Global Hotspots and Research Trends on Night-Time Economy-Based on the CiteSpace analysis

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Abstract. The research analyzes global hotspots and research trends in Nighttime Economy (NTE) based on 506 papers from CNKI and Web of Science (WOS) from 2004 to 2024. According to keyword co-occurrence, highly cited literature, and institutional research networks, the international studies focus on social behaviors like alcohol consumption, while Chinese studies emphasize urban policy development. Future research trends highlight the increasing use of technology, the impact of NTE on public health, and the need for sustainable practices. This study provides a comprehensive overview of the current state and future direction of NTE research.

Keywords: Night-time Economy, Night-time Activity, Web of Science, CNKI, Literature Review.

1 Introduction

In the 1990s, major cities around the world have included nighttime activities in their urban revitalization strategies, promoting the gradual systematization of the nighttime economy and demonstrating its potential economic benefits [1]. Bianchini (1995) further argues that the Night-Time Economy (NTE) not only extends daytime functions but also generates new economic opportunities. Building on earlier urban strategies [2], the NTE has become a key driver of urban development and has been widely adopted globally to foster economic growth, drive consumption and optimize urban functions [3]. Notably, the NTE generates billions in revenue and supports millions of jobs in major cities like New York and London [4]. While the NTE is a well-established model internationally, China's NTE is still in its developmental stages. Following the pandemic, the Chinese government has increasingly focused on it. The Opinions on Accelerating the Development of Circulation and Promoting Commercial Consumption [5] played a significant role in this development, turning the NTE into a key tool for boosting consumption and urban growth. Therefore, the NTE has garnered widespread global attention as a crucial component of economic recovery and urban development strategies.

With the expansion of night-time activities around the world, research on the NTE has increasingly shifted from emphasizing its macroeconomic benefits to addressing

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more localized concerns such as public safety, environmental impact, and governance challenges. This shift has been driven by the rapid growth of NTE, especially in urban centers with concentrated nightlife hubs [6].The rapid growth of the NTE has been closely associated with alcohol consumption and crime problems, especially in urban centers where venues such as bars and nightclubs are concentrated, and crime rates have risen significantly [7]. The activity of nightlife increases public safety risks, with violent crime and public order problems being particularly prominent [8]. At the same time, the environmental impacts of the NTE are becoming apparent, particularly about light pollution and energy consumption [9]. Currently, research on the NTE in China remains relatively limited focusing primarily on macro-level aspects. Chinese scholars, in contrast to the more socially risk-oriented research in Europe and the United States, emphasize how policies can guide the development of the NTE. This focus is partly driven by the economic recovery pressures and the government's aim to stimulate domestic consumption through urban planning and infrastructure improvements [10]. Meanwhile, With the advancement of remote sensing technology and the increasing availability of big data, both international and Chinese scholars have been utilizing these tools to study the NTE [11]. Remote sensing is applied at a micro-level to examine urban areas, commuting patterns, as well as to assess environmental issues like light pollution. Compared to international research, Chinese research focuses more on analyzing the spatial and temporal distribution of night-time economic activities within cities, providing a scientific basis for urban management and policy formulation [12].

Both international and Chinese research on the NTE have produced significant findings. However, existing studies are still scattered, and fail to form a systematic analytical framework for the social effects and environmental impacts of the NTE. This field lacks a panoramic picture to help policymakers comprehensively assess the development of the NTE. Thus, this study seeks to bridge this gap by using bibliometric analysis to map key research trends, predict future developments, and identify under-researched areas. By offering a systematic overview of the NTE, this research will provide valuable insights for both scholars and policymakers, guiding the sustainable advancement of the NTE.

2 Methodology

2.1 Method

Based on two databases, CNKI and Web of Science (WOS), this study systematically analyzes the current status and development trend of domestic and international research on NTE, using CiteSpace 6.3.3 as the main analysis tool. The data retrieval and analysis process strictly followed the principles of scientific and practicality to ensure the comprehensiveness, authority and validity of the selected literature.

2.2 Data Collection

In terms of data collection, firstly, On the WOS platform, the terms “Nighttime economy” OR “24-hour economy” OR “Nightlife “OR “Nighttime commerce” OR “Nighttime Urban Economy” OR “Nighttime Activities” and other keywords for literature search, the type of literature is limited to papers in the SCI database, and the time span was set from 2004 to 2024. On the CNKI platform, we searched for “nighttime urban economy” OR “nighttime economy” OR “nighttime consumption” OR “night life” OR ‘night business’ OR ‘night lifestyle’ and other keywords for literature search by selecting the papers in the core journals of Peking University and the CSSCI database, and the time span was also set from 2004 to 2024. After manually selecting conforming as well as removing duplicate literatures, 300 and 206 literatures were obtained from WOS and CNKI for analysis.

2.3 Data Processing/analysis

In this paper, The collected literature is analyzed using bibliometric methods in five dimensions: annual publications, authors analysis, journal and institution analysis, highly cited literature, and keyword co-occurrence. CiteSpace is used to study the co-occurrence of keywords to find core themes and research directions in NTE. The highly cited literature analysis identifies key influential works. The analysis of research institutions and authors shows academic collaboration networks and research strengths in NTE studies.

3 Literature Statistical Feature Analysis

3.1 Annual Publications

The analysis of the annual number of publications reveals how the interest in the field of NTE research has changed. The number of publications showed a modest growth between 2004 and 2013 (Figure 1). A notable increase began in 2016 and reached a peak of 45 (15%) in 2022. In the following years, publications slightly decreased but remained high with 34 (11.33%) in 2023 and 31 (10.33%) in 2024. Similarly, CNKI’s database revealed a steady increase between 2004 and 2016. The number of publications started to climb fast since 2017, rapidly escalating to a peak of 39 articles (18.93%) in 2022. Obviously, CNKI, starting from a very low initial count, experienced a more dramatic surge in publications beginning in 2019.

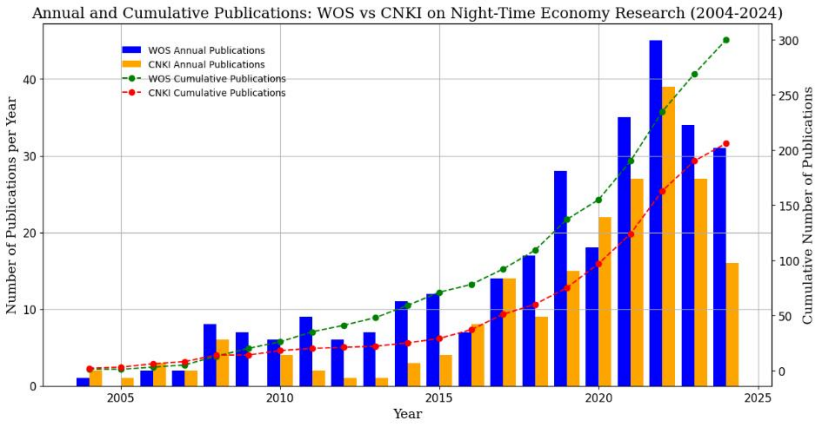

Fig. 1. Trends in WOS and CNKI Publications, 2004-2024.

3.2 Volume of Articles by Authors

In the field of NTE research, analysis of the authors in the WOS database shows that there are two main core author collaboration networks (Figure 2). The first prominent one, is the core author collaboration network dominated by Mark A Bellis, Amador Calafat, Montse Juan, and Karen Huge. They focused on the impact of alcohol and drugs on nighttime social safety led by Karen Hughes [13]. Another key author collaboration network includes Ashlee Curtis, Nicolas Droste, and Kerri Coomber, formed in 2015 and active through 2019. They focused on alcohol consumption and public health which led by Nicolas Droste and Ashlee Curtis[14]. CNKI's analysis shows a decentralized collaboration network with mostly small-scale partnerships (Figure 3). Two key author groups emerge: Cheng Zhou's group, which studies the spatio-temporal evolution and distribution of NTE using nighttime light data, and proposes new methods. The second group, led by Deping Chu, examines China's NTE policy evolution and offers key recommendations for development[15]. Additionally, Xinxiang Cao, as an independent author, concentrates on nighttime tourism and suggests strategies for its future growth in China[16]. By closely collaborating, these core scholars have advanced the multidisciplinary integration of NTE research, particularly in public health and social behavior.

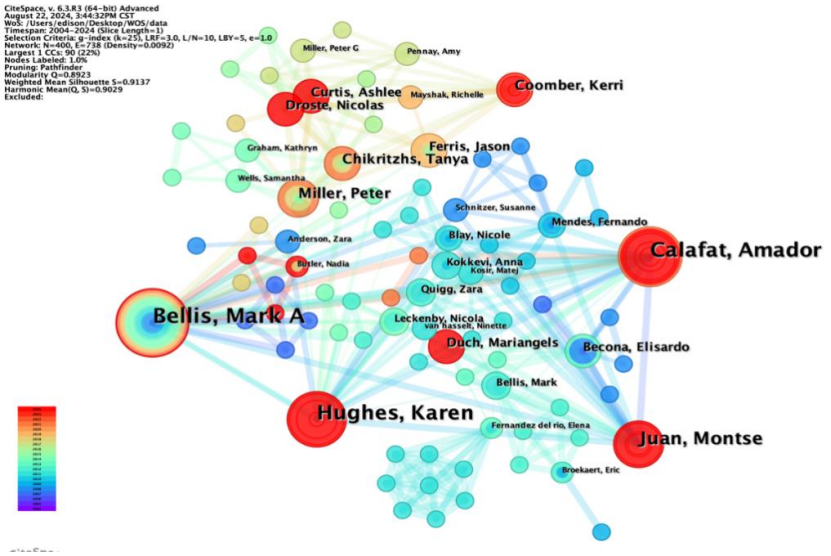

Figure **2.** Cooperative relationships among the major WOS author.

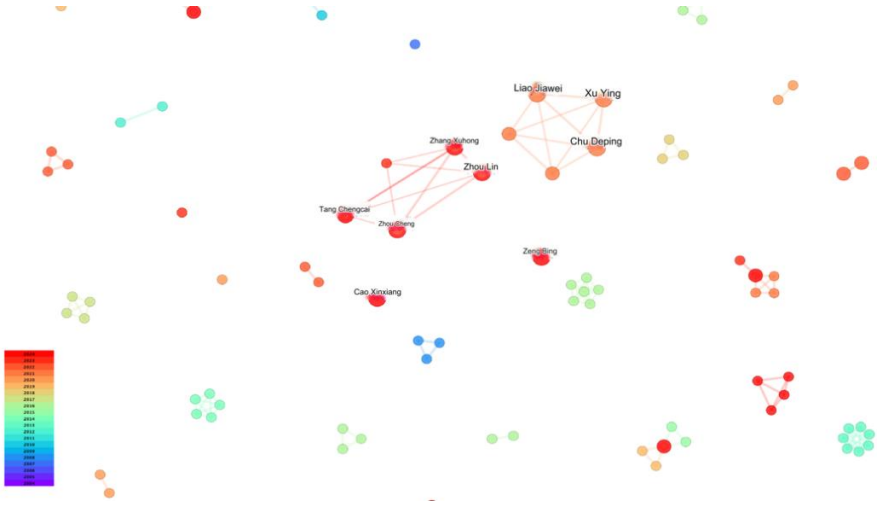

Fig. 3. Cooperative relationships among the major CNKI author.

3.3 Journal and Institutional Analysis

In WOS, studies are frequently published in journals focusing on remote sensing, geoinformation, applied sciences, and sustainability, highlighting a technology-driven and interdisciplinary approach that integrates environmental monitoring, urban analysis, and data science (Table 1). In CNKI, research is mainly found in journals covering fields like consumption economy, urban development, geography, and geo-

information science, reflecting a strong focus on spatial analysis and geographic technologies in nighttime economy studies.

Table 1. Top 5 Journals Publishing NTE Research in WOS and CNKI

Top 5 Journals Publishing NTE Research in WOS	Top 5 Journals Publishing NTE Research in CNKI
Remote Sensing	Consumption Economy
Applied Sciences	Modern Urban Research
Sustainability	Geography and Geo-Information Science
IEEE Geoscience and Remote Sensing Letters	Human Geography
ISPRS International Journal of Geo-Information	Remote Sensing Information

Globally, three core networks of institutions show significant academic impact in the field of NTE, namely Liverpool John Moores University, Deakin University, and the Chinese Academy of Sciences (Figure 4). Liverpool John Moores University specializes in research on alcohol misuse in the NTE and is led by Karen Hughes and Mark A. Bellis. In contrast, institutional research in the CNKI database is more dispersed (Figure 5). Fujian Normal University School of Tourism, led by Deping Chu, published four papers focusing mainly on macro policy research on China's NTE. The other two core institutional networks are from the Beijing International Studies University and the Shandong University of Finance and Economics, but there is no core institution to lead.

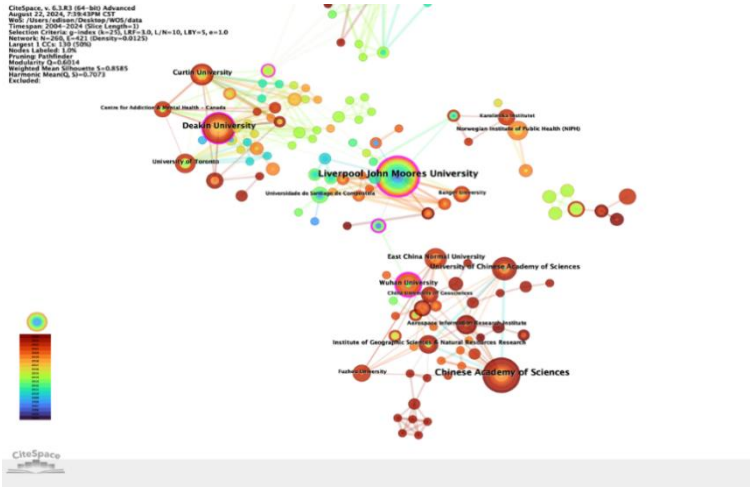

Fig. 4. Cooperative relationships among the major WOS institutions.

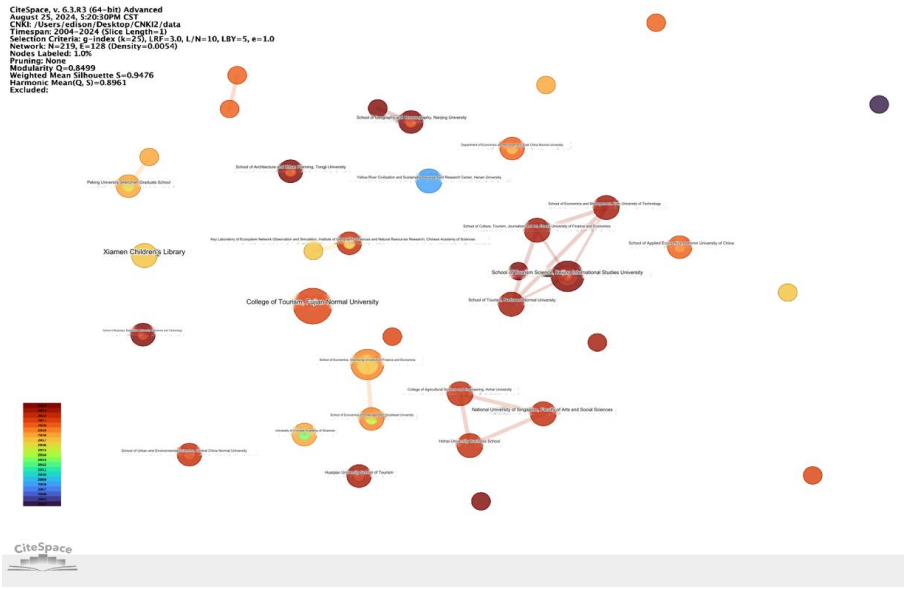

Fig. 5. Cooperative relationships among the major CNKI institutions.

3.4 Highly Cited Literatures

Two main clustered areas of highly cited literature in WOS (Figure 6). The top two highest number of citations in the first cluster were 25 by Hughes K [17] and 10 by Bellis MA[13]. These literatures have driven research to concern about the social issues, like alcohol consumption, health risks and crime in nightlife between 2008-2015. The second clustering appears later but affects up to 2024. The highest cited literature in the cluster is 15 citations by Bennett MM [18], emphasizing the importance of NTL data in the analysis of urbanization and population dynamics, especially in countries lacking statistical data. The later literature by Levin N [19] was cited 14 times. It focuses on the challenges posed by LED lighting at night globally and proposes higher resolution, multi-spectral capabilities, and accurate data processing methods. Due to the limited availability and insufficiency of citation information in CNKI's Chinese journals, a manual search and selection of highly cited literature was necessary. According to the manual searching and reading, CNKI's highly cited literatures more emphasis the strategy and planning. The highest cited literature, 22 times by Ping Yu [20], which discusses the background and development strategy of nighttime tourism and provides a theoretical foundation for China's early NTE.

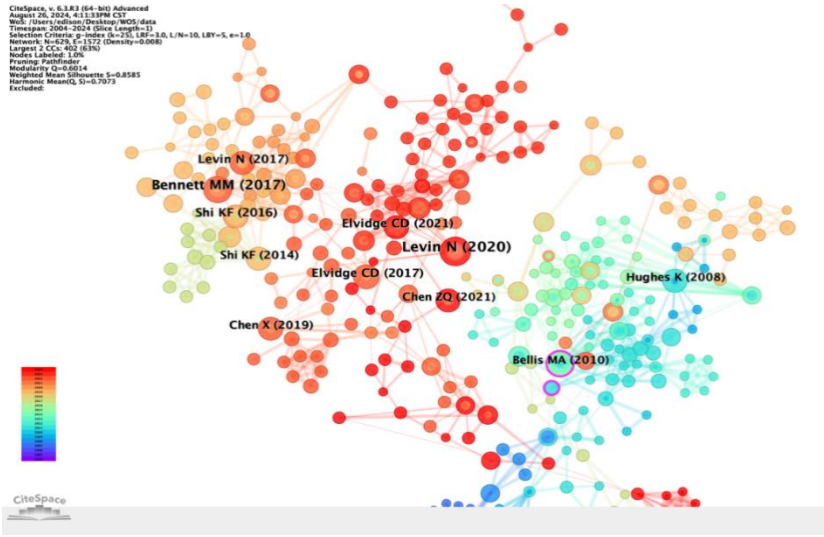

Fig. 6. WOS high cited literatures networks.

3.5 Keywords Analysis

According to the keywords clusters (Figure 7), it shows three main categories of research themes in the WOS clusters: technology and environment, social and health, and spatial and urbanization category. First, the clusters covered in the technology and environment category are remote sensing, night market, and human activity intensity. Among them, remote sensing mainly includes keywords “city” and “nighttime lights” and receiving strong attention during 2019-2021. These research focus on how to analyze NTL (nighttime light) issues through remote sensing data in cities. Secondly, in the social and health category, clusters of intoxication, gender, alcohol drinking, drug-facilitated sexual assault, and situational disinhibition were included, and each cluster is associated with each other. Intoxication cluster contains the keywords “drinking”, “drug use” and “aggression”, which focuses on the years 2007 to 2012. The keywords "drug use" within intoxication and "young adults" within gender categories have been closely linked since 2007, highlighting the ongoing focus on youth substance abuse and the importance of preventive measures. Lastly, In the spatial and urbanization category, the clusters are closing time” and urban expansion. The cluster urban expansion appears from 2010 until 2024. The keyword “impact” has a strength of 2.76 in 2022. It explores how the NTE drives urbanization.

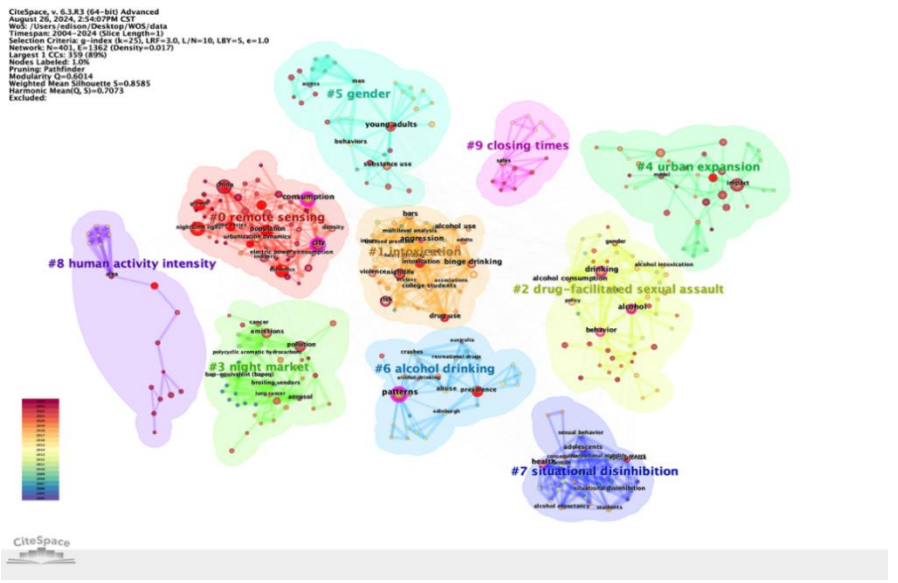

Fig. 7. WOS keywords clusters.

For CNKI, the keywords of NTE research are organized into five major clusters, of which nighttime economy and China are the two major clusters (Figure 8). There are also three minor clusters, including nighttime tourism, nighttime consumption and mechanism. The NTE serves as the largest cluster. Keywords such as “sports industry” and “cultural and tourism integration” are concentrated in the core of the cluster. The sports industry boosts economic vitality through nighttime events and conducting consumption scenarios such as evening sports; culture and tourism integration attracts tourists by combining the cultural backgrounds of different regions in China, which avoiding homogenization, and promoting distinctive development. The keywords “the yellow river basin” and “county economy” in the second largest China cluster from 2015 to 2017. The study of the "Yellow River basin" and "county economies" highlights how the development of the NTE has deeply penetrated regions in China, promoting balanced local economic growth by utilizing regional characteristics and economic layout. The cluster of nighttime tour and nighttime spending was focused on earlier, mainly between 2004 and 2010. Research has focused on how keywords such as “development” and “consumption” have contributed to the development of the tourism and consumption sectors.

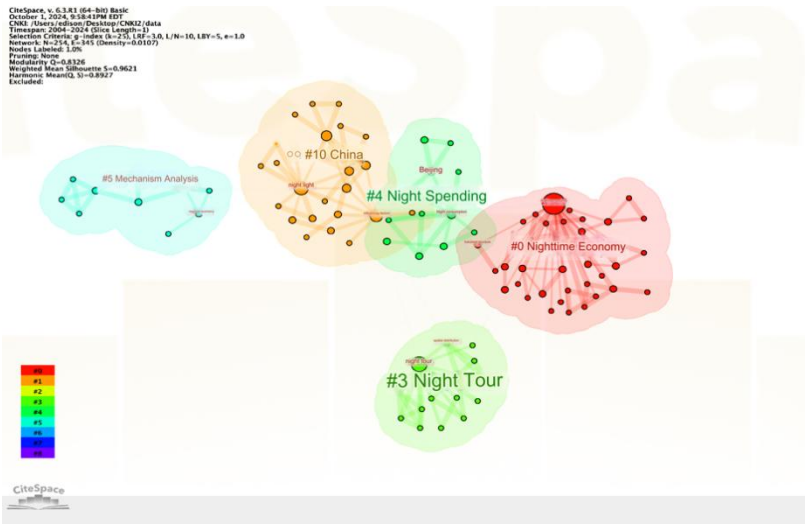

Fig. 8. CNKI keyword clusters.

4 Discussion

4.1 Current Major Research Areas and Future Trends

It is obviously to see key areas of NTE research and future directions from the previous analysis. Firstly, NTE studies have increasingly become technology-driven, leveraging big data, AI, and remote sensing. Researchers like Noam Levin and Yan Ma have used nighttime lighting data to monitor NTE activities, but current remote sensing technologies struggle to capture high-resolution data, limiting accuracy. Future research may integrate multi-source data, machine learning, and big data analytics to enhance regional pattern analysis, providing a stronger foundation for urban development and policy. Secondly, research on NTE and public health, particularly regarding social behaviors like alcohol consumption and crime, has been explored by Mark A. Bellis, and Karen Hughes. However, studies often neglect population differences. Future research should examine these behaviors across various demographic groups, offering targeted insights for public policy, thus creating tailored interventions for specific communities. Lastly, the environmental impact of NTE, such as carbon emissions and light pollution, has been a focus for Lin Wang and John C. Barentine. Yet, existing studies mostly concentrate on localized issues. Future work could examine how NTE aligns with sustainability goals across different cities, promoting a balance between economic activities and environmental objectives.

4.2 Research Limitations

The study attempts to cover the literature on the NTE as broadly as possible, and there are still some limitations that cannot be ignored. Firstly, due to the limitation of data sources, some important literature and topics may have been missed, especially studies on the environmental impacts of the NTE, social equity, and cultural differences. For example, while there are studies on the link among environmental pollution, energy consumption, and the NTE, the existing literature may not fully cover the topic yet. In addition, the impact of the NTE and policy implementation in different cultural contexts may not be fully explored. This limits the scope and detail of current findings. Further study could improve literature search methods and expand data sources to better cover and analyze the various aspects of the NTE and addressing current gaps.

5 Conclusion

Based on the literature analysis of WOS and CNKI, several key findings have emerged. First, the publication volume has shown a consistent upward trend from low to high in both datasets, indicating a growing interest in nighttime economy (NTE) research. Second, highly cited literature is predominantly led by prominent universities and authors, with major contributions from institutions such as Liverpool John Moores University and Fujian Normal University, showcasing their influence in areas such as social and health category. Third, keyword analysis reveals differences between the two datasets: WOS emphasizes social behaviors and public health issues like alcohol consumption, while CNKI focuses more on policy development and urban planning. This paper contributes to the NTE field by identifying current research hotspots and future trends. It provides a comprehensive overview of the evolution of topics and keywords which offers a panoramic view that highlights the essential research issue and future trends globally. This work not only maps the existing literature but also provides valuable guidance for future research and policy development in the field of NTE.

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