Journal of Fiber Bioengineering and Informatics 15:3 (2022) 217–231

Cite as: X. Yan et al.
doi:10.3993/jfbim03641

Analysis of Chinese Core Literatures on Protective Clothing Research ⋆

Xiao-Yan Yan*, Xiao-Peng Chen, Jia-Min Zhang, Jie Wang, Zhao-Qi Huang

College of Fashion Design, Zhongyuan University of Technology, Zhengzhou, Henan 451191, China

Abstract

Protective clothing research is booming worldwide and has become a hotspot in academia. This paper compares the literature in Chinese Core Journals with international journals on protective clothing researches to provide framework for future study. By using the system of CiteSpace, the literatures on protective clothing were selected from CNKI and WOS databases, and knowledge visualization analysis was conducted in terms of the number of articles, clustering graph, time zone view, emergent words, timeline, etc.. The commonalities and differences between literature in Chinese Core Journals with those in international one are discussed, and the achievements in protective clothing research are summarize to providing new research perspectives. It is found that the research themes in both Chinese literature and international literature have changed in response to the social and natural environment, and the research topics on protective clothing are constantly new on the basis of the previous period; the research themes of Chinese literature focus on "emergency rescue", "thermal protection", "public safety" and "medical treatment", while the themes of international literature focus on "textile", "composite", "mechanical property", "antibacterial" and "nanoparticle".

Keywords: Protective Clothing; Knowledge Graph; CiteSpace; Bibliometric Analysis

Protective clothing is used to protect personnel working in a variety of workplaces from physical, chemical and biological factors in the environment [1]. Protective clothing researches affect the lifestyle of people and play a unique role increasingly, with the challenges of living environment and the exploration of the natural.

In 40 years, scholars from various countries have focused on protective clothing researches, and the research directions and achievements are rich and diverse. Thus there is a lack of overall sorting and systematic understanding on the field. The digitization of literature and the development of data analysis tools have provided convenience for quantitative analysis of literature [2]. CiteSpace software, which explores the evolution of knowledge paths from the spatial and temporal dimensions of a subject area, and display the full picture of information in the relevant literature research areas in a visual format, is ability to capture the research hot spots and trends in a specific subject area accurately [3].

⋆Project supported by by the Fundamental Research Project of Higher Education Institutions in Henan Province in 2022 (2022-JCZD-34).

*Corresponding author.
Email address: 183628612210163.com (Xiao-Yan Yan).

This study analysis protective clothing literature in databases of Chinese National Knowledge Infrastructure (CNKI) and Web of science (WOS). By bibliometric methods and knowledge mapping by CiteSpace system, keyword clustering, time zone view, emergent word detection, and timeline analysis on protective clothing researches could be shown, and the knowledge evolution process, hot topics, and development trends of protective clothing research in Chinese literature and international literature could be analyzed.

It should be noted that the Chinese literature analyzed in this paper are limited to the Core Journals database of CNKI, and a large number of non-core journal papers are not covered. Although the non-core literatures are large number and some of them are of high level especially in recent years, the literatures are strictly screened and represents only a portion of the literature in China. In addition, a significant number of research papers by Chinese scholars have been published in foreign journals in languages other than Chinese, so the Chinese literature referred to in this paper is not entirely equivalent to Chinese research in the relevant fields. WOS is the world's largest comprehensive academic information resource covering the largest number of disciplines, including a variety of the most influential core academic journals in various research fields [4]. The literature in WOS represent the international level and status to some extent. Therefore, this study only compares CNKI Core Journals literature and WOS literature, which to a certain extent represents but not fully equates the situation of Chinese and international research.

1 Research Methodology and Data Collection

1.1 Research Methodology

In order to comprehensively explore the background of protective clothing research in China and internationally, this paper uses a combination of bibliometric and the visualization software CiteSpace to map out relevant knowledge. In order to analyze the characteristics of the literature, comparative approach is used to find the similarities and differences between Chinese and international protective clothing research in hot topics, evolutionary lines and development trends.

1.2 Data Collection

The data sources in this paper are divided by language into Chinese part and English part. The Chinese literature data source was from CNKI "Chinese Academic Journals" Core Journals database, the time span of literature selection was 1992-2021, and the search was set as "core journals=Y or CSSCI journals=Y and year between(1992, 2021)and topic=protection and topic=apparel or title=protection and title=apparel and(exact match)". In order to ensure the quality of the data, the retrieved documents were further judged manually, excluding articles of clothing design works and reports, and the final derived documents number is 313.

The English literature data were obtained from the WOS core collection database. To ensure the comprehensiveness of the literature data, the search formula TS=("protective clothing") was constructed using a professional search. The search revealed that after the first international symposium on protection in Denmark in 1984 [5], the papers on protective clothing began to