

## RESEARCH ARTICLE

# Knowledge base and hotspot trends in adolescents' meaning in life: a scientometric review based on CiteSpace analysis

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## ABSTRACT

Using Cite Space to analyze 237 articles from the Web of Science on adolescents' meaning in life, four key scholars and pivotal papers have laid the foundation for knowledge in conceptual frameworks, measurement tools, and influencing factors. Current research hotspots include the relationship between meaning in life and personal growth, social support, adolescent risk behaviors, and strategies to enhance adolescents' sense of meaning. Research frontiers are exploring emerging adulthood, psychometric properties, and search for meaning. This field is primarily nested within personal, educational, and social systems, with rapid advancements in multiple hotspots and frontier areas. Future research should broaden methodologies, enrich topics, consider cultural contexts, and promote interdisciplinary, cross-cultural, and localized development to further understand adolescents' meaning in life.

**Keywords:** Adolescent development; bibliometric analysis; existential psychology; meaning in life; positive psychology; Web of Science

## 1. Introduction

Meaning in life, as a crucial factor in human motivation and life experience, has increasingly garnered attention from the international community. Adolescence and early adulthood are critical periods for cultivating and enhancing an individual's sense of meaning in life. Adolescents' meaning in life refers to their understanding and perception of their existence and the essence of being<sup>[1]</sup>, which is equally important to their physical and psychological development. Since the beginning of the 21st century, scholars worldwide have focused on meaning in life, resulting in a wealth of fruitful outcomes. Studies indicate that meaning in life is a significant predictor of individual happiness, value, and even physical health<sup>[2]</sup>. For adolescents, a strong sense of meaning in life can profoundly impact their academic achievement and career development<sup>[3]</sup>, thereby shaping their values and influencing the trajectory of their lives. In the context of today's era, characterized by concerns over "hollowing out" or a lack of meaning in life, a deep analysis of the hotspots and frontiers in international research on meaning in life among adolescents can help deepen

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research in this area, explore solutions to the lack of meaning in life among adolescents, and promote the development of adolescents and social harmony and progress.

## 2. Research design

### 2.1. Data sources and distribution

This study uses the Web of Science (WOS) core collection database as the data retrieval platform. The search was conducted via the following keywords in the title: “meaning in life” or “meaning-in-life” combined with terms such as “student”, “adolescen\*”, “college”, “school”, “youth”, “young”, “universit\*” or “child\*”. The time span for the search was all years (1900--2024), and the document types were limited to articles and reviews, with the language set to English. As of July 22, 2024, the search yielded 305 documents, and after data deduplication and cleaning, a final set of 237 documents was obtained.

In terms of temporal distribution, international academia began paying attention to meaning in life among adolescents in the 21st century. The first document on this topic was published in 2007, and since then, interest in the issue of meaning in life among adolescents has grown steadily. Notably, there has been an explosive increase in publications since 2019 (see Figure 1). With respect to the distribution of source publications, 237 documents were published across 121 journals. The top three journals in terms of publication volume are *Frontiers in Psychology* (6.3%), *Children and Youth Services Review* (3.8%), and *Current Psychology* (3.8%). In terms of author affiliation distribution, scholars from China and the United States are the most prominent. Chinese scholars account for 45% (107 articles) of the publications, making them the leading force in international research on adolescents’ meaning in life. However, American scholars have greater centrality (0.47) than Chinese scholars do, indicating greater research focus and depth in this field.

### 2.2. Analysis method

This study employs a bibliometric analysis approach with the help of CiteSpace 6.2 R7 visualization software. CiteSpace is a bibliometric visualization tool developed by Professor Chaomei Chen at Drexel University in the United States. It is used to conduct visual analysis of academic literature in a specific research field, scope, or discipline [4], providing an intuitive presentation of the knowledge base, research themes, and research frontiers in a given field over a period of time.

### 2.3. Data processing

On the basis of the principles of CiteSpace, this study explores the knowledge base of international research on meaning in life among adolescents through cocitation analysis of documents and authors. It identifies the hot topics in this field by analyzing the co-occurrence of keywords in the citing documents. Furthermore, it detects emerging trends by identifying burst keywords and examining the citing documents associated with these keywords to explore frontier developments in international research on this topic.

Accordingly, the relevant parameters are set as follows: the time range is from 2007--2024, with one year per slice. The node types are set to cited references and authors for cocitation analysis and to keywords for co-occurrence analysis. The node threshold selection criteria are set to a g index (k=10) for cocitation analysis and a g index (k=25) for keyword co-occurrence analysis. All other parameters are set to default values.

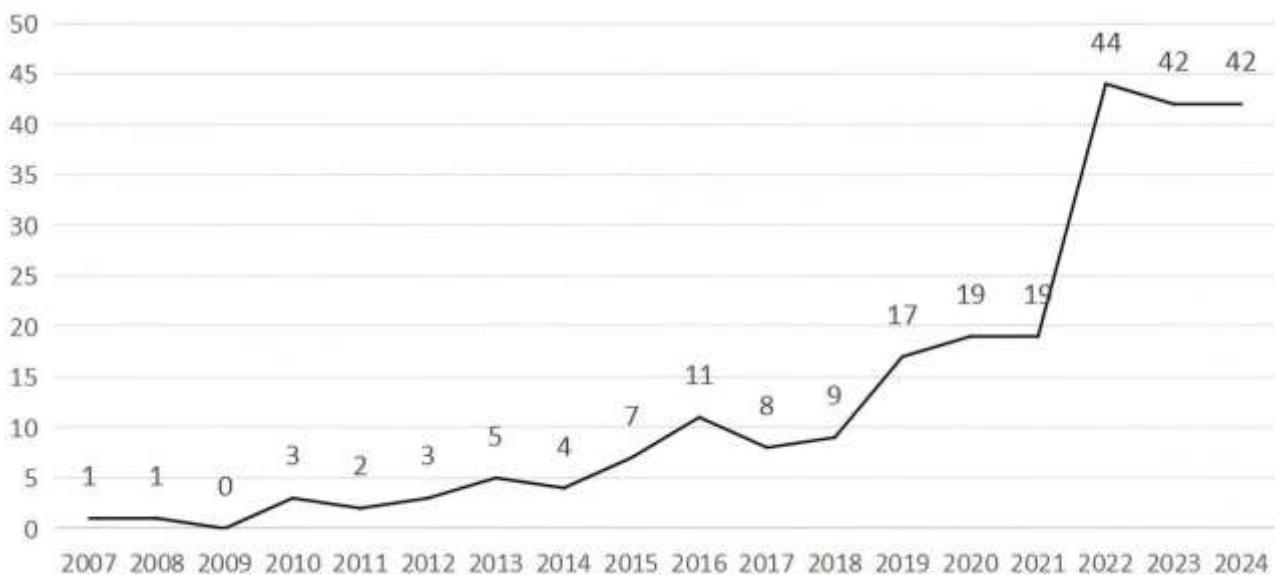


Figure 1. Temporal distribution of publications on adolescents' meaning in life

### 3. Results and discussion

#### 3.1. Cocitation analysis

Author cocitation analysis in CiteSpace can reveal authoritative experts in a particular field whose research findings are crucial for the evolution of knowledge in that field. Document cocitation analysis helps identify highly cited documents in a specific area, whereas centrality measures the intermediary role of nodes in the network. Documents with a high number of cocitations are core documents in the research field, and documents with high centrality may signify turning points or significant theoretical breakthroughs in the field. Therefore, this study examines the knowledge base of international research on adolescents' meaning in life from two perspectives: author cocitation analysis and document cocitation analysis.

##### 3.1.1. Author cocitation analysis

Through author cocitation analysis, four highly cited authors with a citation frequency of no less than 60 were identified. These authors are key scholars in the field of meaning in life, and their related works have laid the foundation for the knowledge base in this area in terms of conceptual frameworks and measurement tools.

Viktor E. Frankl (cited 81 times), a psychiatrist from San Diego, USA, was one of the earliest scholars to focus on meaning in life and a pioneer in studying it from a clinical perspective. As early as 1972, he addressed the issue of the feeling of meaninglessness and noted that it would be a significant challenge in modern psychotherapy<sup>[5]</sup>. In 1985, Frankl introduced the concept of the meaning of life in his classic work, *Man's search for meaning* (cited over 29,000 times according to Google Scholar), which initiated research on meaning in life and introduced logotherapy for the first time.

Michael F. Steger (cited 189 times), a psychologist from the USA, is a mainstream scholar who systematically studies meaning in life, laying the groundwork for its conceptual framework, measurement tools, and primary research topics. In 2006, Steger and colleagues developed the Meaning in Life Questionnaire (MLQ) from a psychometric perspective, which includes two dimensions: the presence of meaning in life and the search for meaning in life<sup>[1]</sup>. This questionnaire established a conceptual framework

and measurement tools for subsequent research on meaning in life. In the 2009 Oxford Handbook of Positive Psychology, Steger defined meaning in life from the core dimensions of coherence and purpose, emphasizing that the acquisition of meaning in life lies in pursuing goals consistent with one's understanding of life [6]. This allows each individual to uniquely construct their own meaning in life. He subsequently suggested that one source of meaning in life should be the intrinsic values of life itself [7]. In collaboration with Professor Martela from the University of Helsinki, he clarified a three-dimensional conceptual framework for meaning in life, encompassing coherence, purpose, and significance [8]. With the introduction of the three-dimensional sense of meaning in life, they redeveloped the Three-Dimensional Meaning in Life Scale (3DM) in 2023, focusing more on individual life values and providing a new measurement tool for the academic community. Additionally, Steger, along with his frequent collaborator Todd B. Kashdan, explored differences in the sense of meaning in life across different life stages and cultural backgrounds [9-10] and examined the relationships between individual emotional states, social activities, well-being, a sense of belonging and meaning in life [11-12], pioneering empirical research on meaning in life among adolescents.

Roy F. Baumeister (cited 62 times), from Florida State University, USA, was one of the earliest researchers to focus on the issue of meaning in life. In his 1991 book Meanings of Life, he delved into how work, love, family, culture, and religion influence people's meaning in life and considered broader issues of life adaptation, such as change, suffering, and death, in relation to individuals' understanding and perception of meaning in life. His subsequent articles in books, such as the Handbook of Positive Psychology and Positive Psychology in search of Meaning, focused on recognizing and exploring the meaning of life through the lens of positive psychology.

Lorand Brassai (cited 60 times), a psychologist from Romania, has made rich contributions to the study of meaning in life among adolescents, particularly in providing substantial empirical support for the antecedent and outcome variables of meaning in life. For example, he explored how psychological factors such as self-efficacy, self-regulation, and social comparison, as well as social factors such as parental responsiveness, parental demands, and social support, affect adolescents' meaning in life [13]. He also investigated the potential utility of meaning in life in promoting healthy eating and physical activity and maintaining mental health among adolescents [14-15], thus revealing the importance of meaning in life as a key psychological resource in adolescent development.

### 3.1.2. Document cocitation analysis

An analysis of the top 10 high-cited and high-centrality documents in the sample (with four documents simultaneously ranking in the top 10 for both categories) reveals that they form the key literature in the study of meaning in life among adolescents, contributing to the knowledge base in two main aspects: structure and measurement of meaning in life and the impact of meaning in life on individual psychological and behavioral patterns.

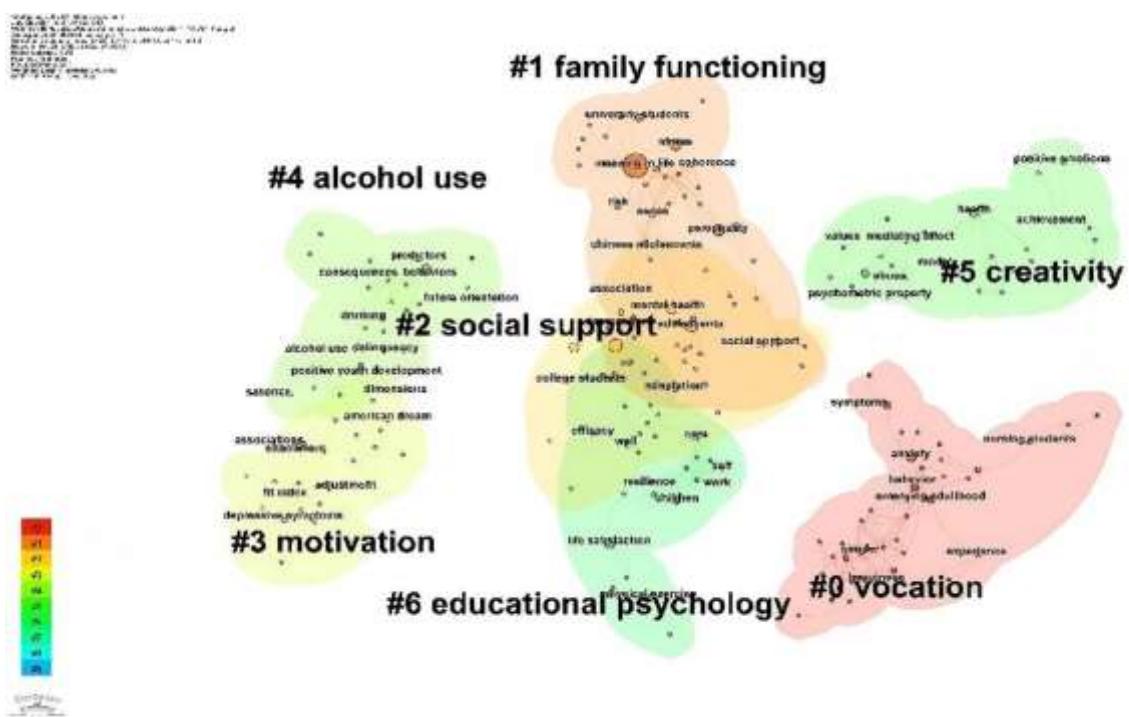
The Meaning in Life Questionnaire (MLQ) developed by Michael F. Steger enjoys widespread recognition and application in academia, with its cross-cultural applicability and reliability thoroughly validated. For example, Boyraz's article, whose document centrality is 0.43, conducted localization and standardization work for the Turkish version of the MLQ [16]. Wang and his collaborators demonstrated the good structural validity and internal consistency reliability of the Chinese version of the MLQ through measurements in Chinese adolescents [17]. The academic community has also delved deeply into the relationship between the dual characteristics of the internal structure of meaning in life. In the article by Li et al., which was cocited 20 times, the authors conducted a large-scale meta-analysis, revealing a nuanced interactive relationship between subjective well-being and the two dimensions of meaning in life [18]. The

study indicates that subjective well-being is more closely associated with the presence of meaning, whereas a broad search for meaning may be detrimental to subjective well-being. This suggests that the relationship between the two components of meaning in life is far from parallel or consistent but rather exhibits a complex dynamic balance, offering important insights into the comprehensive impact of meaning in life. In addition, King and Hicks provided a detailed interpretation of the concept and structure of meaning in life<sup>[19]</sup>, building upon and deepening the three-dimensional conceptual framework meaning in life—coherence, purpose, and significance—advocating by Steger and others, which highlights the complexity and diversity of meaning in life, providing a solid theoretical foundation for subsequent research and the development of measurement tools.

Many other core documents delve into the relationships between meaning in life and adolescents' psychological statements and behavioral patterns. For example, Chen et al., who have been cocited 16 times, reported that the search for meaning has an indirect effect on reducing depression and anxiety symptoms through the presence of meaning, as well as a direct effect on increasing these symptoms<sup>[20]</sup>. Krok discussed the positive correlation between meaning in life and subjective well-being and mental health in late adolescence, emphasizing the positive role of meaning in life in adolescent mental health<sup>[21]</sup>. In addition, Brassai et al. empirically verified the protective role of meaning in life in adolescents with respect to certain health-risk behaviors, such as dieting, drug addiction, and alcohol abuse, as well as its ability to promote healthy eating and physical activity<sup>[15]</sup>. Lew et al. and Kleiman et al. also confirmed that meaning in life plays a crucial role in preventing suicide among adolescents, further emphasizing its importance in maintaining adolescent mental health and crisis intervention<sup>[22-23]</sup>.

### **3.2. Keyword co-occurrence analysis**

Research hotspots refer to themes that are frequently explored within a particular field. Given that keywords are a concentrated reflection of the core content of a research domain, keyword co-occurrence analysis, combined with the automatic clustering function of CiteSpace, was used to generate a keyword cluster map. The log likelihood ratio (LLR) was selected as the standard for keyword selection and cluster naming, automatically identifying 16 clusters containing 324 keyword nodes and 838 node connections. This study focuses on the top seven clusters with the highest number of nodes (see Figure 2). Analysis of these clusters and their citing documents revealed that the research hotspots can be further categorized into four main themes related to meaning in life: individual development, social support, adolescents' risk behaviors, and strategies for enhancing meaning in life among adolescents.



**Figure 2.** Keyword clustering map for research on adolescents' meaning in life

### 3.2.1. Meaning in life and individual development

This research hotspot includes Cluster 0 (silhouette value of 0.898) and Cluster 3 (silhouette value of 0.985), which explore the complex and profound mechanisms of meaning in life in individual growth and development from the dimensions of career and academics.

Cluster 0 contains 38 keyword nodes, with high-frequency keywords, including career, social adaptation, emerging adulthood, nursing students, gender, and anxiety. Analysis of the citing documents associated with these keywords reveals that this cluster focuses on factors influencing the relationships between meaning in life and individual career development and adaptation. For example, Shin et al. reported a strong positive correlation between Korean college students' vocational calling and their career preparation behaviors and meaning in life [24]. A longitudinal study by Li et al. revealed that meaning in life is closely related to career commitment and identity among Chinese adolescents [25]. Additionally, researchers have incorporated various psychological variables into their analytical frameworks to explore the mediating and moderating roles of meaning in life between these variables and career development. For example, Chuang et al. integrated vocational construction theory and self-determination theory to model how meaning in life positively regulates the relationships among self-efficacy, motivation, and career adaptability among vocational students [26]. Yuen and Chan studied vocational education students in Hong Kong and reported that meaning in life mediates the relationship between social connectedness and career adaptability and efficacy [27], providing new perspectives for the career development of students with special educational needs. Notably, given the unique nature of their profession, meaning in life among nursing students has become a focal point in academic research. Qiu et al. reported a positive correlation between meaning in life and professional identity [28], emphasizing the critical role of the sense of meaning in life in shaping the professional identity of nursing students. Xu and Yu noted that, during clinical tasks involving death,

meaning in life can mediate the anxiety associated with death and positively influence attitudes toward palliative care<sup>[29]</sup>, which has profound implications for nursing education.

Cluster 3 contains 25 keyword nodes, with high-frequency keywords, including motivation, fit indices, depressive symptoms, adaptability, and dimensions. Analysis of the citing documents associated with these keywords reveals that this cluster primarily explores the relationship between meaning in life and academic motivation. Adolescents with a greater sense of meaning in life are believed to experience greater autonomy and competence. According to self-determination theory, the fulfillment of these two psychological needs enhances academic motivation, thereby improving academic performance<sup>[30]</sup>. A survey on normative changes in meaning in life among Asian American high school students confirmed this relationship, showing that the search for meaning is positively correlated with motivation for higher education<sup>[31]</sup>. A study of freshmen at a Chinese university also indicated that stronger meaning in life leads to greater autonomous motivation in academics, suggesting that their academic adaptability will improve over time<sup>[32]</sup>. Moreover, the impact of different types of motivation (intrinsic, extrinsic, and amotivation) on meaning in life has become a focal point of research. For example, Bailey and Phillips surveyed 184 freshmen at an Australian university and reported that intrinsic motivation is more strongly associated with meaning in life, subjective well-being, and academic performance than extrinsic motivation is, and students with higher intrinsic motivation exhibit lower levels of depression and anxiety<sup>[33]</sup>. Shen et al. surveyed first-year college students in China and reported that meaning in life is related to initial amotivation levels and that a strong sense of meaning in life helps reduce four types of amotivation (lack of competence beliefs, lack of effort beliefs, lack of academic values, and unattractive task characteristics)<sup>[30]</sup>, highlighting the importance of fostering meaning in life in students at the beginning of their university life or even earlier.

### 3.2.2. Meaning in life and social support

This research hotspot encompasses Cluster 1 (silhouette value of 0.88) and Cluster 2 (silhouette value of 0.887), which focus on the primary factors and interactive relationships that influence adolescents' sense of meaning in life from the perspectives of family function and social support.

Cluster 1 contains 36 keyword nodes, with high-frequency keywords including family function, meaning in life, stress, college students, consistency, and belonging. Analysis of the citing documents reveals that this cluster focuses on the deep-seated relationships between adolescents' family-related experiences and meaning in life. For example, Huang et al. surveyed 900 medical graduate students and reported a significant positive correlation between family function and adolescents' meaning in life, which in turn affects their life satisfaction<sup>[34]</sup>. This suggests that the sense of belonging derived from family members significantly enhances meaning in life. Shek et al. surveyed high school students in Hong Kong and reported that parental behavioral control and parent-child relationships positively predict adolescents' level of meaning in life, whereas parental psychological control negatively predicts it<sup>[35]</sup>. However, the influence of parental factors on the development of adolescents' meaning in life is limited, indicating a "ceiling effect". Brassai et al. surveyed minority adolescents in Romania and reported that perceived parental support and timely parental feedback positively predict adolescents' meaning in life<sup>[13]</sup>, as these variables help adolescents develop positive psychological models of the world, thereby enhancing their meaning in life through the dimension of comprehension. Kealy et al. revealed that parental presence, understanding, and love during childhood can enhance adolescents' optimism and identity commitment<sup>[36]</sup>, providing a foundation for consistent and positive self-representation, which in turn supports the robust development of meaning in life during adolescence. A study of undergraduate students in China confirmed the mediating role of meaning in life between positive childhood experiences and flourishing<sup>[37]</sup>, suggesting that cultivating meaning in life can

serve as a targeted intervention to help students with fewer positive childhood experiences thrive. On the other hand, Kwok et al. reported that meaning in life among college students mediates the relationship between adverse childhood experiences and mental health issues such as depression and anxiety [38]. This not only reaffirms the protective role of healthy family functioning through meaning in life on adolescent mental health but also highlights that poor family functioning and unfortunate childhood experiences may be potential risk factors for a lack of meaning in life and mental health problems.

Cluster 2 contains 27 keyword nodes, with high-frequency keywords including social support, youth, loneliness, mental health, and trauma. There is considerable overlap with Cluster 1, as the primary sources of “social support” include family, friends, and other significant others [39]. Analysis of the citing documents reveals that this cluster primarily explores the interaction between perceived social support and meaning in life. For example, a study of college students in mainland China revealed a significant positive correlation between perceived social support and meaning in life [40], emphasizing the important role of social support in building adolescents’ meaning in life. Additionally, Liu et al. surveyed 936 high school students in China and reported that perceived social support partially mediates the relationship between meaning in life and self-control [41], suggesting that students with greater meaning in life may seek and perceive more social support or that their perception of social support may be influenced by their sense of meaning in life. Another study during the pandemic revealed that a lack of social support can directly or indirectly predict depressive symptoms through increased loneliness and a reduced sense of meaning in life [42], indicating that good social support helps enhance adolescents’ meaning in life and highlighting the bidirectional interaction mechanism between meaning in life and social support. Social support is particularly important for adolescents who have experienced traumatic events. Alfuqaha et al. surveyed Jordanian college students after an earthquake and reported a significant positive correlation between postdisaster social support and the search for meaning in life [43]. College students with more severe PTSD symptoms may require more social support and a desire to find greater meaning in their lives. Aliche et al. surveyed Nigerian youth who survived a terrorist attack and reported that social support indirectly enhanced their psychological resilience and reduced the risk of PTSD by increasing their sense of meaning in life [39]. Therefore, building a broader social support network can effectively compensate for any gap in family and parental support systems, playing a crucial supplementary role in promoting the healthy development of adolescents’ meaning in life.

### **3.2.3. Meaning in life and adolescent risk behaviors**

The research hotspot in this area is represented by Cluster 4 (silhouette value of 0.932), which contains 24 keywords. High-frequency keywords include alcohol use, drug abuse, predictors, behavioral outcomes, and delinquent behavior. Analysis of the citing documents reveals that this cluster primarily explores the relationship between meaning in life and adolescent risk behaviors. For example, empirical studies have revealed a significant negative correlation between perceived meaning in life and alcohol use [44-45]. Additionally, a study of 1032 Israeli adolescents revealed that meaning in life has significant research and practical value in developing drug abuse prevention programs for adolescents [46]. In recent years, an increasing number of researchers have focused on the relationships between meaning in life and smartphone and internet usage behaviors. A study of 1800 Turkish college students revealed a significant negative correlation between meaning in life and smartphone addiction, indicating that college students with a stronger sense of meaning in life are less likely to develop smartphone addiction [47]. Another study of Chinese adolescents revealed that anxiety about the meaning of life increases excessive smartphone use among adolescents, which in turn may lead to confusion or avoidance of life’s meaning, which in turn exacerbates internet gaming disorder [48]. Therefore, a lack of meaning in life may be a significant predictor

of increased risk behaviors in adolescents, whereas enhancing meaning in life could help reduce the occurrence of such behaviors.

### **3.2.4. Strategies for enhancing adolescents' meaning in life**

This research hotspot encompasses Cluster 5 (silhouette value of 0.915) and Cluster 6 (silhouette value of 0.906). Cluster 5 contains 24 keywords, with high-frequency keywords including creativity, achievement, values, positive emotions, mediating effects, and health. Cluster 6 contains 23 keywords, with high-frequency keywords including educational psychology, self-efficacy, psychological resilience, sports, and work. Analysis of the citing documents reveals that these two clusters focus on how internal psychological resources such as self-efficacy, resilience, and creativity, as well as external activity resources such as education, sports, and work, promote adolescents' meaning in life.

Focusing on the development of adolescents' internal psychological resources is one of the key approaches to enhancing their sense of meaning in life. Self-efficacy, as proposed by Bandura, refers to an individual's confidence and belief in his or her ability to achieve specific goals and tasks. It is a crucial positive psychological resource that promotes individual growth and development. A study of high school students in China revealed that self-efficacy significantly predicts the sense of meaning in life and fully mediates the relationship between a growth mindset and meaning in life [49]. Creativity is an important concept in positive psychology and is considered a significant pathway to happiness. A study of college students in China confirmed that creativity not only directly impacts happiness but also indirectly influences it through meaning in life [50]. This suggests that we should leverage the positive correlation between creativity and meaning in life to stimulate students' creative potential and guide them to experience the joy of creation, thereby enhancing the value and meaning of their lives. Psychological resilience is another important psychological resource that enables adolescents to cope effectively with negative emotions or events. Under the influence of psychological resilience, traumatic events can not only cause psychological distress but also provide opportunities for positive change. A study in Taiwan revealed that psychological resilience enhances adolescents' subjective well-being and meaning in life [51]. Positive emotions, as part of an individual's emotional traits, significantly influence adolescents' cognition, thinking, and behavior. Chu et al. reported that both high-arousal and low-arousal positive emotions help adolescents experience and enhance their sense of meaning in life [52].

Structured activity resources are another important aspect of enhancing adolescents' meaning in life. A study of 3196 college students in China revealed that physical exercise is directly positively correlated with meaning in life and indirectly related through the mediating effect of self-efficacy [53]. A study in Turkey also supported this conclusion, emphasizing that college students who engage in more sports activities tend to have a stronger inclination toward seeking meaning in life [54]. School education and interventions are also crucial means of addressing the lack of meaning in life among adolescents. Researchers suggest incorporating schools into the scope of adolescents' meaning-in-life education, viewing schools as places filled with meaning (objective meaning) or creating meaning within the school environment (subjective meaning) [55]. Some studies recommend using class group counseling in meaning-in-life education. An experimental study of college students in China revealed that class group counseling improved students' life satisfaction, positive emotions, and meaning in life [56]. However, a study of European adolescents revealed that school-based gratitude interventions did not effectively promote meaning in life, although expressing gratitude was positively correlated with meaning [57]. This suggests that school education or interventions may require longer trials or more diverse methods to effectively enhance adolescents' meaning in life while also considering cultural differences among adolescents in different regions. Additionally, several emerging

intervention methods are being proposed and tested. For example, improvisational theater is used as an effective contemporary psychological technique to enhance adolescents' meaning in life<sup>[58]</sup>. Service-learning courses, which advocate applying knowledge to community services, have been shown to effectively improve and enhance college students' meaning in life and mental health<sup>[59]</sup>.

### **3.3. Burst terms analysis**

Research frontiers refer to the most advanced, latest, and most promising research topics in a particular field and may lead to new research trends. In CiteSpace, they are reflected by the sudden emergence of burst terms within a certain period<sup>[60]</sup>. On the basis of keyword co-occurrence analysis, burst terms are used to identify the frontiers of research on adolescents' meaning in life. By setting the minimum duration, the top 25 keywords with the highest burst rates are obtained (see Figure 3). According to Figure 3, the keywords that have both high burst rates and burst end years within the past three years are emerging adulthood, psychometric properties, and motivation.

## Top 25 Keywords with the Strongest Citation Bursts

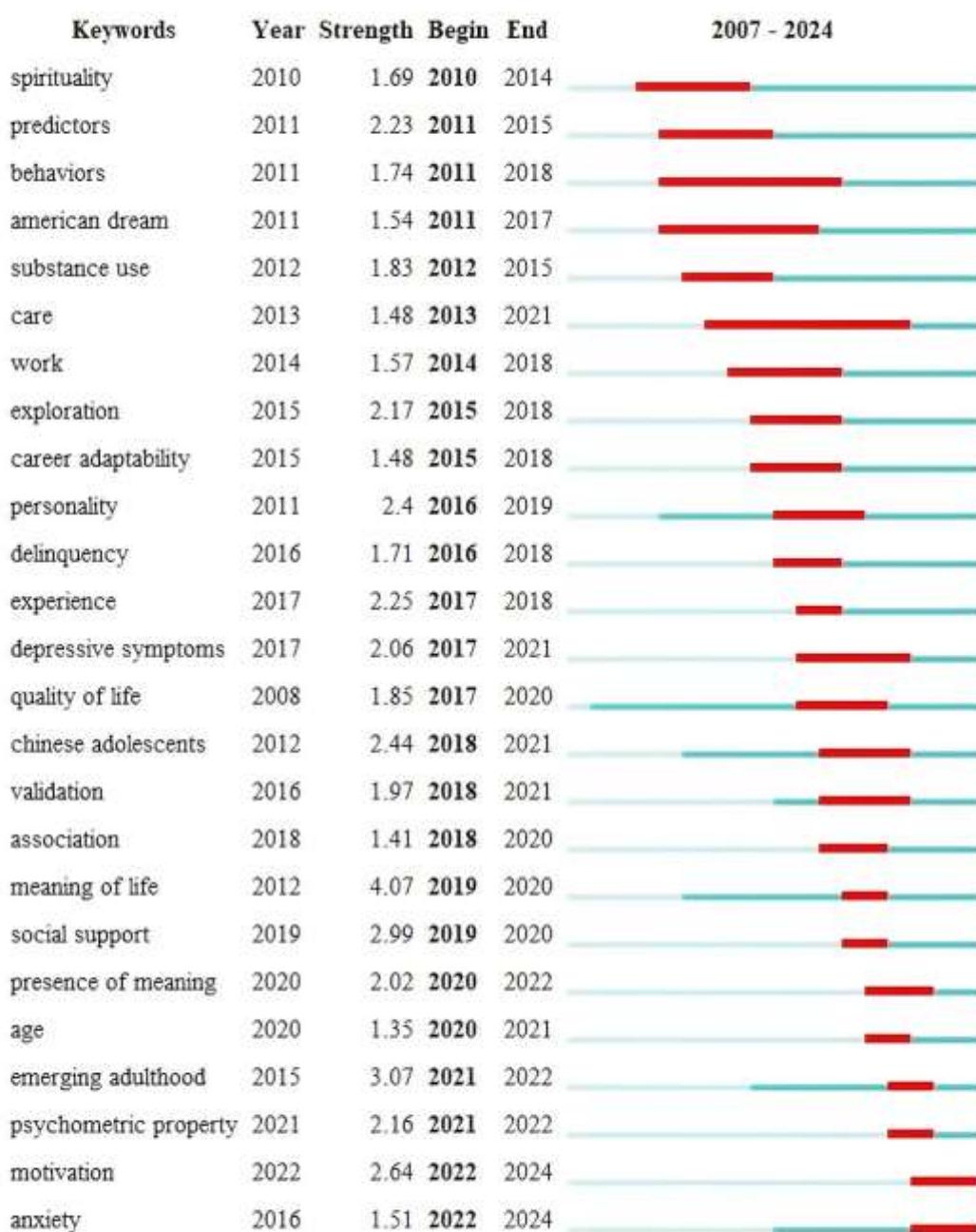


Figure 3. High-burst-rate keywords in research on adolescents' meaning in life

### 3.3.1. Emerging adulthood

Emerging adulthood refers to the transitional period between late adolescence and early adulthood, during which young people become more independent and often need to transition into new roles, exploring various possibilities for their future. Studies have shown that adults at this stage search for meaning in life more actively than older adults [10]. The keyword "emerging adulthood" appeared 9 times during the burst

phase from 2021--2022. Neighboring nodes related to emerging adulthood include developmental tasks, family, and identity.

During this burst phase, researchers shifted their psychological perspective on meaning in life (e.g., its relationship with depression and anxiety) to focus on the life events experienced by adolescents. Entering university is a critical developmental task for young adults. Li et al. examined the development of meaning in life among freshmen during their adaptation period [61]. The study revealed a slight but significant decline in meaning in life during the first year, whereas social relationships with peers and teachers and other adaptive outcomes mitigated further declines. These findings offer important insights for the positive transition of freshmen. Graduating from university is also a significant milestone for many young people. The interactions between graduates and their environment, such as spending time with family and reflecting on their university life, can predict changes in their meaning in life [62].

Additionally, during emerging adulthood, young people often seek meaning and gain a sense of identity by questioning and redefining their place in the world. Social participation can be an effective tool for this exploration. A survey of young people in Hong Kong revealed a connection between their willingness to participate in political activities and their search for meaning in life [63]. A study of young women in Israel further revealed that a positive attitude toward civic engagement could predict participants' life satisfaction through their sense of meaning in life, and their active participation in social activities reflected their exploration of self-identity [64].

Family becomes an indispensable topic during emerging adulthood, and the relationship between the quality of the family environment and young people's meaning in life is increasingly drawing the attention of scholars. A study of young adults aged 18--25 years revealed that parental support received during childhood could significantly predict meaning in life in adulthood through the cultivation of a positive mindset and identity [36]. Another study compared the family allocentrism of adolescents in China and Italy and its impact on meaning in life. The results revealed that Chinese adolescents, who are raised in a collectivist cultural background, place greater value on family concepts, and their stronger identification with family values correlates with a stronger sense of existence in their sense of meaning in life [65].

### 3.3.2. Psychometric properties

The term "psychometric property" appeared 11 times during the burst phase from 2022--2023. Analyzing the node details reveals that related nodes include the meaning-in-life test, measurement invariance, and qualitative research.

In the cited literature, common tools for measuring the sense of meaning in life include the single-dimensional Purpose-in-Life Test-Adolescents Version (PIL-A), the two-dimensional Meaning in Life Questionnaire (MLQ), the three-dimensional Meaning-in-Life in Children Questionnaire (MIL-CQ) based on the "meaning triangle" (creativity, experience, and attitude), and the Three-Dimensional Meaning in Life Scale (3DM) based on the "three-dimensional model" (coherence, purpose, and significance). Among these, the two-dimensional MLQ developed by Steger has undergone extensive validation for measurement invariance. For example, Datu and Yuen evaluated the structural validity of the Chinese version of the MLQ by examining factor validity, gender invariance, internal consistency reliability, and interfactor correlations, proving that the scale is valid and reliable for use among Hong Kong adolescents [66]. Luo et al. focused on the longitudinal measurement validity of the sense of meaning in life scale and empirically demonstrated the strict longitudinal invariance of this measurement tool over a year among Chinese college students [67].

In recent years, an increasing number of qualitative studies have further explored adolescents' meaning in life. For example, Ratner et al. used directed content analysis of adolescent interview data to reveal

adolescents' understanding of meaning in life and reported that although the academic community generally considers purpose and meaning to be distinct concepts, there is no significant difference between the two in adolescents [68]. These findings suggest that actively setting goals may increase adolescents' sense of meaning in life. Olstad et al. conducted a cross-case analysis of adolescent interview texts and identified several themes as sources of meaning in life: relationships with others, perseverance and progress, maintaining regularity and structure in daily life, religious beliefs and spirituality, experiencing positive moments, and finding balance under stress [69].

### 3.3.3. Motivation

Motivation is the third key focus in current research on adolescents' meaning in life and appears 8 times during the burst phase from 2022--2023. This concept of motivation differs from academic motivation and more specifically refers to the motivational dimension of meaning-in-life itself, known as search-for-meaning, which focuses on the intrinsic mechanisms that generate meaning in life. In the early stages of life, a lack of meaning can stimulate a series of meaning-seeking behaviors, suggesting that the search for meaning is one of the fundamental human motivations.

Self-determination theory (SDT) posits that basic psychological needs include autonomy, relatedness, and competency. For adolescents, autonomy is particularly important. When adolescents feel supported and understood in their family and social environments, they are more likely to develop healthy autonomy. This supportive environment encourages adolescents to explore their interests and passions, which helps them find and discover meaning in life. Research has shown that when parents encourage adolescents to make their own choices and recognize their autonomy, adolescents are more likely to find meaning in life through the exploration of their self-worth [70]. Similarly, a supportive and inclusive school environment helps adolescents build confidence and a sense of belonging, promoting their active pursuit of meaning in life [71].

Notably, quantitative studies on the dimension of search-for-meaning have yielded contradictory conclusions. For example, research has shown that in collectivist cultures, the search for meaning may be positively correlated with mental health [72]. However, in Western and individualistic societies, the search for meaning is associated with lower life satisfaction, happiness, and mental health levels; a reduced sense of environmental control; and dissatisfaction with oneself and interpersonal relationships [73]. This suggests that cultural background and group characteristics can have different impacts on the search for meaning, highlighting the need for further research to deepen our understanding of the essence and intrinsic mechanisms of meaning seeking.

## 4. Conclusion and implications

At present, international research on adolescents' meaning in life generally presents a multifaceted development trend, meaning that research in this field is concentrated and nested within individual systems, educational systems, and social systems and has rapidly developed into various research themes, such as psychometrics, risk behaviors, individual development, educational interventions, and social support. Specifically, the structure and measurement of meaning in life serve as the cornerstone of this field, providing reliable tools and frameworks for subsequent research. The impact of meaning in life on individual psychological states and behavioral patterns further demonstrates its importance in promoting adolescent psychological health and development. Moreover, the relationships between meaning in life and individual growth, social support, and adolescent risk behaviors reveal the significant role of meaning in life in different contexts, and strategies for enhancing adolescents' meaning in life provide a concrete and actionable direction for practical interventions. As research has entered a phase of deepening and advancing, emerging

adulthood, psychometric properties, and the search for meaning have become new research trends, indicating that scholars are exploring deeper levels of meaning in life and its measurement methods and paying attention to the application of this concept at different stages of development. On the basis of these findings, the following suggestions are proposed for the future development of this field.

#### **4.1. Expanding research methods to support empirical studies**

From a methodological perspective, the measurement tools used in current research in this field are relatively singular, primarily relying on cross-cultural adaptation and the application of Steger's Meaning in Life Questionnaire (MLQ). Although Steger and his collaborators developed new measurement tools in 2023, the MLQ remains the predominant instrument in current studies. Future research should develop more measurement tools based on the cultural background and characteristics of adolescent groups. Moreover, existing research methods are predominantly cross-sectional quantitative studies with a limited number of qualitative studies. Although there have been some experimental intervention studies aimed at enhancing adolescents' meaning in life, they are generally few in number, have small sample sizes, and have short intervention periods, and their effectiveness still requires further verification. Therefore, future research could further explore qualitative research methods, such as educational phenomenology and grounded theory, to deepen the understanding of individual experiences and developmental trajectories of adolescents' meaning in life. Additionally, randomized controlled trials and longitudinal studies could be employed to test the potential effectiveness of more projects and interventions aimed at enhancing adolescents' meaning in life.

#### **4.2. Enriching research topics and deepening theoretical models**

The themes in the field of adolescents' meaning in life research are closely connected to evolutionary trends. Existing studies have explored the multiple mechanisms of meaning in life and have gradually deepened the connotation, concept, and structure of meaning. However, the multidimensional model of meaning in life still needs further testing to construct a more comprehensive theoretical model and explore how these dimensions function in different contexts. Although existing studies have focused on some special adolescent groups, the overall number of research subjects is not substantial and lacks representativeness. Future research could further expand the research subjects, especially adolescents in socially disadvantaged groups, such as international students in cross-cultural contexts and ethnic minority adolescents. Furthermore, strengthening empirical research on strategies for enhancing meaning in life, especially the application effects in schools and communities to promote policy-making and practical guidance, should become an important research topic for the future. In conducting such research, interdisciplinary collaboration is particularly crucial. Through the joint efforts of psychology, education, sociology, and other disciplines, deeper insight into the nature of the sense of meaning in life can be achieved, and more precise and effective intervention plans can be designed.

#### **4.3. Focus on cultural contexts to promote localized development**

Although Chinese scholars have published many articles internationally, most are surveys on the current state of adolescents' meaning in life, with few in-depth case studies and insufficient consideration of sociocultural factors. With the rapid development of the economy and society, new situations and factors are emerging, especially given the profound changes in education and society in contemporary China. There is an urgent need for researchers to keep pace with the times and actively respond to the demands of social development, educational reform, and adolescent growth. For example, domestic scholars have paid attention to the indigenous phenomenon of "hollow illness", where even adolescents in key high schools or prestigious universities are at risk of lacking meaning in life or being unable to find it. The heated online discussions

about “hollow illness” in China reflect public concern over the lack of meaning in life among adolescents. Therefore, future research should strengthen cross-cultural comparisons and indigenous case studies, engaging in dialog between indigenous cases and international research to develop a theoretical model of adolescents’ meaning in life in the context of Chinese culture. Efforts should also be made to incorporate adolescents’ meaning in life into an individual-educational-societal system, promoting the vertical growth of knowledge within each system while fostering positive interactions between research on adolescents’ meaning in life and the individual, educational, and social systems.

## **Ethical Statement**

Not applicable

## **Data availability statement**

The raw data supporting the conclusions of this article will be made available from the corresponding author without undue reservation.

## **Conflict of interest**

The authors declare no conflict of interest.

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