ASPI | Afarand Scholarly Publishing Institute; Turkey
ISSN: 2345-2897; Health Education and Health Promotion. 2025;13(4):637-644 10.58209/hehp.13.4.637

Unveiling the Landscape of High-Risk Behaviors in Persian-Language Research

ARTICLE INFO

Article Type
Descriptive Study

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How to cite this article
Rahimi S, Soheili F, Jebraeili H. Unveiling the Landscape of High-Risk Behaviors in Persian-Language Research. Health Education and Health Promotion. 2025;13(4):637-644.

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Article History
Received: September 21, 2025
Accepted: November 2, 2025
ePublished: November 11, 2025

ABSTRACT

Aims Given the growing volume and fragmented nature of the literature, this study aimed to identify the conceptual structure and dominant intellectual trends in high-risk behaviors in Iran over the past two decades.

Instrument & Methods This descriptive study employed a quantitative content analysis approach using scientometric indicators. The data comprised research articles indexed in the Islamic World Science Citation Center databases from 2005 to 2023. Co-word analysis and cluster analysis techniques were utilized for data analysis. VOSviewer software was used for conceptual clustering, and UCINET was employed to calculate the indices required for the strategic diagram.

Findings The analysis identified nine main thematic clusters. The strategic diagram revealed that three clusters including "high-risk behaviors and protective factors," "impulsivity and related disorders," and "adolescent issues" constituted the core research area, occupying the first quadrant. Clusters, such as "student mental health" and "women's physical health" were identified as specialized and mature yet peripheral areas in the second quadrant. Meanwhile, topics, like "novel therapeutic approaches" and "social capital" appeared in the third quadrant, representing underdeveloped and emerging themes.

Conclusion The body of knowledge on high-risk behaviors in Iran has achieved structural maturity, characterized by a robust core focused on psychological mechanisms in adolescents.

Keywords Risk-Taking; Impulsive Behavior; Attention Deficit Hyperactivity Disorder; Bibliometrics

CITATION LINKS

[1] Games research today: Analyzing the academic landscape 2000-2014 [2] Knowledge engineering research topic mining based on co-word analysis [3] Thematic analysis and scientific mapping of resistance economy studies [4] The orientation of national security studies by Persian scholars [5] Thematic trends analysis in decision-making research in Islamic world science and technology monitoring and citation institute (ISC): A bibliometric study [6] Knowledge visualization and mapping of information literacy [7] Evolution and diffusion of information literacy topics [8] A scientometric study of digital literacy, ICT literacy, information literacy, and media literacy [9] Global research on financial literacy: A bibliometric analysis [10] An analysis of literacy research in Iran: The conceptual structure of literacy in Islamic world science citation center [11] Identifying emerging areas and map scientific structure of throbbing headaches [12] Knowledge structure of Iranian higher education studies based on co-word network analysis in ISC database [13] Literature review of driving risk identification research based on bibliometric analysis [14] Prevalent high risk behaviors and important family factors from the point of view of adolescents: A qualitative research [15] Social alienation and tendency toward risky behavior: A case study of the city of Mashhad [16] Investigating high-risk sexual behaviors and related social and cultural factors among youth of Shiraz City [17] Investigating the structural model of the relationship between high-risk behaviors and defense mechanisms with the mediation of difficulty in cognitive regulation of emotion in secondary school students [18] Analyzing the Patterns of multiple substance use and risky sexual behavior and the protective role of religious faith in college students [19] A structural model to risky behaviors in 14-17 years old adolescents based on anxiety sensitivity mediated by self-acceptance [20] Relationship between brain/behavioral system, impulsive and delay discounting, with high-risk behaviors in adolescence: The mediation of emotion dysregulation [21] How does psychological distance influence public risky behavior during public health emergencies [22] Universal early childhood education and adolescent risky behavior [23] Depression and risky health behaviors [24] Analysis on current research of supernetwork through knowledge mapping method

Introduction

To understand the structure of a broad and fragmented scientific field, traditional thematic analyses alone are insufficient and require macro-level, data-driven approaches. In this context, co-word analysis serves as a powerful tool for visualizing the intellectual structure, identifying conceptual clusters, and mapping research trends within a scientific domain [1]. The effectiveness of this approach in mapping knowledge across various fields has been demonstrated, including areas such as knowledge engineering [2], resilient economics [3], national security [4], decision-making [5], and various literacy domains, including information literacy [6, 7], digital literacy [8], financial literacy [9], and literacy [10]. Specifically, in health-related research, this approach has been applied to analyze the field of pulsatile headaches [11] and in the social sciences for studies on higher education in Iran [12]. The survey by Ge *et al.* also exemplifies the use of this method to map knowledge in the specialized field of driving risk. They identified key thematic clusters and future research trends, such as human-machine synergy, artificial intelligence, intelligent driving, risk identification, and natural driving, as current hot research topics and future trends [13]. Thus, the present study also employed this approach to structurally analyze the domain of risk behaviors in Iran.

The literature on risk behaviors encompasses a wide range of studies that have examined this phenomenon from psychological, sociological, and environmental perspectives. Studies conducted in Iran have primarily focused on identifying the factors associated with risk behaviors within the country's social and cultural context, revealing an evolutionary shift from examining external factors to internal mechanisms. Atashnafas *et al.* emphasize the key role of parenting styles [14], while Nateghi & Afshani demonstrate a direct relationship between social alienation and these behaviors [15]. Alborzi *et al.* highlight the importance of social and cultural capital in preventing risky sexual behaviors [16]. Other studies have shifted toward exploring deeper psychological mechanisms. Khatib *et al.* elaborate on the role of defense mechanisms and emotion regulation [17], Jebraeili & Felegari report religious faith as a protective factor among students [18], Moghaddam *et al.* explored the roles of anxiety sensitivity and self-acceptance [19], and finally, Alizadeh *et al.* report neuropsychological mechanisms such as brain/behavior systems and impulsivity as fundamental factors [20].

International studies, employing diverse methodologies, have also addressed the complex dimensions of this field. For example, Gao & Sun examined the mediating role of perceived risk and psychological insecurity during public health emergencies [21]. Ando *et al.*, using an econometric approach, showed that childhood interventions can lead to a reduction in risk behaviors during adolescence [22]. Weng, using advanced statistical methods, demonstrate the causal impact of depression on the increase in health risk behaviors [23].

As the literature review indicates, both domestic and international studies have identified numerous factors, ranging from macro-level social and familial influences to micro-level psychological and neurobiological ones. However, almost all of these studies are thematic and case-based in nature, focusing on the relationships between specific parameters. What has been overlooked, however, is a macro-structural analysis of the body of knowledge produced in this domain in Iran. Currently, there is no comprehensive map that systematically and data-drivenly illustrates research trends, focal points, and gaps in this field. This study aimed to fill this knowledge gap by utilizing bibliometric tools to map the knowledge in the domain of risk behaviors in Iran.

Instrument and Methods

This descriptive study used quantitative content analysis and social network analysis. The research population comprised all documents containing the terms "high-risk behavior," "impulsivity," and "impulsive behavior" in their titles. The data were extracted from the Islamic World Science Citation Database (ISC). The retrieval was performed on May 28, 2025.

Data processing was conducted in several stages. Initially, plain-text files extracted from the Islamic World Science Citation Database were imported into BibExcel. Using this software and its natural language processing techniques, key terms (nouns or noun phrases) were extracted, yielding 2,248 concepts. At this stage, standardization and normalization of concepts were performed: Singular and plural forms were unified, acronyms were expanded, and terms with similar meanings were merged, resulting in 854 unique keywords.

In the second step, the standardized data were processed using specific BibExcel commands to generate a matrix. At this stage, a sample of data was selected for analysis; a minimum threshold frequency was established for terms to be included in the bibliometric map. Setting this cut-off threshold is recommended for effectively eliminating erroneous or insignificant terms. Consequently, a 134×134 matrix was constructed.

In the subsequent step, this matrix was transformed into a correlation matrix. Finally, this matrix was imported into VOSviewer, where concept clustering was performed using the K-means clustering method. In the final stage, separate matrices were created for each cluster identified in the previous phase. Using UCINET, centrality and density scores were

calculated for each cluster. By entering the obtained values into Microsoft Excel, a strategic diagram was generated.

Findings

A total of 551 documents published with the term "high-risk behaviors" in their titles were identified. The first articles indexed in the ISC database appeared in 2005. The total number of unique concepts and keywords identified was 854. From the 551 documents analyzed, 2,248 keywords were identified. After the data cleaning and standardization process, 854 unique keywords remained. The terms 'High-Risk Behaviors,' 'Impulsivity,' and 'Adolescents' ranked first to third, with frequencies of 249, 157, and 71, respectively (Table 1).

Table 1. The twenty-four most frequent concepts in the high-risk behaviors

No.	Concept	Frequency
1	High-risk behaviors	249
2	Impulsivity	157
3	Adolescents	71
4	Emotion regulation	42
5	Attention-deficit/hyperactivity disorder	39
6	Students (high school)	36
7	University students	31
8	Cognitive emotion regulation	23
9	Substance abuse	21
10	Sensation seeking	21
11	Risky sexual behavior	19
12	Risky driving	19
13	Mindfulness	18
14	Tendency toward high-risk behaviors	17
15	HIV	16
16	Youth	14
17	Response inhibition	14
18	Personality traits	13
19	Parenting styles	13
20	Internet addiction	13
21	Resilience	13
22	Borderline personality disorder	13
23	Acceptance and commitment therapy	13
24	Addiction	12

With a frequency of 249, 'High-Risk Behaviors' was the most frequent keyword, indicating its status as the central concept within this body of literature. The high frequency of this term reflects the significant attention that researchers have given to high-risk behaviors in the current societal context. In addition to the high-frequency concepts, the 20 most frequent co-occurring keyword pairs were identified during the study period. The pairs "High-Risk Behaviors-Adolescents," "High-Risk Behaviors-Students (High School)," and "High-Risk Behaviors-University Students" exhibit the highest co-occurrence frequencies during this period. Overall, the concepts of 'High-Risk Behaviors' and 'Impulsivity' were frequently used in combination with many other concepts, highlighting their centrality within the research domain (Table 2).

To identify the conceptual structure of the field, cluster analysis was performed using VOSviewer software. The concepts within the high-risk behaviors domain were grouped into nine distinct clusters. The co-word map revealed the following nine clusters: 1. Psychopathology of high-risk behaviors; 2. Impulsivity and related disorders; 3. Adolescent issues; 4. Emotion regulation in psychopathology and treatment; 5. High-risk behaviors and protective factors; 6. Social and cultural capital of adolescents and youth; 7. Psychosocial health of university students; 8. Mindfulness and mental health; and 9. Physical health and psychological capital of women (Figure 1).

Concepts with higher weights represented the primary focal points within each thematic cluster. A content analysis of these clusters revealed the intellectual structure and core knowledge framework of the field. Overall, the research landscape of high-risk behaviors in Iran had a multifaceted structure. This structure began with the explanation of pathologies and psychological mechanisms, placed a special focus on the adolescent population, and ultimately extended to the examination of protective factors, therapeutic approaches, and social contexts (Table 3).

Table 2. The twenty most frequent co-occurring keyword pairs

Rank	Co-occurring pair		Frequency
1	High-risk behaviors	Adolescents	47
2	High-risk behaviors	Students (high school)	22
3	High-risk behaviors	University students	20
4	Impulsivity	Emotion regulation	19
5	Impulsivity	Attention-deficit/hyperactivity disorder	19
6	Impulsivity	Adolescents	11
7	Impulsivity	Cognitive emotion regulation	11
8	High-risk behaviors	Emotion regulation	11
9	High-risk behaviors	Youth	11
10	High-risk behaviors	Cognitive emotion regulation	10
11	High-risk behaviors	Resilience	9
12	High-risk behaviors	Sensation seeking	9
13	Impulsivity	Dialectical behavior therapy	9
14	Impulsivity	Sensation seeking	8
15	High-risk behaviors	Mindfulness	8
16	High-risk behaviors	Family	8
17	High-risk behaviors	HIV	8
18	Impulsivity	Borderline personality disorder	8
19	High-risk behaviors	Substance abuse	8
20	Impulsivity	Mindfulness	8

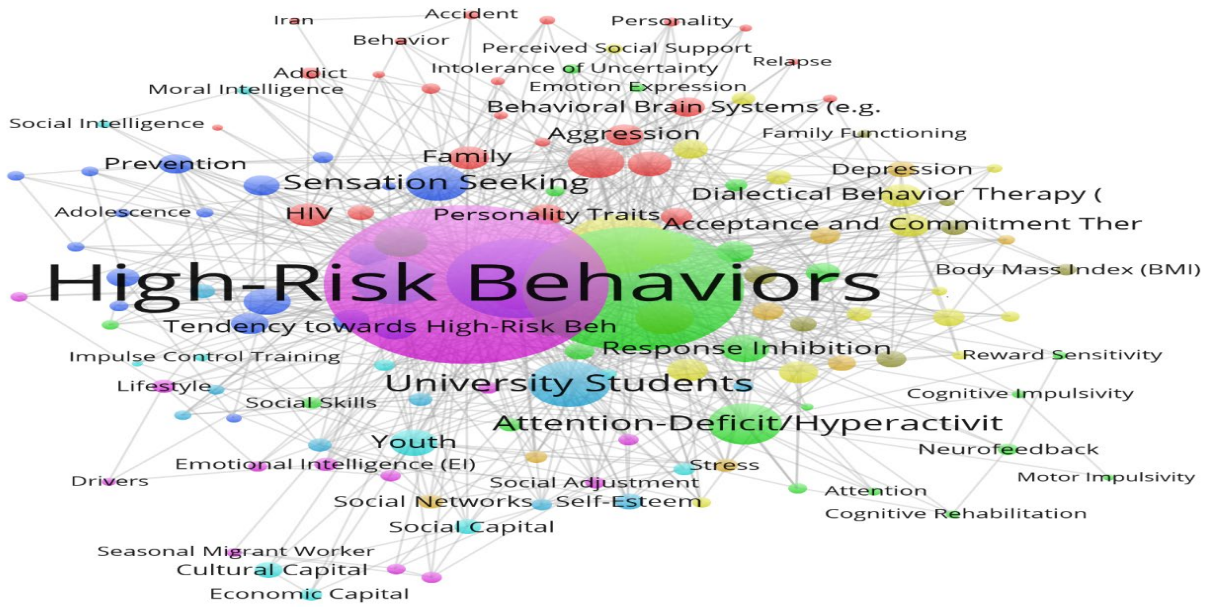

Figure 1. Co-word map of documents in high-risk behaviors

Table 3. Cluster names and key concepts in the high-risk behaviors domain

Cluster No.	Cluster name	Key concepts	Weight
1	Psychopathology of high-risk behaviors	Substance abuse	88
		Risky driving	60
		HIV	56
		Family	54
		Aggression	48
		Personality traits	46
		Behavioral brain systems	44
		Emotions	38
		Sexual behavior	30
		Addict	20
		AIDS virus	18
		Accidents	14
		Risky sexual intercourse	14
		Personality	14
		Dark personality traits	14
		Health belief model	12
		Girls	12
		Bullying	12
		Irrational beliefs	10
		Behavior	10
		Model	10
		Relapse	6
		Educational intervention	4
2	Impulsivity and related disorders	Impulsivity	604
		ADHD	126
		Risky sexual behavior	80
		Response inhibition	72
		Anger	50
		Addiction	48
		Behavioral activation/inhibition	44
		Impulsive behavior	36
		Child	26
		Experiential avoidance	24
		Social skills	20
		Neurofeedback	20
		Veteran	18
		Working memory	18
		Education	16
		Intolerance of uncertainty	16
		Emotional expressiveness	14
		Cognitive impulsivity	12
		Cognitive rehabilitation	12
		Attention	12
		Reward sensitivity	12
		Social harms	10
		Motor impulsivity	8

Continue of Table 3 from the last page.

3	Adolescent issues	Adolescents	322
		Sensation seeking	100
		Parenting styles	66
		Tendency toward high-risk behaviors	54
		Risk-taking	50
		Metacognitive beliefs	46
		Coping strategies	46
		Prevention	44
		Self-efficacy	42
		Identity styles	22
		Communication skills	18
		Conduct disorder	16
		Family-centered interventions	16
		Parental monitoring	16
		Socioeconomic status	16
		Tendency toward drugs	14
		Adolescence	14
		Attitude toward drug use	12
4	Emotion regulation in psychopathology and treatment	Emotion regulation	208
		Cognitive emotion regulation	92
		Acceptance and commitment therapy	56
		Internet addiction	54
		Dialectical behavior therapy	54
		Borderline personality disorder	52
		Alexithymia	44
		Bipolar disorder	38
		Suicidal thoughts	28
		Self-harm	28
		Methamphetamine	26
		Loneliness	18
		Cognitive-behavioral therapy	18
		Perceived social support	16
		Five-factor model of personality	14
		Emotional schema therapy	14
		Rumination	14
5	High-risk behaviors and protective factors	Resilience	866
		Lifestyle	68
		Emotional intelligence	26
		Socio-educational prevention	26
		Social pressure	22
		Addiction tendency	22
		Islamic teachings	22
		Social adjustment	20
		Vulnerability	20
		Islamic approach	18
		Family functioning	18
		Seasonal migrant worker	16
		Drivers	14
6	Social and cultural capital of adolescents and youth	Students (high school)	144
		Youth	66
		Cultural capital	32
		Social capital	30
		Religiosity	24
		Economic capital	24
		Self-control	20
		Phenomenology	16
		Moral intelligence	14
		Impulse control training	12
		Social intelligence	12
		Qualitative study	8
7	Psychosocial health of university students	Attachment styles	148
		Self-esteem	52
		Social health	32
		Social support	28
		Executive functions	26
		Spiritual health	26
		Craving	22
		Academic motivation	22
		University	16
8	Mindfulness and mental health	Mindfulness	90
		Driving	38
		Mental health	36
		Depression	34
		Self-compassion	32

		Social networks	28
		Stress	26
		Happiness	24
		Anxiety	16
9	Physical health and psychological capital of women	Women	40
		Obesity	36
		Overweight	30
		Cognitive flexibility	30
		Body mass index	20
		Psychological capital	14
		Family functioning	12

After generating a matrix for each cluster and importing it into UCINET software, the centrality and density scores for each cluster were determined, and the strategic diagram was plotted.

Notably, the origin of the diagram was set at the mean centrality (6.45) and density (0.499) values of the clusters. Cluster 2 exhibited the highest centrality with a score of 11.13, while Cluster 5 had the highest density with a value of 0.747. This indicates a high level of connectivity within the co-occurrence networks of these two clusters. Specifically, Cluster 2 demonstrated the highest centrality, reflecting its strong influence on and connections with other topics, whereas Cluster 5 showed the strongest internal cohesion (density) among all clusters (Table 4).

Table 4. Density and centrality of clusters

Cluster No.	Cluster name	Density	Centrality
1	Psychopathology of high-risk behaviors	0.185	4.25
2	Impulsivity and related disorders	0.506	11.13
3	Adolescent issues	0.529	9.00
4	Emotion regulation in psychopathology and treatment	0.397	6.353
5	High-risk behaviors and protective factors	0.747	9.714
6	Social and cultural capital of adolescents and youth	0.455	5.00
7	Psychosocial health of university students	0.500	4.60
8	Mindfulness and mental health	0.348	4.00
9	Physical health and psychological capital of women	0.667	4.00

The strategic diagram illustrated the internal cohesion and external interaction among the different thematic clusters. In this diagram, the horizontal axis represented centrality (interaction among clusters), while the vertical axis represented density (the strength of the internal links within a cluster). The strategic diagram is divided into four quadrants.

Quadrant 1 (upper-right): Clusters in this quadrant were both well-developed (dense) and central to the research domain. These were considered core themes that cover a substantial part of the network.

Quadrant 2 (upper-left): Clusters in this quadrant were also coherent (dense) but were less central, representing more specialized or niche areas of the research field.

Quadrant 3 (lower-left): This quadrant contains clusters that were less developed and peripheral, indicating either emerging or declining themes.

Quadrant 4 (lower-right): Finally, this quadrant included clusters that were central but not yet well-developed. These themes were essential but still maturing and had the potential to become core areas in the future.

The first quadrant contained "Impulsivity and Related Disorders" (Cluster 2), "Adolescent Issues" (Cluster 3), and "High-Risk Behaviors and Protective Factors" (Cluster 5), establishing them as the core themes for this period. These clusters were highly coherent (dense) and central to the research domain, covering a significant portion of the network.

Clusters in the second quadrant—"Psychosocial Health of University Students" (Cluster 7), "Physical Health and Psychological Capital of Women" (Cluster 9), and "Mindfulness and Mental Health" (Cluster 8)—were of secondary importance in terms of overall impact and centrality compared to the core themes. While these clusters are well-developed (dense), their peripheral position indicates that they represent more specialized or niche areas of research.

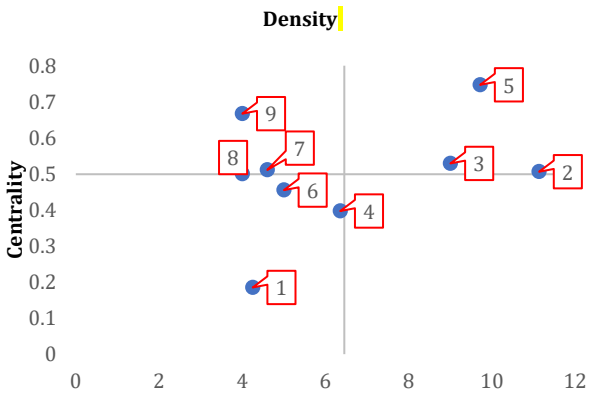

Figure 2. Strategic diagram of the high-risk behaviors

The third quadrant contained "Psychopathology of High-Risk Behaviors" (Cluster 1), "Emotion Regulation in Psychopathology and Treatment" (Cluster 4), and "Social and Cultural Capital of Adolescents and Youth" (Cluster 6). These clusters were characterized by low density and low centrality,

representing emerging or declining themes within the network.

Finally, the fourth quadrant, which typically represents themes that were central but not yet mature (underdeveloped) and have the potential to become core areas, was found to be empty. No clusters were identified in this quadrant in the current analysis (Figure 2).

Discussion

This study aimed to identify the conceptual structure and dominant intellectual trends in high-risk behaviors in Iran over the past two decades. To achieve this, the analysis utilized a strategic diagram designed to illustrate the internal cohesion and external interaction among different thematic clusters. In this diagram, the horizontal axis represented centrality (the interaction among clusters), while the vertical axis represented density (the strength of the internal links within a cluster) [24]. The domain of high-risk behaviors possessed a mature, well-developed structure centered around a strong core; however, it simultaneously lacked emerging, robust interdisciplinary intellectual currents. Consequently, the diagram showed that knowledge in this domain in Iran has followed a trajectory of crystallization and deepening of key concepts. For future dynamism and evolution, this domain requires the development of new intellectual currents and the establishment of conceptual bridges between specialized areas and its central core.

The findings of this study align with the results of Iranian researchers' studies, which have predominantly focused on adolescents [14, 17, 19], psychological mechanisms, such as emotion regulation and impulsivity [20], and protective factors, like family support and religious faith [18]. This trend is reflected in the first quadrant of the strategic diagram. The positioning of the adolescent issues (Cluster 3), impulsivity and related disorders (Cluster 2), and high-risk behaviors and protective factors (Cluster 5) clusters in this quadrant shows that these three axes have constituted the backbone and central core of research in this domain over the past two decades. The research background also references studies that have focused on specific populations, such as university students [18], as well as sociological topics, such as social and cultural capital [16]. The present study confirms these observations and delineates their structural positioning. The placement of the psychosocial health of university students cluster (Cluster 7) in the second quadrant indicates that this domain has evolved into a specialized and mature, yet non-central, topic. Furthermore, the positioning of the social and cultural capital of adolescents and youth cluster (Cluster 6) in the third quadrant suggests that, despite its presence in the literature, this approach has not yet developed into a coherent and central intellectual current within the scientific network and remains on the periphery.

In comparison to international research that addresses emerging and interdisciplinary domains—such as the application of artificial intelligence in risk driving [13], macroeconomic analyses [22], and the impact of public health crises [21]—these topics possess a cross-cutting and bridging nature. They would be expected to appear in the fourth quadrant of the strategic diagram. The absence of clusters in the fourth quadrant in the present study indicates that the innovative, interdisciplinary intellectual currents that are growing globally have not yet formed a strong, central current within the Iranian research corpus. This finding structurally illustrates the existing gap between domestic research and the frontiers of global knowledge.

Domains, such as the psychopathology of high-risk behaviors, novel therapeutic approaches (emotion regulation and mindfulness), and social and cultural capital, despite their importance, exhibited low coherence and centrality. It is recommended that future research deliberately concentrate on these domains. The vacancy in the fourth quadrant indicates both a gap and an opportunity for research. Researchers can draw inspiration from the global trends outlined in the literature review to explore areas such as the impact of emerging technologies and cyberspace on the development and prevention of high-risk behaviors among adolescents. Additionally, they may utilize big data to model the prevalence patterns of high-risk behaviors at the national level and evaluate the impact of macro-level policies—such as economic changes or national educational programs—on these behaviors. Furthermore, researchers are encouraged to investigate the effects of emerging crises, such as climatic and economic crises or future pandemics, on mental health and high-risk behaviors among youth.

Conclusion

The body of knowledge on high-risk behaviors in Iran has achieved structural maturity, characterized by a robust core focused on psychological mechanisms in adolescents.

Acknowledgments: None.

Ethical Permissions: This study involved no direct contact with human subjects; all data were extracted from the ISC citation database. Consequently, institutional ethics committee approval was not required.

Conflicts of Interests: The authors declare no competing financial or non-financial interests related to this work.

Authors' Contribution: Rahimi S (First Author), Introduction Writer/Methodologist/Main Researcher/Discussion Writer (50%); Soheili F (Second Author), Methodologist/Assistant Researcher/Discussion Writer/Statistical Analyst (25%); Jebraeili H (Third Author), Introduction Writer/Assistant Researcher/Discussion Writer (25%)

Funding/Support: None.

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