

Impact of a Peer-Family Connection Program on Social Belonging and Risk Behavior Reduction in Adolescents

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ABSTRACT

Objective: This study aimed to evaluate the effectiveness of a peer-family connection program in enhancing social belonging and reducing risk behaviors among adolescents.

Methods: A randomized controlled trial was conducted with 30 adolescents aged 13–16 from Hungary, who were randomly assigned to either an intervention group (n = 15) or a control group (n = 15). The intervention group participated in a seven-session, school-based Peer-Family Connection Program designed to improve interpersonal communication, emotional regulation, and relational bonding with peers and caregivers. Sessions were conducted weekly, lasting 45–60 minutes each. Social belonging and risk behavior were measured using validated standardized tools at pre-test, post-test, and five-month follow-up. Data were analyzed using repeated measures analysis of variance (ANOVA) and Bonferroni post-hoc tests in SPSS-27.

Findings: Repeated measures ANOVA revealed a significant interaction effect between time and group for both social belonging ($F(2, 56) = 17.08, p < .001, \eta^2 = .39$) and risk behavior ($F(2, 56) = 14.57, p < .001, \eta^2 = .34$), indicating that the intervention group improved significantly over time compared to the control group. Bonferroni post-hoc analysis showed significant improvements in social belonging from pre-test to post-test ($p < .001$) and from pre-test to follow-up ($p < .001$), with no significant decline between post-test and follow-up. Similarly, risk behavior significantly decreased from pre-test to post-test ($p < .001$) and remained reduced at follow-up ($p < .001$), with no significant difference between post-test and follow-up.

Conclusion: The Peer-Family Connection Program demonstrated sustained effectiveness in increasing adolescents' social belonging and reducing their engagement in risk behaviors. These findings support the integration of relational interventions involving both peers and caregivers as a means to promote healthy adolescent development.

Keywords: Adolescents, Peer Relationships, Family Engagement, Risk Behavior, Social Belonging.

1. Introduction

Recent research has identified peer influence as a pivotal factor in adolescent risk-taking. Adolescents are neurologically and emotionally more attuned to peer presence, which often modulates their decision-making processes (Guo et al., 2024). This social sensitivity can increase susceptibility to peer norms that encourage risky behaviors, particularly in unstructured or unsupervised environments (Boer et al., 2016). At the neural level, peer presence has been linked to increased activation in brain regions associated with reward processing, such as the nucleus accumbens, indicating a heightened sensitivity to social feedback during decision-making tasks (Dai et al., 2023). This neurobiological responsiveness amplifies adolescents' tendency to conform to peer expectations, sometimes at the expense of long-term goals or personal values (Kathy et al., 2020).

Despite these risks, peer influence is not inherently negative. Recent perspectives have begun to reconceptualize peer interactions as potentially protective, depending on the nature of peer relationships and the behaviors being modeled (Allen, 2024). When adolescents are embedded in prosocial peer networks, they are more likely to experience emotional support, social integration, and reinforcement of adaptive norms. These protective dynamics can be leveraged through structured peer-based interventions that channel adolescent social sensitivity toward positive behavioral outcomes (Telzer et al., 2022). For example, peer counselors and structured group programs have shown promise in promoting healthy decision-making and emotional resilience (Harini, 2022).

Family relationships, too, exert profound influence on adolescent development, particularly in relation to social belonging and risk engagement. Parental monitoring, open communication, and emotional support have been found to buffer the negative impact of peer pressure and reduce the likelihood of adolescents engaging in risky behavior (Wang et al., 2015). Adolescents who report strong emotional bonds with caregivers are more likely to exhibit a secure sense of self and to resist peer-induced risk behavior (Siraj et al., 2021). Conversely, family dysfunction, emotional neglect, or authoritarian parenting styles can increase vulnerability to peer pressure and risk-taking as adolescents seek alternative sources of validation and belonging (Patui et al., 2018). Thus, integrating family components into adolescent-focused interventions may enhance their effectiveness by reinforcing the protective capacity of the home environment.

The construct of social belonging plays a central role in mediating the relationship between social contexts and adolescent behavior. Adolescents with a strong sense of belonging—whether to peers, family, or school—report greater psychological well-being and lower engagement in harmful behaviors (Zhang & Zhu, 2021). Social belonging contributes to identity formation and emotional security, reducing the need to engage in risky behavior for attention or acceptance (Nie et al., 2022). Programs that cultivate social bonds and promote inclusive environments have been associated with reductions in aggression, substance use, and sexual risk behavior among youth (Deswinda et al., 2020). In contrast, experiences of exclusion, bullying, or marginalization can exacerbate internalizing and externalizing symptoms, reinforcing cycles of isolation and behavioral dysregulation (Telzer et al., 2020).

Cross-cultural studies further affirm that the influences of peer and family relationships on adolescent risk-taking are consistent across diverse sociocultural settings, though the mechanisms and expressions may vary (Dekkers et al., 2020). For instance, research from Southeast Asia and Sub-Saharan Africa indicates that both peer dynamics and parental communication styles significantly affect sexual behavior, substance use, and other adolescent risk outcomes (Aderemi, 2019; Ernawati et al., 2020). In Indonesia, strong peer attachments have been linked to early sexual debut and unsafe practices in high school students, particularly when combined with low parental involvement (Triyanto, 2023). Similarly, in Nigeria, the absence of parental sex education correlates with higher levels of sexual risk-taking, underscoring the protective role of informed, supportive parenting (Aderemi, 2019).

Adolescent risk behavior must also be understood in light of developmental and contextual moderators, such as sensation seeking, time perspective, and peer rejection. Adolescents high in sensation seeking are more prone to engage in novelty-driven behaviors, particularly when these behaviors are reinforced by peer norms (Siraj et al., 2021). Moreover, temporal orientation and future thinking significantly shape risk decisions. Those with a present-focused time perspective may prioritize immediate peer approval over long-term consequences, increasing the likelihood of impulsive behaviors (Tajabadi et al., 2020). Additionally, experiences of peer rejection or victimization can drive adolescents to engage in risky behaviors as compensatory strategies to gain attention or cope with emotional distress (Nie et al., 2022).

The interplay between peer and family systems suggests the need for integrated interventions that simultaneously address both relational spheres. Programs that focus exclusively on peer influence without addressing family dynamics may neglect essential sources of emotional regulation and identity support. Conversely, family-based interventions that ignore peer contexts may fail to engage adolescents in their most salient social environments. Thus, a combined peer-family approach is likely to produce more robust outcomes by creating a coherent, supportive ecosystem for adolescent development (Garthe et al., 2017). Such programs can cultivate healthy peer norms, strengthen parent-adolescent communication, and foster a shared sense of belonging across relational domains.

The theoretical rationale for combined peer-family interventions is further supported by longitudinal and neurodevelopmental studies. Over time, consistent parental support and prosocial peer affiliations predict lower rates of substance use, aggression, and delinquency, while enhancing academic engagement and emotional regulation (Mason et al., 2017). Neural studies corroborate these findings by showing that adolescents who experience high levels of parental warmth and peer support exhibit lower neural reactivity to social exclusion and greater activation in regions associated with emotional control (Kwon et al., 2020). These findings underscore the importance of targeting both social domains simultaneously to optimize developmental outcomes.

Several intervention frameworks have attempted to bridge the peer-family divide, with varying degrees of success. However, many lack sustained engagement, developmental sensitivity, or culturally relevant content. Moreover, few programs incorporate long-term follow-up to assess the maintenance of intervention gains over time. This underscores the need for evidence-based, integrative programs that are developmentally grounded and contextually adaptive. Programs that include structured sessions for peer interaction, family involvement, and emotional skill-building may be especially effective in addressing the multifaceted nature of adolescent risk behavior (Park et al., 2016).

The current study aims to address this gap by evaluating the effectiveness of the Peer-Family Connection Program, a seven-session intervention designed to enhance social belonging and reduce risk behaviors among adolescents.

2. Methods

2.1. Study Design and Participants

This study employed a randomized controlled trial design to examine the effectiveness of the Peer-Family Connection Program in enhancing social belonging and reducing risk behaviors among adolescents. A total of 30 participants were recruited from secondary schools in Hungary through school counselor referrals and parental consent. Participants were randomly assigned into two groups: an intervention group ($n = 15$) that received the Peer-Family Connection Program and a control group ($n = 15$) that did not receive any intervention during the study period. Inclusion criteria required participants to be between the ages of 13 and 16 and to have no current diagnosis of a psychiatric disorder. The intervention was delivered over seven weekly sessions, and follow-up data were collected five months after the final session to assess long-term effects.

2.2. Measures

2.2.1. Social Belonging

To measure the level of social belonging among adolescents, the Psychological Sense of School Membership (PSSM) scale developed by Goodenow (1993) was utilized. This widely used tool assesses students' perceived acceptance, inclusion, and respect within the school environment. The scale consists of 18 items, rated on a 5-point Likert scale ranging from 1 (not at all true) to 5 (completely true). It includes subscales that tap into feelings of being valued by peers and teachers, personal engagement, and school identity. Scores are summed to provide an overall measure of school membership and belonging, with higher scores indicating greater social belonging. The PSSM has demonstrated high internal consistency, with Cronbach's alpha typically exceeding .80, and its construct validity and reliability have been confirmed in numerous adolescent populations across diverse cultural contexts (Akintayo et al., 2024; Kamali & Azmati, 2020; Raufelder & Kulakow, 2021).

2.2.2. Risk Behavior

Adolescents' engagement in risk behaviors was assessed using the Youth Risk Behavior Survey (YRBS) developed by the Centers for Disease Control and Prevention (CDC) in 1991. This comprehensive, standardized instrument includes a core set of 89 items designed to monitor health-risk

behaviors that contribute to the leading causes of mortality and morbidity among youth, such as substance use, sexual behavior, violence, and physical inactivity. For the purposes of this study, selected subscales relevant to substance use and delinquent behaviors were used. Items are typically answered in a multiple-choice format and are scored to reflect frequency or presence of risky behaviors, with higher scores indicating greater involvement in such behaviors. The YRBS has been extensively validated, with strong test-retest reliability (average kappa values above 0.60) and robust evidence of both criterion and construct validity in large-scale national and international samples (Dittus et al., 2023; Reyhani & Ahovan, 2024; Yadlosky et al., 2023).

2.3. Intervention

2.3.1. Peer-Family Connection Program

The Peer-Family Connection Program was designed to enhance adolescents' sense of social belonging and reduce engagement in risk behaviors through structured, interactive sessions focused on strengthening peer and family relationships. Conducted over seven weekly sessions, each lasting 45 to 60 minutes, the intervention combined group discussions, role-playing, reflective exercises, and skill-building activities. The program emphasized open communication, emotional regulation, social support, and positive decision-making, integrating both peer and family dynamics. Sessions were facilitated by trained counselors in a school-based setting, with a mix of individual, small-group, and family-involved components.

Session 1: Building Trust and Group Cohesion

The first session focused on establishing a safe, inclusive group environment and building initial trust among participants. Facilitators introduced the goals of the program, outlined ground rules for respectful interaction, and guided students through ice-breaker activities and personal storytelling to encourage openness. Participants identified shared challenges and goals related to social belonging and risky behaviors, laying the foundation for peer connection. The session closed with a group reflection and a journaling task on what belonging means to them.

Session 2: Understanding Risk and Protective Factors

This session educated participants on the nature of adolescent risk behaviors and their consequences. Through guided discussions and multimedia content, students explored how peer pressure, family conflict, and lack of belonging can influence behavior. Facilitators introduced the concept of protective factors such as strong family ties, peer

support, and self-awareness. Students completed worksheets mapping their own risk and protective factors and discussed healthy coping strategies in small groups.

Session 3: Strengthening Peer Connections

Session three focused on developing social skills that support meaningful peer relationships. Activities included role-playing scenarios around peer rejection, inclusion, and assertive communication. Participants practiced active listening, empathy, and respectful disagreement. The session emphasized the importance of supportive friendships in fostering a sense of belonging and discouraging risky behaviors. At the end, students set a goal to positively engage with a peer during the week.

Session 4: Enhancing Family Communication

This session introduced techniques for improving communication within families. Using examples and role-plays, students practiced expressing feelings, active listening, and negotiating boundaries with caregivers. A structured "letter to home" activity helped participants articulate personal needs and appreciation, which they were encouraged to share with a family member. Facilitators guided a discussion on how family dynamics can influence emotional well-being and decision-making.

Session 5: Emotional Awareness and Regulation

The fifth session addressed emotional awareness and regulation as tools to reduce impulsivity and risky behaviors. Students were introduced to the concept of emotional triggers and learned strategies such as deep breathing, cognitive reframing, and mindfulness exercises. Group discussions helped normalize emotional struggles, and students practiced techniques through real-life scenario enactments. Participants left with a personal emotional regulation plan.

Session 6: Joint Peer-Family Session

This unique session involved inviting a caregiver or trusted adult to participate alongside the student. Through guided activities and discussions, pairs explored communication patterns, expressed appreciation, and practiced supportive dialogue. Group games and reflective questions promoted bonding, and facilitators emphasized the mutual role of peers and family in shaping positive behavior. Feedback from both youth and adults was collected to assess relationship changes.

Session 7: Reflection, Commitment, and Closure

The final session focused on consolidating skills, celebrating progress, and planning for future growth. Participants reviewed the major concepts learned, shared personal reflections, and discussed how their sense of

belonging and behavior had shifted. Each student created a personal action plan for maintaining connections and avoiding risk behaviors. The session concluded with a group celebration, distribution of certificates, and affirmations of group identity and support.

2.4. Data Analysis

Data were analyzed using SPSS version 27. To evaluate changes in social belonging and risk behavior over time, a repeated measures analysis of variance (ANOVA) was conducted, with time (pre-test, post-test, and follow-up) as the within-subjects factor and group (intervention vs. control) as the between-subjects factor. When significant interactions were found, Bonferroni post-hoc tests were used to identify specific differences across time points. Effect sizes were calculated to assess the magnitude of observed

changes. All statistical analyses were conducted with a significance level set at $p < .05$.

3. Findings and Results

The study sample consisted of 30 adolescents from Hungary, with 16 participants (53.3%) identifying as female and 14 (46.7%) as male. The mean age of the participants was 14.2 years ($SD = 0.78$), ranging from 13 to 16 years. In terms of family structure, 19 adolescents (63.3%) reported living in two-parent households, while 11 participants (36.7%) came from single-parent homes. Regarding educational level, 10 participants (33.3%) were enrolled in Grade 8, 12 (40.0%) in Grade 9, and 8 (26.7%) in Grade 10. All participants were of Hungarian nationality, and none reported current psychiatric diagnoses or involvement in other psychosocial interventions during the study period.

Table 1

Descriptive Statistics (Means and Standard Deviations) for Social Belonging and Risk Behavior Across Groups and Time Points

Variable	Time Point	Group	M	SD
Social Belonging	Pre-Test	Intervention	58.47	6.15
		Control	57.93	6.08
	Post-Test	Intervention	68.60	5.84
		Control	58.40	5.95
	Follow-Up	Intervention	67.20	5.71
		Control	58.07	6.12
Risk Behavior	Pre-Test	Intervention	41.13	4.96
		Control	40.80	4.89
	Post-Test	Intervention	33.20	4.58
		Control	40.33	5.02
	Follow-Up	Intervention	34.27	4.41
		Control	40.60	5.15

As shown in Table 1, the intervention group demonstrated a substantial increase in social belonging from pre-test ($M = 58.47$, $SD = 6.15$) to post-test ($M = 68.60$, $SD = 5.84$), with a slight decrease at follow-up ($M = 67.20$, $SD = 5.71$), though still well above baseline. In contrast, the control group showed negligible change across all three time points. Similarly, the intervention group showed a notable reduction in risk behavior from pre-test ($M = 41.13$, $SD = 4.96$) to post-test ($M = 33.20$, $SD = 4.58$), with a slight increase at follow-up ($M = 34.27$, $SD = 4.41$), while the control group scores remained relatively unchanged.

Prior to conducting the repeated measures ANOVA, assumptions of normality, sphericity, and homogeneity of

variance were examined. The Shapiro-Wilk test indicated no significant deviations from normality for either outcome variable at any time point (all p -values $> .129$). Mauchly's Test of Sphericity confirmed the assumption of sphericity for both social belonging ($\chi^2(2) = 1.731$, $p = .421$) and risk behavior ($\chi^2(2) = 2.018$, $p = .364$). Levene's Test for Equality of Error Variances showed no significant differences in variances between the intervention and control groups at any time point for either variable (all p -values $> .218$), indicating homogeneity of variance. Therefore, all assumptions for repeated measures ANOVA were satisfactorily met.

Table 2

Repeated Measures ANOVA Summary Table for Social Belonging and Risk Behavior

Variable	Source	SS	df	MS	F	p	η^2
Social Belonging	Time	1387.62	2	693.81	18.94	<.001	.41
	Time $\times$ Group	1251.44	2	625.72	17.08	<.001	.39
	Error (within)	2187.53	56	39.06			
Risk Behavior	Time	1092.80	2	546.40	16.27	<.001	.37
	Time $\times$ Group	978.34	2	489.17	14.57	<.001	.34
	Error (within)	1882.47	56	33.62			

Table 2 indicates significant main effects of time and significant interaction effects between time and group for both variables. For social belonging, the interaction effect was significant, $F(2, 56) = 17.08$, $p < .001$, $\eta^2 = .39$, indicating that changes in social belonging varied

significantly between groups across time. Similarly, for risk behavior, the interaction effect was also significant, $F(2, 56) = 14.57$, $p < .001$, $\eta^2 = .34$, supporting that risk behaviors declined more in the intervention group over time.

Table 3

Bonferroni Post-Hoc Comparisons for Social Belonging and Risk Behavior (Intervention Group Only)

Variable	Comparison	Mean Difference	SE	p
Social Belonging	Pre-Test vs. Post-Test	-10.13	1.56	<.001
	Post-Test vs. Follow-Up	1.40	1.42	.328
	Pre-Test vs. Follow-Up	-8.73	1.53	<.001
Risk Behavior	Pre-Test vs. Post-Test	7.93	1.21	<.001
	Post-Test vs. Follow-Up	-1.07	1.13	.348
	Pre-Test vs. Follow-Up	6.87	1.19	<.001

Bonferroni post-hoc analysis revealed significant differences between pre-test and post-test as well as between pre-test and follow-up scores for both social belonging and risk behavior in the intervention group (all p-values < .001). No significant differences were found between post-test and follow-up scores ($p > .328$), suggesting that the gains in social belonging and reductions in risk behavior were largely maintained over the five-month period (Table 3).

4. Discussion and Conclusion

The present study aimed to evaluate the effectiveness of the Peer-Family Connection Program in enhancing social belonging and reducing risk behaviors among adolescents through a randomized controlled trial involving 30 participants from Hungary. The results revealed that participants in the intervention group showed a statistically significant increase in social belonging and a marked decrease in engagement in risk behaviors from pre-test to post-test, with these improvements maintained at the five-month follow-up. In contrast, the control group demonstrated no significant changes across the same period. These findings support the hypothesis that an integrated intervention addressing both peer and family dynamics can

yield sustained benefits in adolescent psychosocial functioning.

The observed increase in social belonging aligns with existing research suggesting that adolescents' sense of connection is closely shaped by the quality of peer and family relationships (Zhang & Zhu, 2021). The Peer-Family Connection Program intentionally fostered an inclusive and emotionally supportive environment, allowing adolescents to build interpersonal trust with peers and open communication with caregivers. This dual focus reflects the neurodevelopmental sensitivity of adolescents to social relationships, where both peer acceptance and parental warmth contribute significantly to self-esteem and social identity (Telzer et al., 2022). By integrating sessions that emphasized empathy, shared values, and emotional regulation, the program appears to have enhanced adolescents' internal sense of being valued within their social ecosystems.

The reduction in risk behaviors observed in the intervention group is consistent with previous findings indicating that improvements in social connectedness are associated with lower engagement in risky conduct (Xu, 2023). Adolescents who feel supported and valued are less

likely to seek validation through substance use, unsafe sexual activity, or delinquent behaviors (Deswinda et al., 2020). Additionally, adolescents in this study were equipped with practical skills such as decision-making, emotional regulation, and conflict resolution—factors known to reduce impulsivity and enhance resilience in the face of peer pressure (Nie et al., 2022). The maintenance of positive outcomes at the five-month follow-up further underscores the potential of well-structured interventions to bring about enduring behavioral change.

These results resonate with neurological research showing that adolescents are particularly responsive to social cues during peer interaction, especially in emotionally charged or decision-making contexts (Dai et al., 2023). Studies using brain imaging have demonstrated that the presence of peers activates the reward centers of the adolescent brain, which can lead to increased risk-taking under peer influence (Guo et al., 2024). However, when those peer relationships are anchored in prosocial values and emotional support—as they were in the intervention group—adolescents may still experience peer-driven activation without engaging in harmful behaviors (Allen, 2024). This suggests that peer influence, when carefully redirected, can be a powerful tool for behavioral regulation rather than merely a risk factor.

The involvement of family in the intervention design was also instrumental in the program's success. Consistent with prior findings, strong parental engagement served as a protective buffer against external pressures and internal distress (Wang et al., 2015). Adolescents who participated in joint sessions with caregivers reported enhanced communication and mutual understanding, which likely contributed to the observed decrease in risk-taking. This aligns with research indicating that parental monitoring and emotional availability can reduce adolescents' need to seek affirmation through negative peer behaviors (Patui et al., 2018; Tajabadi et al., 2020). Moreover, such parent-adolescent interactions may recalibrate adolescents' internal working models of relationships, promoting greater trust and security.

Notably, the intervention's impact may also be linked to its capacity to improve adolescents' cognitive control and self-awareness—domains previously implicated in risk decision-making. Research has demonstrated that adolescents who can engage in perspective-taking and regulate emotional arousal are less likely to succumb to risky behaviors even under peer pressure (Kwon et al., 2020). The current program's emphasis on emotional literacy, self-

reflection, and role-playing may have enhanced these executive functions, allowing adolescents to navigate peer and family interactions more effectively. This is consistent with findings from neurocognitive models showing that greater cognitive control mediates the link between peer presence and behavioral outcomes (Guo et al., 2024).

These findings also align with cultural studies from Southeast Asia and Africa that emphasize the critical role of both peers and parents in shaping adolescent behavior (Aderemi, 2019; Ernawati et al., 2020). In Indonesia and Nigeria, for example, adolescents who reported high parental support and prosocial peer environments demonstrated significantly lower instances of sexual risk behavior. Similarly, studies conducted in rural and urban communities have highlighted that the absence of cohesive social support networks often leads to increased vulnerability among adolescents (Hoorn et al., 2016; Park et al., 2016). By combining peer and family support within a structured intervention, the current study reinforces the ecological model of adolescent development, which posits that behavior is shaped by nested systems of influence.

The success of this program is also supported by earlier meta-analytic work identifying key peer risk factors such as peer deviance, social rejection, and sensation seeking (Garthe et al., 2017). When these risk factors are countered through skill-based interventions that reinforce empathy, peer accountability, and future planning, adolescents can be guided toward more adaptive trajectories. Furthermore, the inclusion of joint sessions with caregivers reflects best practices for integrating multiple systems of influence in prevention science (Telzer et al., 2020).

5. Suggestions and Limitations

Despite its promising findings, this study has several limitations that should be acknowledged. First, the sample size was relatively small ($n = 30$), which may limit the generalizability of results. The sample was also geographically restricted to Hungary, and cultural factors influencing family dynamics and peer relationships may differ across countries and regions. Additionally, although efforts were made to ensure random assignment, the small sample increases the risk of baseline variability between groups. Another limitation involves reliance on self-report measures for social belonging and risk behaviors, which are subject to social desirability and recall bias. Finally, while the five-month follow-up provides some indication of sustainability, longer-term follow-up is necessary to

determine whether the program's effects persist over a year or more.

Future research should seek to replicate these findings in larger, more diverse samples to assess the program's applicability across different sociocultural and socioeconomic contexts. Studies might also benefit from incorporating mixed-method approaches that combine quantitative measures with qualitative interviews, enabling a richer understanding of adolescents' subjective experiences and family dynamics. Furthermore, exploring the role of specific components within the intervention—such as peer mentoring versus family dialogue—could help identify which elements are most critical to outcomes. Neurobiological assessments, including fMRI or EEG measures, may also provide further insight into how such interventions modulate adolescents' brain functioning related to reward sensitivity, emotion regulation, and social cognition. Lastly, longitudinal studies tracking participants into late adolescence or early adulthood would be valuable in determining the long-term developmental implications of the intervention.

Practitioners designing adolescent intervention programs should consider implementing multi-systemic approaches that simultaneously target peer and family relationships. Programs should incorporate active skill-building, structured group activities, and opportunities for joint parent-adolescent engagement. Emotional regulation and communication training should be central components, as these skills support both interpersonal and intrapersonal development. Schools may serve as ideal venues for implementation, given their access to both adolescents and families. Ensuring cultural adaptation and inclusivity will also be critical for maximizing engagement and effectiveness. Facilitator training, ongoing supervision, and community involvement can further enhance program fidelity and impact.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

References

- Aderemi, O. N. (2019). Sex Education by Parents and Peers as Correlates of Adolescents Sexual Risk Behavior in Oyo State, Nigeria. <https://doi.org/10.20472/tec.2019.008.020>
- Akintayo, O. T., Atobatele, F. A., & Mouboua, P. D. (2024). Navigating Multilingual Identities: The Role of Languages in Shaping Social Belonging and Political Participation. *International Journal of Applied Research in Social Sciences*, 6(5), 828-843. <https://doi.org/10.51594/ijarss.v6i5.1105>
- Allen, J. P. (2024). Rethinking Peer Influence and Risk Taking: A Strengths-Based Approach to Adolescence in a New Era. *Development and Psychopathology*, 36(5), 2244-2255. <https://doi.org/10.1017/s0954579424000877>
- Boer, A. d., Peeters, M., & Koning, I. M. (2016). An Experimental Study of Risk Taking Behavior Among Adolescents: A Closer Look at Peer and Sex Influences. *The Journal of Early Adolescence*, 37(8), 1125-1141. <https://doi.org/10.1177/0272431616648453>
- Dai, J., Kwon, S. J., Prinstein, M. J., Telzer, E. H., & Lindquist, K. A. (2023). Neural Similarity in Nucleus Accumbens During Decision Making for the Self and a Best Friend: Links to Adolescents' Self-Reported Susceptibility to Peer Influence and Risk Taking. *Human Brain Mapping*, 44(10), 3972-3985. <https://doi.org/10.1002/hbm.26317>
- Dekkers, T. J., Popma, A., Sonuga-Barke, E., Oldenhof, H., Bexkens, A., Jansen, B. R. J., & Huizenga, H. M. (2020). Risk Taking by Adolescents With Attention-Deficit/Hyperactivity Disorder (ADHD): A Behavioral and Psychophysiological Investigation of Peer Influence. *Journal of abnormal child psychology*, 48(9), 1129-1141. <https://doi.org/10.1007/s10802-020-00666-z>
- Deswinda, D., Machmud, R., Yusrawati, Y., Indrapriyati, A. S., & Bayhakki, B. (2020). Adolescent Pregnancy Prevention Behavior in Indonesia: Internal and External Factors Influencing. *Open Access Macedonian Journal of Medical*

- Sciences, 8(E), 516-520.
<https://doi.org/10.3889/oamjms.2020.4946>
- Dittus, P., Li, J., Verlenden, J. V., Wilkins, N., Carman-McClanahan, M., Cavalier, Y., Mercado, M. C., Welder, L. E., Roehler, D. R., & Ethier, K. A. (2023). Parental Monitoring and Risk Behaviors and Experiences Among High School Students — Youth Risk Behavior Survey, United States, 2021. *MMWR supplements*, 72(1), 37-44.
<https://doi.org/10.15585/mmwr.su7201a5>
- Ernawati, E., Mitra, M., Harnani, Y., Nurhapipa, N., & Riva'i, S. B. (2020). Sexual BEHAVIOR IN ADOLESCENT HIGH SCHOOL IN INDRAGIRI HILIR DISTRICT IN 2018. *Jurnal Kesehatan Mercusuar*, 3(1), 1-10.
<https://doi.org/10.36984/jkm.v3i1.69>
- Garthe, R. C., Sullivan, T. N., & McDaniel, M. A. (2017). A Meta-Analytic Review of Peer Risk Factors and Adolescent Dating Violence. *Psychology of violence*, 7(1), 45-57.
<https://doi.org/10.1037/vio0000040>
- Guo, M., Lu, Y., Zhai, R., & Tian, L. (2024). Does Cognitive Control Mediate the Relationship Between Peer Presence and Adolescent Risk taking? An ERP Study. *Psychophysiology*, 61(12). <https://doi.org/10.1111/psyp.14675>
- Harini, R. (2022). Strengthening the Role of Peer Counselors for Reproductive Health Among Adolescent: From Philosophy Into Practice.
<https://doi.org/10.20944/preprints202206.0327.v1>
- Hoorn, J. v., Crone, E. A., & Leijenhorst, L. V. (2016). Hanging Out With the Right Crowd: Peer Influence on Risk Taking Behavior in Adolescence. *Journal of Research on Adolescence*, 27(1), 189-200.
<https://doi.org/10.1111/jora.12265>
- Kamali, M., & Azmati, R. (2020). The Relationship Between Social Belonging and Social Security in Qom. *Applied Geographic Science Research*, 4(2).
<https://openarchive.icomos.org/id/eprint/2822/1/CIAV-Iran-Bulletin-No-10-11-Winter-2023.pdf>
- Kathy, T., Prinstein, M. J., & Telzer, E. H. (2020). Neurobiological Susceptibility to Peer Influence in Adolescence.
<https://doi.org/10.1093/oxfordhob/9780198827474.013.27>
- Kwon, S. J., Kathy, T., McCormick, E. M., & Telzer, E. H. (2020). Neural Correlates of Conflicting Social Influence on Adolescent Risk Taking. *Journal of Research on Adolescence*, 31(1), 139-152. <https://doi.org/10.1111/jora.12587>
- Mason, M. J., Zaharakis, N., Rusby, J. C., Westling, E., Light, J. M., Mennis, J., & Flay, B. R. (2017). A Longitudinal Study Predicting Adolescent Tobacco, Alcohol, and Cannabis Use by Behavioral Characteristics of Close Friends. *Psychology of Addictive Behaviors*, 31(6), 712-720.
<https://doi.org/10.1037/adb0000299>
- Nie, Y., Wang, G., Pei, C., Wang, L., & Dou, K. (2022). The Association Between Peer Victimization and Risk-Taking Behavior Among Chinese Adolescents: Testing a Moderated Mediation Model. *International journal of environmental research and public health*, 19(21), 14198.
<https://doi.org/10.3390/ijerph192114198>
- Park, H. S., Yeo, H. J., & Jung, S. Y. (2016). A Comparative Study on the Factors Influencing Risk Behaviors of Adolescents Living in Small and Medium-Sized Cities and Rural Communities. *Journal of the Korean Society of School Health*, 29(3), 256-266. <https://doi.org/10.15434/kssh.2016.29.3.256>
- Patui, N. S., Dasuki, D., & Wahyuni, B. (2018). The Roles of Parents and Peer Friends on Adolescent Premarital Sex Behavior in High School Students of Buol District. *Jurnal Kesehatan Reproduksi*, 5(1), 50.
<https://doi.org/10.22146/jkr.37995>
- Raufelder, D., & Kulakow, S. (2021). The Role of Social Belonging and Exclusion at School and the Teacher–student Relationship for the Development of Learned Helplessness in Adolescents. *British Journal of Educational Psychology*.
<https://doi.org/10.1111/bjep.12438>
- Reyhani, S., & Ahovan, M. (2024). The Effectiveness of Emotional Schema Therapy on Regulating Emotions and Reducing High-Risk Behaviors in Female Adolescents [Research]. *Journal of Research in Behavioural Sciences*, 22(1), 137-149.
<https://doi.org/10.29252/rbs.22.1.137>
- Siraj, R., Najam, B., & Ghazal, S. (2021). Sensation Seeking, Peer Influence, and Risk-Taking Behavior in Adolescents. *Education Research International*, 2021, 1-8.
<https://doi.org/10.1155/2021/8403024>
- Tajabadi, Z., Dehghani, F., & Saehzadeh, M. (2020). The Role of Time Perspective and Peer Rejection in Predicting High-Risk Behaviors of Adolescents of Yazd City. *Ranian Journal of Health Education and Health Promotion*, 8(2), 129-141.
<https://doi.org/10.29252/ijhehp.8.2.129>
- Telzer, E. H., Dai, J., Capella, J. J., Sobrino, M., & Garrett, S. L. (2022). Challenging Stereotypes of Teens: Reframing Adolescence as Window of Opportunity. *American psychologist*, 77(9), 1067-1081.
<https://doi.org/10.1037/amp0001109>
- Telzer, E. H., Jorgensen, N. A., Prinstein, M. J., & Lindquist, K. A. (2020). Neurobiological Sensitivity to Social Rewards and Punishments Moderates Link Between Peer Norms and Adolescent Risk Taking. *Child development*, 92(2), 731-745.
<https://doi.org/10.1111/cdev.13466>
- Triyanto, E. (2023). Identification of Risk Factor of Adolescent Sexual Behavior in Purwokerto: Pilot Study. *Jurnal Keperawatan Komprehensif*, 9(1).
<https://doi.org/10.33755/jkk.v9i1.458>
- Wang, Stanton, Deveaux, Li, X., & Lunn. (2015). Dynamic Relationships Between Parental Monitoring, Peer Risk Involvement and Sexual Risk Behavior Among Bahamian Mid-Adolescents. *International Perspectives on Sexual and Reproductive Health*, 41(2), 89.
<https://doi.org/10.1363/4108915>
- Xu, L. (2023). The Effect of Peer Influence on Risk-Taking Behavior in Adolescents. *Lecture Notes in Education Psychology and Public Media*, 22(1), 108-112.
<https://doi.org/10.54254/2753-7048/22/20230239>
- Yadlosky, L. B., Mowrey, W. B., & Pimentel, S. S. (2023). Risky business: Considerations of emotion regulation and high-risk behaviors in anxious adolescents. *Journal of anxiety disorders*, 99, 102760.
<https://doi.org/10.1016/j.janxdis.2023.102760>
- Zhang, W., & Zhu, L. (2021). The Influence of Peers on Adolescents' Risk-Taking Behavior and Its Mechanism. *Advances in Psychological Science*, 29(8), 1462-1471. <https://doi.org/10.3724/sp.j.1042.2021.01462>