

The Role of Active Psychological Training in Suicide Prevention: A CitespaceIII analysis based on the ISI Web of Science database

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Abstract

In the United States, approximately 100 people commit suicide per day. In China, there are as many as 290,000 suicides and 2 million attempted suicides every year, and suicide is the leading cause of death among young people. Using the Citespace knowledge map software, this paper makes a visual analysis of articles about the role of positive psychological training for suicide prevention collected in the ISI Web of Science database from January 01, 2011 to January 01, 2021. On this basis, the high academic impact journals and authors in the field of positive psychological training for suicide prevention are identified, and the hot issues and frontier trends of that subject are described on the time axis. The results show that there were 1,159 journals studying the role of positive psychological training for suicide prevention in the last 10 years, showing a fluctuating but overall rising trend of development. The research field of active psychological training for suicide prevention is extensive, and words such as "depression" and "mental health" are research hotspots in this field.

Keywords

Active psychological training; Suicidal behavior; CiteSpaceIII; Knowledge map.

1. Introduction

According to the latest estimate published by the World Health Organization in The Global Suicide Situation, suicide continues to be one of the main causes of death worldwide. More than 800,000 people worldwide die of suicide every year, and one out of every 100 deaths on average is a suicide[1]. Suicide not only brings a heavy burden to families but also has a negative influence on society. Therefore, it is very important to discover the applicable factors of suicide prevention and control them so as to effectively reduce the suicide rate[2].

The internal causes of suicidal behavior are multiple, and there are many factors that lead to suicidal ideation: it is the result of the interaction of biological inheritance, personal susceptibility factors, social culture, family environment, etc.[3] In recent years, researchers have made some achievements in the epidemiology, influencing factors, and theory of suicidal ideation. Among them, positive psychology plays a significant role in predicting and devising interventions for suicidal ideation[4].

Researchers generally believe that positive psychology was born at the 1998 American Psychological Association annual meeting. At that meeting, Martin Seligman, a famous psychologist, proposed that we should change the research perspective of psychology. Specifically, he stated that psychology should change from studying and treating abnormal

behaviors and instead focus on the mental health of normal people and help them explore the broader meaning of life[5]. Seligman guided the psychological community to pay attention to the factors that promote full development and happy life for human beings, opening up a brand-new field of positive psychology[6].

In recent years, positive psychology has gradually shifted from playing a behind-the-scenes role to center stage. Because of this, we should further explore and study the historical evolution, development status, and future trend of positive psychology to help researchers obtain reference resources and direction. Moreover, as the scope of suicidal behavior gradually expands and moves to younger and younger populations, suicide makes a very negative and far-reaching impact on the country[7]. Therefore, we should explore the role of positive psychological training in suicide prevention.

Data is the expression and carrier of information form, which is used to express the original form of objective things. The mining of information helps humans make better decisions and guides humans to better take the next step[8]. In this age of information explosion, the limitations of the human brain mean that we can't process all of the available information. Improper handling of data will increase people's cognitive load, and an incorrect understanding of data and information can cause harm [9].

However, it is worth noting that physiologists have found that about 40% of human sensory capacity is devoted to visual response. Therefore, the human brain has a high processing speed and accuracy for visual information[10]. Studies have further shown that visual information can further stimulate an individual's data processing ability and help people discover inherent implicit relationships in information more quickly[11].

At the end of the 1920s, some American scholars put forward the concept of "Data Visualization" and applied it to the government's risky decision-making for funding. It is precisely because the government departments attach importance to data mining that a variety of data visualization analysis methods have been created. Knowledge maps are generally accepted worldwide as the optimal analysis system for citation network visualization, and thus they can lay a theoretical foundation for new scientific discoveries[12].

Chen Chaomei is a professor at Drexel University in the United States. The Citespace software he developed in 2006 represents both a theory and method for integrating scientometrics, statistics, data science, and other disciplines. Using data collection, calculation, analysis, etc., the knowledge framework and structure are visualized, allowing us to better understand the interactions, intersections, and spreading trends among nodes. In its current iteration, CitespaceIII has been adopted by researchers to map the development process of a discipline by analyzing a database, making it possible to discover possible research directions for the future. This fully embodies the advantages of multiple dynamic data and the development of citation knowledge information on the time axis.

The world's largest comprehensive academic information resource pool is the Web of Science database owned by the Institute for Scientific Information (ISI). The Web of Science database contains more than 8,000 journals of the most influential journals in natural science and social science. The documents collected in this database are comprehensive and can thus provide a basis for the efficient mining of citation data and provide theoretical support for the subsequent visual analysis of articles.

In this paper, the Citespace method is innovatively introduced into the field of positive psychology, with the literature related to positive psychology and suicide collected in the ISI Web of Science database taken as the initial node and included in the final analysis. The corresponding research foundation and development frontier map are then drawn in order to clarify the research status, function, and future development of positive psychological training

for suicide prevention, and to broaden the breadth and depth of the analysis of both positive psychology and suicide.

2. Research Methods

2.1. Data Sources

As stated by the old proverb, "If a worker wants to do his job well, he must first sharpen his tools." In the construction of a knowledge map, the quality of the retrieved documents is very important, and if one is to be able to clearly retrieve the data range one needs, one must strictly analyze and control the retrieval conditions. In the process of document inclusion, the inclusion standard should not be adjusted too broadly, as this would result in a final knowledge map that is influenced by irrelevant documents to the point of ineffectiveness. At the same time, however, one must not adjust the inclusion standard of documents too strictly, as this will result in a final knowledge map that is incomplete and not comprehensive.

Based on the above requirements, this study used the retrieval method of subject words for analysis and research. The specific implementation steps were as follows:

First, based on the definition of positive psychology: "Through some relatively clear measurement methods in psychology, we explored the positive aspects of the human heart." The two keywords of "Positive psychology" and "Positive psychology training" were searched, and the search results were matched with "or" in order to obtain all the search results under the theme background of "Active psychological training".

Second, based on the Integrated Motivational-volitional (IMV Model) put forward by the psychologist O'Connor, Rory C in 2018, suicide was divided into five modules: "Suicide", "Suicidal Behavior", "Suicide Idea", "Self-employment behavior" and "Self-employment idea", and the retrieval results were matched by "or" to obtain search results under the theme background of "Suicide."

Finally, the retrieval results under the above two theme backgrounds were matched with "and" to get the documents that matched the two modules of "Active psychological training" and "Suicide". In order to ensure the comprehensiveness and accuracy of document inclusion, the author analyzed the retrieval results for all included keywords, and then double check based on the search results, eliminating the interference of irrelevant variables such as unclear documents and thereby improving the accuracy of document inclusion.

Through the comprehensive search procedure described above, we finally retrieved the literature records of all years in the ISI Web of Science database and subdivided the literature by using the ISI Web of Science screening function, choosing the discipline "Psychology" and publication years from 2011 to 2021. This ultimately yielded 1,159 retrieval records. Furthermore, we saved the retrieval results according to the full des

cription format in CiteSpaceIII. The data download date was December 7th, 2021.

2.2. Research Tools

In this paper, the software CiteSpaceIII was used to sort, analyze, and verify the collected literature data. Among them, each analysis object was considered as a node, and the larger the position occupied by the node in the result data, the more frequently it is cited, and the larger the range of annual rings. The connection between two analysis objects, i.e. two nodes, indicates that they have a common referenced relationship. There are many dense connections outside some nodes, which shows that those nodes occupy very important positions in the field to be studied, and also that they are "Structural Holes" in the field that deserve further study.

3. Data Analysis

3.1. Analysis of the number of documents on positive psychological training for suicide prevention

We used the following retrieval formula in ISI Web of Science database: "((TS = (Positive psychology) or TS = (Positive psychology training)) and (TS = (Suicide) or TS = (Suicidal behavior) or TS = (Suicide idea) or TS = (Self-employment Behavior) or TS = (Self-employment Idea))) ". Results are shown in Figure 1.

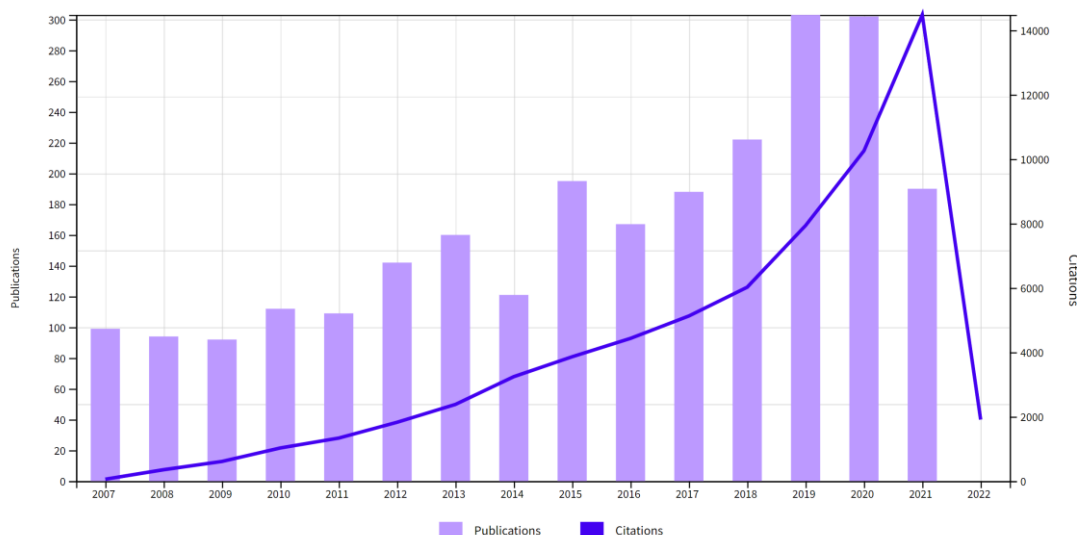


Fig. 1 Table of published documents on the effect of positive psychological training for suicide prevention

By analyzing the annual distribution of the number of papers published in a field, we can measure the trend of academic development in that field. Figure 1 is a table showing the number of published documents on the role of active psychological training for suicide prevention over the years. We can see that the published articles on the role of active psychological training for suicide prevention show a fluctuating upward trend over the period from 2007 to 2021. A research peak was reached in 2019; this may be due to the fact that in 2019, the American Psychological Association (APA) declared the use of big data to be one of the top ten trends of psychology. Researchers can thus identify behaviors and ideas such as suicide and self-injury faster through the analysis of massive data, enabling them to better intervene and analyze suicides and promote the rapid development of this field.

3.2. Cited Journal Analysis of Positive Psychological Training for Suicide Prevention

We selected the time retrieval span for the ISI Web of Science to be from 2011 to 2021, set the Time Slice as a stage every two years, and thereby split the whole time span into five time periods. Analyzing the data requires the use of: titles, abstracts, descriptors and identifiers from the searched literature, the network node was Cited Journal, the correction algorithm was Minimum Spanning Tree, the data extraction object was Top 50, and other options remained in the default state. Using CiteSpaceIII we were able to obtain a cited periodical atlas of the role of positive psychological training in suicide prevention.

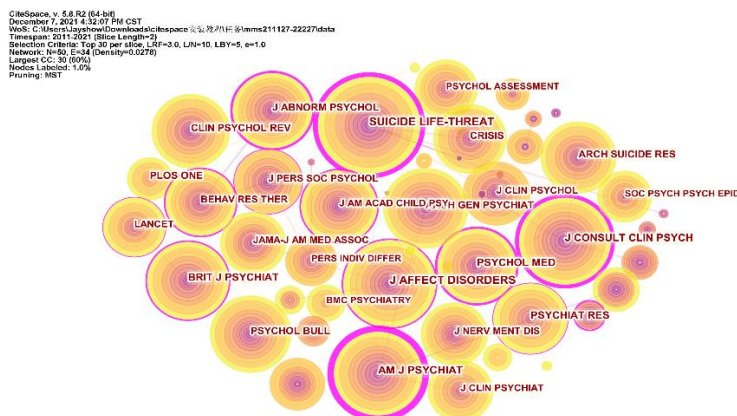


Fig. 2 Atlas of cited journals of positive psychological training for suicide prevention

Fig. 2 is the distribution chart of cited journals on the role of positive psychological training for suicide prevention. In CiteSpaceIII, we reflect the importance of nodes through the two dimensions of node cycle number and centrality. In the analysis of a cited journal, the larger the area occupied by the node, the higher the influence of the journal under the theme of the role of active psychological training for suicide prevention. The centrality of the position occupied by a node indicates the higher the degree of association between that node and other nodes, which is the structural hole for other journals[13]. Among them, "Suicide and Life-threatening Behavior" is the most important node. Suicide and Life-threatening Behavior published scientific research on suicide and other life-threatening behaviors, as well as research on biological, psychological, and sociological methods.

The Journal of Consulting and Clinical Psychology, a professional journal sponsored by the APA, is the second-largest research node. This journal publishes research papers on the treatment and nursing of patients in different environments. It is concerned with the development, demonstration, and use of diagnostic and therapeutic technologies, as well as demographic and cultural studies of behavioral disorders[14]. From the positioning of the cited journals on the theme of the role of positive psychological training for suicide prevention, we find that the research fields for that topic are extensive, covering the achievements of many schools of thought such as Psychokinesis, Constructivism, Behaviorism, Gestalt, Psychoanalysis, and Cognitive psychology[15].

3.3. Cited literature analysis of positive psychological training for the role of suicide prevention

Figure 3 shows the representative literature on the role of positive psychological training for suicide prevention. The larger the number of nodes, the more times the literature is cited in the field, and it is in a basic position in the field of positive psychology and suicide research. This study thus has a very important reference value for later research. These node documents described above have jointly laid the knowledge foundation for the role of positive psychological training for suicide prevention.

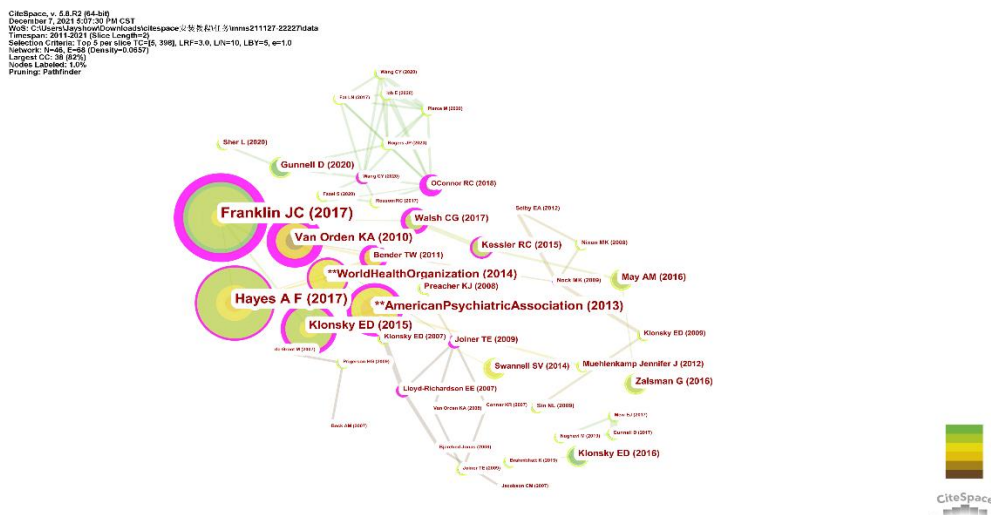


Fig. 3 Atlas of cited literature on the role of positive psychological training for suicide prevention

In Figure 3, apart from the most frequently cited literature in this field (Franklin, J. C., 2017), the most noteworthy node is the World Health Organization (WHO) (2014). In 2014, WHO put forward a global health plan and a data survey and risk assessment of the number of suicides worldwide. The corresponding literature forming a structural hole in the center of the picture is the suicide statistics and coping situation published by the American Psychological Association (APA) in 2013[16]. The APA is a psychological scientific organization representing the forefront of American psychology, including more than 122,000 researchers, educators, clinicians, consultants, and other members. Moreover, the APA (American Psychological Association) not only promotes the progress, exchange, and application of psychological science and knowledge, but also devotes itself to benefiting society and improving mental health through research[17].

3.4. Analysis of research hotspots of positive psychological training for suicide prevention

Keyword frequency was used to obtain a trend analysis of research hotspots. The keywords with high frequency and large node rings here reflect the focus of attention in the field of positive psychological training for suicide prevention and the research directions in which researchers are interested. (Figure 4.)

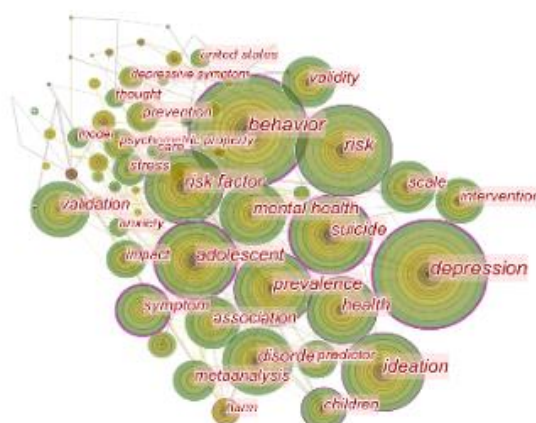


Fig. 4 Keyword map of positive psychological training for suicide prevention

Among the above keyword nodes, "Depression" occupies the largest area and is cited the most frequently, indicating that in the theme of positive psychological training for suicide prevention,

the hot issues are characterized by depression, which also shows that depression may have a predictive effect on suicidal behavior[18].

In addition, we find that "Mental health" is located in the structural hole in the center of the picture, which is connected with other hot keywords. This shows that researchers have put mental health in the key position of preventing suicide, and thus we should pay more attention to it. Through the analysis of keywords, we can know that positive psychological training has the characteristics of wide research angle, prominent emphasis, and high intervention. Its research content spans all stages of suicide, and positive psychological training has a remarkable effect on suicide prevention.

4. Discussion

This study initially searched using "Suicide" and "Positive Psychology" as the subject words[19]. However, this search yielded a large number of irrelevant studies, and the calibration rate was low[20]. At the same time, many studies belong to the research field of positive psychology, but they do not highlight the essential analysis of positive psychological training[21]. Moreover, because keywords related to suicidal behavior such as "Suicide behavior", "Suicide idea", "Self-employment behavior" and "Self-employment idea" did not appear in the retrieval formula, a substantial amount of relevant literature was omitted and the recall rate was low. After expert discussion, we adjusted the retrieval strategy and selected the Boolean logic operation to search as follows: "((TS=(Positive Psychology) OR TS=(Positive Psychology training)) AND (TS=(Suicide) OR TS=(suicidal behavior) OR TS=(Suicide ideation) OR TS=(Self-injury behavior) OR TS=(Self-injury idea)))". Ultimately, 1,159 documents were obtained, and the inclusion degree of the documents was guaranteed to some extent to reflect the hot issues and development trends in the field of positive psychological training for suicide prevention[22].

Positive psychology can be used to apply the principles and methods of psychology to the diagnosis, treatment, and prevention of suicide and self-injury behaviors. In terms of research content, positive psychology covers psychological counseling and psychotherapy[23]. And positive psychology includes clinical research directions such as suicide prevention and depression, as well as basic directions such as neural mechanism, cognitive psychology, and psychological training[24-25]. In recent years, as psychology gradually enters public view, its development momentum is expected to be very rapid. Research hotspots of positive psychology frequently emerge[26], and maintained a fast-updating speed. The concept of positive psychology and its training methods has a very important influence on the control and prevention of suicide[27]. In the future, we can give lectures and education on the sense of the meaning of life from the perspective of positive psychology[28], reduce individual pressure, and enhance self-efficacy and subjective well-being, so that individuals can get positive emotional experience[29] and maintain social harmony and stability, thereby improving the public's mental health[30].

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