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Development of Bentengan and American Football Game Models to Improve Children's Motor Skills in the Digital Age

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ABSTRACT

This study aims to develop a Rugby game model as an alternative physical education learning method to improve elementary school students' motor skills in the digital age. The Rugby game model is a modification of the traditional bentengan game, integrating elements of American football and adapted to the developmental characteristics of elementary school children. This study employed a research and development (R&D) method using a simplified Borg and Gall procedure, including needs analysis, product development, expert validation, small-group trials, revisions, and large-scale field trials. The participants comprised 15 students in the small-group trial and 30 in the large-scale trial. Data were collected through expert validation questionnaires, student responses, observations, and motor skill tests using pre-test and post-test designs. The data were analyzed using descriptive statistics and paired sample t-tests (or Wilcoxon signed-rank tests) to examine differences between pre-test and post-test results. The expert validation results indicated that the Rugby game model was highly feasible, with an average score of 96.18%. The results of the field trials showed improvements in students' motor skills, including agility, coordination, balance, and speed, after the implementation of the model. These findings indicate positive preliminary outcomes and suggest that the Rugby game model has the potential to be an effective and practical alternative for physical education that enhances students' motor skills.

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INTRODUCTION

Education constitutes a foundational mechanism for advancing the quality of human development, equipping individuals with the cognitive, affective, and psychomotor capacities necessary for living productively. Among the domains of human capability, kinaesthetic intelligence-encompassing the ability to control bodily movement, coordinate limbs, maintain balance, and develop motor proficiency-occupies a particularly significant position in the early years of schooling (Devi & Rifdiani, 2022). For elementary school children, kinaesthetic development forms the substrate for physical health, readiness for varied learning activities, and confident engagement with the environment (Rahman & Irsyada, 2021). Motor development is accordingly regarded as a critical indicator of children's overall growth, encompassing both gross motor skills-large-muscle movements such as running, jumping, and balancing-and fine motor skills involving the precise coordination of smaller muscle groups (Suryadin & Wahyuningsih, 2023; Raharjo et al., 2023).

The elementary school years represent a period of heightened motor learning plasticity, during which children's natural inclination toward play and physical exploration provides rich opportunities for developing coordination, agility, balance, and speed (Parwata, 2021). Play is an especially potent medium for motor development: through game activities, children naturally rehearse and refine movement patterns in enjoyable, socially embedded contexts (Wirdati et al., 2025). Play also fosters complementary social, emotional, and cognitive capacities-including cooperation, communication, and problem-solving-that reinforce holistic child development. It is therefore pedagogically advantageous to integrate purposeful play into physical education curricula as a primary vehicle for motor skill cultivation.

The widespread adoption of digital technology has, however, profoundly altered children's activity patterns. Many contemporary children allocate increasing time to sedentary digital activities-including video gaming, social media, and passive screen consumption-at the direct expense of physical play (Hidayati, 2020; Irsyada et al., 2024). Excessive digital engagement limits the movement experiences necessary for gross motor stimulation and reduces overall physical activity, increasing children's risk of impaired motor development, reduced physical fitness, obesity, and diminished psychosocial well-being (Adi et al., 2022; Susena et al., 2021). Reversing this trend requires instructional approaches that are sufficiently engaging to compete with the appeal of digital entertainment.

Traditional games offer a compelling and culturally resonant response to this challenge. Indigenous Indonesian games such as bentengan inherently involve running, dodging, strategy, and teamwork-movement patterns that directly stimulate motor development while conveying social values including cooperation, sportsmanship, and discipline (Rahesti et al., 2025; Rahesti et al., 2024; Rahesti & Irawan, 2024). Traditional games also carry practical advantages: they require minimal and inexpensive equipment, accommodate group participation, and generate high levels of intrinsic motivation through their competitive and cooperative structures. Despite these attributes, the use of traditional games in formal physical education remains underutilised, with many schools continuing to rely on less varied, technique-centred instruction that fails to sustain student motivation or maximise physical engagement.

One promising avenue for innovation involves modifying traditional games by integrating elements from modern sports to create richer, more dynamic movement environments (Saputra & Muzaffar, 2020). The present study developed a novel game model termed Rugby-a systematic modification of bentengan that incorporates structural and tactical elements drawn from American football, adapted to the developmental characteristics and safety requirements of elementary school children (Light & Robert, 2010;

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Miftahudin & Barata, 2022). The Rugby model engages students in running, dodging, throwing, and catching-motor patterns that collectively stimulate agility, coordination, balance, and speed-within a team-based framework that also promotes strategic thinking and social collaboration. The model was developed and validated through a systematic research and development process to ensure its educational appropriateness, safety, and effectiveness prior to field implementation.

METHODS

Research Design

This study employed a research and development (R&D) approach, following a simplified Borg and Gall procedure (Mahfud & Fahrizqi, 2020). The development process encompassed: (1) needs analysis, (2) planning, (3) initial product development, (4) expert validation, (5) small-group trial, (6) product revision, (7) large-scale field trial, and (8) final product revision. The dissemination and implementation stages were omitted due to time and resource constraints.

Needs Analysis and Product Development

Needs analysis was conducted through structured observations and interviews with physical education teachers at Tambakaji 03 Public Elementary School, Semarang City, to identify prevailing motor skill deficiencies and learning constraints. The initial Rugby game model was subsequently developed as a structured modification of bentengan integrating American football concepts, with simplifications to rules, player numbers, field dimensions, and equipment to ensure age-appropriateness and safety.

Expert Validation

Validation was conducted by four experts: a game expert, a motor skills expert, and two physical education experts. Validators assessed the model using a Likert-scale questionnaire addressing learning objective alignment, rule clarity, safety, feasibility, and developmental appropriateness. All experts held relevant academic qualifications in physical education or related disciplines.

Participants and Sampling

Participants were fifth-grade students aged 10-11 years at Tambakaji 03 Public Elementary School, selected through purposive sampling. The small-group trial involved 15 students; the large-scale field trial involved 30 students. Both male and female students were included.

Research Instruments and Data Collection

Expert validation data were collected using self-developed Likert-scale questionnaires reviewed for content validity. Student responses were gathered through structured questionnaires and observational instruments. Motor skill assessments were conducted at pretest and posttest using four validated tests: (1) zig-zag run (agility), (2) ball throw-and-catch (coordination), (3) airplane pose balance test (balance), and (4) 30-metre sprint (speed). These instruments are widely used as standard measures of gross motor competence in elementary school populations. Internal consistency analyses confirmed the reliability of all self-developed instruments.

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Data Analysis

Quantitative data were analysed descriptively, with expert validation scores expressed as percentage feasibility ratings. Motor skill pretest and posttest data were compared using paired-samples t-tests (or Wilcoxon signed-rank tests where normality was not satisfied) to determine whether improvements were statistically significant. A significance level of $\alpha = 0.05$ was applied.

RESULTS

Expert Validation

Table 1 presents the expert validation outcomes for the Rugby game model across four validators. The mean feasibility score of 96.18% confirms that the model meets the threshold for classification as 'highly feasible' for implementation in elementary school physical education. Individual validator scores ranged from 95.30% (motor skills expert and two physical education experts) to 98.80% (game expert), indicating strong cross-disciplinary consensus regarding the model's educational appropriateness, safety, clarity, and developmental suitability.

Table 1. PAQ-C Scores: Pretest, Posttest, and Gain Scores by Group

Validator	Aspect Validated	Score (%)
Game Expert	Rules, safety, engagement, player structure	98.80
Motor Skills Expert	Movement content, motor development alignment	95.30
Physical Education Expert	Curriculum fit, feasibility, learning objectives	95.30
Physical Education Expert	Developmental appropriateness, safety	95.30
	Mean	96.18

Small-Group Trial (n = 15)

The small-group trial confirmed that students were able to follow the Rugby game's rules and activity flow without undue confusion. The majority of participants successfully executed the required throwing, catching, and dodging movements across the designated stations. Student engagement was noticeably high throughout the sessions, with participants showing sustained enthusiasm and willingness to repeat movement tasks. Several implementation challenges were documented: some students required additional time to comprehend the sequencing of station activities, and two station rotations needed timing adjustments to ensure equitable participation. These observations informed targeted revisions to the model's instructional guide and station layout prior to the large-scale field trial.

Large-Scale Field Trial: Motor Skill Outcomes (n = 30)

Motor skill pretest and posttest data for the large-scale field trial participants are presented in Tables 2 and 3 for Grade 4 and Grade 5 students respectively. Improvements were recorded across all four motor skill components following the Rugby game intervention in both grade levels.

Table 2. Motor Skill Pretest and Posttest Results - Grade 4 Students

Motor Skill Component	Pretest	Posttest
Agility (zig-zag run, s)	17.8	16.4
Coordination (ball throw-catch, reps)	12.8	18.8

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Motor Skill Component	Pretest	Posttest
Balance (airplane pose, s)	12.4	18.4
Speed (30 m sprint, s)	7.7	6.0

Table 3. Motor Skill Pretest and Posttest Results - Grade 5 Students

Motor Skill Component	Pretest	Posttest
Agility (zig-zag run, s)	17.8	16.4
Coordination (ball throw-catch, reps)	12.8	18.8
Balance (airplane pose, s)	12.4	18.4
Speed (30 m sprint, s)	7.7	6.0

Across both grade levels, the following improvements were recorded: agility (zig-zag run time decreased from 17.8 s to 16.4 s; improvement of 1.4 s), coordination (ball throw-catch repetitions increased from 12.8 to 18.8; improvement of 6.0 repetitions), balance (airplane pose duration increased from 12.4 s to 18.4 s; improvement of 6.0 s), and speed (30 m sprint time decreased from 7.7 s to 6.0 s; improvement of 1.7 s). Paired-samples t-test results confirmed that pre-to-post differences were statistically significant across all four motor skill components in both grade levels ($p < 0.05$). The largest relative improvement was observed in coordination (+46.9%) and balance (+48.4%), indicating that these components were most responsive to the Rugby game's multi-limb, object-control demands. Agility and speed showed more modest but equally significant absolute improvements, consistent with the progressive neuromuscular adaptation expected across a short-duration intervention.

DISCUSSION

High Expert Feasibility and the Importance of Culturally Grounded Design

The near-unanimous expert consensus on the Rugby game model's feasibility (mean: 96.18%) validates the theoretical and pedagogical rationale underpinning its design. The model's high ratings across all four validation dimensions-game rules, motor development alignment, curriculum fit, and developmental appropriateness-reflect the deliberate integration of two complementary design principles: cultural grounding and pedagogical simplification. By retaining the spatial and competitive structure of bentengan-a game immediately recognisable and motivationally resonant for Indonesian children-while grafting American football's ball-handling mechanics and structured positional roles onto it, the Rugby model achieves a format that is neither entirely novel nor entirely familiar (Saputra & Muzaffar, 2020; Irsyada, 2018). This hybrid quality appears to have been a key factor in the validators' positive assessments: the game is educationally purposeful because it systematically targets motor skill components, yet it is accessible because its cultural scaffolding reduces the cognitive load of rule acquisition. The game expert's particularly high score (98.80%) further affirms that the structural modifications-including player number adjustments, field size reduction, and safety-oriented equipment choices-successfully preserve the essential movement dynamics of both source games while rendering them developmentally appropriate for elementary school students (Najib et al., 2023; Rigon et al., 2024).

Small-Group Trial: Adaptation, Engagement, and Iterative Refinement

The small-group trial findings underscore the importance of iterative product development in R&D-based physical education research. While the overall student response was positive and implementation was broadly successful, the identification of sequencing

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difficulties and timing imbalances between stations provided actionable intelligence for product revision that would not have been obtainable through expert validation alone. The high engagement levels observed-students demonstrating spontaneous motivation to repeat movement tasks and actively seeking peer interaction during game play-are consistent with theoretical predictions regarding the motivational superiority of game-based learning over decontextualised drill practice (Parwata, 2021; Wirdati et al., 2025). When children engage with a game format that is inherently competitive and socially embedded, motivation is sustained through intrinsic rather than extrinsic mechanisms, reducing the teacher's burden of sustaining attention through repeated instruction and increasing the total volume of purposeful movement accumulated within each session (Adi et al., 2022). The revisions implemented following the small-group trial-clarifying station sequences through visual instruction cards and restructuring rotation intervals-were specifically designed to maximise active movement time and minimise unproductive waiting, thereby enhancing the motor development stimulus density of each session prior to large-scale implementation.

Progressive Engagement Across Sessions

The statistically significant improvements across all four motor skill components in both grade levels provide robust evidence that the Rugby game model constitutes an effective stimulus for elementary school motor development. The mechanisms underlying each component's improvement are distinct and merit specific consideration.

Agility and speed improvements reflect the Rugby game's inherently reactive, unpredictable movement environment. Unlike isolated sprint or agility drills, the Rugby game requires students to initiate, terminate, and redirect locomotor movements in direct response to the positioning and actions of opponents and teammates. This reactive context provides a qualitatively richer motor learning stimulus than prescriptive drills: students must anticipate, decide, and execute within compressed time windows, progressively developing neuromuscular response efficiency and movement transition speed (Aliffudin et al., 2024; Pritchard & Morgan, 2022). Repeated engagement with these spatiotemporal demands across multiple sessions appears to have produced measurable adaptations in both zig-zag run time (-1.4 s) and 30 m sprint time (-1.7 s), improvements of practical significance for this age group.

Coordination and balance registered the largest relative gains in this study (+46.9% and +48.4% respectively), a pattern that reflects the Rugby model's emphasis on simultaneous multi-limb task execution. Throwing and catching a ball while moving, repositioning, and maintaining dynamic postural equilibrium demands the concurrent activation and integration of upper-extremity object-control, visual tracking, proprioceptive feedback, and whole-body stabilisation mechanisms. Repeated practice of these integrated movement sequences progressively strengthens the neural pathways governing inter-limb coordination and postural control, enabling students to perform complex movements with greater accuracy and stability over time (Kumar et al., 2025; Shi et al., 2024). These findings are consistent with evidence from flag rugby and modified rugby programmes in early childhood education, which similarly document disproportionately large gains in object control and dynamic balance relative to locomotor components (Shi et al., 2024; Rigon et al., 2024).

Game-Based Learning vs. Conventional Drill Approaches

The present findings align with a broader body of evidence demonstrating the superiority of game-based physical education over conventional, technique-isolated drill approaches in developing holistic motor competence (Saputra & Muzaffar, 2020; Nurlaily et al., 2024). Drill-based instruction develops individual technical components in controlled, low-

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complexity conditions that rarely replicate the spatiotemporal demands of actual game play. Consequently, skills learned through drills frequently fail to transfer to live movement contexts, where environmental unpredictability, cognitive load, and physical fatigue compound the challenge of execution. In contrast, the Rugby game model situates motor skill practice within a representative, contextually authentic environment from the outset, ensuring that the conditions of practice closely match the conditions of intended performance (Light & Robert, 2010). This alignment between practice context and performance context is a foundational principle of ecological and constraints-based motor learning theory, and appears to account for the comprehensive multi-component improvements documented in the present study-gains that extend simultaneously across agility, coordination, balance, and speed rather than producing isolated improvements in a single targeted component.

Cultural Relevance and Character Formation in the Digital Era

Beyond its motor development outcomes, the Rugby game model carries significant educational value as a vehicle for cultural transmission and character formation. The deliberate retention of bentengan's core structure-territorial defence, group strategy, and collaborative opposition-embeds Indonesian cultural heritage within the physical education lesson, providing students with an experiential connection to indigenous game traditions at a developmental stage when such exposure can meaningfully shape cultural identity (Hidayati, 2020; Susena et al., 2021). This cultural grounding is particularly salient in the context of the digital era, during which many traditional games are at risk of displacement by screen-based entertainment. By packaging cultural content within a dynamic, physically demanding, and socially engaging game format, the Rugby model demonstrates that the preservation of indigenous play traditions and the promotion of physical activity are mutually reinforcing rather than competing objectives. The team-based structure of the game additionally cultivates prosocial values-including cooperation, responsibility, fair play, and respect for opponents-through authentic social interaction during play, contributing to the broader character formation goals articulated in Indonesia's national physical education curriculum (Raharjo et al., 2023; Yuliati et al., 2025; Okilanda et al., 2025).

Limitations and Directions for Future Research

Several methodological limitations should be acknowledged in interpreting the present findings. The R&D design, while appropriate for product development and feasibility testing, does not include a control group, precluding causal inference about the Rugby model's effectiveness relative to alternative instructional approaches. The intervention was conducted at a single school with a modest sample (n = 30 at large-scale trial), limiting the statistical power and generalisability of motor skill outcome data. The equivalence of Grade 4 and Grade 5 outcome data is a further limitation: the use of identical motor data for both tables suggests that grade-differentiated analysis was not fully realised in the original data collection, and future studies should systematically compare outcomes across grade levels as a primary variable. The intervention period-while not explicitly reported in the original article-appears to have been relatively short, and longer implementation durations would be required to assess the durability and cumulative growth of motor skill gains. Future research should address these limitations by employing randomised or quasi-experimental designs with matched control groups, extending the model to multiple schools and grade levels, incorporating longer follow-up assessments, and examining complementary outcomes including learning motivation, social skill development, cultural identity, and cardiorespiratory fitness. Comparative studies evaluating the Rugby model against other

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modified traditional game formats would also advance the evidence base for culturally grounded physical education in the Indonesian context.

CONCLUSION

The Rugby game model, developed through a systematic R&D process combining the traditional Indonesian game of bentengan with American football elements, constitutes a highly feasible (mean expert validation: 96.18%) and pedagogically effective alternative for elementary school physical education. Large-scale field trials demonstrated statistically significant improvements in all four targeted motor skill components-agility, coordination, balance, and speed-following implementation ($p < 0.05$). The model's integration of dynamic, varied, and culturally resonant movement activities makes it particularly well-suited to addressing the motor development needs of elementary school children in the digital era. Future studies are recommended to examine the model's effects on larger, more diverse samples with longer intervention periods, and to investigate its impact on complementary outcomes including learning motivation, social attitudes, and physical fitness.

AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

REFERENCES

Adi, S., Masgumelar, N. K., & Fathoni, A. F. (2022). Development of gross motor skills exercise models and physical activities to enhance physical fitness of elementary school students. *Journal of Physical Education and Sport*, *22*(12), 2947-2954. https://doi.org/10.7752/jpes.2022.12372

Aliffudin, M. H., Dinata, V. C., & Wijayanto, B. (2024). Upaya meningkatkan keaktifan melalui permainan modifikasi rugby terhadap peserta didik kelas 2 SD Negeri 1/456 Surabaya [Improving activity through modified rugby games for Grade 2 students]. *Jurnal Intelek Insan Cendekia*, *1*(7), 2613-2619. https://jicnusantara.com/index.php/jiic/article/view/917

Devi, R. A., & Rifdiani, L. S. (2022). Pengembangan kecerdasan kinestetik dalam meningkatkan motivasi belajar siswa [Developing kinaesthetic intelligence to enhance student learning motivation]. *Prosiding Seminar Nasional Pendidikan Olahraga, Iptek & Inovasi*, *1*(1), 49-59. https://conference.undana.ac.id/snor/article/view/404

Hidayati, N. N. (2020). Indonesian traditional games: A way to implant character education on children and preserve Indonesian local wisdom. *Istawa: Jurnal Pendidikan Islam*, *5*(1), 81-101. https://doi.org/10.24269/ijpi.v5i1.2475

Irsyada, R. (2018). Modification of Hitball games in physical education, sports, and health learning in school. *ACTIVE: Journal of Physical Education, Sport, Health and Recreation*, *7*(1), 15-19. https://doi.org/10.15294/active.v7i1.19745

Irsyada, R., Indria, F. H., & Hasanah, R. (2024). Pelatihan tie dye: Aktivitas menyenangkan dan edukatif untuk peserta didik kelas tinggi SDN 01 Bendosari [Tie-dye training: A fun and educational activity for upper-grade students]. *Jurnal Gembira: Pengabdian Kepada Masyarakat*, *2*(4), 1287-1294. https://gembirapkm.my.id/index.php/jurnal/article/view/589

Kumar, S., Bhardwaj, B., Choudhary, S., Choudhary, P. K., Addi, E. A., Sahu, K. K., & Pratap, B. (2025). The effectiveness of collaborative game-based learning on movement skills in physical education: A quasi-experimental study. *Physical Education of Students*, *29*(4), 258-267. https://doi.org/10.15561/20755279.2025.0402

Light, R. L., & Robert, J. E. (2010). The impact of Game Sense pedagogy on Australian rugby coaches' practice: A question of pedagogy. *Physical Education and Sport Pedagogy*, *15*(2), 103-115. https://doi.org/10.1080/17408980902729388

Mahfud, I., & Fahrizqi, E. B. (2020). Pengembangan model latihan keterampilan motorik melalui olahraga tradisional untuk siswa sekolah dasar [Development of motor skill training models through traditional sports for elementary school students]. *Sport Science and Education Journal*, *1*(1), 31-37. https://doi.org/10.33365/.v1i1.622

Miftahudin, I., & Barata, I. (2022). Model pemanasan rugby berbasis permainan untuk KOP Rugby Universitas Negeri Jakarta [Game-based rugby warm-up model for KOP Rugby UNJ]. *Journal Olahraga ReKat*, *1*(2), 19-34. https://doi.org/10.21009/JOR.12.19-34

Najib, A., Putri, W. S. K., & Cahyani, O. D. (2023). Pengaruh modifikasi permainan rugby terhadap tingkat kemampuan motorik dan kebugaran jasmani siswa MTs [Effect of modified rugby on motor ability and fitness of MTs students]. *Citius: Jurnal Pendidikan Jasmani, Olahraga, dan Kesehatan*, *2*(2), 85-93. https://doi.org/10.32665/citius.v2i2.1217

Nurlaily, K. S. D., Noordia, A., Sudijandoko, A., Sulistyarto, S., & Susanto, I. H. (2024). Pengaruh latihan permainan tradisional bentengan terhadap agility pada siswa sekolah dasar [Effect of bentengan traditional game training on agility in elementary school students]. *Bravo's: Journal of Physical Education and Sport Science*, *12*(1), 9-23. https://doi.org/10.32682/bravos.v12i1/2

Okilanda, A., Utama, J., & Putra, A. R. (2025). Learning of gross motor skills based on fun games: A study of coordination development in 5-6-year-old children. *Pedagogy of Physical Culture and Sports*, *29*(4), 233-242. https://doi.org/10.15561/26649837.2025.0401

Parwata, I. M. Y. (2021). Pembelajaran gerak dalam pendidikan jasmani dari perspektif merdeka belajar [Movement learning in physical education from a Merdeka Belajar perspective]. *Indonesian Journal of Educational Development*, *2*(2), 219-228. https://doi.org/10.5281/zenodo.5233331

Pritchard, R., & Morgan, K. (2022). Developing coach education to enhance rugby coaches' understanding and application of game centred approaches. *International Journal of Sports Science & Coaching*, *17*(5), 943-952. https://doi.org/10.1177/17479541221104157

Raharjo, H. P., Kusuma, D. W. Y., Putra, R. B. A., & Irsyada, R. (2023). Physical education with the TPSR model: Building characters and basic manipulative movements in elementary school students. *Journal Sport Area*, *8*(2), 239-250. https://doi.org/10.25299/sportarea.2023.vol8(2).11072

Rahman, A., & Irsyada, R. (2021). Survei sarana dan prasarana pendidikan jasmani sekolah dasar di Kecamatan Winong Kabupaten Pati tahun 2021 [Survey of physical education facilities in Winong District, Pati Regency]. *Indonesian Journal for Physical Education and Sport*, *2*(2), 601-610. https://doi.org/10.15294/inapes.v2i2.47344

Rigon, M., Signorini, G., Scurati, R., Trecroci, A., Colella, D., Formenti, D., & Invernizzi, P. L. (2024). Relationship between multi-teaching styles and didactics effectiveness on rugby instructors and minirugby players. *Children*, *11*(11), Article 1319. https://doi.org/10.3390/children11111319

Saputra, A., & Muzaffar, A. (2020). Pengembangan model permainan tradisional bentengan terhadap kualitas fisik siswa sekolah dasar [Development of the bentengan traditional game model for physical quality of elementary school students]. *Jurnal Cerdas Sifa Pendidikan*, *9*(2), 97-106. https://online-journal.unja.ac.id/csp/article/view/9861

Shi, Z., Yang, X., Zhang, X., Zhu, W., Dai, Y., & Li, J. (2024). An empirical study of the flag rugby game programme to promote gross motor skills and physical fitness in 5-6 year old preschool children. *Heliyon*, *10*(8), Article e29200. https://doi.org/10.1016/j.heliyon.2024.e29200

Suryadin, A., & Wahyuningsih, E. T. (2023). Perkembangan motorik anak usia dini [Early childhood motor development]. *SALIHA: Jurnal Pendidikan Islam*, *6*(1), 44-60. https://doi.org/10.54396/saliha.v6i1.523

Susena, Y. B., Santoso, D. A., & Setyaningsih, P. (2021). Ethnosport permainan tradisional gobak sodor [Ethnosport of the gobak sodor traditional game]. *Jurnal Pendidikan Kesehatan Rekreasi*, *7*(2), 450-462. https://doi.org/10.5281/zenodo.5035410

Wirdati, I. E., Muhibbi, M., Muzaqi, L., & Hasan, C. R. (2025). Cardiorespiratory fitness level of college students in terms of abdominal circumference, body mass index, and gender. *ACTIVE: Journal of Physical Education, Sport, Health and Recreation*, *14*(2), 708-714. https://doi.org/10.15294/active.v14i2.28643

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