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The effect of emotion card games on emotional intelligence among elementary school-aged children: a quasi-experimental study in Mataram, Indonesia

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ABSTRACT

Emotional intelligence is a key skill influencing adaptation, communication, and personal growth in elementary school-aged children. Emotional card games offer a promising interactive approach to enhance children's emotional competencies. To analyze the effect of emotional card games on the emotional intelligence of elementary school-aged children. A quasi-experimental pretest-posttest control group design was conducted among 77 first-grade students at MI Mambaul Khair NW Bertais Mataram in 2025. The intervention group (n = 39) participated in three sessions of an emotional card game, while the control group (n = 38) received no intervention. Emotional intelligence was measured using a validated 24-item questionnaire. The intervention group demonstrated a significant increase in emotional intelligence scores from pre-test to post-test ($p = 0.007$), whereas the control group showed no significant change. Between-group comparison confirmed significantly higher post-test scores in the intervention group ($p = 0.006$). After adjusting for confounding variables and baseline scores, the intervention effect remained statistically significant ($p < 0.001$). Emotional card games effectively improve emotional intelligence among elementary school-aged children. These findings support the integration of game-based social-emotional learning strategies into elementary school curricula. School health practitioners and educators can utilize this low-cost, engaging intervention to promote children's emotional well-being and support holistic child health development.

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1. INTRODUCTION

Emotional intelligence has become a significant focus of global educational research in recent decades, given its crucial role in child development and academic success. International research shows that emotional intelligence is a key skill determining children's successful adaptation, communication, and personal growth [1]. In the context of learning, emotional intelligence not only influences learning outcomes but also students' ability to solve problems and think reflectively [2]. Global studies also reveal that early childhood is a critical period for the development of emotional intelligence, which influences a child's future

ability to build relationships and adapt socially [3]. Research in adult and child populations in Indonesia has highlighted the salience of mystical and supernatural forces as perceived determinants of mental illness and demonstrated the negative impact of stigma on conceptualizations of health and illness [4].

The effectiveness of card-based and game-based interventions for emotional intelligence development in children has been substantiated across multiple studies. Research has demonstrated that card games serve as effective visual media in play-based learning processes, helping children understand and process emotional content in engaging and enjoyable ways [5]. The serious game "The Park of Emotions," based on a nine-level pyramid model of emotional intelligence, demonstrated significant improvements in children's emotional intelligence among 436 children aged 9-12 years [6]. Similarly, gaming technologies have been identified as innovative methods for developing emotional intelligence in schoolchildren [7]. The efficiency of game-based approaches in stimulating engagement and developing specific components of emotional intelligence [8].

Various previous studies have explored intervention approaches to improve children's emotional intelligence through various methods. Developing multimedia gamification applications has proven to be an innovative strategy in emotional intelligence education [9]. In addition, play-based interventions have shown effectiveness in addressing emotional symptoms and improving the mental health of preschool children [10]. Another approach that also shows positive results is drama pedagogy training, which significantly improves the ability of socio-emotional learning in children [11].

Although various studies have demonstrated the effectiveness of game-based interventions on children's emotional intelligence, most were conducted in Western developed countries with different cultural contexts. In Indonesia, intervention studies targeting emotional intelligence among elementary school-aged children remain limited and rarely employ quasi-experimental designs with control groups. Furthermore, previous research generally failed to control for confounding variables such as parental education, birth order, and occupational status through multivariate analysis. No study in Indonesia has specifically examined the effectiveness of emotional card games using ANCOVA and multiple linear regression analyses among elementary school students, leaving a significant methodological and contextual gap in the existing literature.

This study aims to analyze the effectiveness of emotional card games in improving the emotional intelligence of elementary school-aged children, identify demographic factors that influence children's emotional intelligence, including gender, age, birth order, and education level, as well as parental occupation status, and evaluate the role of parental education, especially maternal education, on the development of children's emotional intelligence. The novelty of the study is integrating comprehensive multivariate analysis (multiple linear regression and ANCOVA) to control confounding variables, which is rarely done in intervention studies of children's emotional intelligence in Indonesia, and emotional card games as a social-emotional learning medium is an innovative approach that is applicable to be integrated into the elementary school curriculum.

2. METHOD

2.1. Research design

This study used a quasi-experimental design with a pretest-posttest control group design approach involving two groups: an experimental group that received an emotion card game intervention and a control group that did not receive the treatment. The quasi-experimental design was chosen because the study did not use pure randomization in determining the groups, but rather used intact groups, namely the first-grade students of MI Mambaul Khair NW Bertais Mataram, who had been previously formed. Emotional intelligence measurements were conducted twice in both groups, namely before treatment (pretest) and after treatment (posttest).

2.2. Location and time

This research was conducted at MI Mambaul Khair NW Bertais Mataram in 2025. The selection of the research location was based on several considerations, namely that the madrasah had a sufficient number of first-grade students to be used as research samples, and the results of initial interviews with the principal and first-grade homeroom teachers indicated that there were problems with students' emotional conditions that required attention and intervention. The implementation of the research included four stages, including the preparation stage, consisting of preparing a proposal, processing research permits from the Poltekkes Kemenkes Mataram, and coordinating with the school. The initial data collection stage involved interviews to obtain information on students' emotional conditions. The research implementation stage included providing informed consent, filling in demographic data, conducting a pre-test, providing an emotion cards game intervention for three meetings, and conducting a post-test, as well as the data analysis stage and preparing a research report.

2.3. Population and sample

This study used a quasi-experimental design with a total population of 77 first-grade students of MI Mambaul Khair NW Bertais Mataram, who were divided into two groups. The intervention (experimental) group consisted of 39 students who received treatment in the form of an emotion card game for 3 sessions, while the control group consisted of 38 students who did not receive the intervention. This study used a quasi-experimental design with a pretest-posttest control group design. The quasi-experimental design was chosen because the study used intact groups (existing classes) rather than individual randomization. Class 1A was assigned as the experimental group and Class 1B as the control group.

Inclusion criteria for this study included first-grade students who were actively enrolled in the current academic year, aged 6–7 years, had obtained parental or guardian permission through informed consent, and were willing to participate as respondents. Participants were also required to be present for both the pre-test and post-test, and those in the experimental group had to participate in all three sessions of the emotion card game. Exclusion criteria included students who were absent from either test, did not obtain parental or guardian permission, withdrew during the study, had developmental disabilities or special conditions affecting their ability to participate in the game and complete the questionnaire, or, in the case of the experimental group, did not attend all game sessions.

2.4. Research variables

The independent variable in this study was the emotion card game, defined as a group dynamics-based activity using attractive, colorful picture cards that depict a series of events related to the expression of specific emotions. Measurement parameters covered three main aspects: game rules (understanding and adherence), group dynamics (interaction, active rebuttal, and ability to follow the pace), and game objectives (ability to sequence the plot, develop a story, and identify types of emotions). Measurements were conducted through observation using an ordinal scale, using a score of 1-3 for each aspect, with the following categories: less capable (1-8), fairly capable (9-16), and good (17-24). Confounding variables identified include gender, age, the order of children in the family, parental education, and parental occupation.

Based on the emotional intelligence scale questionnaire instrument used in this study, with a total of 24 items and a scoring system of 1-3, the total score range is 24-72. The categorization of emotional intelligence in this study was compiled using a class interval approach that divides the total score range into five equal categories. The calculation of the class interval is done with the formula: (maximum score - minimum score)/number of categories = (72 24) /5=9.6 which is rounded to 10 points per category. Based on this calculation, five categories of emotional intelligence are obtained as follows: very low category with a score range of 24-33 (33.3-45.8%), low category with a score range of 34-43 (47.2-59.7%), medium category with a score range of 44-53 (61.1-73.6%), high category with a score range of 54-63 (75.0-87.5%), and very high category with a score range of 64-72 (88.9-100%).

2.5. Instrument

This study used a cafeteria question as its instrument format, a question with pre-defined answer choices to represent respondents' opinions. This approach allows for structured data collection and facilitates quantitative analysis. The first instrument was a demographic data questionnaire that collected respondent characteristics, including gender, age (6-7 years), family order, parental education level (primary, secondary, tertiary), and father's and mother's occupation status. This demographic data was essential for identifying control variables and the characteristics of the research sample. The second instrument is an emotional intelligence scale questionnaire. This questionnaire consists of 24 items that measure five aspects of emotional intelligence: recognizing emotions (5 items), managing emotions (7 items), motivating emotions (6 items), empathy (4 items), and building relationships (2 items). The scoring system uses a score of 1-3 with a total range of 24-72, then categorized into very low to very high based on standard deviation. The third instrument was an emotion cards game observation sheet that assessed three components: understanding and adherence to game rules, group dynamics (interaction and activeness), and achievement of game goals (the ability to sort cards, develop stories, and identify emotions). The assessment used a score of 1-3, with categories of poor (1-8), adequate (9-16), and good (17-24). The fourth and fifth instruments are emotion cards game modules containing implementation guidelines (objectives, tools, rules, duration of 30 minutes/meeting for 3 meetings, maximum 5 children/group), as well as an informed consent sheet containing an explanation of the objectives, procedures, benefits, risks, respondent rights, and a statement of willingness signed by parents/guardians.

2.6. Data processing techniques

After the data was collected, data processing was carried out through several systematic stages. The first stage was editing (data editing). The second stage was coding. The coding used included gender (male =

1, female = 2), age (6 years = 1, 7 years = 2), child order (1st child = 1, 2nd child = 2, 3rd child or more = 3), father's and mother's education (Elementary School = 1, Senior High School = 2, University = 3); father's and mother's occupation (working = 1, not working = 2), group (experimental = 1, control = 2), questionnaire answers (A = 1, B = 2, C = 3); and observation score (less = 1, sufficient = 2, good = 3).

2.7. Data analysis

Data analysis was performed using SPSS version 25.0 with a significance level of $\alpha = 0.05$. The analysis process included several systematic stages. First, a homogeneity test was conducted using the Chi-square test to ensure equality of baseline characteristics between the intervention and control groups on demographic variables including gender, age, child order, parental education, and parental occupation status. Next, an intra-group analysis used the Wilcoxon signed-rank test to compare emotional intelligence scores before and after the intervention in each group, as the data were not normally distributed. An inter-group analysis was conducted using the Mann-Whitney U Test to compare emotional intelligence scores between the two groups on the pre-test and post-test measurements. To evaluate the intervention effect more comprehensively, multiple linear regression analysis with an adjusted model was used to control for potential confounding variables, with a comparison of crude and adjusted estimates using a 10% threshold to identify the magnitude of confounding. Finally, an analysis of covariance (ANCOVA) was conducted by including pre-test scores as a covariate to control for baseline differences between groups, thus providing a more accurate estimate of the intervention effect.

3. RESULTS

Table 1 presents the demographic characteristics of respondents in the intervention group (n = 39) and control group (n = 38). The Chi-Square homogeneity test revealed all characteristics had $p > 0.05$, indicating no significant differences between the two groups. The majority of respondents in both groups were female, aged 7 years, and were the first or second child in the family. Parents' education level was predominantly high school graduates, while the majority of fathers and mothers in the intervention group were employed.

Table 1. Respondent characteristics based on research group

Characteristics	Category	Intervention group (n = 39)		Control group (n = 38)		Homogeneity test
		f	%	f	%	p-value
Gender	Male	12	30.8	15	39.5	0.428
	Female	27	69.2	23	60.5	
Age	6 years	16	41.0	18	47.4	0.570
	7 years	23	59.0	20	52.6	
Child order	1st child	15	38.5	12	31.6	0.721
	2nd child	13	33.3	16	42.1	
	3rd or more children	11	28.2	10	26.3	
Father's education	Elementary school	12	30.8	9	23.7	0.766
	Senior high school	15	38.5	16	42.1	
	University	12	30.8	13	34.2	
Mother's education	Elementary school	11	28.2	12	31.6	0.663
	Senior high school	13	33.3	15	39.5	
	University	15	38.5	11	28.9	
Father's occupation	Yes	24	61.5	20	52.6	0.431
	No	15	38.5	18	47.4	
Mother's occupation	Yes	25	64.1	20	52.6	0.304
	No	14	35.9	18	47.4	

Chi-square homogeneity test

Table 2 demonstrates the emotional card game intervention's effectiveness in improving children's emotional intelligence. The Wilcoxon signed-rank test revealed a significant score increase in the intervention group from 62.0 (86.1%) to 67.0 (93.1%) ($p = 0.007$), while the control group showed no significant change ($p = 0.185$). Mann-Whitney U Test confirmed equivalent baseline scores between groups ($p = 0.193$), with significant post-test differences ($p = 0.006$). The intervention group achieved a 7.0% increase compared to 1.4% in the control group, confirming the emotional card game effectively enhances emotional intelligence.

Table 3 demonstrated that the intervention significantly improved children's emotional intelligence, with the intervention group scoring 4.8 points higher than controls after adjusting for confounders ($p < 0.001$, 95% CI: 3.6–6.0). The minimal 4% coefficient change indicated low confounding. Females scored 1.2 points

higher than males ($p = 0.042$), and 7-year-olds scored 2.1 points higher than 6-year-olds ($p < 0.001$). Maternal education exerted a stronger positive effect ($\beta = 3.1$, $p < 0.001$) than paternal education ($\beta = 2.3$, $p = 0.004$), confirming mothers' central role in emotional development. Birth order and parental occupation were non-significant ($p > 0.05$).

Table 4 shows that the change in the estimated intervention effect from the crude model to the adjusted model was only 4%. This value is well below the 10% threshold commonly used to identify substantial confounding. These findings confirm the results of the stratification analysis, indicating that the identified confounding variables did not substantially influence the relationship between the emotional card game intervention and emotional intelligence. Table 5 shows that after controlling for pre-test scores and other confounding variables, the intervention effect remains significant with a coefficient of 3.2 points ($p < 0.001$). The ANCOVA model explained 78.2% of the variation in post-test scores, indicating that pre-test scores were a strong predictor of post-test scores. The smaller intervention effect in the ANCOVA model (3.2 vs. 4.8 in the model without the pre-test) reflects tighter control for baseline differences.

Table 2. Comparison of emotional intelligence scores before and after the emotional card game intervention in the intervention and control groups

Analysis aspects	n	Group	Pre-test	Post test	Δ (Difference)	Statistical test	p-value	Conclusion
Intra-group	39	Intervention	62.0 ± 3.0 (86.1%)	67.0 ± 2.8 (93.1%)	+5.0 (+7.0%)	Wilcoxon signed-rank test	0.007*	Significant
Intra-group	38	Control	61.0 ± 3.5 (84.7%)	62.0 ± 2.3 (86.1%)	+1.0 (+1.4%)	Wilcoxon signed-rank test	0.185	Not significant
Inter-group (Pre)	77	Intervention vs Control	62.0 vs. 61.0 (86.1% vs. 84.7%)	-	1.0 (1.4%)	Mann-Whitney U Test	0.193	Not significant
Inter-group (Post)	77	Intervention vs Control	-	67.0 vs 62.0 (93.1% vs. 86.1%)	5.0 (7.0%)	Mann-Whitney U Test	0.006*	significant

Note: *$p < 0.05$ (statistically significant), maximum score = 72

Table 3. Multiple linear regression results (adjusted model)

Variables	B	SE	β	t	p-value	95% CI
Constant	54.2	2.15	-	25.21	<0.001	49.9 - 58.5
Group (intervention vs control)	4.8	0.62	0.64	7.74	<0.001	3.6 - 6.0
Gender (female vs male)	1.2	0.58	0.16	2.07	0.042	0.04 - 2.4
Age (7 years vs 6 years)	2.1	0.56	0.28	3.75	<0.001	1.0 - 3.2
Order of 2nd child (vs. 1st child)	0.8	0.68	0.10	1.18	0.243	-0.6 - 2.2
Order of 3rd child+ (vs. 1st child)	0.5	0.72	0.06	0.69	0.491	-0.9 - 1.9
Father's education SHS (vs. ES)	1.5	0.71	0.19	2.11	0.038	0.1 - 2.9
Father's education Univ (vs. ES)	2.3	0.78	0.28	2.95	0.004	0.8 - 3.8
Mother's education SHS (vs. ES)	1.8	0.69	0.23	2.61	0.011	0.4 - 3.2
Mother's education Univ (vs. ES)	3.1	0.76	0.38	4.08	<0.001	1.6 - 4.6
Father's occupation (Yes vs. Not)	0.9	0.61	0.12	1.48	0.144	-0.3 - 2.1
Mother's occupation (Yes vs. Not)	0.7	0.63	0.09	1.11	0.271	-0.6 - 2.0

$R^2 = 0.612$, Adjusted $R^2 = 0.546$, $F = 9.28$, $p < 0.001$

Table 4. Comparison of crude and adjusted estimates

Parameter	Crude estimate	Adjusted estimate	Change (%)	Interpretation
Intervention effect (B)	5.0	4.8	-4.0%	Minimal confounding
95% CI lower	3.7	3.6	-2.7%	-
95% CI upper	6.3	6.0	-4.8%	-
p-value	<0.001	<0.001	-	Still significant

Table 5. ANCOVA results with pre-test as covariate

Variables	B	SE	β	t	p-value	95% CI
Constant	12.5	3.42	-	3.65	<0.001	5.7 - 19.3
Pre-test score	0.82	0.05	0.78	16.40	<0.001	0.72 - 0.92
Group (intervention vs control)	3.2	0.48	0.43	6.67	<0.001	2.2 - 4.2
Gender	0.6	0.42	0.08	1.43	0.157	-0.2 - 1.4
Age	0.9	0.44	0.12	2.05	0.044	0.02 - 1.8
Mother's education university (vs ES)	1.2	0.56	0.15	2.14	0.036	0.1 - 2.3

$R^2 = 0.782$, Adjusted $R^2 = 0.767$, $F = 50.8$, $p < 0.001$

4. DISCUSSION

The study's findings demonstrate robust evidence for the effectiveness of emotion card games in improving children's emotional intelligence. The intervention group experienced a significant increase in emotional intelligence scores from 62.0 (86.1%) to 67.0 (93.1%), representing a difference of +5.0 points ($p = 0.007$), while the control group showed only minimal, non-significant improvement. This pattern of results aligns with contemporary research on emotional intelligence interventions in educational settings. Emotional intelligence development programs can significantly enhance emotional competencies in educational contexts, with teachers and students showing marked improvements after participating in structured emotional intelligence programs [12], [13].

The inter-group analysis using the Mann-Whitney U Test confirmed that while both groups had equivalent baseline scores ($p = 0.193$), significant differences emerged post-intervention ($p = 0.006$). This finding is particularly important as it establishes that the observed improvements can be attributed to the intervention rather than pre-existing differences between groups. Similar patterns have been observed in studies examining socio-emotional skills development, where intervention programs designed to develop education for emotions and social skills in elementary school children have demonstrated improvements in school performance and peer relationships [14].

The ANCOVA results presented in Table 5 demonstrate that after controlling for pre-test scores and confounding variables, the intervention effect remains significant with a coefficient of 3.2 points ($p < 0.001$). The model explained 78.2% of the variation in post-test scores, indicating strong predictive validity. This level of explained educational variance is consistent with findings from other intervention studies. Research using multiple linear regression models to examine factors affecting psychological outcomes has demonstrated that well-designed interventions can account for substantial portions of outcome variance [15].

The multivariate regression analysis revealed that gender had a significant influence on emotional intelligence, with females showing scores 1.2 points higher than males ($p = 0.042$). This finding is consistent with a substantial body of literature documenting gender differences in emotional intelligence. Research has consistently shown that females tend to demonstrate higher levels of emotional intelligence and emotional empathy compared to males [16], [17]. The gender differences observed in this study may reflect broader developmental patterns in emotional socialization. Research on social-emotional competencies has documented that boys and girls often show different trajectories in emotional development, with studies revealing significant declines in certain emotional competencies among boys during school transitions [18], [19].

The finding that 7-year-old children demonstrated emotional intelligence scores 2.1 points higher than 6-year-olds ($p < 0.001$) reflects the developmental nature of emotional intelligence. This age-related improvement is consistent with developmental psychology literature suggesting that emotional understanding and regulation capabilities increase with age during early childhood. Research on emotional intelligence in educational contexts has documented that age represents a significant factor in emotional competency development [20], [21].

One of the most significant findings from the multivariate analysis was the strong influence of maternal education on children's emotional intelligence. The effect of maternal education ($\beta = 3.1$, $p < 0.001$) was notably stronger than that of paternal education ($\beta = 2.3$, $p = 0.004$), confirming the central role of mothers in children's emotional development. This finding aligns with extensive research documenting the primacy of maternal influence on children's emotional socialization.

The gradient effect observed for parental education with university-educated parents showing the strongest positive influence suggests that higher education may equip parents with greater knowledge and skills to support children's emotional development. This pattern is consistent with research demonstrating that parental education levels correlate with various aspects of children's psychological and academic development [22], [23]. The significant role of parental education in children's emotional intelligence development has important implications for intervention design. While the emotion card game intervention was effective regardless of parental education level, the findings suggest that family-based components could potentially enhance intervention effectiveness. Research on emotional intelligence training has demonstrated that comprehensive approaches addressing multiple ecological levels can produce stronger outcomes [24].

The consistency of findings across different analytical approaches including Wilcoxon signed-rank tests, Mann-Whitney U Tests, multiple linear regression, and ANCOVA provides strong evidence for the robustness of the intervention effect. The ANCOVA model, which controlled for pre-test scores as a covariate, showed a somewhat smaller but still highly significant intervention effect ($B = 3.2$, $p < 0.001$). This pattern is expected when baseline differences are controlled and provides additional confidence in the intervention's effectiveness. Research on statistical approaches to educational intervention evaluation has emphasized the value of using multiple analytical methods to establish robust findings [25]. The effectiveness of emotion card games likely operates through multiple mechanisms, including social learning and peer interaction. Card games inherently involve social interaction, turn-taking, and communication all of

which provide opportunities for emotional learning. Peer interactions play crucial roles in emotional development [26].

Emotion card games typically involve explicit activities related to emotion recognition and labeling, which are foundational skills for emotional intelligence. By providing structured opportunities to identify, name, and discuss emotions, these games may help children develop more sophisticated emotional vocabularies and understanding. Research on emotional intelligence and learning outcomes has demonstrated that explicit instruction in emotional concepts can enhance emotional competencies [27].

Card games provide a safe, low-stakes environment for children to practice emotional skills. Unlike real-life emotional situations, which can be overwhelming or confusing, game contexts allow children to explore emotions without the pressure of actual consequences. This safe practice environment may facilitate learning and skill development. Research on emotional intelligence development in educational settings has emphasized the importance of supportive learning environments for emotional skill acquisition [28].

The findings of this study have significant implications for educational practice. The demonstrated effectiveness of emotion card games suggests that such interventions could be valuable additions to the elementary school curriculum. Research on socio-emotional skills in academic performance has emphasized the importance of integrating emotional education into school programs [29].

Within the Indonesian educational context, madrasah institutions, including Madrasah Ibtidaiyah (MI) at the elementary level, serve a significant population of students, often from lower socioeconomic backgrounds [30]. These Islamic Schools integrate both religious and general education, developing not only intellectual but also emotional and spiritual intelligence [31]. The finding that maternal education strongly influences children's emotional intelligence aligns with the broader Indonesian context where parental involvement, particularly mothers', is central to children's character formation [32]. The effectiveness of the emotional card game intervention has practical implications: teachers in madrasah settings, who already utilize educative tools such as card-based media [33], can integrate emotion card games into existing curricula to enhance socio-emotional learning. For policymakers, the child-friendly school (*sekolah ramah anak*) framework can provide a natural platform for embedding emotional intelligence programs in Indonesian madrasahs.

This study has several limitations that should be considered. First, the sample size was limited to one madrasah ($n = 77$) in Mataram, so generalization of the findings should be done with caution; however, the consistency of the results across multiple analytical approaches (Wilcoxon, Mann-Whitney, multiple linear regression, and ANCOVA) strengthens the internal validity of the findings. Second, measuring emotional intelligence using a cafeteria questionnaire format in children aged 6-7 years may be influenced by limited literacy skills, although the ANCOVA model explaining 78.2% of the variance in post-test scores indicates adequate measurement reliability.

5. CONCLUSION

This study demonstrates that the emotional card game significantly improves emotional intelligence among elementary school-aged children, with the intervention group showing a meaningfully greater increase (7.0%) compared to the control group (1.4%, $p < 0.001$), even after adjusting for confounding variables. These findings contribute to child health promotion by establishing an evidence-based, low-cost social-emotional learning tool that supports holistic child development beyond academic achievement. The identification of maternal education as the most influential demographic factor ($\beta = 3.1$) underscores the interconnection between family environment and children's emotional growth. Several actionable recommendations emerge from these findings. First, school administrators should consider integrating the emotional card game into existing curricula as a structured social-emotional learning activity. Second, public health practitioners should develop targeted parenting education programs, particularly for mothers, to enhance home-based emotional support. Third, policymakers should allocate resources for teacher training in game-based emotional learning interventions. Future research should employ longitudinal designs to assess the sustained effects of the intervention, explore implementation across diverse socioeconomic and cultural contexts, and investigate potential mediating mechanisms through which maternal education influences children's emotional intelligence outcomes. Randomized controlled trials with larger, multi-site samples are also warranted to strengthen generalizability.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [MA], upon reasonable request.

REFERENCES

[1] A. H. Herut, H. D. Muleta, and M. F. Lebeta, "Emotional intelligence as a predictor for academic achievement of children: Evidence from primary schools of southern Ethiopia," *Social Sciences & Humanities Open*, vol. 9, p. 100779, 2024, doi: 10.1016/j.ssaho.2023.100779.

[2] R. S. Dogham, N. M. Elcokany, A. S. Ghaly, A. M. El-Ashry, and H. F. M. Ali, "Emotional intelligence and reflective thinking: a synergistic approach in nursing education," *BMC Nursing*, vol. 24, no. 1, p. 548, May 2025, doi: 10.1186/s12912-025-03175-w.

[3] N. Pumyoch and S. Srikoon, "Executive function training curriculum to enhance emotional intelligence in early childhood: Theory adaptation in educational design research," *Thinking Skills and Creativity*, vol. 54, p. 101673, Dec. 2024, doi: 10.1016/j.tsc.2024.101673.

[4] L. Willenberg *et al.*, "Understanding mental health and its determinants from the perspective of adolescents: a qualitative study across diverse social settings in Indonesia," *Asian Journal of Psychiatry*, vol. 52, p. 102148, Aug. 2020, doi: 10.1016/j.ajp.2020.102148.

[5] M. S. Alotaibi, "Game-based learning in early childhood education: a systematic review and meta-analysis," *Frontiers in Psychology*, vol. 15, Apr. 2024, doi: 10.3389/fpsyg.2024.1307881.

[6] C. Papoutsi, A. Drigas, C. Skianis, C. Skordoulis, and M. Pappas, "'The park of emotions': a serious game for the development of emotional intelligence in children," *Applied Sciences*, vol. 14, no. 14, p. 6067, Jul. 2024, doi: 10.3390/app14146067.

[7] E. Liverman *et al.*, "Game-based social-emotional learning for youth: School-based qualitative analysis of brain agents," *JMIR Formative Research*, vol. 9, pp. e67550–e67550, Jul. 2025, doi: 10.2196/67550.

[8] M. Nunes, A. Oliveira, and F. Fidalgo, "Gamification and emotional intelligence: development of a digital application for children," *Education Sciences*, vol. 15, no. 4, p. 453, Apr. 2025, doi: 10.3390/educsci15040453.

[9] C. Redondo-Rodríguez, J. A. Becerra-Mejías, G. Gil-Fernández, and F. J. Rodríguez-Velasco, "Influence of gamification and cooperative work in peer, mixed and interdisciplinary teams on emotional intelligence, learning strategies and life goals that motivate university students to study," *International Journal of Environmental Research and Public Health*, vol. 20, no. 1, p. 547, Dec. 2022, doi: 10.3390/ijerph20010547.

[10] A. N. Veraksa, V. A. Plotnikova, V. L. Sukhikh, D. S. Kornienko, and N. A. Rudnova, "Non-therapeutic play to overcome negative emotional symptoms and improve emotional intelligence in children aged 3–7: a systematic review," *Frontiers in Psychology*, vol. 16, Mar. 2025, doi: 10.3389/fpsyg.2025.1475387.

[11] M.-P. Celume, T. Goldstein, M. Besançon, and F. Zenasni, "Developing children's socio-emotional competencies through drama pedagogy training: an experimental study on theory of mind and collaborative behavior," *Europe's Journal of Psychology*, vol. 16, no. 4, pp. 707–726, Nov. 2020, doi: 10.5964/ejop.v16i4.2054.

[12] M. L. Aponte, A. D. V. Sánchez, and M. A. Vasquez, "The effects of emotional intelligence training programs on educators: a systematic review," *F1000Research*, vol. 14, p. 842, Aug. 2025, doi: 10.12688/f1000research.166190.1.

[13] A. Mukhametkairov, B. Matayev, A. Kalimova, M. Utegenova, and L. Ibraimova, "Fostering emotional intelligence and self-regulation in gifted high school students: experimental evidence from a soft skills development program," *Frontiers in Education*, vol. 10, Jan. 2026, doi: 10.3389/feduc.2025.1733922.

[14] E. Martins, "Socio-emotional skills in the academic performance of Portuguese basic education students (emotional intelligence program)," *Social Science and Humanities Journal*, vol. 8, no. 02, pp. 3451–34528, Feb. 2024, doi: 10.18535/sshj.v8i02.934.

[15] H. Xu, C. Zhang, Z. Wang, C. Zhang, L. Peng, and X. Liu, "Factors associated with depressive disorders in college students using quantile regression analysis," *BMC Psychiatry*, vol. 25, no. 1, p. 868, Sep. 2025, doi: 10.1186/s12888-025-07334-w.

[16] J. Xu *et al.*, "Nursing students' emotional empathy, emotional intelligence and higher education-related stress: a cross-sectional study," *BMC Nursing*, vol. 22, no. 1, p. 437, Nov. 2023, doi: 10.1186/s12912-023-01607-z.
[17] E. Urbón, C. Salavera, and P. Usán, "The influence of gender on the relationship between emotional intelligence and psychological well-being in Spanish university students," *BMC Psychology*, vol. 13, no. 1, p. 393, Apr. 2025, doi: 10.1186/s40359-025-02730-z.
[18] C. Shum, S. Dockray, S. Gallagher, and J. McMahon, "Social–emotional competencies and psychological well-being across secondary school transition," *British Journal of Developmental Psychology*, vol. 43, no. 4, pp. 922–942, Nov. 2025, doi: 10.1111/bjdp.12564.
[19] S. Hassani, "Fostering social-emotional competencies to improve social functioning, social inclusion, and school well-being: Results of a cluster non-randomized pilot study," *Mental Health & Prevention*, vol. 36, p. 200365, Dec. 2024, doi: 10.1016/j.mhp.2024.200365.
[20] J. G. Aragundi-Moncada *et al.*, "The relationship between age and emotional intelligence in postgraduate students," *Frontiers in Education*, vol. 10, Jul. 2025, doi: 10.3389/feduc.2025.1558339.
[21] G. E. Gignac and K. Schlegel, "Age and ability-based emotional intelligence: evidence from the Geneva emotional competence test," *Intelligence*, vol. 111, p. 101934, Jul. 2025, doi: 10.1016/j.intell.2025.101934.
[22] Y. Xiang, R. Cao, and X. Li, "Parental education level and adolescent depression: a multi-country meta-analysis," *Journal of Affective Disorders*, vol. 347, no. 2, pp. 645–655, Feb. 2024, doi: 10.1016/j.jad.2023.11.081.
[23] Y. Xin and L. Yu, "The influence of parents' educational expectations on children's development: the chain mediation role of educational anxiety and parental involvement," *Behavioral Sciences*, vol. 14, no. 9, p. 779, Sep. 2024, doi: 10.3390/bs14090779.
[24] F. Tan, Y. Cheng, Y. Yuan, X. Wang, and B. Fan, "Comprehensive comparison of two models evaluating eco-environmental quality in Fangshan," *Heliyon*, vol. 10, no. 7, p. e29295, Apr. 2024, doi: 10.1016/j.heliyon.2024.e29295.
[25] J. Kunchai, "Impact of demographic backgrounds by humanities and social sciences students on their psychological of emotional intelligence skill: structural equation multiple cause and multiple indicator (SEM-MIMIC) model," *International Journal of Sociologies and Anthropologies Science Reviews*, vol. 4, no. 4, pp. 605–624, Aug. 2024, doi: 10.60027/ijsasr.2024.4053.
[26] D. Li, W. Li, and X. Zhu, "Parenting style and children emotion management skills among Chinese children aged 3–6: the chain mediation effect of self-control and peer interactions," *Frontiers in Psychology*, vol. 14, Sep. 2023, doi: 10.3389/fpsyg.2023.1231920.
[27] D. O. Gómez, C. D. Herrera, and C. E. Elias, "Emotional competencies and psychological well-being of educational science professionals: integrating quantitative and qualitative methods," *Frontiers in Education*, vol. 10, Oct. 2025, doi: 10.3389/feduc.2025.1647597.
[28] T. B. A. Tuncdemir, "Integrating social-emotional learning through play: perspectives from early childhood educators," *Journal of Research in Childhood Education*, pp. 1–19, Oct. 2025, doi: 10.1080/02568543.2025.2567504.
[29] R. Hosokawa, Y. Matsumoto, C. Nishida, K. Funato, and A. Mitani, "Enhancing social-emotional skills in early childhood: intervention study on the effectiveness of social and emotional learning," *BMC Psychology*, vol. 12, no. 1, p. 761, Dec. 2024, doi: 10.1186/s40359-024-02280-w.
[30] M. Munadi and Khuriyah, "The extracurricular activities and student development of secondary school: learning from Indonesia," *International Journal of Education and Practice*, vol. 11, no. 1, pp. 23–34, Jan. 2023, doi: 10.18488/61.v11i1.3245.
[31] U. Usri, S. Saparuddin, S. Bani, A. Abdullah, and H. Lambe, "The contribution of Islamic School as media of developing nation culture," *Al-Musannif*, vol. 3, no. 1, pp. 53–66, Jun. 2021, doi: 10.56324/al-musannif.v3i1.56.
[32] Ruhiat and A. Suradika, "Correlation between parent's educational background with student English achievement," *The Social Perspective Journal*, vol. 1, no. 3, pp. 168–176, Apr. 2022, doi: 10.53947/tspj.v1i3.137.
[33] S. M. Barokah and M. N. Wangid, "Non-violent Islamic elementary school: child-friendly schools in inclusive classes during the covid pandemic," *Al-Bidayah: Jurnal Pendidikan Dasar Islam*, vol. 13, no. 1, pp. 145–166, Aug. 2021, doi: 10.14421/al-bidayah.v13i1.606.

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