

Research Paper

Understanding Gendered Patterns in Adolescent Risk-Taking: Health, Recreational, and Social Domains in Focus

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ABSTRACT

Adolescence is a critical juncture of development marked by identity formation, increased independence, and heightened engagement in risk-taking behaviours. These behaviours often vary across domains such as health/safety, recreational, and social contexts, and are influenced by gender-based differences in psychological disposition and socialization. The present study aimed to examine whether male and female adolescents differ significantly across these specific domains of risk-taking. A sample of 60 adolescents (33 males and 27 females) from Kolkata, West Bengal, was selected using purposive sampling. The Domain-Specific Risk-Taking Scale (DOSPRT) and analysed using descriptive and inferential statistics, including the Mann-Whitney test to assess behavioural tendencies in three domains: health/safety, recreational, and social risk-taking. Statistical analysis revealed significant gender differences in health/safety and recreational risk-taking, with males demonstrating higher engagement in these areas. However, no significant gender differences were found in social risk-taking behaviours. The findings highlight the relevance of gender in understanding adolescent risk tendencies and underscore the need for gender-sensitive approaches in behavioural assessments and interventions.

Keywords: *Adolescents, health/safety, recreational, social risk-taking behaviour*

Adolescents take more risks due to underdeveloped self-regulation, not faulty risk perception, caused by a mismatch between early sensation seeking (starting at puberty) and delayed maturation of self-control into adulthood. This biological disjunction suggests that harm-reduction strategies may be more effective than educational interventions (Steinberg, L. 2004). In a sample of 51 inner-city adolescents, performance on the Balloon Analogue Risk Task (BART) predicted real-world risk behaviours like delinquency and substance use, outperforming demographic data and self-report measures of impulsivity and sensation seeking (Aklin, W. M., et al., 2005). Across five experiments, individuals with high perceived power took more risks (e.g., unprotected sex, aggressive negotiation). The effect was driven by optimistic risk perception, not self-efficacy. A sense of responsibility moderated this relationship (Anderson, C., et al., 2006). Neuroscientific evidence shows that adolescent risk-taking is driven by early-emerging reward sensitivity and late-developing cognitive control. Structural brain development limits the effectiveness

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of educational programs, favouring environmental interventions (Steinberg, L. 2007). Using the Columbia Card Task (CCT) in four experiments with adolescents (13–19) and adults, adolescents showed greater risk-taking under emotionally charged ("hot") conditions, influenced by need-for-arousal, whereas adults relied more on executive function in "cold" conditions (Figner, B., et al., 2009). Animal model research on adolescent rats showed heightened social behaviour, drug sensitivity, and risk-taking, paralleling human adolescence. The study found increased responsiveness to rewards and reduced sensitivity to aversive outcomes, informing models of substance vulnerability (Doremus-Fitzwater, T. L., et al., 2010). Using fMRI and a simulated driving game, this study found that adolescents showed greater activation in the ventral striatum and orbitofrontal cortex when peers were present, predicting increased risk-taking. Adults showed no such peer modulation of reward sensitivity (Chein, J., et al., 2011). A meta-analysis of 15 investment game experiments showed women consistently exhibited greater financial risk aversion than men, with implications for gendered decision-making patterns in economic contexts (Charness, G., et al., 2012). Using executive data from German banks, this study found younger executives and a higher proportion of female executives increased portfolio risk, while those with PhDs reduced it. The findings highlight how demographic traits affect financial governance (Berger, A. N., et al., 2014). Through a critical analysis, this study found that risk-taking does not necessarily peak in mid-adolescence. Substance use and risky behaviours were more common in emerging adulthood, advocating for a broader lifespan developmental framework (Willoughby, T., et al., 2014). A longitudinal neuroimaging study (N = 254; aged 8–27) found a quadratic increase in nucleus accumbens activity during adolescence. Puberty, testosterone, and self-reported reward sensitivity were linked to risk-taking, confirming age-related neural sensitivity (Braams, B. R., et al., 2015). Among 273 adolescents (157 females, 116 males), males reported more risk-taking, lower social anxiety, and lower risk perception. A path analysis revealed that personality traits like impulsiveness and behavioural inhibition influenced adolescent risk-taking patterns (Reniers, R. L., et al., 2016). This critique of dual-systems models highlights the diversity of adolescent risk types—sensation seeking vs. impulsive choice—and proposes the Life-Span Wisdom Model, emphasizing adaptive learning and context-specific risk modulation over time (Romer, D., et al., 2017). This study distinguishes between negative (illegal) and positive (constructive) adolescent risk-taking. It proposes a theoretical framework for positive risks like activism or sports achievement, which remain under-researched in developmental psychology (Duell, N., et al., 2019).

Theoretical Framework and Hypothesis:

Adolescent risk-taking can be understood through some key frameworks. Sensation Seeking Theory attributes higher male risk-taking in health and safety domains to elevated arousal needs. Evolutionary Theory explains gendered recreational risks as adaptive behaviours rooted in ancestral survival and competition. Social-Cognitive Theory highlights peer modelling and reinforcement, aligning with the absence of gender differences in social risk-taking. The Biopsychosocial Model integrates neurological immaturity, personality traits, and gendered socialisation to explain domain-specific risk variation. ***Sensation Seeking Theory:*** Introduced by Zuckerman (1994), conceptualizes risk-taking as a dispositional trait, where individuals seek varied, novel, complex, and intense experiences, often accompanied by a readiness to take physical, social, and legal risks to achieve such stimulation. Thus, the theoretical foundation of Sensation Seeking Theory offers a compelling explanation for domain-specific gender differences observed in adolescent health/safety risk behaviours. It contextualizes how biologically rooted arousal needs intersect with behavioural patterns to produce differential outcomes between male and female adolescents. ***Evolutionary Theory:***

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Provides a foundational explanation for adolescent risk-taking by framing it as an adaptive behavioural tendency rooted in survival and reproductive advantage. Although modern recreational risks differ in form from ancestral challenges, the underlying motivational systems remain evolutionarily consistent, indicating that the gendered expression of recreational risk-taking is both biologically ingrained and socially reinforced across developmental contexts. **Social-Cognitive Theory:** Proposed by Bandura (1986), offers a comprehensive framework for understanding adolescent risk-taking as a product of continuous interaction between personal cognition, social environments, and observed behaviour, emphasizing that adolescents do not develop risky behaviours in isolation but acquire them through modelling, reinforcement, and vicarious learning. Interestingly, the current study found no significant gender differences in social risk-taking behaviours, suggesting that male and female adolescents may be exposed to increasingly similar social norms and reinforcement patterns regarding socially risky behaviours, such as expressing unpopular views, defying authority, or engaging in socially non-conforming acts. This is consistent with social-cognitive expectations: when environmental modelling and reinforcement structures are balanced across gender, behavioural differences tend to diminish. **Biopsychosocial Model:** By George L. Engel, 1977 provides a holistic understanding of adolescent risk-taking by integrating biological, psychological, and social factors that interact dynamically across development, particularly during adolescence when neurobiological sensitivity, emotional volatility, and peer socialization converge. Biologically, adolescents experience a developmental mismatch: while the limbic system responsible for reward and emotional reactivity matures early, the prefrontal cortex, which regulates decision-making and impulse control, matures later—making adolescents particularly vulnerable to impulsive and risk-laden decisions in the presence of immediate rewards. This tripartite interaction validates the need for multidimensional analysis in adolescent risk research and explains why gender differences emerge more sharply in domains with strong physiological or culturally sanctioned risk factors.

METHODOLOGY

Present study aims to find out whether there are significant differences between male and female adolescents in terms of Health/safety, Recreational and Social risk-taking. It investigates gender-based differences across these psychological and behavioural variables.

Objectives:

1. To find out if there is any difference between male and female adolescent in terms of health/safety risk-taking.
2. To find out if there is any difference between male and female adolescent in terms of recreational risk-taking.
3. To find out if there is any difference between male and female adolescent in terms of social risk-taking.

Hypothesis:

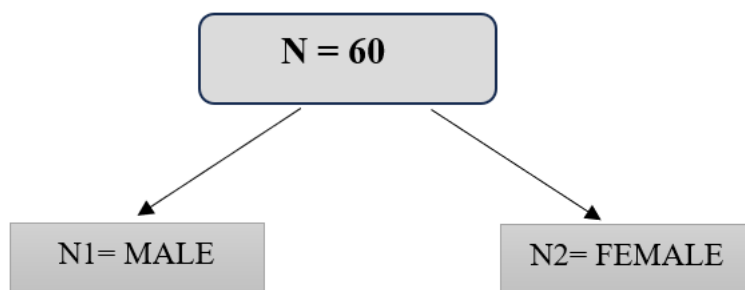
- **H1.** There is significant mean difference between male and female adolescent in terms of health/safety risk-taking.
- **H2.** There is significant mean difference between male and female adolescent in terms of recreational risk-taking.
- **H3.** There is significant mean difference between male and female adolescent in terms of social risk-taking.

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Methods:

Sample:

The purposive sampling technique was used for the present study. A total no of 70 participants was approached among which 60 participants, aged 12–18 years, from urban schools and early college settings in Kolkata, was used; signed a consent form and filled up the questionnaire booklet. Out of 70 participants, 6 participants did not return the questionnaire and 4 participants submitted the filled-up questionnaire (who belong above 18 years). From this pool of data, 60 usable data were selected for the present study. The total sample was divided based on male and female.



The participants were selected on the basis of the following inclusion and exclusion criteria:

Inclusion criteria:

- Age range between 12 to 18 years.
- Male female both genders.
- Educational Qualification at least 6th grade
- Family Type: nuclear, joint, single parent
- Socioeconomic Status: low to high
- Peer Group Size: 2 to 8 members
- Time Spent with Peers Per Day: 2-8 hours
- No history or presence of psychological/mental illness

Exclusion criteria:

- Age below 12 or above 18 years.
- Educational qualification below 6th grade
- Family type other than nuclear, joint, or single-parent (e.g., institutional care, foster care)
- Socioeconomic status not falling within low to high range (e.g., extreme poverty with no stable living conditions)
- Peer group size less than 2
- Time spent with peers per day below 2 hours or more than 8 hours (e.g., extreme isolation or excessive socialization)
- History or presence of any psychological/mental illness

Procedure for data collection:

All the participants were contacted personally and rapport were established. Consent forms were signed. They were given a briefing about the aim of present study. Instructions were given according to the used questionnaire. The tool used for this study Domain-Specific Risk-Taking Scale (DOSPRT; Blais & Weber, 2006). They were assured that their

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information would be kept confidential and used only for research purpose, so they were requested to be open and honest in their responding, after that scales were administered and data were collected.

Statistical analysis:

For the data analysis purpose of the present study, Jamovi 2.4.66 was used, in which descriptive and inferential analysis were made according to the decision rules for testing the null hypothesis. In the **first phase** Shapiro Wilk W and Shapiro Wilk P were calculated, found that the Shapiro-Wilk p-value is significant at the 0.01 level, and the distribution deviates significantly from normality.

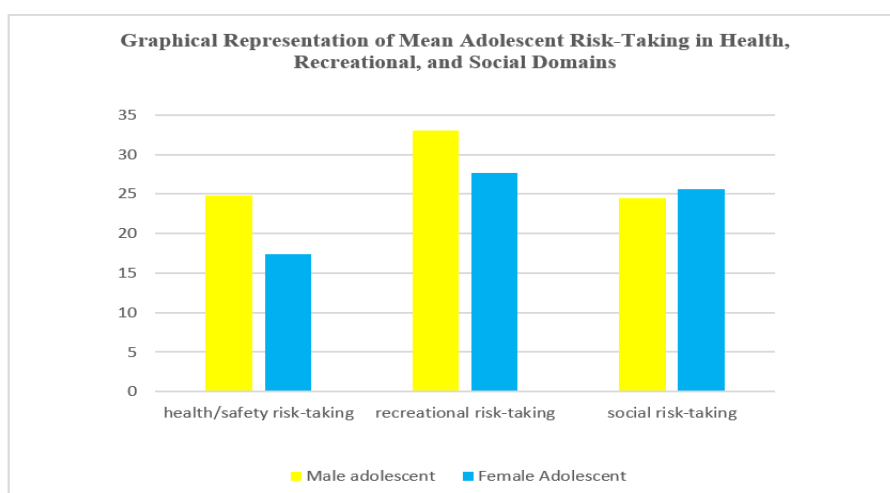
In the **second phase** Mean and SD were calculated (Table 1).

In **third phase**, the data were subjected to Mann-Whitney t test to find out the significant mean difference between male and female adolescent in terms of Peer and School Involvement (Table 2).

Table: 1 Results of Descriptive Statistics

Descriptive	Gender	Health/Safety risk taking behaviour	Recreational risk-taking behaviour	Social risk-taking behaviour
N	F	27	27	27
	M	33	33	33
Mean	F	17.4	27.7	25.6
	M	24.8	33.0	24.5
Median	F	20	26	27
	M	26	33	25
Mode	F	23.0 ^a	19.0	27.0
	M	23.0 ^a	42.0	20.0 ^a
SD	F	8.01	6.47	3.48
	M	6.31	7.71	6.01

Table 1: Represents descriptive statistics (mean, median, mode and SD) of Health/Safety risk-taking behaviour (H/S), Recreational risk-taking behaviour(R), Social risk-taking behaviour(S).



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Table:2 Results of Inferential Statistics:

VARIABLES		STATISTICS	P-VALUE
HEALTH/SAFETY RISK TAKING	Mann-Whitney U	197**	<.001
RECREATIONAL RISK TAKING	Mann-Whitney U	267**	0.008
SOCIAL RISK TAKING	Mann-Whitney U	406	0.556

** Significant at 0.01 level

Table 2 Represents the result of the Mann-Whitney t test. P value is significant at 0.01 level for health/safety risk taking behaviour and recreational risk behaviour. Thus, H1 and H2 is accepted at 0.01 level. There is a significant mean difference between male and female adolescent in terms of health/safety and recreational risk-taking behaviour.

Other variables showed no statistically significant gender differences. Thus, H3 are rejected at 0.01 level. This indicates that there is no significant mean difference between male and female adolescent in terms social risk-taking behaviour.

General Discussion and Theoretical Contributions:

Table 1 presents the descriptive statistics for mean scores of male and female adolescents across three domains of risk-taking behaviour: health/safety, recreational, and social. In the health/safety domain, the mean score for females ($F = 17.4$) was notably lower than that of males ($M = 24.8$), suggesting that male adolescents are more likely to engage in behaviours that may pose physical or safety-related risks. Similarly, in the recreational domain, males ($M = 33.0$) scored higher than females ($F = 27.7$), indicating a greater propensity among males to participate in adventurous or sensation-seeking activities. However, in the social domain, females ($F = 25.6$) slightly outscored males ($M = 24.5$), reflecting a marginally greater inclination among female adolescents to take risks in interpersonal or socially driven contexts. These findings point to gender-based variations in the types of risk adolescents are more inclined to take, aligning with prior research suggesting domain-specific differences in adolescent risk-taking patterns.

Table 2 indicates that gender significantly influences adolescent behaviour in the domains of health/safety and recreational risk-taking, but not in social risk-taking. Specifically, males reported higher risk-taking in health/safety ($U = 197$, $p < .01$) and recreational activities ($U = 267$, $p = .008$), confirming H1 and H2. No significant gender difference emerged in social risk-taking ($U = 406$, $p = .556$), resulting in the rejection of H3.

These results are consistent with prior literature suggesting that male adolescents are more inclined toward sensation-seeking and physical risks, driven by both evolutionary predispositions and gendered socialisation patterns. The lack of difference in social risk-taking may reflect shifting cultural norms or equalised peer expectations across genders in urban adolescent settings. Overall, the results validate the proposed conceptual model and underscore the importance of gender-sensitive, domain-specific approaches to risk prevention in adolescence. Educational and developmental frameworks should address these nuanced patterns to enhance adolescent well-being.

Practical Implications:

This study provides crucial insights for educators, mental health professionals, NGOs, and policymakers aiming to address adolescent risk-taking behaviour in the Indian context. The gender-specific patterns identified—particularly higher male engagement in health/safety

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and recreational risk domains—suggest the need for targeted, domain-sensitive interventions. For instance, male adolescents may benefit from structured programs that redirect risk-prone tendencies toward prosocial or skill-based challenges, such as adventure-based learning, competitive sports, or digital simulation tasks that enhance decision-making under pressure (Steinberg, 2004; Figner et al., 2009). School-based frameworks should integrate modules that promote emotional regulation, impulse control, and reflection on consequences in real-world scenarios. Conversely, the relative restraint observed in female adolescents does not imply immunity to risk. Subtle and internalized risk-taking—particularly in social, emotional, or relational contexts—may remain underreported due to social desirability or cultural norms. Programs focusing on emotional literacy, body autonomy, and safe boundary-setting are essential to address non-visible but impactful risk behaviours such as self-silencing or relational dependency. Universal interventions should also be considered for domains like financial or ethical risk-taking, where no significant gender differences emerged. Decision-making curricula that simulate real-life financial or moral dilemmas can improve adolescent reasoning and moral maturity. NGOs like Room to Read or Plan India can collaborate with schools to implement culturally sensitive life-skills training grounded in adolescent neurodevelopmental science and domain-specific risk education (Romer et al., 2017). Integrating psychological theory with practical tools enhances early prevention and fosters healthier long-term behavioural outcomes.

Limitations and Directions for Future Research:

While the present study advances the understanding of gender-differentiated risk-taking behaviour, several limitations must be acknowledged. First, the relatively small sample size ($N = 60$) and limited geographical scope—an urban region in West Bengal—constrain generalizability. Larger, cross-regional studies encompassing rural, tribal, and semi-urban populations would allow for exploration of how sociocultural and geographic variables influence risk behaviour typologies. Second, the exclusive reliance on self-report measures introduces the possibility of social desirability bias, particularly in sensitive risk domains such as ethical misconduct or health-risk behaviours (Berger et al., 2014). Future studies should adopt a multimethod approach, incorporating behavioural assessments like the Columbia Card Task, Balloon Analogue Risk Task, or real-time decision-making simulations to capture implicit risk propensities (Figner et al., 2009; Aklin et al., 2005). Third, gender was treated as binary in this study. Future research must recognize gender as a spectrum to include LGBTQIA+ adolescents, whose experiences of risk-taking may differ due to unique psychosocial stressors and protective factors. NGOs such as Breakthrough India and Save the Children have advocated for inclusive programming, and research must parallel this commitment by integrating inclusive tools and sampling frameworks. Future studies should also leverage longitudinal designs to assess how adolescent risk behaviour evolves over time, particularly across puberty, cognitive maturation, and changing family structures (Willoughby et al., 2014; Braams et al., 2015). Statistical models such as latent class analysis or structural equation modelling (SEM) can identify how cognitive, biological, and contextual factors intersect to produce domain-specific risk-taking profiles. Additionally, collaboration with field-based NGOs can help validate intervention models using naturalistic, real-world testing environments.

CONCLUSION

This study highlights the central role of risk-taking behaviour in adolescent development, demonstrating that while both male and female adolescents engage in risky behaviour, they do so in domain-specific ways. Notable gender differences were observed in health/safety

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and recreational risk domains, indicating that sociocultural expectations and psychological traits contribute to differentiated risk engagement. These findings reinforce the need for addressing risk-taking behaviour through targeted educational and psychosocial interventions, particularly during adolescence—a period marked by identity exploration and increased susceptibility to sensation-seeking tendencies. Integrating risk-awareness programs within school curricula and community-based initiatives may enhance adolescents' decision-making skills and promote healthier developmental trajectories.

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Conflict of Interest

The author(s) declared no conflict of interest.

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