

UNIVERSITI TEKNOLOGI MARA

**BIBLIOMETRIC AND VISUALIZATION
ANALYSIS OF THE METABOLOMICS
LANDSCAPE OF OBESITY
(2013-2023)**

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ABSTRACT

Obesity is a major issue in nutrition and health, contributing to many chronic diseases. Due to its complex causes, metabolomics offers valuable insights for developing effective strategies to address it. This study conducted a bibliometric analysis on metabolomics in obesity to identify temporal trends in research output, influential publications, and prominent themes within the field. We retrieved all articles on metabolomics and obesity published from 2013 to 2023 in Scopus database. VOSviewer software version 1.6.20 was used to perform the bibliometric analysis and visualize the bibliometric networks. These include authorship, citation, co-citation and keywords analysis. There were 1,489 articles eligible for the analysis. There was an increasing trend in the annual publication and cumulative percentage of articles published in this field. The United States was the most active country regarding publication, citations, and global cooperation. Metabolites published the most articles, while articles in Plos One were cited more frequently. Newgard C. B. and Ilkayeva O. R. were the prolific authors. Citations from influential references highlighted the role of gut microbiota in metabolism, health, and disease states. Keyword co-occurrence results showed that the metabolome and gut microflora were popular topics, while lipid metabolism, lipidomics, NAFLD, bariatric surgery, and pregnancy were at the forefront of research. This shows the growing interest and progress in the field. Insights into trends, leading authors and countries, key references, and emerging themes can guide future research and encourage interdisciplinary collaboration.

Keywords: Metabolomics; obesity; gut microbiota; bibliometric analysis, lipid metabolism

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CHAPTER ONE

INTRODUCTION

1.1 Research background

Obesity is declared a disease by The World Obesity Federation, labeled as a chronic disease by The Obesity Society, and considered as an epidemic in Malaysia (Ministry of Health Malaysia, 2021). By definition, obesity is a chronic, relapsing, multifactorial disease of excessive adiposity stored in the body that increases the risk of non-communicable diseases (NCDs) (World Health Organization, 2021; World Obesity Federation, 2022). The development of obesity is driven by genetics, behavior, obesogenic environment, and diet. Thus, this complexity makes addressing obesity particularly challenging (Bray et al., 2018; Brown, 2017). Furthermore, obesity leads to chronic, systemic inflammation, which affects various tissues and contributes to the development of type 2 diabetes, cardiovascular conditions, non-alcoholic fatty liver disease (NAFLD), and other inflammation-related disorders (Rohm et al., 2022).

In this context, metabolomics has become increasingly relevant. According to Brennan & De Roos (2021), utilizing metabolomics in nutrition research has grown exponentially owing to the fact that metabolites are the tangible outcomes of dietary consumption and metabolism. Besides, Levatte et al. (2022) highlight the utilization of metabolomics in comprehending the dietary-related mechanisms linked to numerous chronic diseases like cardiovascular disease, diabetes, and obesity. Metabolomics is a relevant omics tool in nutritional science. The trend towards individualized treatment in medicine and nutrition underscores the importance of analyzing how specific nutrients or dietary patterns affect metabolism, as revealed through metabolomics (Levatte et al., 2022).