

# Halal Pharmaceutical Development in Indonesia

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This study attempts to map research related to Halal pharmaceutical in Indonesia published by Dimensions indexed journals from 2006 to 2023. NVivo 12 Plus was used to conduct thematic studies and frequency was used to evaluate 109 publications in the scientific literature. The results found that there was a fluctuating number of publications from year to year related to Halal pharmaceutical research in Indonesia, indicating that this topic is an interesting topic and should continue to be developed. In addition, various foci of discussion and cluster analysis that describe research paths in Halal pharmaceutical research in Indonesia include Gelatin Source and Halal Pharmaceutical, Supply Chain Traceability in Indonesia Halal Pharmaceutical Industry, Halal Certification Challenges in Food and Pharmaceutical Industry, and Innovative Halal Alternatives in Pharmaceutical Formulations. This research can be used as a starting point for experts to build graphic visualizations of Halal pharmaceutical research patterns in Indonesia in published scientific research.

**Keywords:** Halal pharmaceutical, Indonesia, Qualitative

## OPEN ACCESS

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Received: 11 October 2023

Accepted: 9 December 2023

Published: 29 December 2023

Citation:

(2023) Halal Pharmaceutical  
Development in Indonesia.  
Islamic Economics Methodology.  
2.2.

## INTRODUCTION

Halal pharmaceuticals are an important component in the growth of the halal industry in Indonesia (Lever, 2023). Pharmaceutical halal in Indonesia has received attention due to the large Muslim population in the country and the increasing demand for halal products. In 2013, the Indonesian Muslim Ulema Council (MUI) issued Fatwa No. 30/2013 on "medicine and treatment", which encourages consumers to consume only halal medicines (Kasri et al., 2023). In response, the Government of Indonesia issued Law No. 33/2014 on Halal Product Guarantee, which requires all products entering, circulating, and trading in Indonesia to obtain halal certification. This emphasizes that halal medicines produced must comply with Islamic law, and the ingredients are safe and free from ethanol, blood, pork, carnivorous and omnivorous animal parts, and human body parts. The process of cultivation, manufacturing, preparation, packaging, and distribution must also meet halal standards. In other words, pharmaceutical halal refers to the production of halal pharmaceutical products and is produced in accordance with Islamic regulations, where pharmaceutical products must contain halal ingredients and must be produced in accordance with Islamic provisions. Ali (2021) adds that ingredients of animal origin must come from animals that are allowed to be slaughtered in accordance with the methods prescribed by Islamic law.

As the halal industry is growing rapidly, pharmaceutical halal products are also gaining popularity around the world and setting new safety and quality standards. Muslim-majority countries have adopted regulatory frameworks that guide the halal certification process for pharmaceutical products. The increasing awareness of Muslims in the world has also accelerated the recognition of halal products as a new standard for safety and quality assurance. Although at the beginning of the development of the halal industry, the main attention was on halal food, it has now penetrated other sectors, including medicine and medical devices (Herdiana & Rusdiana, 2022). According to the State of the Global Islamic Economy Report 2022, total Muslim consumer spending on halal products will reach US\$2 trillion in 2021, which represents an 8.9% (yoy) growth from 2020. Specifically, the State of The Global Islamic Economy Report 2022 also states that Muslim spending on pharmaceuticals increased by 6.5% in 2021, from US\$93.5 billion to US\$100 billion, and is expected to grow further by 6.7% in 2022 to US\$106 billion and

reach US\$129 billion in 2025 with a 4-year CAGR of 6.7%.

However, consumers now demand not only the quality but also the integrity of the products they consume (Nghah et al., 2019). Norazmi & Lim (2015) argue that, for a Muslim, the halalness of a medicine guarantees that the product does not contain pork or other prohibited ingredients (such as animal products or their unauthorized derivatives, or alcohol) and reassures consumers that the product has been prepared and manufactured using equipment that is specialized for halal medicines. This is because the concept of halal in Islam is one of the important factors to choose between the efficacy of medicines. Whereas, these medicines have different origins and usually people consume medicines that are in accordance with their religion, safety, and health concerns (Wace, 2014). Therefore, it is important for the pharmaceutical industry to pay attention to the halalness of the products it produces.

This certainly raises the perception that amid its rapid development, halal pharmaceuticals still face various problems or challenges. Norazmi & Lim (2015) state that the need to build a proper, well-regulated and harmonized halal accreditation and management system is a major challenge for the developing industry. In addition, ingredients used in the pharmaceutical industry must be halal certified, and there are still doubts about the halalness of some ingredients (Herdiana & Rusdiana, 2022). It is also related to halal critical points that require one to be careful during pharmaceutical preparation, processing, handling, packaging, storage, and distribution. Kasri et al (2023) added that the production of halal pharmaceutical products in Indonesia is highly dependent on imported raw materials, which can affect the cost and availability of these products. In addition, the implementation of halal certification regulations in Indonesia is still weak, and the lack of technical guidance for industry players, as well as the limited availability of qualified human resources, can hinder the growth and development of the halal pharmaceutical industry. Other challenges or problems are expressed by Herdiana & Rusdiana (2022) that the rules regarding halal products in Indonesia are clear, but their implementation is weak, and most halal products in the Indonesian market are still produced by non-Muslim entrepreneurs.

Thus, Norazmi & Lim (2015) explained the need for sustainable and integrated efforts from all stakeholders to ensure the continuity and sustainability of the halal pharmaceutical industry. In addition, awareness and practice of halal medicine must be instilled through a variety of more integrated programs

involving relevant stakeholders, for example by conducting socialization to schools, outside communities, expansion through social media, and so on. [Zehra & Naqvi \(2017\)](#) added the importance of certification by certification bodies and harmonization of halal conformity assessment in various countries that can ease the challenges faced by suppliers and support industry expansion.

Furthermore, a number of opportunities can also be utilized to face challenges and of course develop the pharmaceutical halal industry. In the research of [Norazmi & Lim \(2015\)](#) and [Ali \(2021\)](#), it is revealed that the increasing global Muslim population has increased the demand for halal medicines, this is certainly a great opportunity that must be utilized by related parties involved in the pharmaceutical halal industry. [Kasri et al \(2023\)](#) also revealed a similar thing, where the growth of global and local markets, increased awareness of halal products, and abundant pharmaceutical resources, can be utilized to develop the pharmaceutical halal industry. In addition, the halal pharmaceutical industry in Indonesia has the potential to attract not only Muslim customers but also non-Muslim customers due to safety and hygiene concerns ([Herdiana & Rusdiana, 2022](#)). Indonesia is competent to become the world's largest producer of halal industries, including the pharmaceutical industry of halal medicines that comply with Islamic law. Therefore, to take advantage of this opportunity, the government and industry must encourage domestically produced raw materials, encourage halal certification among global industry players, increase the role of pharmacists as halal supervisors in companies, and encourage the issuance of technical regulations for marking non-halal products ([Herdiana & Rusdiana, 2022](#)).

As far as the author's observation, there is still little research related to pharmaceutical halal. For this reason, research is needed that describes the mapping of pharmaceutical halal research. Among the relevant studies, [Noorazmi & Lim \(2015\)](#) discuss the opportunities and challenges of the halal pharmaceutical industry. In their research, it is stated that the halal pharmaceutical industry has great opportunities for the future. This is because a quarter of the world's population is Muslim, which will certainly affect the demand for halal products. On the other hand, the challenge that must be met in the halal pharmaceutical industry is to achieve drugs that are recognized by all Muslims as halal, and by non-Muslims as equal or superior quality. The main challenge is the need to implement a well-regulated and harmonized

accreditation and halal management system that is globally accepted. [Herdiana & Rusdiana \(2022\)](#) also discussed the challenges and opportunities of Indonesia's halal pharmaceutical market. In their research, it is explained that the pharmaceutical industry will continue to experience growth along with the increasing halal awareness of Muslims. The unpreparedness of the domestic industry will be an opportunity for other countries to make Muslims a potential market. This is because the western pharmaceutical industry also develops guidelines and consensus and regulatory statements intended to protect consumers from harmful products. Some of these guidelines differ from halal principles.

[Mohezar et al \(2016\)](#) explain the issues and challenges of the halal pharmaceutical market. The increasing economic power and Muslim population globally demands a deeper understanding of the concept of halal. However, efforts to explain halal issues in the production of medicines are still rare. This emphasizes that the halal pharmaceutical industry needs not only to highlight halal values in production, but also needs to image and inject a broader picture of Islamic values, such as good, clean, and healthy in the manufacturing process that will attract a wider market segment. Manufacturers do not only need to pay attention to Shariah-compliant operations and procedures. They need to consider running halal pharmaceutical processes within a sustainable practice regime, where raw materials must be produced sustainably and business must be conducted with good intentions.

[Alserhan et al \(2020\)](#) describe the awareness of halal medicines. Pharmaceuticals remain an under-researched area and a source of controversy, especially in terms of the ingredients used and the manufacturing process. The results revealed that there is a general lack of awareness at all levels regarding the Halal aspects of pharmaceutical products. These results may be specific to the Arab market rather than the wider Muslim market where Halal is part of the Islamic identity, in contrast to Arab countries where Halal is regarded as mandatory. [Kasri et al \(2023\)](#) analyzed the intention to consume halal pharmaceutical products. Although pharmaceutical products are very important in everyday life, especially after the coronavirus outbreak in early 2020, few studies have attempted to analyze consumer behavior regarding halal pharmaceutical products. The results of his research found that the intention to buy halal pharmaceutical products is positively influenced by attitude, religiosity, halal product knowledge and perceived behavioral control. However, the influence of

subjective norm variables was found to be insignificant in this study.

Nasaruddin et al (2012) discuss aspects of the manufacturing process in the food and pharmaceutical industries that reflect the importance of standardizing Islamic Manufacturing Practice (IMP). Halim et al (2014) examined related to halal pharmaceuticals, namely legal issues, sharia and fatwas related to gelatin, alcohol and drugs. Nur Famiza et al., (2017) examined consumer knowledge regarding the purchase of halal pharmaceutical products. Karjoko et al (2020) examines patent policies in the pharmaceutical sector in Indonesia. Based on these studies, there is no research that specifically examines halal pharmaceuticals in Indonesia using NVivo analysis. Therefore, this study seeks to map research related to halal pharmaceuticals in Indonesia indexed by Dimensions from 2006 to 2023.

## METHODOLOGY

The analysis of these 109 papers combines qualitative methods with descriptive statistics. Qualitative deepening is a research technique that focuses on exploring the meaning, characteristics, symptoms, understanding, concepts, symbols, and descriptions of a phenomenon using many methodologies and narrative styles. Qualitative methods are seeking, collecting, evaluating, and interpreting extensive visual and narrative data to gain deeper knowledge about an event or topic of interest. Descriptive research is qualitative in nature; it studies the techniques of collecting, compiling, and summarizing research data in a statistical discipline. Data must be frequently and adequately summarized for evaluation in tables, graphs, and other graphical displays. In addition, other advantages of qualitative methods are richness in

data collection, valid coding, and reliable interpretation (Moretti et al., 2011).

Furthermore, the research process used NVivo 12 Plus software. NVivo, one of today's most popular qualitative data management programs has its roots in NUD\*IST. Software developers have described it as an improved and expanded version of NUD\*IST<sup>3</sup>. NVivo has features such as character-based coding, rich text analysis capabilities, and multimedia functions that are essential for qualitative data management. One of NVivo's strengths lies in its high compatibility with research design. The software is not methodologically specific and works well with a variety of qualitative research designs and data analysis methods such as discourse analysis, grounded theory, conversation analysis, ethnography, literature review, phenomenology, and mixed methods (Zamawe, 2015). In addition, another advantage of using NVivo 12 Plus is that it can collect, organize, analyze, and visualize unstructured or semi-structured data by importing data in various file formats, organizing demographic data, source code, capturing ideas, running queries, and visualizing project items (Izza & Rusydiana, 2022).

Finally, data in excel and csv formats were processed and then analyzed using NVivo 12 Plus software to automatically utilize and separate data in files with sentences, paragraphs, or unique text strings by utilizing the autocode wizard. From the sources analyzed, the Auto Code Wizard is then used to provide results related to Halal pharmaceuticals in Indonesia.

## RESULTS

## Word Frequency Query



Figure 1. Wordcloud of Halal Pharmaceutical in Indonesia

The analysis through the word frequency tool aims to find the research problem with the highest repetition in terms of the searched material. Frequently used words and terms in the text are shown in Figure 1 based on automatic coding. The word size in the word frequency results shows a higher frequency of occurrence than others.

Based on the results of word frequency from 109 Scopus indexed publications with the theme Halal Pharmaceutical in Indonesia obtained from mapping and percentages calculated automatically by Nvivo 12 Plus Wizard. The words with the highest frequency in

published journals after the word halal are "gelatin" with a percentage of 6.63%, followed by "pharmaceutical" at 2.02%, and followed by the third highest word, namely "food" at 1.73%. In addition, the automatic coding results also show some other interesting terms such as authentication, chain, porcine, pcr, chemometrics, detection, dna, identification, alternative, capsule, gelatine, product, and others.

### Hierarchy Chart



Figure 2. Hierarchy Chart "Title"

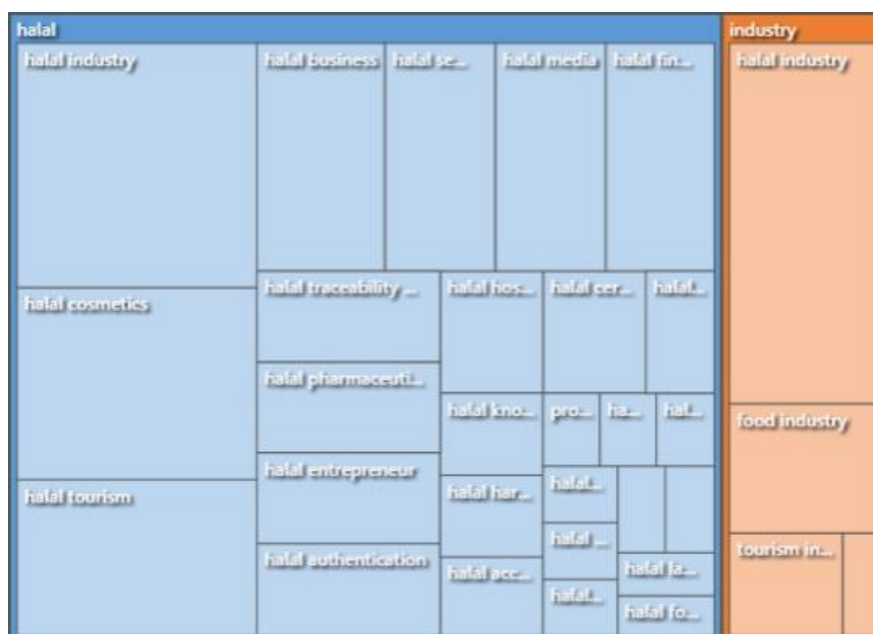


Figure 3. Hierarchy Chart "Author's Keywords"



Based on the coding, it automatically generates a hierarchical chart on the title showing several relevant words that appear frequently, including halal, pharmaceutical, products, food, gelatin, and chain. Among these charts, the word "halal" has a larger square size than the others.

Based on the coding, it automatically generates a hierarchical chart based on the author's keywords. Figure 3 presents relevant words that often appear including halal and industry. The word "halal" has a larger square size than the others.

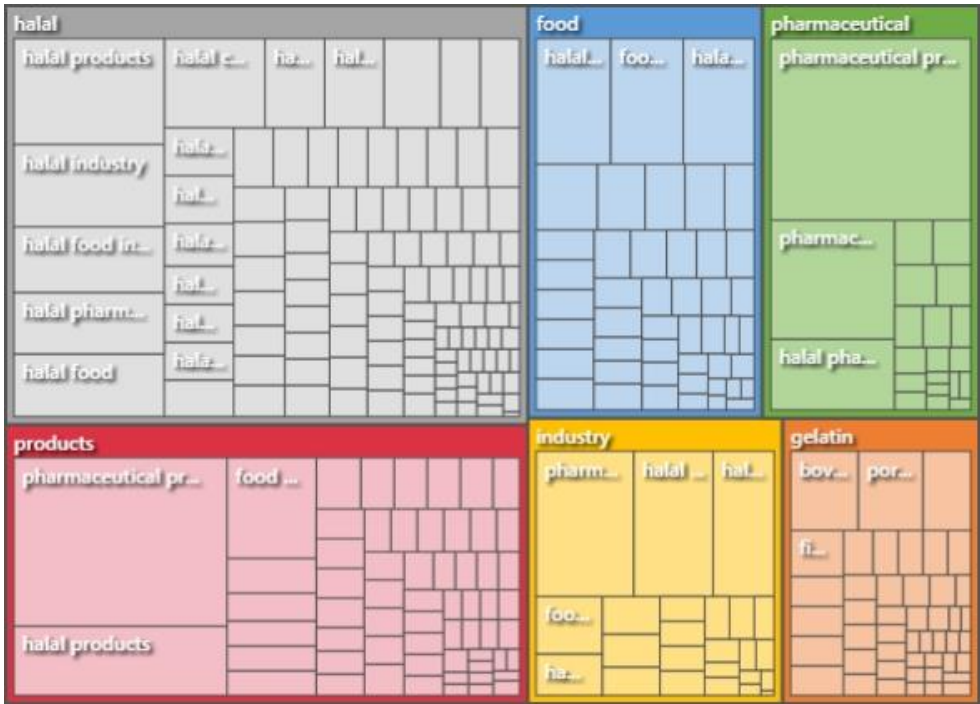


Figure 4. Hierarchy Chart "Abstract"

Based on the coding, it automatically generates a hierarchical chart based on the abstract. Figure 4 presents some relevant words that often appear, including tourism, halal, kosher, food, pharmaceutical,

products, industry, and gelatin. The word "halal" has a larger square size than the others.

Treemap

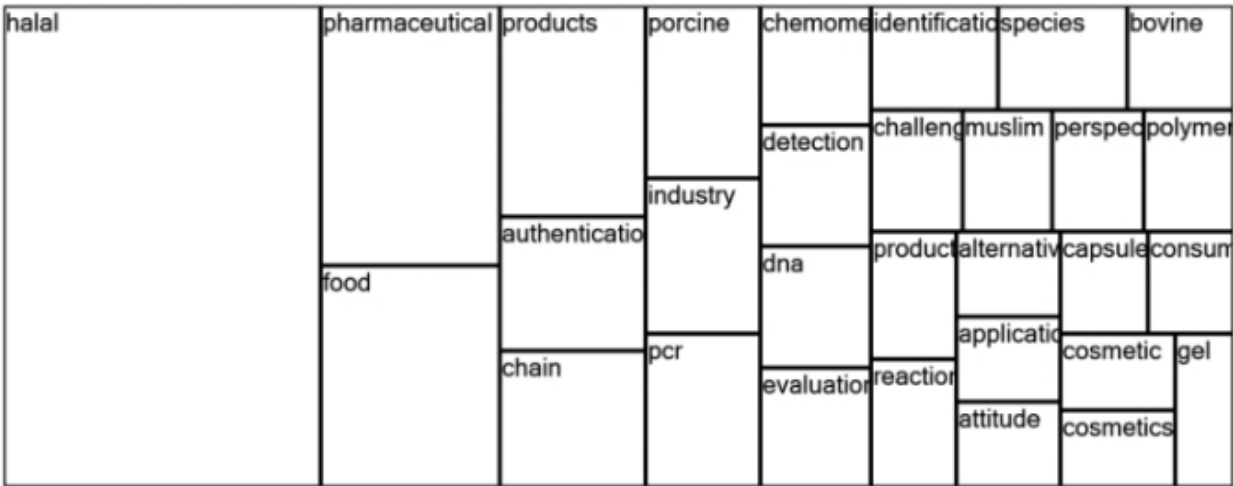


Figure 5. Treemap of Essential Concerns and Focus of Halal Pharmaceutical in Indonesia

The next tool presented from Word Frequency analysis is a treemap. A treemap is a diagram that shows data in hierarchical order, as a collection of nested rectangles with different dimensions, sizes, and shapes. The size shows the number by frequency and percentage. Treemaps are scaled to fit the space offered. The size of the rectangles should be considered in the network's relationship to each other which results in a larger area view at the top left of the chart, versus, a smaller rectangle view at the bottom right (Help NVivo, 2020). From the Word frequency analysis, the treemap generated from this analysis has shown two different aspects:

Concerns are the main concerns in the grouping of related general topics. Among those related to this topic are Halal pharmaceutical and food. Focus, this section discusses the focus of discussion in Halal Pharmaceutical research in Indonesia. The focus discussed is related to products, authentication, porcine, industry, detection, identification, challenges, Islamic perspective, production, cosmetic, gelatin, gel, alternatives

### Cluster Analysis

#### Items clustered by word similarity



Figure 6. Items Clustered Analysis of Halal Pharmaceutical in Indonesia based on Title, Abstract, and Keywords

Furthermore, figure 6 shows cluster analysis, which is a technique used in exploring and visualizing patterns in the theme of Halal Pharmaceutical in Indonesia in general in scientific research by grouping similar or related sources or words using automatic codes from NVivo 12 software based on title, abstract, and author's keywords. This is used to obtain detailed and comprehensive results so as to determine the research path related to Halal Pharmaceutical research in Indonesia. There are 4 main clusters in general that group words and their interrelationships.

#### Cluster 1 Gelatin Source and Halal Pharmaceutical

Research that discusses related topics is still very rare in Indonesia. An example of research relevant to this topic is Nirwandar (2020) discussing the needs and opportunities for gelatin production in Indonesia. In this study, it is discussed that halal food is not only a necessity for Muslims in Indonesia and the world, but has become a business and economic opportunity for everyone. Data from Dinar Standard in the Global

Islamic Economic Report 2019-2020, states that the amount of halal food spending in the Muslim world in 2018 amounted to US 1.37 Trillion and is expected to increase to US 1.97 Trillion by 2024. With an average growth of US\$ 1.97 Trillion. 6.3% (CAGR). This is not only due to the growth of the world's Muslim population which currently stands at 1.8 billion, but also the growth of GDP and per capita income and the addition of the Muslim middle class in Muslim-majority countries. Gelatin is one of the important ingredients in the halal industry. Its application is very wide, ranging from food, cosmetics, personal care and medicine.

#### Cluster 2 Supply Chain Traceability in Indonesia Halal Pharmaceutical Industry

Research that examines this topic is also still very little found. One of the relevant studies found is Alamsyah et al (2022) explaining the Blockchain-Based Traceability system to Support Indonesia's Halal Supply Chain Ecosystem. The halal industry continues to develop into a broader concept of Islamic economics,

namely economic activities that follow Islamic-based principles. As a Muslim-populated country, Indonesia is following the growth trend by aiming to dominate the global halal market, ranging from halal food, fashion, halal pharmaceuticals, and others. The strategy is to improve the current halal assurance process. Currently, technology and procedures do not provide sufficient process transparency, traceability, and detailed information. To achieve these strategic goals, technological change is required. A new emerging technology, blockchain, has the potential to address these challenges.

### Cluster 3 Halal Certification Challenges in Pharmaceutical Industry

A number of relevant studies, namely [Herdiana & Rusdiana \(2022\)](#) examine the challenges and opportunities of the Indonesian pharmaceutical halal market. The halal food market has grown worldwide, including the transition from food to other products, including halal pharmaceuticals (HPC). This growth has been followed by an abundance of literature on halal, especially pharmaceuticals. Muslim consumers require halal certification (HCT) on pharmaceuticals to ensure that they are not consuming or using products or services that are not halal. The government must guarantee to Muslim consumers that consumer goods or services circulating in the community are truly halal. Halal labeling itself will increase consumer confidence, expand the reach of the global halal food market, and increase product marketability. Indonesia, where the majority of the population is Muslim, is still considered a long time in implementing HP until 2034. Different attitudes are shown by several countries whose majority population is non-Muslim but are very concerned about the application of HPC. The rapid growth of halal knowledge that has an impact on social media will encourage the industry to implement HPC.

[Kasri et al \(2023\)](#) explored the opportunities and challenges of developing the halal pharmaceutical industry in Indonesia after the issuance of the Halal Product Guarantee Law (UU JPH) and the 2019-2024 Indonesian Master Plan for Islamic Economy and Finance (MEKSI). The results identified five opportunities for the halal pharmaceutical industry in Indonesia, including rapidly growing global and local markets, increasing awareness of halal products, a more flexible timeframe to adjust to Indonesia's Halal Product Guarantee Law, cross-institutional regulatory involvement in maintaining halal regulations, and abundant pharmaceutical resources. Meanwhile, the

challenges faced include the large amount of imported raw materials to produce halal pharmaceutical products, the lack of technical guidelines regarding halal certification regulations, and the lack of qualified human resources. Two strategies are suggested to overcome these challenges, namely promoting domestically produced raw materials and encouraging halal certification among global raw material suppliers.

[Asmuni et al \(2020\)](#) explain the dynamics of the application of halal certification of medicinal products in Indonesia. In this study, products refer to goods and / or services related to food, beverages, medicines, cosmetics, chemical products, biological products, genetically modified products, and used goods that are used, used, or utilized by the public. Meanwhile, a halal certificate is a certificate issued by the Central or Provincial MUI regarding the halal status of a food product, food ingredients, beverages, medicines, and cosmetics produced by a company after being declared halal by an institution authorized to issue halal product certification. Article 4 of Law Number 33 of 2014 concerning Halal Product Guarantee states that products that enter, circulate, and are traded in the territory of Indonesia must be halal certified. Normatively, the article clearly stipulates that medicines that enter, circulate, and are traded in Indonesian territory must be guaranteed halal. However, the halal certification process for medicines in Indonesia takes a long time due to various dynamics, which is the focus of researchers looking at the gap between Law Number 33 of 2014 and the current reality.

### Cluster 4 Innovative Halal Alternatives in Pharmaceutical Formulations

[Herdiana et al \(2023\)](#) investigated the importance of halal and non-halal issues in pharmaceutical ingredients, their potential impact on the Muslim community, and opportunities and challenges in the search for alternative ingredients. Halal is an important concept for Muslim consumers regarding the products they consume, including pharmaceutical ingredients that are essential in modern medicine. To address the issue of using pharmaceutical ingredients derived from pigs, it is important to look for halal alternatives derived from poultry, animal by-products from meat processing, marine sources, and plants. However, the complexity of this issue is further compounded by rapid advances in innovation and technology, which can lead to adulteration of pig-derived ingredients. Other challenges involve sustainability of alternative materials, waste management or by-product practices, halal awareness,



certification, government policies, religious compliance of consumers, food suppliers, marketers and product purchases. The importance of halal and non-halal issues, particularly in the context of pharmaceutical ingredients, is rarely discussed, including alternatives derived from poultry, animal by-products, marine sources and plants. Due to the growing global population, there is a growing need to raise awareness and concern among Muslim consumers towards halal products, including pharmaceuticals.

## CONCLUSION

This study aims to identify and map research related to the extent of the development of Halal pharmaceutical research in Indonesia in the scientific literature. The results show that there are 109 paper publications from 2006-2023 with Digital-Object-Identifier (DOI) indexed by Dimensions.

In addition, this review includes metadata information, co-occurrence, and sentiment analysis. This study also found that there is a fluctuating number of publications from year to year related to Halal pharmaceutical research in Indonesia which indicates that this topic is an interesting topic and should continue to be developed. In addition, various foci of discussion and cluster analysis that describe the research path in Halal pharmaceutical research in Indonesia include Gelatin Source and Halal Pharmaceutical, Supply Chain Traceability in Indonesia Halal Pharmaceutical Industry, Halal Certification Challenges in Food and Pharmaceutical Industry, and Innovative Halal Alternatives in Pharmaceutical Formulations.

Thus, the results of this study are expected to be used as a basic reference to see how graphical visualization of the development of Halal pharmaceutical research trends in Indonesia in published scientific research so that it can be further developed by experts. Recommendations for further research can refer to the most popular keywords that can be discussed further. In addition, it is possible to conduct a more complete bibliometric analysis with other types of software. Finally, it should be noted that this study has limitations in that the time frame is limited and the results offered are still dynamic. Suggestions for future research could use better databases such as Scopus or WoS and other sources for better results (Antonio, 2023; Uula, 2022; Firmansyah, 2022; Nasution & Shikur, 2023).

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