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Research Paper

Influence of Group Active Play on Social Skill and Emotion Regulation in Children With Hearing Impairment

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ABSTRACT

Objective: Hearing impairment is one of the sensory problems in children that affects various aspects of their lives and impacts their social skills (SS) and emotion regulation (ER).Research indicated that active play has a crucial role in children's social and emotional development. In this regard, the present study aims to investigate the effectiveness of group active plays (GAP) on the SS and ER of children with hearing impairment.

Methods: This quasi-experimental study involved a pre-test/post-test design with a two-month follow-up. The participants included 7 to 12-year-old boys with hearing impairment enrolled in the deaf-hearing impaired schools (2022-2023). Thirty children were randomly assigned to an experimental group (n=15) and a control group (n=15). The experimental group participated in 12 interventional sessions, while the control group had the regular school program. Both groups completed SS and ER questionnaires (including before and after the intervention, and two months after the intervention [follow-up]). The data were analyzed using analysis of variance (ANOVA) with SPSS software, version 25.

Results: The results of this study indicated a significant difference between the control and experimental groups in SS (P<0.002). GAP also had a significant effect on ER (P<0.001). Moreover, it had a significant effect on liability/negativity which was one of the components of ER (P<0.022).

Conclusion: Based on the obtained results, it can be concluded that the implemented intervention (GAP) helped to improve SS, ER, and its component (liability/negativity) in children with hearing impairment. Coaches, teachers, and therapists can take steps to enhance SS and ER in children with hearing impairment by implementing GAP.

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Highlights

- Significant effect of group active play (GAP) on Social skill (SS) of children with hearing impairment.
- GAP had a positive effect on the Emotion regulation (ER) of children with hearing impairment.
- The effectiveness of GAP on the liability/negativity of children with hearing impairment was shown.

Plain Language Summary

Children with hearing impairments usually experience social and behavioral or emotional problems that can lead to some psychological health problems. The role of play, especially active play, can be vital in the children's development. Play is the first motor behavior that children eagerly engage in and by play children learn how to interact with the external world and acquire skills in engaging with others. The relationship between cognitive-motor development and the social development of individuals is shown in different studies. Play also is associated with Emotion regulation (ER) and behavior and plays are used in interventions as a central tool for treating problems and disorders of childhood. Active and group plays provide opportunities for communication, and interaction and promote the development of SS. In interaction with others, our emotions are formed, and interpersonal experiences shape us. The results of the present study suggest that to improve SS and ER of children with hearing impairment, group active play (GAP) can be planned and implemented in their school or treatment programs.

Introduction

Children with hearing impairments may experience social and behavioral problems. Around 50% of deaf individuals are exposed to educational and rehabilitation programs. Hearing impairment is a crucial factor in the emergence of a wide range of psychiatric disorders, such as anxiety, depression, and some other mental disorders (Nian et al., 2024). The negative impact of this disorder can complicate an individual's performance (Baradaran & Abdollahzadeh Rafi, 2021; Jiang et al., 2020). It also affects the emotional and social skill (SS) of these children and causes more difficulties in their relationships. Children with hearing impairment demonstrate lower levels of social participation. Reduced hearing ability is one of the factors for reduced social participation in children (Aggarwal et al., 2024). Improving SS in this population can lead to the alleviation of psychological problems, stress, and aggression, ultimately contributing to the overall mental well-being of individuals with hearing impairment (Nurani & Pratiwi, 2020).

Today's mechanized life has limited children's vibrant activities, which are considered essential elements of their lives (Al Shloul et al., 2024). The development of many human abilities begins in childhood, and the role of play can be vital in this process. Play is the first motor behavior that children eagerly engage in (Badrotaleyi, 2019). It is a tool through which children learn how to interact with the external world and acquire skills in engaging with others. The role and impact of learning through play were investigated. The pedagogies that align closely with learning through play are those that arise from learning theories, such as active learning, discovery learn-ing, collaborative and cooperative learning, experiential learning, problem-based learning, and Montessori education (Parker & Thomsen, 2019). Play helps children become human, and it is not just childish entertainment (Al Shloul et al., 2024).

The benefits of play are significant and extend beyond the physical health advantages. Play has been widely recognized as an essential part of human development and has been acknowledged by the United Nations High Commissioner for Human Rights as a fundamental right of every child (Akay, 2023). Although there is no consensus among scholars regarding a comprehensive definition of "play", common features of playful behaviors include voluntary choice, personal agency, intrinsic motivation, self-directedness, and enjoyment (Nurani & Pratiwi, 2020). Piaget (Piaget, 1983) believed that play may be of crucial importance in children's cognitive development. His theories about learning focused on children's needs to explore and experiment for themselves. For Vygotsky (Vygotsky, 1987), play was not only critical for an individual's cognitive development but also for the social and cultural aspects. Active play involves activities that significantly exceed the level of bodily

maintenance during rest. Active play occurs sporadically and with frequent rest periods. However, recent research has shown that active play is associated with moderate to vigorous physical activity (Cheng & Bololia, 2023).

Scientific studies in this field have referred to the relationship between cognitive-motor development and the social development of individuals (Lavega et al., 2014). SS is a set of purposeful behaviors that are context-dependent and under individual control (Darling et al., 2020). Acquiring SS is one of the fundamental elements of socialization for humans in all cultures (Cheng & Bololia, 2023).

Group plays strengthen the collective spirit of children and teach them the necessary skills for social interactions (Mukela, 2020). In group plays, it is necessary for goals to be clear and roles to be coordinated. Play is associated with ER and behavior. Play therapy is a type of therapeutic intervention in which plays are used as a central tool for treating problems and disorders of childhood. Studies on older children have shown that improving mood and emotion is associated with physical and bodily activities (Lavega et al., 2014). Active play can improve many aspects of emotional well-being, such as reducing anxiety, depression, aggression, and sleep problems. Additionally, in adults, physical activity can reduce symptoms of depression and improve cognitive and emotional skills (Zheng et al., 2021). In group plays, children learn cooperation and empathy towards their peers, as well as developing decision-making and problem-solving skills. They realize that winning in a play is not the vital aspect and that fair play and sportsmanship are essential during play interactions (Soto et al., 2024). Group plays can also be beneficial in creating meaningful connections and penetrating the emotional world of children. The utilization of group plays for the growth of deaf and hard-of-hearing children is employed in various areas, such as speech, thinking, learning, academic, emotional, social, and addressing their major issues (Stefanica et al., 2024).

The importance of physical activity and exercise, as well as improving physical health and enhancing emotional well-being, cannot be overstated. It plays a significant role in boosting self-esteem, increasing self-confidence, improving cognitive and emotional skills, and reducing social problems, behavioral issues, academic difficulties, social withdrawal, and social exclusion (Jiang et al., 2020). When interacting with others, our emotions are constantly shaped and influenced by our interpersonal experiences. Most of the time, regulating emotions and emotional behaviors is essential for healthy social relationships (Mulyana et al., 2024).

Active and group plays provide opportunities for communication and promote the development of SS (such as cooperation, problem-solving, and empathy) in individuals, both with and without hearing impairments (Orel & Calik, 2024). When interacting with others, our emotions are constantly forming, and interpersonal experiences shape us. Even though the importance of active playing is known to many people, children prefer playing computer games and they may not know about the negative mental and physical outcomes of those plays. Parents, schools, and professionals should consider and plan for active plays in children's daily activities. Hear-ing impairment affects a person's communication, be-havior, and motor development, and limited physical activity, affects the health condition and psychological state of an individual. Even though some studies (Tzanetakos et al., 2017) investigated the effect of some computer games in which children with hearing impairment should do physical activities, most looked at the impact of active play on developing emotional skills and emotional intelligence in children without disabilities and less on children with some kinds of disorder. Also, many studies are not conducted about effect of traditional group active plays (GAP), especially on children with disability. Therefore, this study attempted to investigate; can group active play be effective in the improvement of SS and emotional regulation in children with hearing impairment?

Materials and Methods

The present study was a quasi-experimental pre-test, post-test design with a control group and an 8-week follow-up. The statistical population included all male students with hearing impairments (deaf) aged 7-12 who were studying in schools for students with deafness and hard of hearing (in Karaj City, Iran). Two schools were selected. To detect the optimum sample size, considering a confidence level of 80%, a margin of error of 5%, and referring to the study (Rajabian Dehzireh et al., 2019), the sample size was calculated to be 11 and by inspecting participants' drops, 30 students were entered in the study. They were randomly placed in experimental and control groups (15 students in each group). The inclusion criteria included boy students with hearing impairments (deaf), not having any mental or physical disorders (observable and stated in their documents), and having parental consent. The exclusion criteria included having more than three consecutive absences and not being willing to continue the sessions in which no one was excluded from the study.

Study measures

SS rating system (SSRS)

The SS rating system (Garsham & Elliot, 1990) is an assessment of students' social behavior. Based on the rater's perception of the frequency of the behavior, each item in the scale is rated on a 3-point frequency scale (0=never, 1=sometimes, and 2=very often). The Cronbach's α coefficient was reported to be0.94. Shahim recorded the Cronbach's α coefficient of 0.86 for Garsham and Elliot scale in students with hearing impairment.

Emotion regulation (ER) checklist

ER checklist (Shields & Cicchetti, 1997) includes 24 items describing behaviors, the frequency of which is evaluated on a four-point Likert scale (1=never to 4=almost always). The items are distributed in two scales: ER and emotional liability/negativity. The Cronbach's α coefficient was reported to be 0.76 and 0.69 for negativity/liability and ER (Shafietabar et al., 2020).

Procedure

To implement this research, after receiving the ethical from the university, and coordinating with the Department of Exceptional Education, two boys' schools for children with deafness were introduced. One of the schools was randomly selected for the experimental group (15 individuals divided randomly into two or three teams according to the type of play) and another one for the control group. In a session, the importance and position of this research were explained to the parents of students, and the intervention plans and goals were explained to them. Also, it was mentioned that they could choose their children to participate or not and were not forced to join. With their approval, the written consent form was obtained from the parents. With the help of school's counselor, they were given the Griffiths and Elliott SS questionnaires, as well as the Shields and Cicchetti ER parent forms to complete (pre-test). They were instructed on how to answer the questionnaires. For the intervention, in the first stage, necessary explanations regarding the implementation of the plays were given to the students through lip-reading and sign language methods. Also, initial training was provided to enhance security aspects. Then, with the consent of the physical education teacher and the school principal, GAP was implemented during the physical education period for the experimental group two times a week for an hour, while the control group received no intervention. The researcher who was a special teacher instructed and supervised the plays as a facilitator. The group plays used by Ilchizadeh et al. (2021), Foroozanfar, (2014) and those in the book of traditional plays for children and adolescents (Badrotaleyi, 2014) were considered for the intervention. They were revealed by hearing-impaired teachers and university professors and some of them were selected to apply. The aims, descriptions of plays, practices, and activities of intervention sessions are addressed in the Appendix 1.

After the intervention, with the help of schools counselor the parents of both the experimental and control groups completed the Griffiths and Elliott sensation seeking scale (SSS) questionnaires and the Shields and Cicchetti ER as a post-test. Additionally, two months after the post-test, both questionnaires were completed as follow-up by the parents of the participants.

Data analysis

The present study used SPSS software, version 24 for data analysis. Also, descriptive statistics (Mean±SD) and inferential statistics, including covariance test, were used.

Results

Table 1 presents the demographic characteristics of participants. The number of students in the experimental group for 11-12 years old was highest with 7 students and the control group for 9-11 with 7 students.

In Table 2, the results showed that the mean of the SS in the pre-test was 43.73 for the experimental group, and it increased to 48.06 in the post-test and 46.93 for the follow-up. The mean score of emotional regulation in the pre-test for the experimental group was 43.33, and it increased to 48.73 in the post-test and 47.53 in the follow-up. However, no significant change was observed in the emotional regulation scores in the post-test and follow-up assessments of the control group.

In Table 3, the results indicated that the significance values for both variables are smaller than the significance level of 0.05, indicating that the reported difference in the hypothesis is significant. Additionally, the squared eta (effect size) indicated the influence of time and group variables on the improvement of SS in hearing-impaired students, with the effect size for the combined time and group variable being 0.120, indicating that 12% of the changes in the variable of social relationships are due to the simultaneous effect of these variables. Furthermore, the effect size for the combined time and group variable for emotional regulation is 0.193, indicating that 19.3%

Table 1. Frequency distribution of the age of students with deafness

Groups	No. (%)			Total
	Age (y)			
	7-9	9-11	11-12	
Experimental	5(33.3)	3(20.0)	7(46.7)	15(100)
Control	3(20.0)	7(46.7)	5(33.3)	14(100)

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Table 2. The Mean±SD scores for pre-test, post-test, and follow-up

Stages	Groups	Mean±SD	
		SS	ER
Pre-test	Experimental	43.73±20.69	43.33±12.31
	Control	36.67±15.38	48.47±10.38
Post-test	Experimental	48.06±20.67	48.73±10.56
	Control	40.27±15.27	48.23±10.27
Follow-up	Experimental	46.93±17.45	47.53±12.06
	Control	39.73±12.84	50.01±8.60

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of the changes in the emotional regulation variable are due to the simultaneous effect of this variable. In the variable of liability/negativity, the significance values of period and group are 0.022, which are smaller than the significance level of 0.05, indicating that the reported difference in the hypothesis is significant, and active plays have had an impact on the mean liability/negativity. The squared eta (effect size) indicates the influence of time and group variables on the liability/negativity variable. The effect size for the combined time and group variable shows that 12.7% of the changes in the liability/negativity variable are due to the simultaneous effect of these variables.

Table 3. Inter-group changes

Variables		SS	df	MS	F	Sig.	Partial ETA Squared
Time	SS	142.489	2	71.244	6.17	0.004	0.181
	ER	155.356	2	77.678	9.540	0.000	0.254
	Inliability/negativity	142.489	2	71.244	10.303	0.001	0.269
Time×group	SS	88.267	2	44.133	3.822	0.028	0.120
	ER	109.356	2	54.678	6.715	0.002	0.193
	Inliability/negativity	56.267	2	28.133	4.068	0.022	0.127
Time error	SS	646.578	56	11.546	-	-	-
	ER	125.266	56	2.24	-	-	-
	Inliability/negativity	387.244	56	6.915	-	-	-

SS: Sum of squares; MS: Mean squares.

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Discussion

The results of the present study indicated that group active play had a significant effect on SS of students and also those with hearing impairments which is consistent with the results conducted by Hartanto et al., (2021); Ilchizadeh et al., (2021) and Yazdani-Pour and Yazdkhasty. (2012). Some studies focused on the effectiveness of group play on SS and the impact of indigenous-local plays on aspects of social growth and mental health in students, showing social and mental improvements. Hartanto et al.'s study, with a large sample of elementary school students, investigated the effectiveness of indigenous-local plays on SS development, confirming the effectiveness of indigenous-local plays on SS of students. One of the influential factors in enhancing SS is observational learning, where children improve their behavioral patterns by observing the SS of others and modeling their communication and social abilities (Hartanto et al., 2021). Approximately 90% of children with hearing impairments come from families whose primary communication tool is speech, leading these children to experience isolation and lose early natural verbal communication, negatively affecting their speech and communication skills. As a result, they tend towards visual stimuli and computer plays for communication (Nadertabar et al., 2017). Some studies indicate participation in physical activities is associated with greater social integration, such as building friendships and enhancing social skills in children (Su et al., 2018). The benefits are vital for children and adolescents with disabilities (Shields & Synnot, 2016) and those with hearing impairment (Wenhong et al., 2020). In the present study, the instructor used sign language and lip reading to teach the students the rules and process of playing in the group and guide them through it. Thus, group plays allowed students to observe the group interactions and modeling, leading to the enhancement of children's SS.

Furthermore, the results of this study in terms of ER were consistent with Yazdani-pour & Yazdkhasti (2012), Hansen Sandseter et al., (2023); and Thompson et al., (2019). Hansen Sandseter et al. (2023) researched risk plays in ER, social functioning, and physical health of children which examined six domains of risky plays and showed promising results in terms of effective regulation, and social and physical health. According to the theory of emotion-focused therapy, two processes of arousal and appraisal, which are processed in the right and left hemispheres of the brain, are influential in emotional experiences. Additionally, a brain region called the amygdala plays a significant role in ER. It processes emotional cues based on facial expressions and assists in regulating emotions in individuals. In the present study, it is likely that children with hearing impairments improved their ER through receiving facial expressions in group plays and the effective role of the amygdala in processing emotional cues based on facial change (Thompson et al., 2019).

Active plays have been shown to have a positive impact on reducing negativity/ liability in students with hearing impairments. These results are consistent with the study conducted by Luchoro-Parrilla et al. (2021) on the effectiveness of traditional sports plays in emotional regulation. They indicated that the emotions of children and adolescents who participate in physical activities have significantly improved compared to those who did not participate in physical activities. The involvement of children and adolescents in physical activities is associated with positive emotions. Currently, four different explanations exist in the field of medicine for the impact of physical activities on the emotions of children and adolescents. One perspective focuses on enjoyment and suggests that children and adolescents who experience a diversion from undesirable stimuli during physical activities have a significant improvement in their emotions during and after the activity (Luchoro-Parrilla et al., 2021). Another perspective emphasizes self-efficacy and suggests that physical activities can be considered challenging activities. Regular physical activities may improve emotions and increase self-confidence. The third perspective focuses on social interactions and refers to the presence of social relationships associated with physical activities. Mutual support among individuals participating in physical activities plays a significant role in influencing positive emotions. Therefore, group plays with the rule of inclusiveness at each stage of the activity help reduce the components of liability negativity in regulating emotions in children (Yazdani-pour & Yazdkhasti, 2012).

Conclusion

The present study supports some positive effects of active play intervention on enhancing SS of students with hearing impairment. Additionally, the GAP had been effective in enhancing adaptive emotion and reducing negativity/liability in these students. The schools can plan for active plays to be in the physical education classes for children.

Usually, every research has limitations. One limitation was that two instruments were used in which parents were completed. Also, the study lacked a trained observers or specific instruments to assess the teachers' work.

Future work can concentrate on other groups of children. Also using different instruments completed by self or teachers and considering other aspects of emotions and SS can contribute to these areas. Assessing teacher or trainer's work can be addressed in future studies.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of University of Social Welfare and Rehabilitation Sciences, Tehran, Iran (Code: IR.USWR.REC.1401.159).

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Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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Appendix 1. Sessions and description of activities

Title	Activities
Initial assessment	1. In this session, the impact of hearing problems on social skills and emotional regulation was discussed, highlighting the importance of research work and its influence on the social skills and emotional regulation of children with hearing impairment. The consent forms were collected, and pre-test questionnaires were completed by students.
Play window	2. This play focused on children's motor skills and jumping ability The children were divided into two groups for the play. One group sat on the ground, while the other group jumped over obstacles. The members of the sitting group placed their right foot's palm on the left foot's palm, and the members of the opposing team jumped over it. In the next stage, they placed their right hand's palm on their foot and palm, and the members jumped over it. In the following stage, they placed their left hand's palm on their foot and hand, and the members of the opposing team jumped over it. The objective was for each player to avoid being touched by the jumping team members, and anyone who was touched would lose
Play Tissue	3. In this team play, agility and increasing reaction speed are crucial. The play was divided into two teams, and in front of each team, a starting point and a finish line were observed three meters apart. Each team had a handkerchief, and the first person would carry it from the starting point to the finish line and then return to the starting point, handing the handkerchief to their teammate. This process continued until all team members covered the distance. The team that completed the process faster would be the winner
Play Boneh (Tug of war)	4. This team play promotes the development of motor skills, strengthening of hand muscles, agility, and fostering a sense of collaboration. In this play, the participants were divided into two teams. The members of the first team held the right side of a long rope, while the members of the second team held the other side. They would start pulling the rope in opposite directions. The team that crossed the center line would lose the play.
Playing Vasati	5. This play can improve accuracy, attention, and concentration, along with increased hand muscle skills In this team play, the players are divided into two teams. The members of the first team are positioned at the ends of a line, while the members of the second team are positioned in the middle. The members who are positioned at the ends of a line try to hit the members of the other team in the middle with a ball and send them out of play, while the members in the middle try to catch the ball and not going out of play.
Play seven stones	6. This play helps strengthen hand muscles, improve accuracy, attention, and focus by hitting the target. In this play, the players are divided into two teams. One group stands behind the rocks (seven rocks stacked together), while the other group hits the rocks from a distance with a ball. If the ball hits the rocks, the players behind the rocks target the players from the opposing team with the ball. The person who gets hit by the ball on their body is eliminated from the play.
Play kabaddi	7. This play enhances agility, communication skills, and emotional management. In this play, the players are divided into two teams. The members of one team stand on one side of a line, while the members of the other team stand on the opposite side. A "tagger" is determined through a lottery, and they run toward the opposing team while saying a specific word. Anyone they touch is eliminated from the play. If the tagger is caught by the opposing team, they are also eliminated from the play.
Play tissue 1	8. This play helps enhance sensory perception, accuracy, attention, and focus. In this play, the players form a circle, and one person is chosen in the center of the circle through a lottery. The person in the center has their eyes blindfolded, and a handkerchief is placed in the hand of one of the group members. The person in the center, guided by another person, must try to catch the individual holding the handkerchief.
Play spin the mill	9. In this play, concentration, balance, social skills, and emotional regulation improve. In this way, the players formed a circle, held each other's hands, and with the help of the coach, they sang a poem. Whenever the coach signaled, they would sit down, and with the coach's signal, they would stand up and recite the poem with the coach's help. (The mill turned and the members turned, the mill sat and the members sat, the mill stand on one foot and the members responded, "I won't stand up", the coach replied, "For the sake of Aunt's life", the members responded, "I won't stand up", the coach replied, "For the sake of Aunt's sister's life", the members responded, "I won't stand up", and the coach replied, "For the sake of the car's ignition", the members responded, "I won't stand up", and the coach replied, "Please, for God's sake", and the members stood up, and the coach said, "The mill, go to sleep", and the members lowered their heads, and the coach said, "The mill, build a chair", and the members raised one of their legs, and the coach said, "The grinder, turn", and the members turned).
Play throwing stones	10. This play helps strengthen hand muscles and improves hand-eye coordination and timing. In this play, the players are divided into two teams, and a stone is designated as the target. The members of each team take turns throwing a ball at the stone. The team whose members successfully hit the stone with the ball wins.
Play rubber band	11. This play helps improve agility skills, and jumping ability and enhances communication. In this play, the players are divided into two teams. Two members of Team A stand side by side with a one-meter gap between them, and a high rope is placed around their ankles, forming an obstacle. The members of the opposing team jump over this rope. In each round, the height of the rope is increased, and anyone whose foot touches the rope is eliminated from the play.
Play tag	12. This play includes increasing reaction speed, flexibility, endurance, and muscle strengthening. In this play, the players randomly choose one wolf among themselves, and the remaining members scatter in an open space. The wolf chases the other players, and anyone who is touched by the wolf becomes a wolf themselves, while the original wolf reverts to being a regular player.

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