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CHANGES IN KINDERGARTEN CHILDREN'S SOCIAL SKILLS FOLLOWING GROUP TRADITIONAL GAMES: A ONE-GROUP PRETEST–POSTTEST STUDY

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Abstrak

Keterampilan sosial anak taman kanak-kanak sering belum berkembang optimal. Penelitian ini mendeskripsikan perubahan skor keterampilan sosial anak setelah kegiatan permainan tradisional kelompok di TK Mutiara Agam, Kecamatan Tanjung Mutiara. Penelitian menggunakan desain pra-eksperimen *one-group pretest-posttest* dengan sepuluh anak berusia 5 tahun 2 bulan sampai 5 tahun 6 bulan. Tindakan berupa satu sesi permainan *ular naga* dan *gobak sodor* (*galah panjang*) selama sekitar 60 menit; *pre-test* dilakukan pada 7 Oktober 2026 dan *post-test* pada 8 Oktober 2026. Guru kelas menilai setiap anak dengan angket observasi 20 butir dalam lima dimensi. Rata-rata skor naik dari 46,00 menjadi 66,00, dengan selisih rata-rata 20,00 poin (IK 95% 16,05–23,95), t(9) = 11,46, p < 0,001, dan dz = 3,62 (IK 95% 1,86–5,37). Skor seluruh anak dan kelima dimensi meningkat, dan hasil tetap sama ketika satu pasangan data yang dicocokkan tanpa nama dikeluarkan. Namun, ketiadaan kelompok pembanding, satu sesi tindakan, jarak pengukuran satu hari, dan penilai tunggal yang juga memimpin kegiatan membuat perubahan ini belum dapat ditafsirkan sebagai pengaruh kausal. Temuan ini merupakan bukti pendahuluan yang perlu diuji lebih lanjut dengan kelompok pembanding dan pengamat independen.

Kata Kunci: Permainan Tradisional Kelompok; Keterampilan Sosial; Anak Prasekolah; Bermain Kooperatif; Studi Pretest–Posttest

Abstract

Kindergarten children's social skills are often not yet optimally developed. This study describes changes in children's social skills scores following group traditional games at TK Mutiara Agam, Tanjung Mutiara District. A one-group pretest–posttest pre-experimental design was used with ten children aged 5 years 2 months to 5 years 6 months. The activity was one session of about 60 minutes in which the children played ular naga and gobak sodor (galah panjang); the pre-test was conducted on 7 October 2026 and the post-test on 8 October 2026. The class teacher rated each child with a 20-item, five-dimension observation questionnaire. The mean score increased from 46.00 to 66.00, a mean change of 20.00 points (95% CI 16.05–23.95), t(9) = 11.46, p < .001, dz = 3.62 (95% CI 1.86–5.37). Scores increased for every child and in all five

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dimensions, and the result held when one pair matched without a name was excluded. However, the absence of a comparison group, the single session, the one-day interval, and a single rater who also led the activity mean that the change cannot be interpreted as a causal effect. The findings are preliminary and require testing with a comparison group and independent observers.

Keywords: *Traditional Group Games; Social Skills; Preschool Children; Cooperative Play; Pretest–Posttest Study*

PENDAHULUAN

Social skills are an essential asset that enables children to build relationships with peers, adapt to school, and succeed in learning. Children who are able to cooperate, share, wait their turn, and communicate politely are more readily accepted in play groups and better prepared for the demands of school. A study of 164 four- and five-year-old children showed that prosocial and aggressive behaviours in peer relationships predicted children's liking of school (Ünlüer, 2024), while aggressive behaviour was the strongest factor associated with peer exclusion (Vatou et al., 2026). In Indonesia, social-emotional development is set as one of the learning outcomes that early childhood education (ECE) children are expected to achieve (Permendikbudristek, 2022). There is, however, a paradox: amid these expectations, children increasingly play alone with digital devices and less often play together face to face. This gap between children's need to practise interaction and their shrinking opportunities for shared play raises academic and practical problems that warrant investigation.

Children's opportunities for face-to-face group play are also changing. A review of the influence of social media on early childhood development reported that excessive use is associated with reduced face-to-face interaction, emotional difficulties, and unfavourable behavioural changes in young children (Khotimah et al., 2025). Evidence that links traditional games to screen use comes mainly from older children: a cross-sectional study of 314 children with a mean age of about 11.6 years found that children who did not play traditional games were more likely to use the internet, and that social skills were associated with playing traditional games (Ayaz-Alkaya & Akca, 2025). Because the design was cross-sectional and the participants were much older than kindergarten children, this finding shows an association rather than evidence that traditional games reduce screen use in preschool children. At the same time, efforts to revive traditional games, including traditional-game animations designed to foster prosocial attitudes, have emerged in Indonesian early childhood education (Taqwa et al., 2026). These developments make it relevant to examine how group traditional games can be used deliberately as a classroom activity in which kindergarten children practise social skills.

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The specific problem addressed in this study was identified at TK Mutiara Agam, Tanjung Mutiara District. An initial measurement of ten children showed that the mean social skills score was only 46.00 out of a maximum of 80, with four children in the low category and six in the moderate category; no child was in the high category. Percentage scores on each dimension were also relatively low, namely 55.63% for sharing and empathy, 56.25% for cooperation, and 58.13% for following rules and taking turns. In daily activities, some children still chose to play alone, cut in line, took friends' toys without permission, and could not resolve disputes without shouting at or pushing their peers. This condition was presumably related to the limited number of play activities requiring children to cooperate in groups and follow shared rules. The situation highlights a gap between the social skills expected of five-year-old children and the reality observed in the field.

This problem is urgent because low social skills in kindergarten have far-reaching consequences for children's later development. A case study of five-year-old children showed that low social-emotional skills were reflected in passivity, low self-confidence, dependence on adults to initiate interaction, and weak cooperation and communication in groups (Aurelia et al., 2024). Self-regulation in preschoolers is also closely related to social-emotional competence and pre-academic skills (Korucu et al., 2021), and a meta-analysis of 57 studies showed that self-regulation is associated with the social competence of children aged 3–8 years (Geng et al., 2024). Children who are excluded by peers because of aggressive behaviour risk losing opportunities to learn from peer interaction (Vatou et al., 2026). If not addressed promptly, this problem may hinder children's readiness to enter primary school. Children's social skills therefore carry strategic value and call for systematic research to test alternative solutions.

Various solutions have been implemented to develop young children's social skills. School-based social and emotional learning programmes have been shown to have positive effects on students' social skills, attitudes, and behaviour (Cipriano et al., 2023), especially when teachers possess social-emotional skills and programmes are delivered at an adequate dosage (Shi & Cheung, 2024). Role-play activities improve empathy, cooperation, and emotion regulation (Ramadhanti et al., 2025) as well as children's self-confidence (Cleviandra et al., 2025). A summary of twenty years of findings from evaluations of the cooperative-creative "Game Program" interventions has reported improvements in the social behaviour and emotional development of children aged 4–12 years (Garaigordobil et al., 2022), peer-based interventions have helped children engage in social play in inclusive preschools (Gladh et al., 2022), and gardening together has fostered cooperation among children aged 5–6 years (Husna et al., 2024). Nevertheless, some of these programmes require special training, standardised materials, or long implementation periods. These limitations point to the need for activities that are

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inexpensive, close to children's culture, and easy for teachers to implement, one of which is traditional games played in groups.

Previous studies on traditional games and children's social development can be grouped into three strands. The first comprises experimental studies in Indonesia showing that the games *bakiak* and *engklek* had a positive effect on children's social-emotional development (Fitri et al., 2022), that *gobak sodor* affected the social-emotional abilities of children aged 5–6 years (Hasibuan & Marbun, 2023), and that *gobak sodor* and *bentengan* improved students' moral emotions (Iswinarti & Laily, 2024). The second comprises literature reviews concluding that traditional games play a role in developing children's social-emotional abilities (Mashar, 2025) and that ethnopedagogy-based play activities developed the problem-solving skills of children aged 5–6 years (Dewi et al., 2025). The third is a theoretical synthesis that views traditional games as cultural tools for developing children's social intelligence through rule-based cooperation, emotion regulation, and the internalisation of shared values (Sovieti et al., 2026). In general, the benefits of traditional games have been widely studied, but their measurement is often limited to a single game or a single developmental aspect.

Based on this synthesis, three research gaps can be identified. First, most studies measure social-emotional development globally (Fitri et al., 2022; Hasibuan & Marbun, 2023) or moral emotions (Iswinarti & Laily, 2024), so it remains unclear which specific social behaviours, such as cooperating, sharing, following rules and taking turns, communicating, or managing conflict, change when children take part in group games. Second, previous studies rarely describe the structural features of the games used, namely the rules, the alternation of roles, and the shared goal, or explain why these features should affect particular behaviours; the games are usually treated as a single undifferentiated treatment. Third, several previous studies used one-group designs or small samples without reporting the uncertainty of the estimated change or the possibility of rater bias, so the strength of their claims is difficult to judge. The synthesis literature likewise calls for empirical examination of the cooperation, emotion-regulation, and shared-value pathways of traditional games (Sovieti et al., 2026). This study therefore asks a pedagogical rather than a purely statistical question: how do children's scores in specific social-skill dimensions change after they play two group games whose rules and roles demand cooperation, rule following, and turn-taking, and how strongly can such a change be interpreted given the design?

This study is grounded in several theoretical perspectives. First, Vygotsky's sociocultural theory emphasises that development occurs through social interaction, and that play creates a zone of proximal development when children follow shared rules and roles (Schunk, 2020). Second, Bandura's social cognitive learning theory states that children learn social behaviour through observation, imitation, and reinforcement from

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peers and teachers (Schunk, 2020). Third, the concepts of social skills and self-regulation in preschool children encompass cooperation, rule compliance, emotional control, and communication (Korucu et al., 2021; Geng et al., 2024). Fourth, traditional games are viewed as cultural tools that develop social intelligence through transparent rules, alternating roles, and jointly agreed values (Sovieti et al., 2026). These theories underpin the formulation of the hypothesis, the construction of the five instrument dimensions, and the interpretation of the relationship between group traditional games and children's social skills.

The two games used in this study were selected because their structures correspond to particular social-skill dimensions. In *ular naga*, two children form an arch with joined hands while the other children form a line, each holding the shoulders of the child in front, and pass under the arch while singing; when the song ends, the arch is lowered, and the child who is caught must choose to join one of the two gatekeepers' sides. The game therefore requires moving together, following a shared song and capture rule, and accepting the role assigned when caught. In *gobak sodor*, known locally as *galah panjang*, two teams alternate as guards and attackers: the guards defend lines drawn on the ground, while the attackers try to cross them without being touched. The game therefore requires team strategy, turn-taking between roles, adherence to boundary rules, and the settling of disputes about whether a player was touched. Accordingly, cooperation and following rules and taking turns were expected to be the dimensions most directly practised; sharing and empathy and communication were expected to be practised through team coordination and calling to teammates; and conflict resolution was expected to be engaged mainly during disagreements about the rules. Previous experiments with *gobak sodor* support its relevance for social-emotional abilities and moral emotions (Hasibuan & Marbun, 2023; Iswinarti & Laily, 2024).

The contribution of this study lies in three aspects. First, it specifies the two group games used and links their rules, alternating roles, and shared goals to five dimensions of social skills, so that changes can be read against the features of the activity rather than against "traditional games" in general. Second, it reports individual scores, dimension scores, and the uncertainty of the estimated change, together with a sensitivity check for an uncertain data pair, so that readers can judge the robustness of the change. Third, it explicitly reports the dose actually delivered, a single session of about 60 minutes, and interprets the results in proportion to a one-group design with a single rater, thereby providing a transparent baseline for future controlled studies. Practically, the findings indicate whether group traditional games deserve further testing as a low-cost classroom activity for social learning in kindergarten.

Accordingly, this study aims to describe changes in children's social skills scores following a session of group traditional games at TK Mutiara Agam, Tanjung Mutiara

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District. Specifically, it addresses three questions: (1) what were the children's social skills scores before and after the game session; (2) is the difference between pre-test and post-test scores statistically significant, and how large and how precise is the estimated change; and (3) how did the scores change in each dimension. The hypotheses are: H_0, there is no significant difference between children's social skills scores before and after the game session; and H_1, post-test scores are significantly higher than pre-test scores. Because the design has no comparison group, a significant difference is interpreted as a change observed after the activity, not as evidence of a causal effect.

METODE PENELITIAN

The study was conducted at TK Mutiara Agam, Tanjung Mutiara District, Agam Regency, West Sumatra, in October 2026. The participants were all ten children in one kindergarten group (a saturated sample), six boys and four girls, aged 5 years 2 months to 5 years 6 months. Social skills were defined as children's ability to interact positively with peers and were measured through five dimensions: cooperation, sharing and empathy, following rules and taking turns, communication, and conflict resolution and self-confidence. The last dimension combines items on settling disputes without aggression and on apologising with an item on daring to participate actively in the group; these behaviours were grouped because all concern how a child asserts himself or herself in peer interaction, but they represent partly different constructs, so this dimension is interpreted cautiously. Group traditional games were defined as folk games played by several children together with agreed rules, alternating roles, and a common goal (Sovieti et al., 2026). The study was conducted with the permission of the head of the kindergarten, and the parents of all children gave written consent before data collection. Children's identities are anonymised with codes A01–A10, and no photographs of children are presented.

This study used a quantitative approach with a one-group pretest–posttest pre-experimental design (Creswell & Creswell, 2018), as shown in Table 1. The pre-test (O_1) was conducted on 7 October 2026. The treatment (X) was a single session of group traditional games lasting approximately 60 minutes, held on 7 October 2026 after the pre-test, in which the children played *ular naga* and *gobak sodor* (*galah panjang*). The post-test (O_2) was conducted on the following day, 8 October 2026. The design was used because the children formed one class and no equivalent comparison class was available. Its main weaknesses, namely the absence of a control group, the very short interval between measurements, and the possibility of rater expectancy, were recognised from the outset; consequently, the study is positioned as an exploratory pre-experiment, and its results are reported as changes observed after the activity rather than as causal effects.

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Table 1. One-Group Pretest-Posttest Research Design

Group	Pre-test	Treatment	Post-test
Experimental (n = 10)	O_1	X (*ular naga* and *gobak sodor*; one session, ±60 minutes)	O_2

Note: O_1 = social skills score before treatment; X = one session of group traditional games on 7 October 2026 (pre-test on 7 October, post-test on 8 October 2026); O_2 = social skills score after treatment.

The instrument was a social skills observation questionnaire developed by the researchers for this study and completed by the class teacher for each child. It contains 20 statements, four per dimension, with one negatively worded item in each dimension (items 4, 8, 12, 16, and 20); the blueprint and the game features expected to engage each dimension are presented in Table 2. Each item was rated by the frequency of the behaviour: Always (4), Often (3), Sometimes (2), and Never (1). Negative items were reverse-scored (5 − rating) automatically by the online form before the data were sent, so higher scores always indicate better social skills. Total scores range from 20 to 80 and were divided into three equal-width bands: low (20–40), moderate (41–60), and high (61–80); these bands describe positions on the score range and are not normative cut-offs. Content validity was not examined through expert judgement, so the items rely on their correspondence with the dimensions described in the literature (Korucu et al., 2021; Geng et al., 2024); this is acknowledged as a limitation. Cronbach's alpha was 0.90 at pre-test and 0.80 at post-test, but with only ten children these estimates are unstable and cannot establish the quality of a 20-item instrument. Within each occasion, corrected item-total correlations ranged from 0.08 to 0.94 at pre-test and from −0.05 to 0.82 at post-test; several items showed little variance at post-test because most children received the highest ratings, which lowered their item-total correlations.

Table 2. Blueprint of the Social Skills Observation Questionnaire and Related Game Features

Dimension	Positive items	Negative item (reverse-scored)	Game features expected to engage the dimension
Cooperation	1. Plays together with peers in a group; 2. Helps peers complete the game; 3. Accepts peers' invitations to play	4. Chooses to play alone and refuses to join the group	Holding on to the line in *ular naga*; team strategy in *gobak sodor*
Sharing and empathy	5. Shares toys or equipment; 6. Helps or comforts a sad or fallen peer; 7. Lends own belongings	8. Takes peers' toys without permission	Helping a caught or fallen teammate; sharing the playing area and roles

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Following rules and taking turns	9. Waits patiently for a turn; 10. Follows agreed rules; 11. Accepts losing well	12. Cuts in on a peer's turn	Song-based rounds and capture rule in *ular naga*; boundary lines and guard–attacker rotation in *gobak sodor*
Communication	13. Greets and invites peers to play; 14. Expresses wishes politely; 15. Responds when spoken to	16. Stays silent and does not talk with peers during play	Singing together in *ular naga*; calling to teammates in *gobak sodor*
Conflict resolution and self-confidence	17. Settles disputes without fighting; 18. Apologises and forgives; 19. Dares to participate actively in the group	20. Shouts, hits, or pushes peers during disputes	Disputes about being caught or touched; taking the role of gatekeeper or guard

Note: items are rated Always (4), Often (3), Sometimes (2), or Never (1); negative items are scored 5 − rating. The game features are the expected links that guided the selection of games and were not measured separately.

The procedure consisted of three stages. First, the pre-test was carried out on 7 October 2026: the class teacher rated each child on the basis of the child's behaviour observed during play and daily class routines. Second, on the same day, after the pre-test, the children took part in one session of group traditional games lasting approximately 60 minutes, in which they played *ular naga* and *gobak sodor*. The teacher explained the rules, demonstrated each game, formed groups, organised turns, accompanied the children during play, and praised cooperative behaviour, waiting for turns, sharing, and settling disputes well. The games were played in their commonly known form; the specific adaptations, group composition, and turn order used in the session were not recorded in detail. Third, the post-test was carried out on 8 October 2026 with the same questionnaire and the same rater, again based on behaviour during play and class routines. All ratings were made by the first author, the class teacher, who also led the activity and knew the purpose of the study; no second observer was involved, so rater expectancy could not be controlled and is treated as a major threat to validity. Pre-test and post-test forms were matched by the child's name. One pre-test form had no name; it belonged to a girl aged 5 years 5 months and was matched to A03, the only child without a named pre-test form, because the other girl of the same age (A05) had a named pre-test form. To check the influence of this match, the analyses were repeated without A03. Two earlier submissions dated 6 October 2026 and labelled as post-tests, which preceded the pre-test, were excluded; the analysis used only the complete sets dated 7 and 8 October 2026.

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Data were analysed descriptively and inferentially at a significance level of 0.05 (Field, 2018). Descriptive statistics included the mean, standard deviation, minimum, maximum, and category distribution. The Shapiro-Wilk test was applied to pre-test, post-test, and difference scores; a non-significant result was taken only as no evidence of departure from normality, since the test has low power with ten cases. The hypothesis was tested with the paired sample t-test, and the 95% confidence interval of the mean difference was reported. The Wilcoxon signed-rank test was used as a robustness check on the same data, not as an independent replication (Field, 2018). The effect size was Cohen's dz, the mean difference divided by the standard deviation of the differences, which is the standardised effect for paired designs (Langenberg et al., 2023); its 95% confidence interval was computed from the noncentral t distribution. The normalised gain (N-gain), (post − pre)/(maximum − pre), was reported as the proportion of the available improvement that was achieved, both as the mean of individual gains and as the gain computed from group means. Because N-gain was developed for achievement tests in physics education (Coletta, 2023), its use on a frequency-rating scale with ordinal properties and a ceiling is limited, and it is reported here only as a descriptive index. Dimension scores were compared with the Wilcoxon signed-rank test, and the five p-values were adjusted with the Holm procedure for multiple comparisons.

HASIL DAN DISKUSI

1. Results

Finding 1: Children's Social Skills Scores Before and After the Game Session

Each child's social skills scores at pre-test and post-test are presented in Table 3. At pre-test, scores ranged from 37 to 56 with a mean of 46.00 (SD = 7.73) and a median of 48.5. Four children (A01, A04, A06, and A10) were in the low category with scores of 37–38, and six children were in the moderate category with scores of 47–56. At post-test, scores ranged from 60 to 74 with a mean of 66.00 (SD = 5.29) and a median of 65.5. Eight children were in the high category and two children (A04 and A06) were at the upper limit of the moderate category with a score of 60. Individual gains ranged from 12 to 27 with a mean of 20.00 (SD = 5.52), and every child's score increased. By sex, the mean score of the six boys rose from 44.83 to 63.67, whereas the mean score of the four girls rose from 47.75 to 69.50. The pattern of change for each child is visualised in Figure 1.

Table 3. Children's Social Skills Scores at Pre-test and Post-test

Code	Sex	Age	Pre-test	Category	Post-test	Category	Gain	N-gain
A01	M	5 y 3 m	38	Low	61	High	23	0.55
A02	M	5 y 3 m	50	Moderate	66	High	16	0.53

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A03	F	5 y 5 m	56	Moderate	74	High	18	0.75
A04	M	5 y 2 m	37	Low	60	Moderate	23	0.53
A05	F	5 y 5 m	51	Moderate	70	High	19	0.66
A06	F	5 y 4 m	37	Low	60	Moderate	23	0.53
A07	M	5 y 6 m	51	Moderate	63	High	12	0.41
A08	M	5 y 4 m	55	Moderate	67	High	12	0.48
A09	F	5 y 6 m	47	Moderate	74	High	27	0.82
A10	M	5 y 4 m	38	Low	65	High	27	0.64
		Mean	46.00	Moderate	66.00	High	20.00	0.59
		SD	7.73		5.29		5.52	

Note: M = male; F = female; y = years; m = months; scores 20–40 = low, 41–60 = moderate, 61–80 = high.

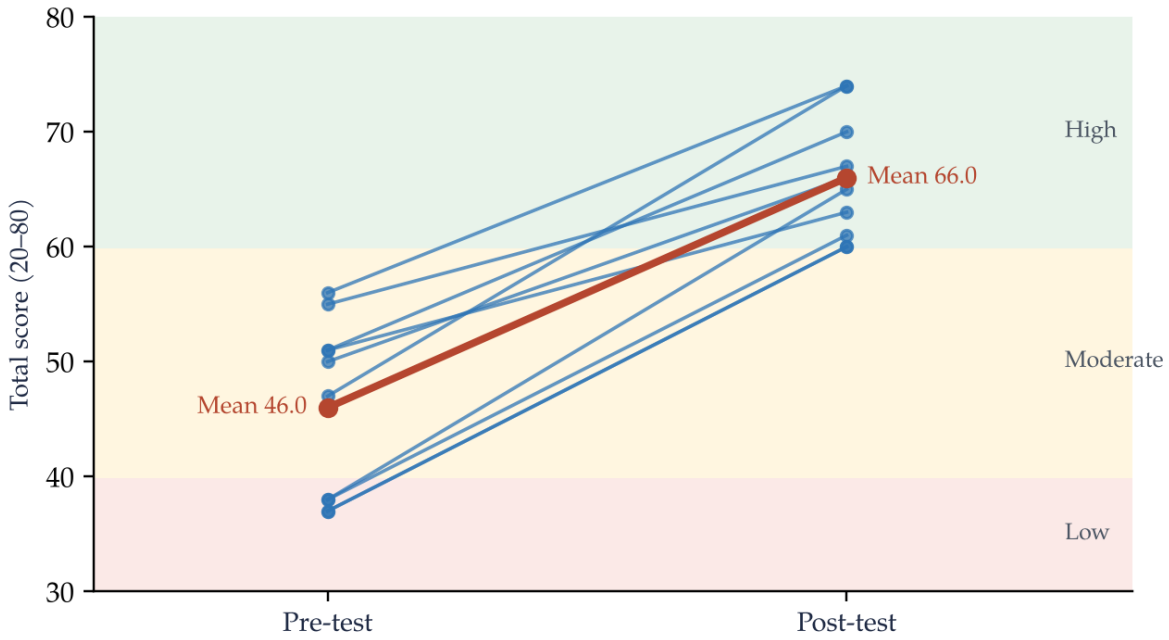


Figure 1. Change in each child's social skills score from pre-test to post-test; the red line shows the group mean

The data in Table 3 and Figure 1 can be explained as follows. Before the activity, children's scores were in the low to moderate range, and no child reached the high

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category. After the activity, every child obtained a higher score than at baseline, with the smallest gain of 12 points and the largest of 27 points. Of the four children initially in the low category, two (A01 and A10) moved to the high category and two (A04 and A06) moved to the moderate category, reaching its upper limit of 60. All six children initially in the moderate category moved to the high category. Children with relatively high initial scores, such as A07 and A08, showed smaller gains of 12 points. The spread of scores also narrowed, as indicated by the standard deviation decreasing from 7.73 to 5.29. Figure 1 shows that all individual lines move upward and that the group mean shifts from the moderate band to the high band.

The first finding shows four patterns. First, children's initial scores were low to moderate, with 40% of children in the low category. Second, every child's score increased, and 80% of children were in the high category at post-test. Third, children with low initial scores tended to gain more in absolute terms than children with higher initial scores, so the differences between children narrowed; this pattern may partly reflect regression toward the mean and the ceiling of the scale. Fourth, both girls and boys showed increases, with mean gains of 21.75 and 18.83 points, respectively; with four girls and six boys, this difference is reported descriptively only and is not interpreted.

Finding 2: Normality and Hypothesis Testing

The results of normality and hypothesis testing are presented in Table 4. The Shapiro-Wilk test gave p-values above 0.05 for pre-test scores ($W = 0.845$; $p = 0.051$), post-test scores ($W = 0.905$; $p = 0.246$), and difference scores ($W = 0.913$; $p = 0.301$), so there was no evidence of departure from normality, although the pre-test p-value was close to the threshold. The paired sample t-test yielded $t(9) = 11.46$, $p < 0.001$. The mean difference was 20.00 points, with a 95% confidence interval of 16.05 to 23.95. The Wilcoxon signed-rank test yielded $W = 0$, $p = 0.002$, because all ten children had positive differences. Cohen's dz was 3.62 (95% CI 1.86–5.37). The mean of individual N-gains was 0.59, the same as the gain computed from group means (0.59); individual values ranged from 0.41 to 0.82. When A03 was excluded, the mean difference was 20.22 points (95% CI 15.76–24.68), $t(8) = 10.45$, $p < 0.001$, Wilcoxon $p = 0.004$, and $dz = 3.48$ (95% CI 1.68–5.27).

Table 4. Results of Normality Tests, Hypothesis Tests, Effect Size, N-gain, and Sensitivity Analysis

Analysis	Statistic	Value	Decision
Shapiro-Wilk, pre-test	W	0.845 (p = 0.051)	No evidence of non-normality
Shapiro-Wilk, post-test	W	0.905 (p = 0.246)	No evidence of non-normality
Shapiro-Wilk, difference	W	0.913 (p = 0.301)	No evidence of non-normality
Paired sample t-test	t(9)	11.46 (p < 0.001)	H_0 rejected

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Mean difference (95% CI)	M diff	20.00 (16.05–23.95)	Increase
Wilcoxon signed-rank test (robustness check)	W	0 (p = 0.002)	H_0 rejected
Effect size (95% CI)	Cohen's dz	3.62 (1.86–5.37)	Very large; imprecise
N-gain	g	0.59 (mean of individual gains); 0.59 (from group means)	Moderate (descriptive)
Sensitivity analysis without A03 (n = 9)	t(8)	10.45 (p < 0.001); M diff 20.22 (15.76–24.68); dz 3.48	Conclusion unchanged

Source: research data analysis (2026); CI = confidence interval; robustness check = analysis of the same data without the normality assumption.

The data in Table 4 can be interpreted as follows. Because no departure from normality was detected in the difference scores, the paired t-test was appropriate, although with ten cases this check has limited power. The p-value far below 0.05 means that H_0 is rejected: post-test scores were significantly higher than pre-test scores. The confidence interval of the mean difference lies entirely above zero and indicates an increase of roughly 16 to 24 points. The Wilcoxon test, which does not assume normality, led to the same conclusion; because it uses the same data, it shows that the result does not depend on the normality assumption rather than replicating it. The confidence interval of dz is wide, so the exact size of the change is uncertain. The mean N-gain of 0.59 indicates that, on average, children achieved about 59% of the improvement still available on the scale. Excluding the child whose pre-test form had no name did not change the conclusion.

The second finding shows three tendencies. First, the parametric and nonparametric tests gave consistent results, and the result did not depend on the uncertain data pair. Second, the change was large relative to the variation in differences between children, but a very large dz obtained after a single session, a one-day interval, and ratings by the same teacher should be read with caution, because rater expectancy and repeated rating can inflate such estimates in small samples. Third, statistical significance shows that the increase is unlikely to be due to random variation alone; whether the change is pedagogically meaningful and stable cannot be determined without follow-up and independent observation.

Finding 3: Changes in Social Skills Scores in Each Dimension

The results of the dimension-level analysis are presented in Table 5 and Figure 2. In the cooperation dimension, the mean score rose from 9.0 to 13.3 (56.25% to 83.13%). In sharing and empathy, it rose from 8.9 to 13.4 (55.63% to 83.75%). In following rules and taking turns, it rose from 9.3 to 13.5 (58.13% to 84.38%). In communication, it rose from 9.4

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to 12.8 (58.75% to 80.00%). In conflict resolution and self-confidence, it rose from 9.4 to 13.0 (58.75% to 81.25%); one child (A08) showed no change in this dimension. The means of individual N-gains were 0.61, 0.65, 0.64, 0.51, and 0.52, respectively, and the gains computed from group means were 0.61, 0.63, 0.63, 0.52, and 0.55. The Wilcoxon test gave unadjusted p-values of 0.002 for the first four dimensions and 0.004 for conflict resolution and self-confidence; after Holm adjustment for five comparisons, all p-values were 0.010.

Table 5. Changes in Children's Social Skills Scores in Each Dimension

Dimension	Mean pre-test	Mean post-test	% pre-test	% post-test	N-gain (individual / group)	p (unadjusted / Holm)
Cooperation	9.0	13.3	56.25	83.13	0.61 / 0.61	0.002 / 0.010
Sharing and empathy	8.9	13.4	55.63	83.75	0.65 / 0.63	0.002 / 0.010
Following rules and taking turns	9.3	13.5	58.13	84.38	0.64 / 0.63	0.002 / 0.010
Communication	9.4	12.8	58.75	80.00	0.51 / 0.52	0.002 / 0.010
Conflict resolution and self-confidence	9.4	13.0	58.75	81.25	0.52 / 0.55	0.004 / 0.010

Note: maximum score for each dimension = 16 (four items × score of 4); individual = mean of individual N-gains; group = N-gain computed from group means; Holm = p-value adjusted for five comparisons.

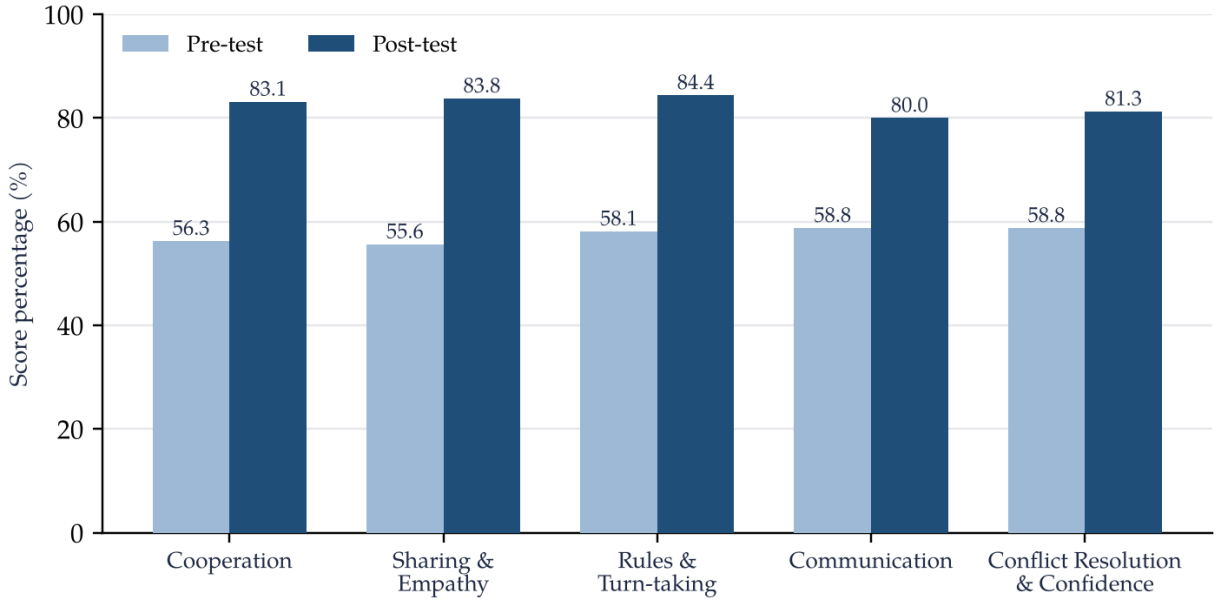


Figure 2. Percentage of children's social skills scores in each dimension before and after the game session

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The data in Table 5 and Figure 2 show that scores increased in all dimensions, from 55–59% of the maximum before the activity to 80–84% after it, and that the increases remained significant after adjustment for multiple comparisons. The largest relative gains occurred in sharing and empathy, following rules and taking turns, and cooperation, whereas communication and conflict resolution and self-confidence showed smaller gains. Because each dimension contains only four items and all ratings came from the same observer, the differences between dimensions are small and are treated as descriptive patterns rather than as evidence that the games affected some dimensions more than others.

The third finding can be summarised in three points. First, scores increased in all five dimensions. Second, the dimensions with the largest gains, namely cooperation, sharing and empathy, and following rules and taking turns, correspond to the behaviours that the two games were expected to practise most directly. Third, communication and conflict resolution and self-confidence showed smaller gains. Overall, children's social skills scores were significantly higher on the day after the game session than before it, with a mean change of 20.00 points (95% CI 16.05–23.95), $t(9) = 11.46$, $p < 0.001$; this is a change observed over time in one group, not an established effect of the games.

2. Discussion

This study examined changes in kindergarten children's social skills scores following one session of group traditional games. Three main findings emerged. First, every child's score was higher at post-test, and most children moved from the low or moderate band to the high band. Second, the increase was statistically significant, consistent across parametric and nonparametric tests, robust to the exclusion of an uncertain data pair, and large relative to the variation between children, although its size was estimated imprecisely. Third, scores increased in all five dimensions, with the largest gains in cooperation, sharing and empathy, and following rules and taking turns. The hypothesis of a significant pre–post difference is therefore supported, but the design does not allow the difference to be attributed to the games alone.

Two groups of explanations should be considered. The first concerns the activity itself. *Ular naga* requires children to hold on to one another, move together, and follow a shared song and capture rule, whereas *gobak sodor* requires team strategy, alternation between guard and attacker roles, and adherence to boundary lines; these features correspond to the dimensions that showed the largest gains. The second concerns the design. Only one session of about 60 minutes was delivered, and a substantial change in habitual social behaviour after a single session is unlikely to result from the activity alone. The same teacher led the activity and rated the children one day apart while knowing the purpose of the study, so expectancy and a tendency to rate more favourably after an

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intervention may have contributed to the higher scores. The narrowing of differences between children may also reflect regression toward the mean and the ceiling of the scale. The present data cannot separate these explanations, so the observed change is regarded as preliminary.

The results are in line with previous studies reporting that traditional games are associated with improved social-emotional development, including studies of *bakiak* and *engklek* (Fitri et al., 2022), of *gobak sodor* with children aged 5–6 years (Hasibuan & Marbun, 2023), and of *gobak sodor* and *bentengan* for moral emotions (Iswinarti & Laily, 2024). Like Hasibuan and Marbun (2023), this study used a one-group design with a small sample, and the same caution applies to both. The findings are also consistent with the twenty years of evaluation findings of the cooperative "Game Program," which report improvements in social behaviour (Garaigordobil et al., 2022), and with reviews describing the role of traditional games in early childhood social-emotional development (Mashar, 2025). This study differs from previous work in naming the games, linking their structural features to specific dimensions, reporting the dose delivered, and quantifying the uncertainty of the change. It also shows that a comparable pattern of increase can be recorded after a single short session, which strengthens the need for controlled studies, since such a rapid change is likely to include measurement effects.

From a theoretical perspective, games with rules create a zone of proximal development in which children restrain individual impulses to follow shared rules and receive support from more skilled peers, and children can learn social behaviour by observing and imitating peers and receiving praise (Schunk, 2020). Rule following and cooperation also involve self-regulation, which is related to social competence in early childhood (Korucu et al., 2021; Geng et al., 2024). Traditional games can be regarded as cultural tools that convey shared values through transparent rules and alternating roles (Sovieti et al., 2026). These perspectives explain why group games are plausible vehicles for social learning. However, this study did not measure rule use, role alternation, or self-regulation separately, so it cannot show that these mechanisms produced the observed change; they remain hypotheses for future studies.

The findings have several implications. Group traditional games are inexpensive, easy to organise, and familiar to children, and they are consistent with the social-emotional learning outcomes of the Indonesian early childhood curriculum (Permendikbudristek, 2022). They may also provide opportunities for face-to-face group play at a time of growing concern about young children's screen use (Khotimah et al., 2025). Nevertheless, the findings must be interpreted within clear limits. The one-group design cannot rule out maturation, school experience, testing effects, or rater expectancy. The intervention consisted of a single session, and the post-test followed one day later, so the durability of any change is unknown. The instrument was developed for this study

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without expert validation, its reliability estimates are based on ten children, and several items showed little variance at post-test. Finally, behaviour was rated by one observer who also led the activity.

Several practical steps can be recommended. First, teachers at TK Mutiara Agam can continue to use *ular naga* and *gobak sodor* as group activities, while recognising that this study tested only one session; any recommended frequency, such as regular weekly play, is a proposal for future implementation rather than a dose shown to be effective. Second, teachers can add a short reflection after each game in which children talk about their feelings and how they settled disagreements, to support communication and conflict resolution. Third, the kindergarten can compile local traditional games with written rules and adaptations for young children, because the effectiveness of early childhood learning strategies depends on teacher preparation and institutional conditions (Mayangsari et al., 2022). Fourth, parents can be invited to play such games at home, since family involvement is associated with children's social-emotional development (Martinez-Yarza et al., 2024) and school readiness (Józsa & Oo, 2026), in line with school–family partnership models (Epstein, 2018). Fifth, future assessments should involve a second, independent observer and a revised instrument with expert content validation.

KESIMPULAN

Children's social skills scores at TK Mutiara Agam, Tanjung Mutiara District, were significantly higher on the day after one session of *ular naga* and *gobak sodor* than before it. The mean score increased from 46.00 in the moderate band to 66.00 in the high band, a mean change of 20.00 points (95% CI 16.05–23.95), $t(9) = 11.46$, $p < 0.001$, confirmed by the Wilcoxon test ($p = 0.002$) and unchanged when an uncertain data pair was excluded. Every child's score increased, 80% of children were in the high band at post-test, and all five dimensions increased, with the largest gains in cooperation, sharing and empathy, and following rules and taking turns. Because the study had no comparison group, involved one short session, measured outcomes one day later, and relied on a single rater who led the activity, these results show a change observed after the activity in one group rather than a causal effect of the games.

The contribution of this study is transparent preliminary evidence: it names the games used, links their features to specific social-skill dimensions, reports individual and dimension scores with their uncertainty, and states the dose actually delivered. Statistical significance indicates that the increase is unlikely to be due to chance alone, but it does not establish that the change is pedagogically meaningful or lasting. The study therefore offers a starting point for testing group traditional games as a low-cost social learning activity rather than a confirmation of their effectiveness.

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This study has several limitations. First, the one-group pretest–posttest design without a comparison group does not allow causal conclusions. Second, the intervention consisted of a single session of about 60 minutes, and the post-test was conducted one day later, so the durability of the change is unknown. Third, only ten children from one institution took part. Fourth, all ratings were made by one teacher who also led the activity, so rater expectancy could not be controlled and inter-rater reliability could not be estimated. Fifth, the instrument was not validated by experts, its reliability estimates are based on a small sample, and the conflict resolution and self-confidence dimension combines partly different behaviours. Sixth, the specific adaptations of the games during the session were not recorded in detail. Future studies should document the games and their rules, deliver multiple sessions over several weeks, include a comparison group, use independent observers who are unaware of the measurement occasion where possible, conduct follow-up measurements, and examine whether the skills transfer to other play situations.

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