Research Paper
A Bibliometric Analysis of Publications on Obesity and Hypertension

Yanuan Ben Olina[1*] , Suparman Suparman[2] , Budi Santosa[3] , Satriya Pranata[1]

1. Department of Nursing, Faculty of Nursing and Health Sciences, Universitas Muhammadiyah Semarang, Semarang, Indonesia.
2. Mathematics Education, Faculty of Teacher Training and Education, Universitas Ahmad Dahlan, Yogyakarta, Indonesia.
3. Department of Medical Laboratory Science, Faculty of Nursing and Health Sciences, Universitas Muhammadiyah Semarang, Semarang, Indonesia.

ABSTRACT

Background: No bibliometric study of published research subjects was conducted on obesity and hypertension to identify trends and novelties. As a result, this study aims to look into the trend of number of publications, trend of citations, journal with the most publications, area with the most publication approval, network visualization, overlay visualization, and density visualization on the topic of obesity and hypertension using bibliometric analysis.

Methods: This study uses a bibliometric analysis. The data in this study are based on Internet searches conducted using Dimensions app. The VOSviewer software, version 1.6.18 was used to create and display the latest trends in network visualization, overlay visualization, and density visualization. The preferred reporting items for systematic reviews and meta-analyses (PRISMA) flowcharts were used to show the steps after data collection. Step 1 (identification), step 2 (screening), step 3 (study eligibility) and the final sample (included) in phase 4 were all documented.

Results: The search for publications on obesity and hypertension yielded 995.13 articles. After screening using the specified criteria, 9 541 articles were found. Most publications on obesity and hypertension were published in 2021, the fewest in 2003. Research on obesity and hypertension is conducted by health sciences. In addition, trends in obesity with hypertension currently focus on the impact of obesity and hypertension on specific populations (e.g. children, and elderly), novel therapeutic approaches, or the role of technology in monitoring and managing these conditions. From the density visualization, the topics that visualized the low category are mortality rate, severity, risk of hypertension, and metabolic abnormalities.

Conclusion: From the results of the bibliometric analysis using these keywords, researchers can identify information about trends and innovations in obesity research topics in the future. This study recommends other researchers choose topics from the low visualization category to conduct new studies in the future.

Keywords: Obesity, Hypertension, Bibliometric, Trend

* Corresponding Author:
Yanuan Ben Olina
Address: *Department of Nursing, Faculty of Nursing and Health Sciences, Universitas Muhammadiyah Semarang, Semarang, Indonesia.*
Phone: *+62 (813) 925118288*
E-mail: *yanuanbenolina@unimus.ac.id*

Introduction

Hypertension is a significant risk factor for heart attack, stroke, kidney failure, and mortality [1]. Obesity increases the risk of conditions, such as hypertension, dyslipidemia, diabetes, coronary heart disease, stroke, and heart failure [2, 3]. Both obesity and hypertension are associated with an increased risk of mortality from any cause and cardiovascular disease, and the two often co-occur [1]. Socioeconomic and demographic changes in many developing countries have contributed to the burden of hypertension and obesity, as well as the shift in morbidity from infectious diseases to non-communicable diseases [4]. The prevalence of hypertension and obesity has increased dramatically in recent decades as a result of rapid industrialization and urbanization [5].

Higher body mass index (BMI) and lower levels of physical activity were independently associated with hypertension in a previous cross-sectional study in China, after controlling for socioeconomic variables and diabetes mellitus [6]. Another cohort study in Finland found an increased risk of hypertension in people with higher BMI and less physical activity [7]. When obesity indices, such as BMI, waist circumference, waist-to-hip ratio, and waist-to-height ratio increase, the risk of hypertension increases by one to twofold [8, 9].

As shown by 2021 trend statistics, the number of people suffering from hypertension worldwide is increasing year by year, especially in Asian countries [10]. Similarly, obesity has not changed significantly in the last five years [3, 9]. Interest in obesity and hypertension research is not clear enough. Researchers are looking for information on trends and progress for future studies on obesity and hypertension. This issue is currently of interest to researchers. The results of bibliometric analysis can be used to guide future studies by showing the quality and research focus of current publications in specific areas [11]. In addition, researchers can use bibliometric analysis to quickly access information on topics of interest from the enormous number of published papers.

No bibliometric analysis on the published research topics was conducted on obesity with hypertension to find out trends and novelties related to those topics. Therefore, this study was conducted to investigate the trend of the number of publications, the trend of the number of citations, the journal with the most publications, the field with the most consent to publish, network visualization, overlay visualization, and density visualization on the topic of obesity with hypertension through bibliometric analysis.

Methods

The bibliometric analysis used in this study, the data inclusion and exclusion criteria used to establish the final sample of articles evaluated, and data processing concerning the research objectives are all described in this chapter.

This study's data is based on online searches conducted using Dimensions app On May 30, 2023, data were collected [12]. Dimensions is an A and I database that aims to provide new insights into research information, a more open and comprehensive data infrastructure that allows users to explore relationships between different research data. Dimensions are freely accessible to the scientific research community. Dimensions data and solutions for discovery and analysis. The following information was extracted from retrieved documents, publication year, title, keywords, abstract, author, country/region, affiliation, document type, journal, and number of citations.

The data were imported into Microsoft Excel 2019 for analysis, ranking, and computation, including the most cited authors, journals, nations, and organizations. VOSviewer software, version 1.6.18 from Leiden University in the Netherlands [11]. Leveraging metadata derived from diverse sources, including academic journals, researchers' profiles, and individual publications, this software provides a versatile platform for research exploration and analysis. The software facilitates the creation of networks through various means, including citations, bibliographic linkages, shared citations, and authorship relationships [13]. Moreover, it offers advanced text mining capabilities to construct and visualize co-occurrence networks of significant phrases extracted from the extensive corpus of scientific literature. VOSviewer offers a multifaceted approach to constructing research networks [14]. This flexibility empowers researchers to tailor their analyses to the specific research questions they seek to address. Each term (words, countries, journals, and authors) is indicated by a circle [11]. The distance between the two circles roughly indicates the strength of the relationship between the stems. Different term clusters are represented by different colors. The size of the circles is positively correlated with the frequency of occurrence of the terms, and the strength of the relationship between the terms is expressed by the thickness of the line.
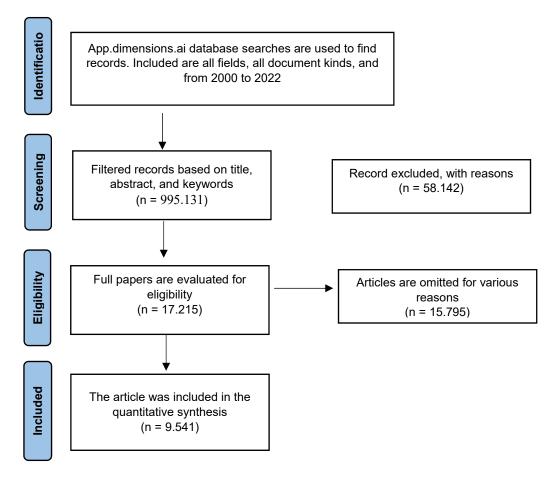
Figure 1. PRISMA paper sample

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The systematic review approach was employed in this study to remove as much bias as feasible from the literature review procedure [15]. This study also includes explanations and elaborations, as well as steps presented using the preferred reporting items for systematic reviews and meta-analyses (PRISMA) flowchart [16].

PRISMA steps comprise identification, screening, eligibility, and inclusion, as illustrated in Figure 1 [10]. Stage 1 (identification) discovered 995.131 records from the Dimensions database [12], taking into account "all fields", "all document kinds", and "all published data in the data span (all years 2000 to 2022) for each key search phrase (obesity and hypertension). In the initial literature study, search phrases were identified (see Figure 1 for the primary publications evaluated). In step 2 (screening), in the field of each search term, the option "title, abstract, and keywords" was selected, yielding 58,142 entries. To ensure the quality achieved from the peer review process, only "article" was picked as the kind of article and proceedings in stage 3 (eligibility) out of 17.215 records, and 15.795 recordings were collected. Finally, the final sample yielded 9.541 open-access papers in phase 4 (included).

Results

Number of publications and academic impact from citations on the topic of obesity and hypertension

Every year, more papers on the subjects of obesity and hypertension are published, and these publications have a greater academic impact. These journals often serve as primary outlets for disseminating research in the field Figure 2.

Network visualization of publications on obesity and hypertension

Figure 3 depicts the keyword co-occurrence cluster analysis. According to co-occurrence analysis, keywords are separated into 9 distinct groups, with each group marked by color. Cluster 1 contains the most items (39), followed by clusters 2 (25), 3 (21), 4 (20), 5 (16), 6 (13), 7 (12), 8 (11), and 9 (6). The keyword "index" (total link strength 2447) appeared most, with 186 co-occurrences,
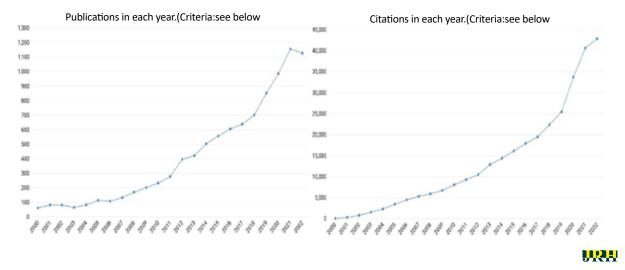
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Figure 2. Number of publications and academic impact from citations on the topic of obesity and hypertension from 2000 to 2022 [12]

followed by a child (154), patient (152), overweight obesity (94), and consumption (76).

Overlay visualization of publications on obesity and hypertension

The color of a phrase corresponds to the average publication year of the publications in which it appears. Darker colors reflect the oldest years, whereas lighter shades show the most recent keyword occurrences. These study fields are interconnected but also contain specialized material highlighting specific research subjects within obesity and hypertension, overweight obesity, child, index, patient, central obesity, and other relevant themes (Figure 4).

Density visualization of publication on obesity and hypertension

Bright hues suggest frequently used keywords, while faded colors indicate keywords that are infrequently investigated. Figure 5 shows the keywords that have been
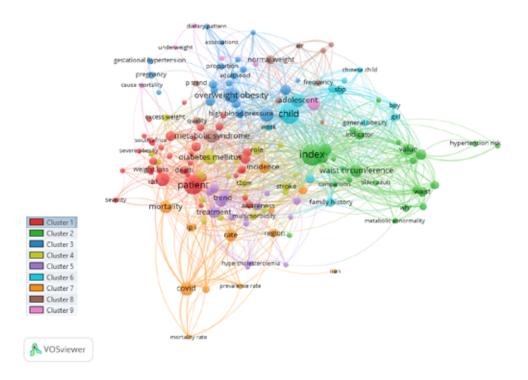

Figure 3. Network visualization: Cooccurrence map of keywords

Figure 4. Overlay visualization: Term co-occurrence network in obesity and hypertension

explored the most, index, child, patient, adolescent, and trend.

Discussion

The search results in Figure 2 produced 9.541 published scientific paper articles from 2000 to 2022 [12]. The following criteria were included in the search for title and abstract, "obesity and hypertension"; field of research is nursing and health sciences; type of publication is article or proceedings; and open access as all open access. The visualization shows that the number of publications published on the topic of obesity and hypertension is slowly increasing each year, but in 2022, the publications have slightly decreased. Over the years, the number of publications related to obesity and hyperten-
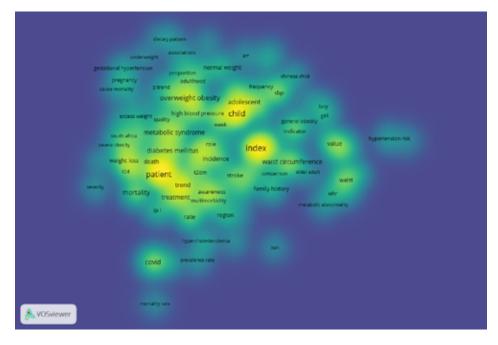

Figure 5. Density visualization: Analysis of the publications performed largely by researchers

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sion has significantly increased. This indicates the growing interest and importance of studying the relationship between these two conditions [17-20] obesity, and type II diabetes. Mobile health technologies (mHealth. publication on this issue increases every year, and peaks in 2021, but slightly decreases in 2022, this is likely caused by many researchers focusing on COVID-19 issues in that year.

Figure 2 shows the visualization of the number of obesity and hypertension-related citations received each year. The number of citations to publications cited by other articles in the database has increased from year to year, especially from 2019 to 2021, which has increased significantly. Obesity and hypertension are research subjects that may be raised since this is a problem that is tough to deal with every year, and there should be research that can be utilized to lessen this issue. The high citations on this issue every year are by the vision of the sustainable development goals regarding degenerative problems globally [21]. Certain articles and authors may receive a significant number of citations, indicating their influence and impact on the field. These highly cited works often contribute to advancing knowledge and shaping research directions [22, 23].

The most numerous classification of publications related to obesity and hypertension this year were articles from the health sciences category with the highest number of articles (9541 articles, 320357 citations), followed by biomedical and clinical sciences (6.199 articles, 226309 citations), public health (6150 articles, 204388 citations), health services and systems (2 215 articles, 47976 citations), epidemiology (1845 articles, 126603 citations), and nutrition and dietetics (1687 articles, 65168 citations), clinical sciences (1477 articles, 54058 citations). The statistics presented above show that research on obesity and hypertension in nursing is still very limited compared to other fields. Further studies on obesity and hypertension in nursing are needed [24, 25]. Common research topics include the epidemiology of obesity and hypertension, risk factors, genetic and environmental influences, mechanisms underlying the association between the two conditions, prevention and treatment strategies, lifestyle interventions, and the impact on cardiovascular health [2, 5, 18, 26-28] complete blood count (CBC).

The finished articles are entered into the VOS-viewer to visualize and analyze trends in the form of bibliometric maps. The VOS-viewer provides keyword creation based on shared networks, as well as the overview of publication maps, nation maps, journal maps, and maps based on co-citations of publications. To eliminate less useful terms, users can adjust the frequency of keywords. The VOS-viewer software can be used to map, classify, and mine data for articles from databases. A keyword co-occurrence analysis of 9541 articles from the Dimensions database [12]. Figure 3 depicts a network representation of discovered keywords from a sample of research papers. Co-occurrence analysis has revealed that keywords are divided into 9 distinct groups, each group identified by color. Cluster 1 has the most items (39), followed by cluster 2 (25), cluster 3 (21), cluster 4 (20), cluster 5 (16), cluster 6 (13), cluster 7 (12), cluster 8 (11), and cluster 9 (6). The most often appearing topics in obesity and hypertension-related articles are divided into nine colored clusters, cluster 1 (red) contains hypertensive-related keywords, such as comorbidity, death, management, weight loss, noncommunicable illness, uncontrolled hypertension, and so on. Cluster 2 (green) contains index-related keywords, such as female, male, waist circumference, indicator, hypertension risk, or height ratio, among others. Cluster 3 (blue) keywords include cardiometabolic risk factor, consumption, high blood pressure, diet, food, proportion, childhood, and so on. Cluster 4 (yellow) contains diabetes-related keywords, such as chronic disease, stroke, multimorbidity, type 2 diabetes, chronic condition, and so on. Cluster 5 (purple) contains treatment-related keywords, such as control, trend, exposure, awareness, age group, and so on. Cluster 6 (tosca) contains keywords related to child problems, such as adolescent, general obesity, school, arterial hypertension, family history, boy, girl, and so on. Cluster 7 (orange) contains keywords related to incidence issues, such as mortality, rate, COVID-19, region, and so on. Cluster 8 (brown) contains keywords related to metabolic syndrome problems, such as quality, frequency, normal weight, and so on. Cluster 9 (lilac) contains keywords related to central obesity issues, such as respondent, cause mortality, underweight, etc.

On the other hand, this analysis allows us to identify research lines generated by the primary driving agents of this study topic, and it is based on the usage of keywords in papers. As a result, it may be further improved by linking other objects, resulting in new research and results.

Bibliometric analyses can identify emerging trends in the field, such as the impact of obesity and hypertension on specific populations (e.g. children, and elderly individuals), novel therapeutic approaches, or the role of technology in monitoring and managing these conditions. In Figure 4, the yellow part shows the highest trend at the moment. Currently, research on obesity and hypertension is associated with COVID-19. Based on research from

the UK looking at high blood pressure, which is considered a significant risk factor for poor outcomes in those admitted to hospital with COVID-19 [29]. In addition, the issue is also currently linked to mortality and multimorbidity, region, and dietary patterns. Some prominent research topics in the field include the impact of obesity on hypertension, mechanisms underlying the association between the two conditions, lifestyle interventions for preventing and managing obesity and hypertension, genetic and environmental factors, comorbidities, and the effects of pharmacological interventions.

Figure 5 shows that it is not advisable to deal with the subject of index patients, child, index, adolescent, overweight, etc. because many studies have already been conducted on this subject. Therefore, it is advisable to choose topics with a slightly faded color, such as mortality rate, severity, risk of hypertension, metabolic abnormalities, etc. because they have not been studied by many and are a novelty for future researchers.

Conclusion

Certain journals have consistently published a considerable number of articles on obesity and hypertension. In addition, certain authors or research groups have contributed significantly to the literature in terms of number of publications and citations. A bibliometric analysis of hypertension and obesity can help to understand the latest research developments and trends on these two topics. These bibliometric results show that the current trend in publications on obesity and hypertension is beginning to address important issues, such as mortality rates, hypertension risk, severity, dietary habits, underweight, prevalence rates, and others. However, the results of the bibliometric analysis only reflect what has been published in the scientific literature and may not cover all aspects of the relationship between hypertension and obesity. Nevertheless, the software can be a valuable tool to examine trends, patterns, and contributions in the field. This highlights the global impact and interest in understanding and researching the relationship between these two conditions. In future studies, researchers should consider recent trends and new findings in the field of obesity and hypertension.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

Conflict of interest

The authors declared no conflict of interest.

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