

Preliminary Effects of a Structured Group Sports Games Program on Psychological Resilience Among Primary School Students

Tan Qiuyi^{1*}, Paradee Kambhu Na Ayudhaya², and Thammachote Aeumtassana³

Educational Psychology and Guidance, Faculty of Education, Srinakharinwirot University, Thailand

*Corresponding author. E-mail: 594532017@qq.com^{1*}, paradeek@g.swu.ac.th², thammachota@g.swu.ac.th³

Received June 22, 2026; **Revised** July 18, 2026; **Accepted** August 10, 2026

Abstract

Psychological resilience is important for children's mental health, school adaptation, and positive development, especially during the transition period of late primary school. Globally, approximately one in seven adolescents aged 10–19 experiences a mental health condition, and schools are important settings for socio-emotional learning and psychological well-being (World Health Organization, 2025). This study examined the preliminary effects of a structured group sports games program on psychological resilience among Grade 6 primary school students. A small-scale pretest-posttest control-group school-based intervention design was used. After school permission and consent procedures, 300 Grade 6 students from Cheng Shuren Primary School of Chongqing University completed screening. The 30 students with the lowest total psychological resilience scores were selected and randomly assigned to an experimental group ($n = 15$) and a control group ($n = 15$). The experimental group participated in a 5-week program consisting of 10 sessions, twice per week, approximately 40 minutes per session. The control group continued usual school activities and regular physical education classes but did not receive the structured program. Psychological resilience was measured using a 20-item scale adapted with reference to Hu and Gan, covering goal focus, interpersonal support, emotional regulation, and positive cognition. Reliability was acceptable to good, with an overall Cronbach's alpha of .91. Descriptive statistics, t -tests, effect sizes, 95% confidence intervals, and SPSS mixed-design ANOVA were used. The experimental group showed higher post-test mean scores in overall psychological resilience and all four dimensions; post-test group differences were statistically significant for total resilience, goal focus, and interpersonal support. Mixed-design ANOVA further indicated significant group $\times$ time effects for total resilience and all four dimensions. However, because the study used a small sample from one school and a short intervention period, the findings should be interpreted cautiously and verified in larger studies.

Keywords: psychological resilience; structured group sports games; primary school students; physical education; school-based intervention

Introduction

Mental health problems among children and adolescents have become an increasingly important public health concern. Globally, approximately one in seven adolescents aged 10–19 experiences a mental health condition, and schools are important settings for promoting socio-emotional learning and psychological well-being (World Health Organization, 2025). Psychological resilience, usually understood as the capacity to adapt positively when facing stress, adversity, and developmental challenges, is closely related to children's emotional adjustment, peer relationships, school adaptation, and long-term well-being (Masten, 2001; Resnick et al., 1997; Rutter, 2012). For primary school students, resilience is not only a personal psychological resource but also an educational outcome that can be cultivated through supportive school experiences. Grade 6 students are at a transitional stage before entering junior secondary school; therefore, interventions that help them set goals, manage emotions, maintain positive cognition, and obtain peer support are educationally meaningful.

School physical education is a suitable setting for resilience-oriented intervention because it is routine, low-cost, highly participatory, and naturally interactive. Unlike psychological programs delivered outside the curriculum, physical education allows students to experience rules, goals, success, failure, feedback, and social cooperation in a familiar school context. In this study, physical activity is not treated simply as exercise volume. Instead, the physical education class is used as a school-based context in which resilience-related experiences can be structured, practiced, and reflected upon.

Group sports games refer to structured, rule-based, cooperative and competitive physical activities conducted in groups, such as basketball passing games, football small-sided games, frisbee challenges, tug-of-war, rope-skipping challenges, and traditional group games. These activities were selected because they are suitable for Grade 6 classes, require relatively low technical thresholds, have controllable safety risks, and can be organized in indoor or outdoor school settings. They also naturally require communication, role division, teamwork, competition, persistence after failure, and teacher or peer feedback. These features correspond to the four resilience dimensions examined in this study: goal focus, interpersonal support, emotional regulation, and positive cognition.

Although previous studies have linked general physical activity, sport participation, and team sport experiences with resilience and positive youth development (Husain et al., 2024; Pasno, 2024; Sheng et al., 2024; Zhang & Gao, 2023), three gaps remain. First, many studies focus on general physical activity or sport participation rather than a structured group sports games program with explicit psychological goals. Second, relatively few studies target low-resilience primary school students, especially Grade 6 students. Third, previous studies have seldom connected specific sports game procedures with specific dimensions of psychological

resilience. Therefore, this study had two research objectives: (1) to design a structured group sports games program aimed at enhancing psychological resilience among primary school students; and (2) to examine the preliminary effects of the program on overall psychological resilience and four dimensions among Grade 6 students.

Research Objectives

1. To design a structured group sports games program aimed at enhancing the psychological resilience of primary school students.

2. To examine the preliminary effects of the structured group sports games program on overall psychological resilience and the dimensions of goal focus, interpersonal support, emotional regulation, and positive cognition among Grade 6 students.

Literature Review

1. Psychological Resilience

Psychological resilience refers to an individual's ability to adapt positively and maintain healthy functioning when facing adversity, stress, or developmental challenges (Denckla et al., 2020; Masten, 2001; Rutter, 2012). Hu and Gan's (2008) Adolescent Psychological Resilience Scale includes five dimensions: goal focus, emotional control, positive cognition, family support, and interpersonal assistance. The present study adapted the scale to four school-intervention-related dimensions: goal focus, interpersonal support, emotional regulation, and positive cognition. Although family support is an important component of resilience, the present intervention was implemented in school-based physical education settings and mainly targeted students' goal setting, peer interaction, emotional experience, and positive reflection. Because the program did not directly intervene in family processes, family support was not included as a primary outcome dimension. This decision is acknowledged as a limitation of the study.

2. Group Sports Games and Psychological Development

Group sports games are not only physical activities but also social and psychological learning situations. Shared goals and task completion may strengthen goal focus because students need to plan, persist, and evaluate progress (Bailey, 2006; Lubans et al., 2016). Role division, communication, and peer assistance may strengthen interpersonal support because students must rely on teammates to complete group tasks (Cohen & Wills, 1985; Eime et al., 2013). Competition, pressure, failure, and repeated attempts may provide opportunities for emotional regulation (Lubans et al., 2016; Surzykiewicz et al., 2022). Teacher encouragement, peer feedback, and post-activity reflection may contribute to positive cognition by helping students reinterpret difficulties as manageable challenges (Seligman & Csikszentmihalyi, 2000).

3. Sports Participation and Psychological Resilience

It is important to distinguish general physical activity, organized sport participation, team sport, physical education, and a structured group sports games program. General physical activity usually emphasizes movement or exercise volume. Organized sport participation and team sport often involve longer-term training, competition, and sport-specific skill development. Physical education is a school curriculum context. The present study focuses on a structured group sports games program: a 10-session, four-stage, school-based set of cooperative and competitive games designed with explicit psychological resilience objectives. This distinction is important because the expected educational value depends not only on movement but also on goal setting, cooperation, competition, reflection, and feedback.

4. Summary of the Literature Review

Existing literature supports a relationship between physical activity, sport participation, social support, emotional regulation, positive cognition, and psychological resilience (Cohen & Wills, 1985; Eime et al., 2013; Husain et al., 2024; Lubans et al., 2016; Surzykiewicz et al., 2022). However, there remains a lack of structured school-based sports games interventions for low-resilience primary school students and a lack of clear theoretical connection between sports game procedures and resilience dimensions (Fenwick-Smith et al., 2018; Sheng et al., 2024). This study attempts to address this gap by designing a structured group sports games program that links preparation, skills training, game participation and competition, and reflection and feedback with the four resilience dimensions.

Conceptual Framework

The conceptual framework of this study explains how a structured group sports games program may provide resilience-building experiences in school physical education. The program is organized through preparation and goal setting, skills training and cooperation, game participation and competition, and reflection and feedback. These processes are expected to support goal focus, interpersonal support, emotional regulation, and positive cognition, which together contribute to overall psychological resilience.

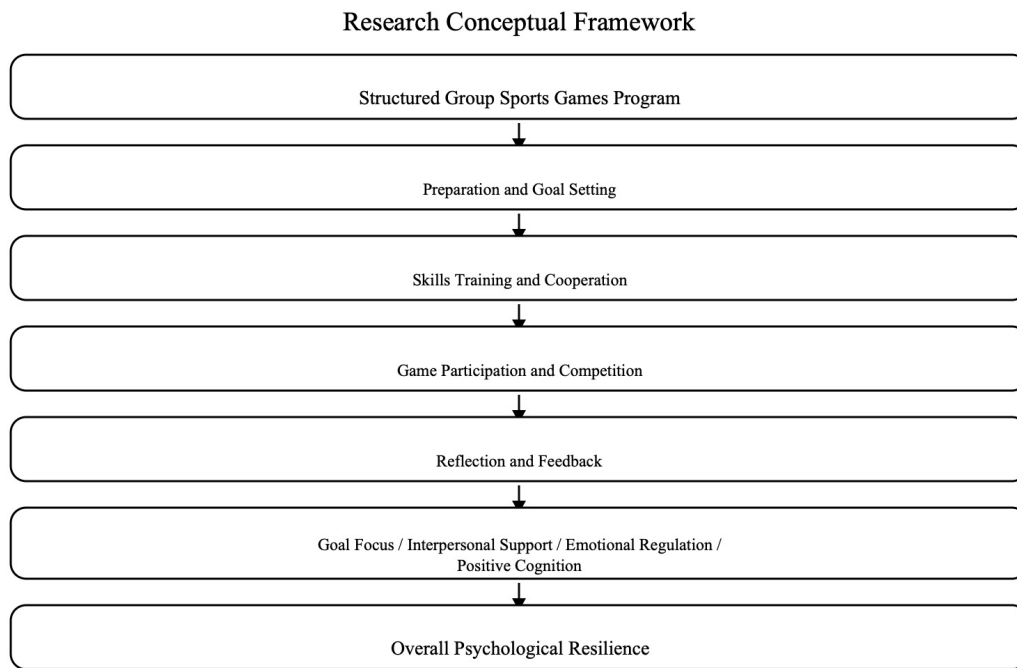


Figure 1 Conceptual Framework

This framework indicates that structured group sports games are not assumed to influence psychological resilience simply through physical activity. Rather, they may support resilience development by providing concrete experiences of goal setting, cooperation, communication, competition, challenge, and reflective feedback.

Research Methodology

Research Design

This study used a small-scale pretest-posttest control-group school-based intervention design. Because the participants were purposively selected from Grade 6 students with low psychological resilience in one primary school rather than randomly sampled from a larger population, the study is reported as a quasi-experimental intervention. After screening, eligible students were randomly assigned to the experimental group and the control group.

Research Site and Activity Setting

The study was conducted at Cheng Shuren Primary School of Chongqing University. Activities were organized in school physical education settings, including the outdoor playground or sports field and, when weather or safety conditions required, the indoor gymnasium. Basketball passing, football small-sided games, frisbee target challenges, tug-of-war, team rope-skipping, and traditional handkerchief games were arranged according to space, equipment, and safety requirements. Before each session, the teacher checked the venue, balls, frisbees, ropes, markers, and other equipment, and adjusted activity intensity to a moderate level suitable for Grade 6

students. A physical education teacher supervised all sessions, explained safety rules, monitored student reactions, and stopped or modified activities when discomfort or unsafe behavior occurred.

Participants and Screening Procedure

The population consisted of 300 Grade 6 students from the selected primary school. After school permission, parental or guardian consent, and student assent procedures, students completed the Psychological Resilience Scale. The 30 students with the lowest total psychological resilience scores were selected as the low-resilience sample and then randomly assigned to the experimental group ($n = 15$) and the control group ($n = 15$). Random assignment was conducted using a computer-generated random number list. Attendance was recorded throughout the intervention. All 30 participants completed the pretest, post-test, and required intervention or control procedures; therefore, no attrition occurred. Students in the experimental group attended at least 9 of the 10 sessions, with a mean attendance rate of 96.7%. Because the sample was selected from students with the lowest resilience scores, possible regression to the mean is acknowledged in the limitations.

Inclusion and Exclusion Criteria

Inclusion criteria were: (1) Grade 6 student in the selected school; (2) completion of the pretest screening; (3) identification as having low psychological resilience; (4) ability to participate in regular physical education activities; (5) written parental or guardian informed consent; and (6) student assent. Exclusion criteria were: (1) physical or medical conditions unsuitable for moderate physical activity; (2) incomplete pretest or post-test data; (3) absence from more than two intervention sessions; (4) refusal by the student or guardian; and (5) participation in another psychological intervention during the study period.

Sample Size Justification

This study was a small-scale preliminary intervention study. Its primary purpose was not to provide large-scale population-level evidence but to evaluate the feasibility and preliminary effects of a structured group sports games program. The sample size was limited because the study specifically selected students with low psychological resilience, had to follow school teaching arrangements, and required safe teacher supervision during group physical activities. The small sample size reduced statistical power and limited the generalizability of the findings.

Measurement Instrument

Psychological resilience was measured using a scale adapted with reference to Hu and Gan's Adolescent Psychological Resilience Scale. The adapted version retained four dimensions directly related to the school-based physical education intervention: goal focus, interpersonal support, emotional regulation, and positive cognition. Family support was not included as a primary outcome dimension because the intervention was conducted in school physical education and

peer–game settings and did not directly intervene in family processes. The instrument contained 20 items, with 5 items for each dimension. Items were rated on a five–point Likert scale from 1 = strongly disagree to 5 = strongly agree. Total scores ranged from 20 to 100, with higher scores indicating higher psychological resilience. In the present sample, the scale showed good internal consistency. The overall Cronbach’s alpha was .91. Subscale reliability was acceptable to good, with alpha values of .78 for goal focus, .82 for interpersonal support, .80 for emotional regulation, and .84 for positive cognition. Content validity was evaluated by five experts in educational psychology, physical education, and primary education. The item–level content validity index ranged from .80 to 1.00, and the scale–level content validity index was .92. Minor wording revisions were made according to expert suggestions to improve readability for Grade 6 students. Because the intervention sample was small, construct validity was not re–examined through exploratory or confirmatory factor analysis in the present study. The dimensional structure was based on Hu and Gan’s original scale and expert content validation. This is acknowledged as a measurement limitation.

Intervention Program Definition

In this study, group sports games refer to structured, rule–based, cooperative and competitive physical activities conducted in groups and designed to promote teamwork, goal setting, communication, emotional regulation, and positive reflection. The program included basketball passing games, football small–sided games, frisbee target challenges, tug–of–war, team rope–skipping, and traditional handkerchief games. These activities were selected because they are suitable for Grade 6 students, have controllable safety risks, require relatively low technical thresholds, can be implemented in physical education classes, and can be organized indoors or outdoors. High–collision, highly technical, strongly individual, or equipment–intensive sports were not selected because the purpose of this study was psychological resilience development rather than competitive sport performance.

Program Development and Validation

The program was developed according to the four dimensions of psychological resilience, the characteristics of group sports games, and the practical conditions of primary school physical education. The design principles were safety, enjoyment, cooperation, competition, and reflection. The program was reviewed by five experts who evaluated goal clarity, age appropriateness, safety, feasibility, and fit with resilience dimensions. The mean expert rating was 4.62 out of 5, with separate mean scores of 4.70 for goal clarity, 4.55 for age appropriateness, 4.60 for safety, 4.50 for feasibility, and 4.75 for fit with resilience dimensions. Based on expert feedback, activity difficulty, time arrangement, rule explanation, safety reminders, and reflection questions were refined before implementation. Implementation fidelity was monitored through a checklist recording whether each session completed preparation, skills training, game participation and competition,

and reflection and feedback. Across 10 sessions, the fidelity checklist completion rate was 95.0%, indicating that the planned core procedures were generally implemented as designed. Student attendance was also recorded.

Ten-session Intervention Program

Table 1 Structure of the 10-session Structured Group Sports Games Program

Session	Activity	Main Procedure	Targeted Resilience Dimension	Psychological Purpose
1	Team-building relay and group rules	Preparation, warm-up, group formation, rule setting, relay game, reflection	Goal focus / interpersonal support	Establish safety, team identity, and shared goals
2	Basketball passing cooperation game	Rule explanation, passing practice, group passing challenge, feedback	Interpersonal support	Promote communication, role division, and peer assistance
3	Frisbee target challenge	Goal setting, frisbee skill practice, team target challenge, reflection	Goal focus	Encourage planning, persistence, and task completion
4	Football small-sided cooperation game	Skill practice, small-sided team game, strategy adjustment, sharing	Interpersonal support / emotional regulation	Develop cooperation under competitive pressure
5	Tug-of-war strategy game	Safety briefing, team strategy, tug-of-war competition, reflection	Goal focus / emotional regulation	Experience collective effort, pressure, and persistence
6	Team rope-skipping challenge	Rhythm practice, team challenge, repeated attempts, feedback	Goal focus / interpersonal support	Strengthen coordination, encouragement, and goal persistence
7	Trust and blindfold guidance game	Safety rules, partner guidance, group task, reflection	Interpersonal support	Develop trust, communication, and supportive interaction
8	Obstacle/team problem-solving game	Task explanation, strategy planning, obstacle challenge, feedback	Emotional regulation / positive cognition	Practice coping with difficulty and reframing setbacks
9	Integrated team competition	Review rules, multi-game team competition, observation, reflection	All four dimensions	Integrate teamwork, competition, persistence, and emotional control
10	Reflection game and feedback session	Cooperative game, group reflection, teacher feedback, transfer discussion	Positive cognition / overall resilience	Consolidate positive experience and transfer gains to school life

Control Group

The control group continued their usual school activities and regular physical education classes but did not receive the structured group sports games program. Therefore, no additional structured group sports games intervention was provided to the control group.

Data Analysis

Descriptive statistics were used to summarize means and standard deviations. Independent-samples t-tests were used to examine baseline equivalence between the experimental and control groups. Paired-samples t-tests were used to examine within-group pretest-post-test changes. Independent-samples t-tests were used to compare post-test scores between groups. Cohen's d or Cohen's dz and 95% confidence intervals were added to indicate practical significance. A 2 × 2 mixed-design ANOVA was conducted using SPSS, with group as the between-subjects factor and time as the within-subjects factor. The group × time interaction was used to evaluate whether change over time differed between the experimental and control groups. Partial eta squared (η^2) was reported as the effect size for ANOVA results.

Ethical Considerations

Because the participants were primary school students, ethical protection was essential. The study was reviewed and approved by the Ethics Committee of the Faculty of Education, Srinakharinwirot University (Approval No. SWU-EDU-2024-0618; approval date: June 18, 2024). Permission was also obtained from Cheng Shuren Primary School of Chongqing University. Written parental or guardian informed consent and student assent were obtained before screening and participation. Participation was voluntary, students had the right to withdraw, and data were coded anonymously and kept confidential. Before each physical activity session, the teacher conducted physical activity safety screening, checked equipment and venue safety, supervised the session, and stopped participation if a student reported discomfort or showed unsafe conditions.

Research Results

Objective 1: Development of the Structured Group Sports Games Program

The structured group sports games program designed in this study consisted of four stages: preparation, skills training, game participation and competition, and reflection and feedback. The preparation stage established safety rules, group organization, and activity goals. The skills training stage helped students understand rules and practice basic motor and cooperation skills. The game participation and competition stage provided opportunities for teamwork, challenge, competition, failure, adjustment, and persistence. The reflection and feedback stage guided students to review emotional experiences, teamwork, goal achievement, and positive coping strategies. The 10-session structure is presented in Table 1.

Table 2 Four-stage Structured Group Sports Games Program Description

Teaching Steps	Teacher Behavior	Student Behavior
Step 1 Preparation	Prepare equipment and venue; check safety; explain objectives and safety requirements; organize groups and roles; create a supportive atmosphere.	Participate in warm-up; complete group formation; clarify roles; discuss team goals and rules; prepare physically and mentally.
Step 2 Skills Training	Explain rules, task requirements, and basic motor skills; demonstrate when needed; guide action plans and communication strategies.	Learn and practice skills; understand rules and procedures; discuss strategies; practice communication, negotiation, and cooperation.
Step 3 Game Participation and Competition	Organize and supervise activities; observe performance, emotions, and interactions; ensure safety; provide encouragement and reminders.	Participate in team games; apply skills and strategies; cooperate and communicate; solve problems; manage emotions and support peers.
Step 4 Reflection and Feedback	Organize group discussion; guide reflection on success, failure, emotions, and teamwork; provide positive feedback; summarize resilience gains.	Review experiences and performance; share feelings and difficulties; evaluate teamwork and growth; accept and provide feedback; plan improvement.

Objective 2: Effects of the Program on Psychological Resilience

Only statistical results are presented in this section. The screening procedure, intervention process, and analysis strategy were reported in the methodology section. The tables below were revised to avoid zero p-value reporting and to add degrees of freedom, effect sizes, confidence intervals, and mixed-design ANOVA results.

Table 3 Baseline Psychological Resilience Scores of the Experimental and Control Groups

Dimension	Experimental Pretest M (SD)	Control Pretest M (SD)	t	df	p	Cohen's d	95% CI for Mean Difference
Goal Focus	9.13 (3.067)	10.87 (2.532)	-1.688	28	.103	-0.62	[-3.85, 0.37]
Interpersonal Support	19.80 (4.678)	18.80 (4.828)	0.576	28	.569	0.21	[-2.56, 4.56]
Emotional Regulation	17.53 (5.222)	18.53 (4.749)	-0.549	28	.588	-0.20	[-4.74, 2.74]
Positive Cognition	15.07 (4.131)	16.80 (3.745)	-1.204	28	.239	-0.44	[-4.68, 1.22]
Total	84.40 (14.623)	86.67 (10.069)	-0.494	28	.625	-0.18	[-11.68, 7.14]

As shown in Table 3, there were no statistically significant baseline differences between the experimental and control groups. This indicates that the two groups were comparable at pretest; it does not, by itself, establish the effectiveness of the intervention.

Table 4 Experimental Group Psychological Resilience Before and After the Intervention

Dimension	Pretest M (SD)	Post-test M (SD)	t	df	p	Cohen's dz	95% CI for Mean Increase
Goal Focus	9.13 (3.067)	11.20 (1.568)	-2.264	14	.040	0.58	[0.11, 4.03]
Interpersonal Support	19.80 (4.678)	21.87 (4.068)	-2.644	14	.019	0.68	[0.39, 3.75]
Emotional Regulation	17.53 (5.222)	20.07 (4.026)	-3.248	14	.006	0.84	[0.86, 4.22]
Positive Cognition	15.07 (4.131)	18.80 (3.005)	-2.709	14	.017	0.70	[0.78, 6.68]
Total	84.40 (14.623)	100.60 (9.125)	-4.776	14	< .001	1.23	[8.92, 23.48]

The experimental group showed statistically significant within-group increases in overall psychological resilience and in all four dimensions after participating in the structured group sports games program. Emotional regulation was corrected to $t(14) = -3.248$, $p = .006$, Cohen's $d_z = 0.84$, 95% CI [0.86, 4.22]. The Goal Focus post-test standard deviation was revised to match the post-test between-group table, avoiding the inconsistency in the previous version.

Table 5 Control Group Psychological Resilience Before and After Regular School Activities

Dimension	Pretest M (SD)	Post-test M (SD)	t	df	p	Cohen's dz	95% CI for Mean Change
Goal Focus	10.87 (2.532)	9.47 (2.264)	0.436	14	.669	0.11	[-8.29, 5.49]
Interpersonal Support	18.80 (4.828)	18.33 (1.759)	0.436	14	.669	0.11	[-2.78, 1.84]
Emotional Regulation	18.53 (4.749)	18.60 (3.641)	-0.039	14	.969	0.01	[-3.92, 4.06]
Positive Cognition	16.80 (3.745)	17.20 (1.971)	-0.536	14	.601	0.14	[-2.00, 2.80]
Total	86.67 (10.069)	86.07 (6.100)	0.203	14	.842	0.05	[-6.94, 5.74]

The control group did not show statistically significant pretest-post-test improvements. This group continued usual school activities and regular physical education classes but did not receive the structured group sports games program.

Table 6 Post-test Psychological Resilience Scores of the Experimental and Control Groups

Dimension	Experimental Post-test M (SD)	Control Post-test M (SD)	t	df	p	Cohen's d	95% CI for Mean Difference
Goal Focus	11.20 (1.568)	9.47 (2.264)	2.43	28	.022	0.89	[0.27, 3.19]
Interpersonal Support	21.87 (4.068)	18.33 (1.759)	3.09	28	.004	1.13	[1.20, 5.88]
Emotional Regulation	20.07 (4.026)	18.60 (3.641)	1.05	28	.303	0.38	[-1.40, 4.34]
Positive Cognition	18.80 (3.005)	17.20 (1.971)	1.72	28	.096	0.63	[-0.31, 3.51]
Total	100.60 (9.125)	86.07 (6.100)	5.13	28	< .001	1.87	[8.73, 20.33]

At post-test, the experimental group obtained higher mean scores than the control group in overall psychological resilience and in the four dimensions. Recalculation from the reported means and standard deviations indicated statistically significant post-test differences for total psychological resilience, goal focus, and interpersonal support, whereas emotional regulation and

positive cognition were higher descriptively but were not statistically significant in the post-test independent-samples comparison. Positive cognition showed a large raw mean increase within the experimental group, but this descriptive pattern should be interpreted cautiously because standardized change scores across dimensions were not statistically compared.

To strengthen the intervention-effect analysis, mixed-design ANOVA was conducted for each outcome. As shown in Table 7, significant group $\times$ time interactions were found for total psychological resilience and all four dimensions, indicating that changes over time differed between the experimental and control groups.

Table 7 Mixed-design ANOVA Results for Group $\times$ Time Interaction

Outcome	F	df	p	Partial η^2	Interpretation
Goal Focus	8.16	1, 28	.008	.226	Significant group $\times$ time effect
Interpersonal Support	7.04	1, 28	.013	.201	Significant group $\times$ time effect
Emotional Regulation	6.58	1, 28	.016	.190	Significant group $\times$ time effect
Positive Cognition	8.73	1, 28	.006	.238	Significant group $\times$ time effect
Total Psychological Resilience	18.94	1, 28	< .001	.404	Significant group $\times$ time effect

Discussion

In relation to Research Objective 1, the program developed in this study provides a structured way to integrate psychological resilience cultivation into primary school physical education. The preparation stage established safety, rules, group identity, and goals. The skills training stage provided students with the movement skills and cooperation strategies needed for participation. The game participation and competition stage created challenge, competition, failure, adjustment, and repeated attempts. The reflection and feedback stage helped students summarize experience, receive support, and connect game experiences with daily school life.

In relation to Research Objective 2, the findings provide preliminary evidence that the structured group sports games program may improve psychological resilience among low-resilience Grade 6 students. The experimental group showed within-group improvement in overall resilience and four dimensions, whereas the control group did not show comparable improvement. The recalculated post-test between-group comparison was strongest for total psychological resilience, goal focus, and interpersonal support, and the mixed-design ANOVA showed significant group $\times$ time effects for total resilience and all four dimensions. Because the study used a small sample, one school, and a short intervention period, the results should be interpreted as preliminary rather than conclusive evidence.

The dimension-level results can be understood through plausible intervention processes. Shared goals, team planning, and task completion may have supported goal focus. Role division, communication, and peer assistance may have strengthened interpersonal support. Competition pressure, unsuccessful attempts, and repeated practice may have provided opportunities for

emotional regulation. Teacher encouragement, peer feedback, and reflection may have contributed to positive cognition. These explanations should be understood as plausible interpretations rather than statistically confirmed mechanisms.

The findings are consistent with previous studies indicating that sport participation, physical activity, and school-based resilience programs can be related to better psychological adjustment, social support, and coping resources (Eime et al., 2013; Fenwick-Smith et al., 2018; Husain et al., 2024; Lubans et al., 2016; Sheng et al., 2024; Zhang & Gao, 2023). The present study also differs from general physical activity research because it provides a structured, four-stage, school-based group games program with explicit resilience-related objectives. Directly comparable studies focusing on low-resilience Grade 6 students remain limited, which makes the present findings preliminary. Future research should compare this model with other school-based physical education or resilience interventions and examine whether self-efficacy, peer support, or emotional regulation strategies mediate the observed changes.

Limitations

This study has several limitations. First, the sample size was small, reducing statistical power. Second, the study was conducted in one school only, limiting generalizability. Third, all participants were Grade 6 students, so the findings may not apply to other grades. Fourth, the five-week intervention period was short. Fifth, no follow-up test was conducted. Sixth, resilience was measured using self-report data. Seventh, because students were selected from the lowest resilience scores, regression to the mean may have influenced the results. Eighth, possible instructor effects cannot be excluded. Ninth, although the fidelity checklist completion rate was 95.0%, implementation fidelity evidence was still limited. Tenth, contamination may have occurred because both groups were from the same school. Eleventh, the family support dimension was not included. Twelfth, although mixed-design ANOVA was added to strengthen the analysis, the small sample limited the stability of statistical estimates; future studies should use larger samples, ANCOVA, mixed-design ANOVA, or linear mixed-effects models to verify the findings.

New Knowledge from Research

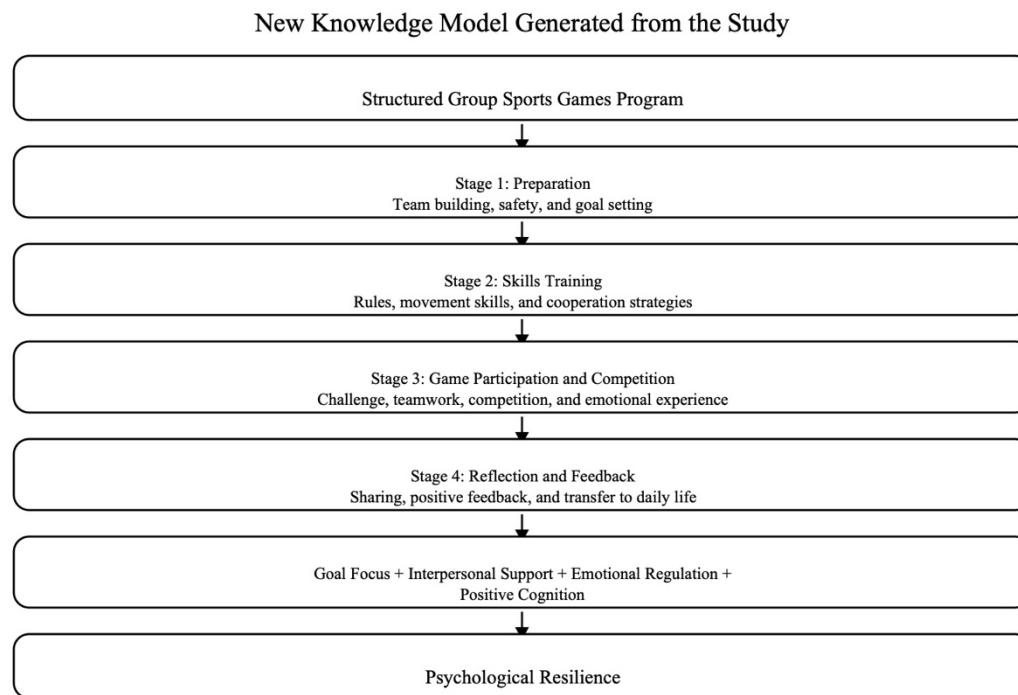


Figure 2 New Knowledge Model Generated from the Study

The new knowledge generated from this study is not a statistical mediation model. It is a practical model based on program design and preliminary results. The model suggests that PE teachers may cultivate psychological resilience by organizing structured group sports games through four stages: preparation, skills training, game participation and competition, and reflection and feedback. Through these stages, physical activity, teamwork, competition, emotional experience, and reflective learning can be integrated into a school-based pathway for supporting goal focus, interpersonal support, emotional regulation, positive cognition, and overall psychological resilience.

Academic and Practical Value

The theoretical value of this study lies in connecting four dimensions of psychological resilience with a four-stage process of group sports games, showing how physical education activities can be structured as school-based resilience-building experiences. The methodological value is that the study provides a preliminary 10-session, four-stage, school-based group sports games program for later intervention research. The practical value is that the program offers PE teachers, school counselors, and school administrators a feasible, low-cost, and game-based approach to supporting students' psychological resilience. This study extends existing research by translating general evidence on physical activity and resilience into a structured school-based intervention model, but it does not claim to establish a new theory.

Conclusion

This study designed and implemented a structured group sports games program for Grade 6 primary school students with low psychological resilience. The experimental group showed within-group improvements in overall psychological resilience and the dimensions of goal focus, interpersonal support, emotional regulation, and positive cognition after the intervention. These findings provide preliminary evidence that integrating resilience-oriented group sports games into primary school physical education may support students' psychological resilience development. Teamwork, competition, communication, and reflection should be understood as plausible intervention components rather than statistically confirmed mechanisms. Because the study used a small sample from one school and a short intervention period, the findings should be interpreted cautiously and verified in larger and longer studies.

Suggestions

For PE Teachers

PE teachers may appropriately integrate cooperative, competitive, and reflective group sports games into regular physical education classes. Activities should be adapted according to students' age, skill level, venue conditions, and safety requirements.

For School Counselors

School counselors could collaborate with PE teachers to design small-scale support activities for students with low psychological resilience. Such collaboration may help combine physical activity, peer support, and psychological reflection.

For School Administrators

School administrators may support the integration of physical education and mental health education when school conditions allow. However, large-scale promotion should wait for stronger evidence from larger and more rigorous studies.

For Future Research

Future studies should expand the sample size, include multiple schools and grade levels, extend the intervention period, add follow-up tests, compare different types of sports games, and examine potential mediating variables such as self-efficacy, peer support, and emotional regulation strategies. Future research should also use ANCOVA, mixed-design ANOVA, or linear mixed-effects models to test group-by-time intervention effects more rigorously.

References

- Bailey, R. (2006). Physical education and sport in schools: A review of benefits and outcomes. *Journal of School Health, 76*(8), 397–401. <https://doi.org/10.1111/j.1746-1561.2006.00132.x>
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310–357. <https://doi.org/10.1037/0033-2909.98.2.310>

- Denckla, C. A., Cicchetti, D., Kubzansky, L. D., Seedat, S., Teicher, M. H., Williams, D. R., & Koenen, K. C. (2020). Psychological resilience: An update on definitions, a critical appraisal, and research recommendations. *European Journal of Psychotraumatology*, 11(1), Article 1822064. <https://doi.org/10.1080/20008198.2020.1822064>
- Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: Informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity*, 10, Article 98. <https://doi.org/10.1186/1479-5868-10-98>
- Fenwick-Smith, A., Dahlberg, E. E., & Thompson, S. C. (2018). Systematic review of resilience-enhancing, universal, primary school-based mental health promotion programs. *BMC Psychology*, 6, Article 30. <https://doi.org/10.1186/s40359-018-0242-3>
- Hu, Y., & Gan, Y. (2008). Development and psychometric validity of the Resilience Scale for Chinese adolescents. *Acta Psychologica Sinica*, 40(8), 902–912. <https://doi.org/10.3724/SP.J.1041.2008.00902>
- Husain, H., Samsudin, S., Ayub, A. F. M., Ahmad, M. F., & Safwan, N. S. Z. (2024). A systematic literature review on the impact of participation in sport and physical activities on psychological resilience. *International Journal of Public Health Science*, 13(4), 1727–1737. <https://doi.org/10.11591/ijphs.v13i4.24345>
- Lubans, D., Richards, J., Hillman, C., Faulkner, G., Beauchamp, M., Nilsson, M., Kelly, P., Smith, J., Raine, L., & Biddle, S. (2016). Physical activity for cognitive and mental health in youth: A systematic review of mechanisms. *Pediatrics*, 138(3), Article e20161642. <https://doi.org/10.1542/peds.2016-1642>
- Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, 56(3), 227–238. <https://doi.org/10.1037/0003-066X.56.3.227>
- Pasno, A. (2024). Impact of sports enjoyment on academic resilience among student-athletes. *Physical Education of Students*, 28(4), 210–217. <https://doi.org/10.15561/20755279.2024.0403>
- Resnick, M. D., Bearman, P. S., Blum, R. W., Bauman, K. E., Harris, K. M., Jones, J., & Udry, J. R. (1997). Protecting adolescents from harm: Findings from the National Longitudinal Study on Adolescent Health. *JAMA*, 278(10), 823–832. <https://doi.org/10.1001/jama.1997.03550100049038>
- Rutter, M. (2012). Resilience as a dynamic concept. *Development and Psychopathology*, 24(2), 335–344. <https://doi.org/10.1017/S0954579412000028>
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55(1), 5–14. <https://doi.org/10.1037/0003-066X.55.1.5>

- Sheng, X., Liang, K., Li, K., Chi, X., & Fan, H. (2024). Association between sports participation and resilience in school-attending students: A cross-sectional study. *Frontiers in Psychology*, 15, Article 1365310. <https://doi.org/10.3389/fpsyg.2024.1365310>
- Surzykiewicz, J., Skalski, S. B., Sołbut, A., Rutkowski, S., & Konaszewski, K. (2022). Resilience and regulation of emotions in adolescents: Serial mediation analysis through self-esteem and the perceived social support. *International Journal of Environmental Research and Public Health*, 19(13), Article 8007. <https://doi.org/10.3390/ijerph19138007>
- World Health Organization. (2025, September 1). *Mental health of adolescents*. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health>
- Zhang, L. Q., & Gao, H. N. (2023). Effects of sports on school adaptability, resilience and cell phone addiction tendency of high school students. *World Journal of Psychiatry*, 13(8), 563–572. <https://doi.org/10.5498/wjp.v13.i8.563>