

Analysis on the Current Situation and Hot Spots of Internet Game Addiction Research in China and Abroad (1990-2020)

Shengnan Pang¹, and Na Cui²

¹Macau University of Science and Technology, Macau, China

²Shandong Women's University, Jinan, Shandong Province, China

Keywords: Internet game addiction, R language, Bibliometrics, Research hotspots

Abstract: This paper focuses on domestic and international literature review on Internet game addiction researches. It uses R language to analyze high-yield researchers who study Internet game addiction, the cooperation between countries in this research, as well as the concurrence and clustering of high-frequency keywords, and summarizes hot spots and trends of Internet game addiction research in China and abroad. The key of this paper is to analyze the original data, find out hidden information, and pay close attention to the research hotspots in this field. The research shows that the whole world pays attention to the research of Internet game addiction, but the focuses of domestic and foreign researches are different. Foreign research focuses on the theoretical review of Internet game addiction, while domestic research focuses on the psychological and medical analysis of the harm of Internet game addiction as well as the prevention and treatment of the disease. The paper points out the direction for the future research of Internet game addiction in China.

1. Introduction

Internet game addiction is a serious topic. It affects the study, work and interpersonal relationship of teenagers in different degrees. Internet game addiction, also known as Internet Gaming Disorder (IgD), mainly refers to the addictive behavior that damages the normal social function caused by the addiction to games (mainly Internet games).^[1] Internet game addiction not only has great negative effects on addicts, but also has certain adverse impacts on the stability and development of society.

Bibliometrics (literature metrology) takes document system and bibliometric characteristics as research objects, analyzes document information, and then evaluates the current situation, level and trend of the scientific development in this field.^[2-3] It is a relatively mature method for document analysis and information data mining.^[4] Billiometrix is a R language based software for scientific literature metrology, which is used in the whole process of scientific literature metrology and visual display.^[5-6]

2. The Data Source and Research Methods

The data of this paper comes from the SCI database of Web of Science, in which the keyword “gaming disorder” is used to search papers on Internet game addiction all over the world. The time span is from January 1, 1990 to February 1, 2020. After screening one by one, 521 pieces of data (including Chinese papers) are collected. Afterwards, the same keywords and time span are input; the region is selected as “Peoples R China”. Chinese papers on Internet game addiction are found; 169 data are obtained after screening.

This paper mainly focuses on two aspects. One aspect is the research subjects, namely, the volume of papers, high-yield countries and high-yield researchers; the other perspective is the research of hot spots. The paper finds out hidden information from analyzing high-frequency keywords, keyword co-occurrence networks and keyword clustering networks. Selected papers at home and abroad are imported into the Rstudio software to describe and analyze the data, to analyze

the time sequence of keyword knowledge units, and to build the cooperation network as well as the keyword co-occurrence network.

3. Analysis on the Subjects of Internet Game Addiction Research

3.1 Analysis on the Number of Articles

Through the analysis, we know that China's research on Internet game addiction started later than foreign countries, but it developed rapidly in the later stage. After 2010, the growth of literature published in China is no less than that in the world, which shows that China's ability on researching Internet game addiction is gradually enhanced. At the same time, it can be seen that China's economic strength is continuously enhanced, and the level of science and technology is gradually improved.

3.2 Analysis on Countries and Regions

3.2.1 Countries / Regions with High Literature Output

Through data analysis on the study output of countries and regions, it is found that China ranks first in the world in the research of Internet game addiction, and the amount of independent publications in China is far more than other countries, which shows the rapid development of Internet game addiction research in China since the 21st century. South Korea, the United States and the United Kingdom rank the second, third and fourth respectively.

3.2.2 Analysis on Research Cooperation between Countries and Regions

Research cooperation between countries and regions can promote academic exchanges between the two sides. Through the construction of cooperative networks, we can see that in the world, the cooperative networks on Internet game addiction research are divided into three clusters. The first cluster includes the United States, China, South Korea, Japan and Canada. The second cluster includes the United Kingdom, Australia, Germany and other countries. The third cluster has less cooperation than the first two clusters. The close cooperation between the United States, China, South Korea as well as the United Kingdom with other countries and regions shows that these countries have high influences in the research and play an important role in the spread of related knowledge.

As a large country with high-yield literature, China has close cooperation with other countries, and occupies a very important position in this field. But its cooperation with other countries still needs to be deepened.

3.3 Analysis on High Yield Researchers

3.3.1 Analysis on High Yield Researchers At Home and Abroad

Through analyzing the amount of papers published by high-yield researchers and papers quoted in research literature, the authors with high influence in this research field can be quickly located [7-8].

In terms of international Internet game research, the top three high-yield researchers are Griffiths M.D., Kim D.J. and Choi J.S., with 53, 35 and 27 papers published respectively. However, the papers of these three authors are not among the top ten highly cited papers, which shows that although these three scholars have a large number of publications, they are not highly concerned. The researcher Ko C.H. published two articles which are in the top ten highly cited papers; they are cited for 331 times and 233 times respectively, which fully shows that in the field of Internet game addiction research, Ko C.H. has received much attention and produced great influence.

In China, the most prolific author in the field of Internet game addiction research is Dong G.H., followed by Du X.X. and Potenza M.N., with 36, 28 and 19 articles respectively. Each of the top ten high-yield researcher has published more than 10 papers. According to information on high cited papers, the three papers of Dong G.H. are in the top ten of high cited papers, which fully shows that Dong G.H. has a high academic authority in the field of Internet game addiction research

in China. In addition, a paper on pathological games written by Gentile D.A. is cited more frequently than others in this research field, which shows the important influence of this paper on the research of game addiction in China.

To sum up, domestic researchers Dong G.H. and Du X.X. made great contributions to the research as well as the prevention of Internet game addiction in China.

3.3.2 Analysis on the Cooperation Network between Domestic and Foreign Scholars

We selected 50 Internet game addiction researchers abroad and 50 Internet game addiction researchers in China to carry out cooperative network analysis.

There are six clusters in the cooperative analysis among researchers in the world. The first cluster is centered on researchers King D.L. and Billienx J. The cooperative relationship between these researchers is very close. Griffiths M.D., Kim D.J. and Choi. Is are the center of the second cluster; the cooperation among the three researchers is very active. The position of each researcher has little difference in the other four clusters. Therefore, in the global research field on Internet game addiction, King D.L., Billienx J., Griffiths M.D., Kim D.J. and Choi Is are undoubtedly the most active scholars, and their cooperative groups are very stable.

There are three clusters in the cooperation among Chinese researchers. Rumpf B.J. is the most dominant one in the largest cluster, and researchers in this group cooperate closely with each other. The second cooperative network is centered on Dong G.H., Zhang J.T. and Du X.X.; the scholar Potenza M.N. has cooperative relationship between many scholars in the first cluster. There are few researchers in the last cluster. Except for Du X.X., the other four researchers cooperate with each other.

In a word, the cooperative relationship between domestic researchers is relatively close, which lays a solid foundation for the prevention and treatment of Internet game addiction among Chinese teenagers.

4. Analysis on Hotspots in Internet Game Addiction Research

Key words are the essence and core of scientific literature. Refining specific research contents and highlighting the research focus of the paper can better reveal research hotspots in the field of Internet game addiction^[9-11].

4.1 Analysis on High Frequency Keywords

Through analyzing the key words of papers on Internet game addiction, it is found that the top ten high-frequency key words include Internet Gaming Disorder, Internet Addiction, Behavioral Addiction and Adolescence. It explains that most of the research on Internet game addiction focuses on the research of video game addiction of teenagers, the theoretical review of Internet game addiction and other aspects.

The high frequency keywords of Internet game addiction papers in China include Internet Gaming Disorder, FMRI (functional magnetic resonance imaging), Internet Addiction, Decision Making and so on, which fully shows that the research on Internet game addiction in China is closely related to medicine and psychology. It shows certain advantages compared with researches in foreign countries.

Through the cumulative time sequence changes of keywords, it can be found that the amount of research papers published before 2000 was very small both at home and abroad. Before 2005, the types of keywords in this research field gradually increased, and the amount of papers published increased. After 2010, Internet game addiction appeared in related papers as the core keyword.

4.2 Analysis on Keyword Co-Occurrence

The co-occurrence analysis of key words can reflect the situation that the key words of a research topic or research direction in a scientific field appear in the same paper at the same time, so as to judge the relationship between various topics or directions in this field^[12-14]. This method is applied in many research fields to explore hot spots and research trends of certain discipline.

According to analysis, in the research field of Internet game addiction in the world, the keyword Internet Gaming Disorder accounts for the highest proportion, and the common occurrence frequency of this word is very high with most of other keywords. The second and third keywords are Internet Addiction and Addiction, which shows that the current research on Internet game addiction focuses on the relationship and mutual influence between Internet addiction and game addiction, as well as the addiction behavior.

In China, the central key word in the field of Internet game addiction research is also Internet Gaming Disorder, followed by FMRI. It shows that in China, the research in this field is mainly focused on the prevention and treatment of symptoms of Internet game addiction.

4.3 Analysis on Keyword Clustering

Clustering analysis is the process of decomposing the disordered network into a series of non overlapping subgroups, and then dividing and analyzing the subgroups. Each group of subgroups in the cluster is a common topic of a group of research literature with internal relations^[15-16].

There are two parts in the keyword cluster of international research. The first cluster mainly includes Internet Gaming Disorder, Internet Addiction and Problematic Internet Use. It mainly involves the overview of Internet use and Internet game addiction. Another cluster mainly includes Children, Loneliness, Social Anxiety, Depression and Gender, which shows that the cluster mainly discusses the causes of teenagers' excessive addiction to Internet games and whether there is gender difference in Internet game addiction.

In the cluster of key words of domestic research on Internet game addiction, the large cluster includes Internet Gaming Disorder, Depression, FMRI, and Risky Decision Making, indicating that the cluster mainly involves the psychological and medical research of Internet game addiction. Smaller clusters include the key words like DSM-5 (Internet game disorder), Behavioral Addiction and Diagnosis, indicating that the research involved is mainly the analysis and review of the symptoms of Internet game addiction.

Through above analysis, we can see that researchers at home and abroad have paid attention to the psychological research based on Internet game addiction. The difference is that in China, more attention is paid to the prevention and treatment of Internet addiction and Internet game addiction.

5. Conclusion

First, in foreign countries, the research on Internet game addiction is earlier than that in China, but there are few papers about it in the early stage. After 2010, the amount of articles on Internet game addiction research has been increasing year by year at home and abroad. It shows that different countries are increasing efforts in the research of Internet game addiction.

Second, China attaches great importance to the study of Internet game addiction, with the largest number of articles published in the world. China has a close cooperative relationship with many countries in the world in terms of scientific research, and there are stable cooperation among domestic researchers, which contributes to the prevention and control of game addiction in China.

Third, the analysis of high-frequency keywords, keyword co-occurrence network and keyword clustering show that the international research focuses on the theoretical review of various aspects related to Internet game addiction. In China, most scholars analyze the harm of Internet game addiction to health, and study the prevention and treatment of Internet game addiction symptoms. It fully reflects that in China, prevention and treatment of Internet game addiction is the hot research direction in this field.

To sum up, at present, the research on Internet game addiction has received attention from scholars all over the world. But the research focuses are different at home and abroad. Foreign research focuses on the theoretical review of Internet game addiction, while domestic research focuses on the psychological and medical analysis of the harm of Internet game addiction as well as the prevention and treatment of the disease. This paper also has shortcomings. On one hand, the data is only limited to literature in the Web of Science database, and the amount of data is limited. On the other hand, the literature data are screened manually, and there may be some errors.

Acknowledgment

This paper is the outcome of the study, *Research on the Dependence of Adolescents on Internet Games from the Perspective of Gender*, which is supported by the Foundation for Social Sciences Planning Projects of the Youth Program of Shandong Province in 2020, 1/5. The Project Number is 20DXWJ03.

References

- [1] Zheng, H. The Imbalance Between Goal Orientation and Habit Control system of Internet Game Addiction: Evidence of Behavior and Brain Imaging, Zhejiang Normal University, 2019.
- [2] Lu, W., Qian, K., Tang, X.B. Study on the Correlation Between the Frequency of Document Downloading and Cited Frequency: A Case Study of Library and Information Science. *Information Science*, vol.34, no.1, pp. 3-8, 2016.
- [3] Wang, G., Chang, C., Yu, X.Q., et. al. Current Situation and Hotspot of Coral Reef Research Based on Bibliometric Analysis. *Acta Ecologica Sinica*, vol. 39, no. 3, pp. 1114-1123, 2019.
- [4] Liu, Q.X., Wu, H.Q., Huang, Z.L. The Response of Wheat to Climate Warming Based on Global Literature Measurement. *Chinese Agricultural Science Bulletin*, vol. 35, no. 23, pp.142-151, 2019.
- [5] Li, H., Pan, Y.G., Wang, L. Bibliometrix: Introduction and Evaluation of A New Bibliometrix Software Based on R Language. *Journal of Academic Library and Information Science*, vol. 36, no. 4, pp. 93-104, 2018.
- [6] [10] Mongeon, P., Paul-Hus, A. The Journal Coverage of Web of Science and Scopus:a Comparative Analysis . *Scientometrics*, vol. 106, no. 1, pp. 213-228, 2016.
- [7] Xue, W., Zhu, M., Xiao, D., et. al. Progress of River Health Research Based on Bibliometrics. *Modern Agricultural Science and Technology*, no. 20, pp. 169-173, 2019.
- [8] Wang, G., Chang, C., Shi, Y.H. Status and Hot Spots of Natural Capital Research Based on Bibliometrics. *Acta Ecologica Sinica*, vol. 39, no. 21, pp. 8183-8192, 2019.
- [9] Bai, B.Y. Diabetes Research Paper Cooperation and Hot Spot Analysis, Shanxi Medical University, 2018.
- [10] Mokhnacheva, Y., Tsvetkova, V. Bibliometrics and Modern Scientific Libraries. *Nauchnye I Tekhnicheskije Biblioteki-scientific and Technical Libraries*, no. 6, pp. 51-62, 2018.
- [11] Li, Q.Y., Han, G.S., Zhang, A.P., et. al. Bibliometrics and Content Analysis of Chinese Literature on Tourism Geography from 1979 to 2012. *Tourism Tribune*, vol. 29, no. 09, pp.110-119, 2014.
- [12] Sun, H. Research on Scientific Research Achievements of Librarians in Local Universities Based on CNKI Bibliometrics. *Technology and Market*, vol. 24, no. 05, pp. 287-290, 2017.
- [13] Han, R.B., Ye, J.L. Interpretation on Research Status of Global Governance in China: Bibliometric Analysis Based on CNKI. *Theory and Reform*, no. 03, pp. 62-73, 2017.
- [14] Gong, S.N. Analysis on Current Situation and Hot Spot of Educational Game Research Based on Bibliometrics, Central China Normal University, 2019.
- [15] Xing, Y.H., Zhao, Y. Progress of Research on Game Industry in China: Bibliometric Analysis Based on CiteSpace. *Journal of Qingdao University (Natural Science Edition)*, vol. 32, no. 02, pp. 127-133, 2019.