Int J High Risk Behav Addict. 2025 June; 14(2): e158619 https://doi.org/10.5812/ijhrba-158619

Published Online: 2025 May 17 **Research Article**

Broadening Thinking Skills Training and Improved Psychosocial Outcomes in High-Risk Adolescents

Ali Afshari [1,*], Somayeh Shirinbek [2]

[1] Department of Psychology, Faculty of Human Science, University of Maragheh, Maragheh, IR Iran
[2] Azad University of Urmia, Urmia, IR Iran

[*] ***Corresponding Author:*** Department of Psychology, Faculty of Human Science, University of Maragheh, Maragheh, IR Iran. Email: aliafshari.psy@gmail.com

Received: 21 December, 2024; **Revised:** 30 March, 2025; **Accepted:** 26 April, 2025

Abstract

Background: Broadening thinking skills training is considered an effective approach for preventing and treating addiction in adolescents.

Objectives: The present study aimed to investigate the effect of teaching broadening thinking skills on moral development, altruism, cognitive flexibility, and sexual rights in adolescents with high-risk behaviors such as addiction.

Patients and Methods: A quasi-experimental design with control and intervention groups was employed. Twenty-six male high school students with identified high-risk behaviors were randomly assigned to either the intervention group (n = 13) or the control group (n = 13). Participants were 26 male high school students, aged 15 - 18, with identified high-risk behaviors including substance use, risky sexual behaviors, and a history of school behavior problems, and without a history of severe psychiatric disorders. Randomization was conducted using simple random assignment. Due to the nature of the intervention, blinding was not feasible. The primary outcome was the change in cognitive flexibility from baseline to post-intervention. Secondary outcomes included changes in moral development, altruism, and sexual rights. The intervention group received five weeks of broadening thinking skills training, based on Edward de Bono's six thinking hats, and conducted by trained facilitators in a school setting. The Cognitive Flexibility Questionnaire (CFQ), Moral Development and Altruism Questionnaire (MDAQ), and Halbert Sexual Assertion Questionnaire (HISA) were administered at pre-intervention and post-intervention. Data were analyzed using ANCOVA and MANCOVA.

Results: Broadening thinking skills training significantly improved cognitive flexibility, moral development, altruism, and reduced problematic sexual rights ($P < 0.05$). Specifically, in the intervention group: Cognitive flexibility increased from 43.92 (SD = 2.69) to 51.15 (SD = 1.62); moral development/altruism increased from 37.76 (SD = 3.29) to 39.00 (SD = 1.91); and sexual rights decreased from 53.92 (SD = 2.98) to 46.69 (SD = 5.25). The results indicated that the educational intervention had a significant impact on participants' cognitive flexibility, moral/altruistic development, and sexual rights. Specifically: 1. Cognitive flexibility: Mean difference 7.23, 95% CI: 4.12 - 10.34, $P < 0.001$. 2. Moral/altruistic development: Mean difference 1.24, 95% CI: 0.11 - 2.37, $P = 0.03$. 3. Sexual rights: Mean difference -7.23, 95% CI: -10.98 to -3.48, $P < 0.001$. These results suggest that the educational intervention led to an increase in cognitive flexibility and moral/altruistic development, and a decrease in negative attitudes towards sexual rights among the participants.

Conclusions: Broadening thinking skills training effectively improves moral development, altruism, and cognitive flexibility, and reduces problematic sexual rights in adolescents with high-risk behaviors, such as addiction. These results are consistent with previous studies demonstrating the efficacy of cognitive skills training in improving psychological functioning in adolescents. However, limitations related to the small sample size and lack of blinding limit the generalizability of the findings and highlight the need for future studies with larger sample sizes and more rigorous designs.

Keywords: Moral Development, Altruism, Cognitive Flexibility, Sexual Rights, High-risk Behaviors, Addiction

1. Background

The issue of addiction among adolescents is a serious social and health challenge. This phenomenon not only endangers the physical and mental health of adolescents but also affects various aspects of their liver (1). Adolescence is one of the most important and sensitive periods of human life (2). The prevalence of risky behaviors in adolescents is increasing, and reports indicate an increase in risky behaviors among Iranian adolescents (3). The issue of risky behaviors in adolescents has long been of concern to scholars in human society. Zuckerman defines risky behaviors as behaviors that cause harm and damage to the individual and society (4). No definitive approach has been presented regarding the causes of risky behaviors, but various explanations have been proposed, including factors such as poor cognitive skills, social learning, cognitive inflexibility, impulsivity and aggression, lack of altruism and moral development, low social control, delinquent friends, thrill-seeking, sexual entitlement, and so on (5). According to the World Health Organization, combating risky behaviors at an early age is very important for living a healthy life in adulthood

How to Cite: Afshari A, Shirinbek S. Broadening Thinking Skills Training and Improved Psychosocial Outcomes in High-Risk Adolescents. Int J High Risk Behav Addict. 2025; 14 (2): e158619. https://doi.org/10.5812/ijhrba-158619.

and old age (6). In the view of risky behaviors are behaviors over which little cognitive control is seen (7). Qureshi believes that risky behaviors are mostly formed in adolescence and continue into later periods (8). According to Boyer, the most important risky behaviors in adolescence are drug and alcohol addiction, unsafe sexual behavior, dangerous driving, interpersonal violence, and smoking (9). One of the factors that causes risky behaviors in adolescents is the lack of appropriate cognitive skills in stressful situations (10). This report is consistent with the findings of Elgar et al., who stated that risky behaviors are caused by individuals' lack of flexibility and moral development, especially in adolescents (11). Settembre-Blundo et al suggest that risky behaviors are more caused by individuals' lack of high capacity and flexibility, as these individuals do not have the appropriate cognitive and management skills to deal with situations (12).

One of the important components of substance use and risky behaviors is moral development and altruism. According to Batson, altruism refers to the level of connection with others in which the individual has appropriate relationships with others and does not have exploitative and dangerous beliefs (13). Altruism is a state in which the individual does not have exploitative thoughts and ideas about others, has the skills to establish rational communication with others, and has reached the threshold of moral development to refrain from engaging in risky behaviors (14). Despite having moral developments (such as fairness, loyalty, honesty, etc.), due to the lack of appropriate skills for self-control, individuals in society still engage in risky behaviors, and even these individuals are aware of their risky behaviors and, in fact, have no control over not engaging in those behaviors (15). According to Icenogle and Cauffman, moral development and altruism are very important components for a balanced identity in which an individual does not engage in antisocial behaviors such as substance use (16). It can be inferred that the ability to delay and control oneself in not using substances and engaging in risky behaviors is due to high cognitive flexibility and skills, which even indicates the individual's moral development. These findings are consistent with the reports of Malti (17). As Wainrybe observes, people who have high moral development and altruism can generalize this adaptive state to risky situations, save themselves from stressful situations, and resist peer pressure to use substances (18).

Another very important component involved in engaging in addictive and risky behaviors is cognitive flexibility. Luthar and Eisenberg states that flexibility plays a very decisive role in the emergence of risky behaviors (19). Cognitive flexibility is the positive ability of an individual to manage stressful and risky situations, in which the individual can review the problems resulting from engaging in addictive behaviors in his or her mind and avoid engaging in that risky behavior (12). In the view of Philip, cognitive flexibility is a state in which an individual can adapt to the stressors (20). People who have high flexibility act at a high level in terms of self-control and do not lose their frame of mind in risky events (21). The concept of cognitive flexibility is expressed as the ability to change cognitive dispositions in order to adapt to changing environmental stimuli (22). Studies by Ma showed that high flexibility has a significant relationship with altruism and healthy relationships away from risky relationships (23). People who have high cognitive flexibility are less likely to engage in risky behaviors such as substance use because these people review and predict the problems arising from substance use and risky behavior well in their minds (24).

Another component that plays an important role in addictive behaviors is sexual rights. Sexual justification is when a person presents a reason for their behavior as sexual entitlement; for example, they consider bullying as a man's right to show masculinity or drug use as a sign of reaching adulthood (25). People with high sexual rights do not consider the rights of others much, and these individuals even consider sexual entitlement for their own actions (26). People with high sexual justification indulge in more risky sexual behaviors and commit extramarital infidelity very early; these individuals also engage in false excitements such as using high doses of drugs and engaging in risky sexual behaviors (27). People with more positive and rational sexual rights have higher general health and report less depression and risky behaviors (28).

Broadening thinking skills include a wide range of abilities such as critical thinking, problem-solving, creativity, judgment, information analysis, evaluation, and decision-making (29). These skills help adolescents challenge information, test hypotheses, and make independent judgments. Numerous studies have shown that training in broadening thinking skills can have a positive impact on changing the level of moral thinking, increasing cognitive flexibility, reducing risky addictive behaviors, and increasing self-confidence (30). Training in broadening thinking skills affects adolescents through various mechanisms such as changes in cognitive structures, changes in beliefs and attitudes, and strengthening social skills.

According to studies and current research literature, the occurrence and performance of risky and harmful

behaviors have various causes and reasons, among which the lack of moral development and sufficient altruism, cognitive inflexibility, and negative sexual rights are primary reasons. However, new approaches, especially in the field of social harms, emphasize the fundamental importance of education for prevention and intervention with the aim of reducing the associated harms. Therefore, considering the research literature and predicting the possibility of controlling and reducing social harms and risky behaviors, the main question of this study is whether it is possible to reduce the harmful behaviors of adolescents with risky behaviors by teaching skills such as the expansion of thinking model by affecting the three components of moral development, cognitive flexibility, and sexual rights.

2. Objectives

The present study aimed to examine the efficacy of teaching broadening thinking skills on changing the components of moral development, altruism, cognitive flexibility, and sexual rights in adolescents with high-risk behaviors such as addiction.

3. Patients and Methods

A semi-experimental design was used in this study, with both a control group and an intervention group. In the first stage, 26 male high school students in Tabriz city who had been identified for engaging in high-risk behaviors were selected. The participants were randomly allocated to one of two groups: An intervention group (n = 13) and a control group (n = 13). All study participants were actively involved in the data collection process, which included administering assessment tools during the pre-test, post-test, and follow-up phases. We conducted a post-hoc power analysis using G*Power software. The results of this analysis indicated that, given the observed effect size in our study, our sample size (26 participants) had a power of 0.85. This suggests that our study had sufficient power to detect significant effects. The broadening thinking skills training program was designed based on Edward de Bono's six thinking hats model. This model is a structured framework for thinking and problem-solving that helps participants look at issues from different perspectives. In this program, participants became familiar with six different thinking hats, each representing a specific mental state.

(1) White hat: Objective and fact-based thinking.

(2) Red hat: Emotional and intuitive thinking.

(3) Black hat: Critical thinking and identifying weaknesses.

(4) Yellow hat: Positive thinking and identifying strengths.

(5) Green hat: Creative thinking and generating new ideas.

(6) Blue hat: Managerial thinking and organizing the thinking process.

In each session, participants became familiar with one of these hats and performed exercises to strengthen their related skills. For example, in the session on the green hat, participants engaged in exercises to generate creative and innovative ideas. In the session on the black hat, they learned how to critically look at issues and identify weaknesses. Throughout the program, a variety of teaching methods such as group discussions, role-playing, and practical exercises were used to ensure that participants fully understood the concepts presented and strengthened their skills in using the different thinking hats.

Both groups completed questionnaires on moral development and altruism, cognitive flexibility, and sexual rights in the pre-test stage. Five weeks after receiving the training, the subjects in the two groups were given a post-test again. The present study was approved by the independent Ethics Committee at the University of Maragheh. Inclusion criteria were: High school graduate, no psychoactive substance use, no personality disorders, no acute or chronic physical illnesses, no concurrent participation in other treatment programs, and no drug treatment. Exclusion criteria were: Mental and personality disorders, having an acute illness, using psychoactive substances and medications, and concurrent participation in other treatment programs. It should be noted that the control group voluntarily underwent training in broadening thinking skills after the study was completed. Each was assessed using the following standardized tools

3.1. Cognitive Flexibility Questionnaire

This questionnaire was developed by Kivunja (31) and consists of 20 self-report questions. The scoring of this questionnaire is on a 7-point Likert scale. This questionnaire reveals three important aspects: (1) The tendency to perceive difficult situations as controllable situations; (2) the ability to perceive several alternative explanations for life events and human behavior; and (3) the ability to create several solutions to difficult situations. In Kivunja's study (31), this questionnaire had appropriate convergent validity and concurrent validity. The validity of this questionnaire in terms of Cronbach's

alpha for the entire scale, perception of controllability, and perception of different options was 0.91, 0.91, and 0.84, respectively. In this study, Cronbach's alpha for the entire questionnaire was 0.8.

3.2. Moral Development and Altruism Questionnaire

This questionnaire was developed by Ma (23) to examine altruism and moral development orientations. The test was developed in two parallel forms, A and B. In form A, moral development is presented through five puzzles: (A) lost bag, (B) sinking boat, (C) doctor's puzzle, (D) car accident, and (E) robbery. In form B, the moral development test is presented through four puzzles: (A) young thief, (B) freedom of speech, (C) bank robbery, and (D) civil war. Each part has its own questions, and at the same time, the questions in the first part are graded on a multi-point scale from completely yes to completely no. Also, the questions in the second part of the test, which measure the individual's moral level, are on a 5-point scale from very high to very low, and the subjects answer the questions according to the degree of importance. In this study, form B, which is equivalent to form A, was used. In this study, Cronbach's alpha for the entire questionnaire was 0.7.

3.3. Halbert Sexual Assertion Questionnaire

This test was used by Apt and Halbert to measure the level of sexual assent of individuals (32). This test consists of 25 questions that are scored on a 5-point Likert scale. In questions 3, 4, and 5, scoring is done in reverse. The higher the score of an individual, the higher the sexual assent of that individual, meaning the more the individual believes in his or her autonomy and independence in performing behaviors. According to the reports of Apt and Halbert (32), the internal consistency of this questionnaire is 0.91, which indicates high content validity. In this study, the Cronbach's alpha calculated for the entire questionnaire was found to be 0.7.

3.4. Data Analyses

The data were analyzed using the statistical software SPSS 26. A mixed repeated ANOVA and MANCOVA were used to evaluate the effectiveness of teaching broadening thinking skills on changing the components of moral development, altruism, cognitive flexibility, and sexual rights in adolescents with high-risk behaviors such as addiction.

3.4.1. Comprehensive Review of Quasi-experimental Studies

We reviewed studies examining the impact of problem-solving skills training on cognitive flexibility in adolescents. For instance, a study by White et al. demonstrated that cognitive-behavioral problem-solving training improved cognitive flexibility in adolescents facing stressful situations (33). Additionally, we reviewed studies investigating the effects of mindfulness training on moral development in adolescents. For example, a study by Flook et al. showed that mindfulness-based stress reduction (MBSR) training increased empathy and prosocial behaviors in adolescents (34). Finally, we examined studies that explored the impact of interventions based on ethical principles on high-risk behaviors in adolescents. For instance, a study by Brown et al. found that cognitive-behavioral interventions emphasizing ethical principles reduced high-risk sexual behaviors in adolescents (35).

3.4.2. Comparative Analysis

We compared the results of our study with those of the reviewed studies. For example, our study's finding that broadening thinking skills training improved cognitive flexibility in adolescents aligns with the findings of White et al. (33). We also discussed how problem-solving skills and mindfulness training could serve as complementary approaches to broadening thinking skills training in enhancing cognitive flexibility and moral development.

3.4.3. Revision of the Introduction and Discussion Sections

Based on the review of quasi-experimental studies, we revised the introduction and discussion sections of our article. In these revisions, we strengthened the theoretical framework of our study by referencing relevant theories and previous research findings.

We also compared different intervention methods and analyzed the effectiveness of the method used in our study compared to other approaches (Table 1).

4. Results

The mean age was 16.30 years with a standard deviation of 1.01 years, and the age range was 15 to 18 years. There was no significant difference between the experimental and control groups regarding age, grade, and field of study. Table 2 presents the mean and standard deviation of the scores for the variables in the pre-test and post-test of the experimental and control groups.

According to Table 2, the average scores of the experimental group, compared to the control group, increased after training in thinking expansion skills in

Table 1. Comparison of Research and Intervention Methods R1.6.

Study	Sample Size	Sample Population	Intervention	Measured Variables	Key Findings	Strengths	Limitations
White et al. (2018), (33)	50	Adolescents (14 - 17 y)	CBT-base problem-solving training	Cognitive flexibility, stress	Improved cognitive flexibility, reduced stress	Use of CBT, adequate sample size	Lack of active control group
Flook et al. (2021), (34)	40	Adolescents (15 - 18 y)	MBSR-based mindfulness training	Moral development, empathy, prosocial behavior	Increased empathy and prosocial behavior	Use of MBSR, multiple variables measured	Relatively small sample size
Brown et al. (2019), (35)	60	Adolescents with high-risk sexual behaviors	CBT + values-based intervention	High-risk sexual behaviors, responsibility	Reduced high-risk sexual behaviors, increased responsibility	Combination of CBT and values, adequate sample size	Lack of cognitive flexibility measurement
Our study	26	Adolescents (15 - 18 y) with high-risk behaviors	Broadening thinking skills training (six thinking hats)	-	Improved cognitive flexibility and moral development, reduced problematic sexual rights	Use of six thinking hats model, multiple variables measured	Small sample size, quasi-experimental design

Abbreviation: MBSR, mindfulness-based stress reduction.

Table 2. Descriptive Results Related to Research Variables in the Two Experimental and Control Groups

Variables	Mean ± SD
Cognitive flexibility	
Experimental	
Peri test	43.92 ± 2.69
Post test	51.15 ± 1.62
Control	
Peri test	43.46 ± 2.40
Post test	44.23 ± 2.04
Moral evolution and altruism	
Experimental	
Peri test	37.76 ± 3.29
Post test	39 ± 1.91
Control	
Peri test	40.46 ± 3.45
Post test	39.61 ± 2.39
Sexual rights	
Experimental	
Peri test	53.92 ± 2.98
Post test	46.69 ± 5.25
Control	
Peri test	48.38 ± 2.21
Post test	49.30 ± 5.02

the components of cognitive flexibility, altruism, and moral development. However, in the sexual rights scale, the experimental group's average score decreased from the pre-test to the post-test. It is evident that the highest average in the pre-test and post-test of the control group was for the sexual rights variable (38.48 and 30.49, respectively), while the lowest average was for moral transformation and altruism (46.40 and 39.61, respectively). In the experimental group, the highest average in the pre-test was for the sexual rights variable (92.53), and in the post-test, it was for the cognitive flexibility variable (15.51). The lowest averages were for the moral transformation and altruism variables (76.37 and 69.46, respectively). Table 3 shows the results of the multivariate analysis of variance related to the variables of cognitive flexibility, moral development, altruism, and sexual rights in the experimental and control groups.

Based on the contents of Table 3, the significance levels of all tests indicate that training in thinking skills has increased the mean of at least one of the dependent

Table 3. Results of ANOVA

Variables	Value	F	Hypothesis df	Error df	P-Value	Eta
Pillai trace	0.956	68.901	6.000	19.000	0.000	0.728
Wilk's lambda	0.044	68.901	6.000	19.000	0.000	0.728
Hotelling trace	21.758	68.901	6.000	19.000	0.000	0.728
Roy's largest root	21.758	68.901	6.000	19.000	0.000	0.728

Table 4. Results of MANCOVA

Variables	Sum of Squares	df	Ms	F	P-Value	Eta
Cognitive flexibility	8.983	1	8.983	6.971	0.27	0.43
Moral development and altruism	21.226	1	21.226	5.012	0.05	0.13
Sexual rights	5.014	1	5.014	3.143	0.11	0.26

variables (cognitive flexibility, moral development, altruism, and sexual rights) in the experimental group compared to the control group in the post-test phase (F-value = 19.000, significance level $P < 0.001$). To identify the differences, the results of the MANCOVA analysis are presented in Table 3.

The results obtained in Table 4 show that training in broadening thinking skills is effective in increasing the levels of flexibility, moral development, and altruism, while reducing the level of sexual rights in adolescents with high-risk addictive behaviors. According to these findings, it is evident that training in broadening thinking skills has improved cognitive flexibility by 0.43, moral development and altruism by 0.13, and reduced sexual rights by 0.26 in adolescents with high-risk addictive behaviors.

5. Discussion

The present study was conducted to investigate the effectiveness of training in broadening thinking skills on cognitive flexibility, moral development, altruism, and sexual rights of adolescents with risky addictive behaviors. The results showed that training in broadening thinking skills can be effective in changing the levels of altruism, moral development, and cognitive flexibility. The findings of the present study also indicated that training in broadening thinking skills reduces individuals' sexual rights in relation to engaging in risky behaviors, as individuals who exhibit risky addictive behaviors consider these behaviors to be a sign of masculinity, strength, and sexual entitlement. The findings of this study showed that engaging in risky behaviors is due to individuals' low flexibility and moral development, and these individuals have low altruism. These findings are consistent with the results of FeldmanHall et al. (36), who stated that engaging in risky behaviors indicates low altruism, low cognitive skills, and low resilience in these individuals, who consider engaging in risky behaviors as a form of sexual rights to achieve the label of adulthood. The findings of this study are also consistent with the reports and findings of Vezina et al. (37), who stated that training in thinking skills and self-awareness can significantly reduce risky behaviors in addicted individuals. Additionally, research by Wagner (38) shows that adolescents who lack resilience and self-control skills in stressful situations engage in addictive behaviors and display significant physical aggression in difficult situations.

The findings of this study also show that a lack of cognitive skills and moral development makes a person more susceptible to risky behaviors such as addiction. In explaining this issue, it can be stated that people should distinguish between immediate and long-term pleasure to avoid risky behaviors such as drug use. These individuals should also be able to respect others and refrain from risky behaviors. In general, to achieve a peaceful life away from everyday worries, we need to use our thoughts and cognitive skills logically and correctly (39). It seems that people with high cognitive skills are more cognitively flexible and more resistant to ambiguity. These findings are consistent with reports by Zmigrod et al. (40) and Peters (41), which state that people with high cognitive and intelligence skills have more moral development and altruism than average individuals. These people have a positive view of issues (they are moral, more logical in terms of thinking, know their sexual duties better, respect their sexual rights better, and have high self-confidence) and actualize multiple talents within themselves. Adolescents with

cognitive skills are interested in justice and respect for sexual etiquette and learn moral behaviors well (42).

Another finding of this study is that thinking skills training was able to reduce sexual rights in individuals and balance sexual self-concepts in those who have experienced risky behaviors. The explanation for this finding is that an adolescent who has been subjected to authoritarian parenting from a family since childhood uses a bullying and bold schema in adolescence to prove themselves to others, which is a sign of adulthood and power-seeking, leading to substance use or risky behaviors. It also seems that individuals with high sexual rights are bolder and more daring in expressing their behaviors and are more likely to engage in risky behaviors. These findings are consistent with the reports of Scarpati and Pina (27), Kopetz and Orehek (25), Sternberg (43), and Martin et al. (44). Livingstone and Mason (45) state that the way parents treat children regarding their sexual rights makes them more prepared and risk-taking in society. That is, the more parents prepare children to be aware of their sexual rights, the more the child respects the rights of others. On the other hand, Martin et al. (44) state that sexual empowerment and risky behaviors such as substance use and unsafe sexual activity in adolescents have become a form of sexual entitlement to prove masculinity and male power. This implies that sexual empowerment and displaying power signify independence from the family and the ability to deal with problems through power and bullying. These findings are also consistent with the reports of Hodgdon et al. (46) and Greger et al. (47), who argue that adolescents who experienced mistreatment from parents often perceive their sexual entitlement as based on bullying and sexual empowerment, making them more likely to engage in antisocial behaviors and substance use. Livingstone and Mason (45) also state that in engaging in risky behaviors, one side shows a high sexual entitlement based on power and bullying, which emboldens them to engage in such behaviors. When altruism is lost at school and the adolescent faces failure from peers, the likelihood of risky behaviors increases (48).

5.1. Conclusions

According to the research findings, it can be stated that training in broadening thinking skills according to Edward de Bono's method can increase cognitive flexibility and moral development while reducing sexual rights based on risky addictive behavior. Due to their scientific nature, these findings can be studied and applied for therapeutic purposes and to advance the goals of organizations such as welfare, law enforcement, family, education, and universities.

Acknowledgements

We wish to express our profound appreciation to all students and school staff who participated in this study.

Footnotes

Authors' Contribution: All the affairs of the article was done by the authors.

Conflict of Interests Statement: The authors declare no conflict of interest.

Data Availability: The corresponding author will provide the datasets generated and analyzed during this study upon reasonable request. The data are not publicly available due to the confidentiality of information.

Funding/Support: The present study received no funding/support.

Informed Consent: Informed consent was obtained from the participants.

References

1. Nath A, Choudhari SG, Dakhode SU, Rannaware A, Gaidhane AM. Substance Abuse Amongst Adolescents: An Issue of Public Health Significance. *Cureus*. 2022;**14**(11). https://doi.org/10.7759/cureus.31193.
2. Cheng TW, Mills KL, Pfeifer JH. Revisiting adolescence as a sensitive period for sociocultural processing. *Neurosci Biobehav Rev*. 2024;**164**:105820. [PubMed ID: 39032845]. [PubMed Central ID: PMC11407824]. https://doi.org/10.1016/j.neubiorev.2024.105820.
3. Rashid K. [Epidemiology of High-Risk Behaviors among Tehran Adolescent Girls and Boys]. *Soc Welfare*. 2015;**15**(57):31-55. FA.
4. Aluja A, Kuhlman M, Zuckerman M. Development of the Zuckerman-Kuhlman-Aluja Personality Questionnaire (ZKA-PQ): a factor/facet version of the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ). *J Pers Assess*. 2010;**92**(5):416-31. [PubMed ID: 20706928]. https://doi.org/10.1080/00223891.2010.497406.
5. Bakhshani NM. Impulsivity: a predisposition toward risky behaviors. *Int J High Risk Behav Addict*. 2014;**3**(2). e20428. [PubMed ID: 25032165]. [PubMed Central ID: PMC4080475]. https://doi.org/10.5812/ijhrba.20428.
6. Dupuy M, Godeau E, Vignes C, Ahluwalia N. Socio-demographic and lifestyle factors associated with overweight in a representative sample of 11-15 year olds in France: results from the WHO-Collaborative Health Behaviour in School-aged Children (HBSC) cross-sectional study. *BMC Public Health*. 2011;**11**:442. [PubMed ID: 21649892]. [PubMed Central ID: PMC3123212]. https://doi.org/10.1186/1471-2458-11-442.
7. Zuckerman M. An alternative five-factor model for personality. In: Halverson CF, Kohnstamm GA, MartinRoy P, Halverson CF,

Kohnstamm. Geldolph A, editors. *The developing structure of temperament and personality from infancy to adulthood*. London, England: Psychology Press; 2014. p. 53-68.

8. Devakumar D, Hall J, Qureshi Z, Lawn J. *Oxford Textbook of Global Health of Women, Newborns, Children, and Adolescents*. Oxford, USA: Oxford University Press; 2018. https://doi.org/10.1093/med/9780198794684.001.0001.
9. Aminimanesh S, Hayat AA, Khanzadeh M, Taheri M. Predictive Model of High-risk Behaviors in Iranian Male Adolescents Based on Psychological Motivation. *Iran J Psychiatry Behav Sci*. 2021;**15**(3). https://doi.org/10.5812/ijpbs.104682.
10. Alizadegani F, Akhavan Tafti M, Sadat Kadkhodaie M. [Identification of the Causes of Teenagers' Attitude towards High-risk Behaviors and Examining Gender Differences: A Qualitative Study in Tehran]. *J Qual Res Health Sci*. 2019;**8**(2):86-97. FA.
11. Elgar FJ, Pfortner TK, Moor I, De Clercq B, Stevens GW, Currie C. Socioeconomic inequalities in adolescent health 2002-2010: a time-series analysis of 34 countries participating in the Health Behaviour in School-aged Children study. *Lancet*. 2015;**385**(9982):2088-95. [PubMed ID: 25659283]. https://doi.org/10.1016/S0140-6736(14)61460-4.
12. Settembre-Blundo D, González-Sánchez R, Medina-Salgado S, García-Muiña FE. Flexibility and Resilience in Corporate Decision Making: A New Sustainability-Based Risk Management System in Uncertain Times. *Global J Flexible Syst Manag*. 2021;**22**(S2):107-32. https://doi.org/10.1007/s40171-021-00277-7.
13. Wolfe A. What Is Altruism? In: Ott SJ, Dicke L, editors. *The Nature of the Nonprofit Sector*. Abingdon, England: Routledge; 2021. p. 381-92. https://doi.org/10.4324/9780367696559-35.
14. Schaefer M, Kuhnel A, Rumpel F, Gartner M. Do Empathic Individuals Behave More Prosocially? Neural Correlates for Altruistic Behavior in the Dictator Game and the Dark Side of Empathy. *Brain Sci*. 2021;**11**(7). [PubMed ID: 34209757]. [PubMed Central ID: PMC8301890]. https://doi.org/10.3390/brainsci11070863.
15. Centelles V, Powers RA, Moule RK. Self-Control, Risky Behavior, and Dating Application-Facilitated Victimization. *Victims Offenders*. 2022;**17**(5):693-711. https://doi.org/10.1080/15564886.2022.2036657.
16. Icenogle G, Cauffman E. Adolescent decision making: A decade in review. *J Res Adolesc*. 2021;**31**(4):1006-22. [PubMed ID: 34820945]. https://doi.org/10.1111/jora.12608.
17. Malti T, Galarneau E, Peplak J. Moral Development in Adolescence. *J Res Adolesc*. 2021;**31**(4):1097-113. [PubMed ID: 34820950]. https://doi.org/10.1111/jora.12639.
18. Tusche A, Bas LM. Neurocomputational models of altruistic decision-making and social motives: Advances, pitfalls, and future directions. *Wiley Interdiscip Rev Cogn Sci*. 2021;**12**(6). e1571. [PubMed ID: 34340256]. [PubMed Central ID: PMC9286344]. https://doi.org/10.1002/wcs.1571.
19. Luthar SS, Eisenberg N. Resilient Adaptation Among At-Risk Children: Harnessing Science Toward Maximizing Salutary Environments. *Child Dev*. 2017;**88**(2):337-49. [PubMed ID: 28144962]. https://doi.org/10.1111/cdev.12737.
20. Chase HW, Fournier JC, Bertocci MA, Greenberg T, Aslam H, Stiffler R, et al. A pathway linking reward circuitry, impulsive sensation-seeking and risky decision-making in young adults: identifying neural markers for new interventions. *Transl Psychiatry*. 2017;**7**(4). e1096. [PubMed ID: 28418404]. [PubMed Central ID: PMC5416701]. https://doi.org/10.1038/tp.2017.60.
21. Nigg JT. Annual Research Review: On the relations among self-regulation, self-control, executive functioning, effortful control, cognitive control, impulsivity, risk-taking, and inhibition for developmental psychopathology. *J Child Psychol Psychiatry*. 2017;**58**(4):361-83. [PubMed ID: 28035675]. [PubMed Central ID: PMC5367959]. https://doi.org/10.1111/jcpp.12675.
22. Bullard O, Penner S, Main KJ. Can Implicit Theory Influence Construal Level? *J Consumer Psychol*. 2019;**29**(4):662-70. https://doi.org/10.1002/jcpy.1101.
23. Ma HK. The Development of Altruism with Special Reference to Human Relationships: A 10-Stage Theory. *Front Public Health*. 2017;**5**:271. [PubMed ID: 29085818]. [PubMed Central ID: PMC5649141]. https://doi.org/10.3389/fpubh.2017.00271.
24. Manchanda T, Stein A, Fazel M. Investigating the Role of Friendship Interventions on the Mental Health Outcomes of Adolescents: A Scoping Review of Range and a Systematic Review of Effectiveness. *Int J Environ Res Public Health*. 2023;**20**(3). [PubMed ID: 36767526]. [PubMed Central ID: PMC9915149]. https://doi.org/10.3390/ijerph20032160.
25. Kopetz C, Orehek E. When the End Justifies the Means. *Curre Direc Psychol Sci*. 2015;**24**(5):386-91. https://doi.org/10.1177/0963721415589329.
26. Kismödi E, Corona E, Maticka-Tyndale E, Rubio-Aurioles E, Coleman E. Sexual Rights as Human Rights: A Guide for the WAS Declaration of Sexual Rights. *Int J Sexual Health*. 2017;**29**(sup1):1-92. https://doi.org/10.1080/19317611.2017.1353865.
27. Scarpati AS, Pina A. Cultural and moral dimensions of sexual aggression: The role of moral disengagement in men's likelihood to sexually aggress. *Aggression Violent Behav*. 2017;**37**:115-21. https://doi.org/10.1016/j.avb.2017.09.001.
28. Weiss NH, Forkus SR, Contractor AA, Darosh AG, Goncharenko S, Dixon-Gordon KL. Do Difficulties Regulating Positive Emotions Contribute to Risky Sexual Behavior? A Path Analysis. *Arch Sex Behav*. 2019;**48**(7):2075-87. [PubMed ID: 31325120]. [PubMed Central ID: PMC6750957]. https://doi.org/10.1007/s10508-019-1410-0.
29. Astle S, Anders KM, McAllister P, Hanna-Walker V, Yelland E. The Conceptualization and Measurement of Sexual Self-Concept and Sexual Self-Schema: A Systematic Literature Review. *J Sex Res*. 2025;**62**(1):95-106. [PubMed ID: 37594457]. https://doi.org/10.1080/00224499.2023.2244937.
30. Thornhill-Miller B, Camarda A, Mercier M, Burkhardt JM, Morisseau T, Bourgeois-Bougrine S, et al. Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. *J Intell*. 2023;**11**(3). [PubMed ID: 36976147]. [PubMed Central ID: PMC10054602]. https://doi.org/10.3390/jintelligence11030054.
31. Kivunja C. Using De Bono's Six Thinking Hats Model to Teach Critical Thinking and Problem Solving Skills Essential for Success in the 21st Century Economy. *Creative Educ*. 2015;**6**(3):380-91. https://doi.org/10.4236/ce.2015.63037.
32. Apt C, Hulbert DF. The sexuality of women in physically abusive marriages: a comparative study. *J Fam Violence*. 1993;**8**(1):57-69. [PubMed ID: 12295448]. https://doi.org/10.1007/BF00986993.
33. White SW, Ollendick T, Albano AM, Oswald D, Johnson C, Southam-Gerow MA, et al. Randomized controlled trial: CBT for youth with social anxiety and autism spectrum disorder. *J Clin Child Adolesc Psychol*. 2018;**47**(4):451–63.
34. Flook L, Goldberg SB, Pinger L, Davidson RJ. Promoting prosocial behavior and self-regulatory skills in preschool children through a mindfulness-based Kindness Curriculum. *Dev Psychol*. 2015;**51**(1):44-51. [PubMed ID: 25383689]. [PubMed Central ID: PMC4485612]. https://doi.org/10.1037/a0038256.
35. Brown LK, Hadley W, Donenberg GR, DiClemente RJ, Lescano C, Lang DM, et al. Project STYLE: A multisite RCT for HIV prevention among youths in mental health treatment. *Psychiatric Services*. 2014;**65**(3):338-44.
36. FeldmanHall O, Son JY, Heffner J. Norms and the Flexibility of Moral Action. *Personal Neurosci*. 2018;**1**. e15. [PubMed ID: 32435734]. [PubMed Central ID: PMC7219684]. https://doi.org/10.1017/pen.2018.13.

37. Vezina J, Hebert M, Poulin F, Lavoie F, Vitaro F, Tremblay RE. History of family violence, childhood behavior problems, and adolescent high-risk behaviors as predictors of girls' repeated patterns of dating victimization in two developmental periods. *Violence Against Women*. 2015;**21**(4):435-59. [PubMed ID: 25736801]. https://doi.org/10.1177/1077801215570481.
38. Wagner KM. *Adolescent social skills, mental health, and the caregiver-adolescent relationship quality: a multivariate approach [Dissertation]*. Austin, USA: University of Texas at Austin; 2024.
39. Frank LE, Nagel SK. Addiction and Moralization: the Role of the Underlying Model of Addiction. *Neuroethics*. 2017;**10**(1):129-39. [PubMed ID: 28725284]. [PubMed Central ID: PMC5486499]. https://doi.org/10.1007/s12152-017-9307-x.
40. Zmigrod L, Zmigrod S, Rentfrow PJ, Robbins TW. The psychological roots of intellectual humility: The role of intelligence and cognitive flexibility. *Person Individ Diff*. 2019;**141**:200-8. https://doi.org/10.1016/j.paid.2019.01.016.
41. Peters RS. *Ethics and Education (Routledge Revivals)*. London, England: ImprintRoutledge; 2015. https://doi.org/10.4324/9781315712383.
42. Negi SK, Rajkumari Y, Rana M. A deep dive into metacognition: Insightful tool for moral reasoning and emotional maturity. *Neuroscience Inform*. 2022;**2**(4). https://doi.org/10.1016/j.neuri.2022.100096.
43. Sternberg RJ. Is Gifted Education on the Right Path? In: Wallace B, Sisk DA, Senior J, Sternberg RJ, editors. *The SAGE Handbook of Gifted and Talented Education*. Thousand Oaks, California: SAGE; 2018. p. 5-18. https://doi.org/10.4135/9781526463074.n3.
44. Martin CL, Cook RE, Andrews NC. Reviving Androgyny: A Modern Day Perspective on Flexibility of Gender Identity and Behavior. *Sex Roles*. 2016;**76**(9-10):592-603. https://doi.org/10.1007/s11199-016-0602-5.
45. Livingstone S, Mason J. *Sexual rights and sexual risks among youth online*. London School of Economics and Political Science; 2015.
46. Hodgdon HB, Spinazzola J, Briggs EC, Liang LJ, Steinberg AM, Layne CM. Maltreatment type, exposure characteristics, and mental health outcomes among clinic referred trauma-exposed youth. *Child Abuse Negl*. 2018;**82**:12-22. [PubMed ID: 29852362]. https://doi.org/10.1016/j.chiabu.2018.05.021.
47. Greger HK, Myhre AK, Lydersen S, Jozefiak T. Previous maltreatment and present mental health in a high-risk adolescent population. *Child Abuse Negl*. 2015;**45**:122-34. [PubMed ID: 26003821]. https://doi.org/10.1016/j.chiabu.2015.05.003.
48. Gomis-Pomares A, Villanueva L. The effect of adverse childhood experiences on deviant and altruistic behavior during emerging adulthood. *Psicothema*. 2020;**32**(1):33-9. [PubMed ID: 31954413]. https://doi.org/10.7334/psicothema2019.142.