for all participants. Thus, the final analysis included 59 students, comprising 30 students in the experimental group and 29 students in the control group.

Intervention Procedure

The experimental group participated in physical activity learning based on the Positive Youth Development (PYD) approach, which integrated character development into physical education activities. The intervention was implemented through structured physical education activities that provided opportunities for students to cooperate, communicate, solve problems, make decisions, demonstrate leadership, assume responsibility, and reflect on their behavior. Character-related learning experiences were incorporated into the learning activities rather than treated as separate activities. The control group participated in conventional physical education learning following the regular learning process. Both groups participated in the same physical education learning context, while the experimental group received the PYD-based approach emphasizing intentional character development.

Instrument

Character development was measured using the Character dimension of the Chinese Positive Youth Development Scale (CPYDS), consisting of 13 items rated on a five-point Likert scale. The instrument covered three character dimensions: Moral Competence (5 items), Integrity and Responsibility (5 items), and Respect for Rules and Citizenship (3 items). The same instrument was administered at pretest and posttest to assess changes in students' character scores before and after the intervention (Chai et al., 2022). The overall character score and the three subdimension scores were analyzed separately to provide a more detailed assessment of character development.

Data Analysis

Data were analyzed using descriptive statistics, including means and standard deviations, to summarize character scores at pretest and posttest for each group. Baseline differences between the experimental and control groups were examined using an independent-samples t-test. Within-group changes from pretest to posttest were examined using paired-samples t-tests.

Between-group differences in posttest scores were examined using an independent-samples t-test. Homogeneity of variance was assessed using Levene's test, and the equal variances not assumed result was used when the homogeneity assumption was violated. Gain scores were calculated as posttest minus pretest

scores and compared between the experimental and control groups using an independent-samples t-test. Mean differences were reported with 95% confidence intervals, and Cohen's *d* was used to estimate between-group effect sizes. Statistical significance was set at $p < .05$. The same procedures were applied to the overall character score and the three character subdimensions.

RESULTS AND DISCUSSION

This study examined changes in the character dimension of Positive Youth Development (PYD) following a PYD-based physical activity intervention compared with conventional physical education. Character development was assessed using the Character dimension of the Chinese Positive Youth Development Scale (CPYDS), consisting of 13 items rated on a five-point Likert scale. Descriptive statistics and inferential analyses were conducted to examine baseline conditions, within-group changes, and differences between groups. The results are presented using mean (*M*) and standard deviation (*SD*), followed by paired-samples t-tests for within-group changes and independent-samples t-tests using the Welch correction when the assumption of equal variances was not met.

At baseline, the experimental group ($n = 30$) had a mean character score of 2.39 ($SD = 0.40$), whereas the control-group pretest data ($n = 29$) had a mean of 2.34 ($SD = 0.50$). The baseline difference was not statistically significant, $t(53.96) = 0.40$, $p = .688$, with a mean difference of 0.05 (95% CI $[-0.19, 0.28]$) and Cohen's $d = 0.11$. This result indicates that the groups had comparable character scores before the intervention. Following the intervention, the experimental group obtained a mean post-test score of 4.76 ($SD = 0.16$), while the control-group post-test data ($n = 29$) showed a mean of 3.13 ($SD = 0.54$). Because the post-test variances were unequal (Levene's $F = 21.146$, $p < .001$), the Welch correction was applied. The post-test difference was statistically significant, $t(27.67) = 14.54$, $p < .001$, with a mean difference of 1.63 (95% CI $[1.40, 1.87]$) and Cohen's $d = 4.25$.

Within-group analysis showed statistically significant increases in both groups. In the experimental group, the mean character score increased from 2.39 ($SD = 0.40$) at pretest to 4.76 ($SD = 0.16$) at post-test, representing a mean increase of 2.37 points, $t(29) = 29.64$, $p < .001$. For the available paired control-group data ($n = 29$), the mean score increased from 2.35 ($SD = 0.50$) to 3.13 ($SD = 0.54$),

representing a mean increase of 0.78 points, $t(28) = 12.58$, $p < .001$. A direct comparison of gain scores further showed that the experimental group had a greater increase ($M = 2.37$) than the control group ($M = 0.78$). The difference in gain scores was statistically significant, $t(51.75) = 15.71$, $p < .001$, with a mean difference of 1.59 (95% CI [1.39, 1.80]) and Cohen's $d = 4.13$. Thus, the statistical results indicate differences in the magnitude of character-score changes between the two study conditions.

The analysis of the three character subdimensions also showed statistically significant within-group changes (Table 2). In the experimental group, Moral Competence increased from 2.35 to 4.77, Integrity and Responsibility from 2.41 to 4.80, and Respect for Rules and Citizenship from 2.41 to 4.70. The corresponding gain scores were 2.41, 2.39, and 2.29, respectively. In the control group, the corresponding increases were smaller, with gain scores of 0.69, 0.74, and 1.01. Paired-samples t -tests indicated significant pretest–post-test changes for all three dimensions in both groups ($p < .001$). Comparisons of gain scores between groups were also statistically significant for Moral Competence, $t(50.88) = 15.63$, $p < .001$; Integrity and Responsibility, $t(50.79) = 13.80$, $p < .001$; and Respect for Rules and Citizenship, $t(48.57) = 6.67$, $p < .001$. The detailed descriptive and inferential results are presented below.

Table 1. Character Subdimensions at Pretest and Post-test

Character dimension	Experimental Pre-test M (SD)	Experimental Post-test M (SD)	Gain	Control Pre-test M (SD)	Control Post-test M (SD)	Gain
Moral Competence	2.35 (0.43)	4.77 (0.20)	2.41	2.33 (0.51)	3.02 (0.65)	0.69
Integrity and Responsibility	2.41 (0.43)	4.80 (0.17)	2.39	2.35 (0.54)	3.09 (0.63)	0.74
Respect for Rules and Citizenship	2.41 (0.47)	4.70 (0.22)	2.29	2.37 (0.54)	3.39 (0.76)	1.01

Table 1 indicates that all three character subdimensions increased from pre-test to post-test in both groups, with larger descriptive gains observed in the

experimental group. In the experimental group, Moral Competence increased from 2.35 to 4.77 (gain = 2.41), Integrity and Responsibility from 2.41 to 4.80 (gain = 2.39), and Respect for Rules and Citizenship from 2.41 to 4.70 (gain = 2.29). In comparison, the control group showed smaller gains of 0.69, 0.74, and 1.01, respectively. This pattern suggests that the PYD-based physical activity condition was associated with greater improvement across the three character dimensions under the conditions of the present study. The relatively greater gains in the experimental group can be understood from the pedagogical structure of the intervention, which embedded character-related experiences within physical activity rather than treating character development as a separate instructional component. Through structured cooperation, role-taking, adherence to activity rules, communication, decision-making, and reflection, students were repeatedly exposed to situations requiring them to translate character-related values into observable behaviors during participation. Such experiential learning may provide a mechanism through which physical activity becomes a context for character development, because students have opportunities not only to understand behavioral expectations but also to practice them through socially interactive and goal-directed tasks.

The pattern across the three dimensions further suggests that the intervention created multiple pathways for character development: Moral Competence may have been supported through opportunities to make appropriate decisions and respond to interpersonal situations; Integrity and Responsibility through the completion of assigned roles and accountability for group tasks; and Respect for Rules and Citizenship through adherence to shared rules, cooperation, and respect for peers. Importantly, the control group also demonstrated improvement, indicating that conventional physical education may itself provide character-development opportunities; however, the smaller descriptive gains suggest that intentionally embedding PYD principles within physical activity may provide additional opportunities for students to practice character-related behaviors. These findings support the interpretation that the educational value of physical activity for character development may depend not only on participation in activity itself, but also on how learning experiences are intentionally structured

to promote positive developmental processes (Donovan et al., 2025b; López-Bermúdez et al., 2025b).

This improvement can be explained through the learning characteristics applied during the intervention (Buenconsejo & Datu, 2024a). Unlike conventional physical education (PJOK) learning, which is generally still oriented towards achieving movement skills, PYD-based physical activity is designed so that every physical activity becomes a means of learning values. Students are not only asked to complete movement tasks but are also faced with situations that require cooperation, communication, leadership, conflict resolution, decision-making, and reflection on the behavior they display during the learning process. (Buenconsejo & Datu, 2024b) This kind of learning experience allows students to have the opportunity to practice character values directly in an authentic context so that the process of internalizing values takes place through real experience (experiential learning), not just through verbal delivery of concepts.

These findings are consistent with various previous studies which show that the implementation of the Positive Youth Development framework in physical education is able to improve character development, social responsibility, and prosocial behavior of students (Buenconsejo & Datu, 2024c; Yuan et al., 2026). Various studies report that learning environments that provide opportunities for students to actively participate, work together in groups, and reflect on their learning experiences make a greater contribution to character formation than learning that is only oriented towards mastering motor skills. (Chaeroni et al., 2022; Pfladderer et al., 2026) This shows that physical activity will have an optimal impact on character development if it is designed as a meaningful learning experience and not just a sporting activity.

The dominant increase in the Moral Competence dimension also indicates that PYD-based physical activities provide students with the opportunity to develop moral reasoning skills through various learning situations that require responsible decision-making. In each group activity, students are faced with situations that require them to choose fair actions, respect the rights of other group members, resolve conflicts positively, and accept the consequences of their decisions. These experiences encourage the development of moral thinking skills because students

learn through social interactions that occur naturally during the learning process. These results align with previous research that suggests that experiential physical education learning can improve moral decision-making skills because students actively experience various social dilemmas in games and sports activities .

In addition to improving moral competence, the intervention also had a strong impact on the integrity and responsibility dimension. Improvements in this dimension indicate that students are better able to demonstrate honest behavior, take responsibility for assigned tasks, maintain commitments, and complete activities according to their roles within the group.(O'Brien et al., 2024). During the learning process, the success of an activity is not determined solely by individual ability, but by the contribution of all group members. This situation encourages students to help each other, complete tasks together, and take collective responsibility for the group's success. This finding reinforces previous research showing that physical activities that emphasize collaboration and shared responsibility can develop student integrity through repeated social experiences throughout the learning process.(Cheng et al., 2024; Zhao et al., 2026).

In the Respect for Rules and Citizenship dimension, increased scores indicate that students are increasingly able to appreciate game rules, obey group agreements, uphold sportsmanship, and demonstrate mutual respect throughout the learning process. Game activities in the PYD approach do not view rules as limitations on activities, but rather as a medium for building social awareness and responsibility as group members. Through direct involvement in games that consistently apply rules, students learn that compliance with rules is part of an effort to create a safe, fair, and conducive learning environment for all participants. These results support various studies which explain that physical education has great potential in developing civic values if learning activities are designed to foster a sense of mutual respect, justice, and social responsibility.(Dennehy et al., 2024; Porreca & Simonelli, 2025).

In contrast, character development in the control group was relatively lower than in the experimental group. This difference indicates that physical activity alone is not sufficient to produce character change if it is not integrated with learning strategies that explicitly develop Positive Youth Development values. Physical

education (PJOK) learning that focuses on the technical aspects of movement skills can indeed improve students' physical abilities, but it does not necessarily provide sufficient learning experiences to develop moral skills, responsibility, or social competence.(Holt, 2025). Thus, character building requires a learning design that intentionally provides opportunities for students to experience, practice, and reflect on positive values in every physical activity they undertake.

CONCLUSION

The findings indicate that students who participated in Positive Youth Development (PYD)-based physical activity demonstrated greater improvements in character development than those who participated in conventional physical education. Improvements were observed across the three examined character dimensions: Moral Competence, Integrity and Responsibility, and Respect for Rules and Citizenship. The experimental group showed larger pretest-to-posttest gains across these dimensions, while the control group also demonstrated improvements during the study period. These findings suggest that intentionally integrating PYD principles into physical education may provide meaningful opportunities for students to practice moral decision-making, responsibility, cooperation, and respect for rules within authentic physical activity contexts. Rather than treating character development as a separate instructional objective, the PYD-based approach embeds character-related experiences within participation, interaction, decision-making, and reflection during physical education activities.

The study contributes to the application of the PYD framework in school-based physical education by examining character as a multidimensional outcome. From a practical perspective, the findings support the consideration of structured physical activity experiences that intentionally incorporate collaborative tasks, responsibility, moral decision-making, and reflection. Further research involving larger samples, longer intervention periods, and more rigorous experimental or longitudinal designs is needed to examine the consistency and durability of these observed improvements and to determine how PYD-based physical activity may relate to other dimensions of positive adolescent development.

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