

Halal Pharmaceutical Trend: A Bibliometric Analysis

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Abstract

Halal pharmaceuticals involve drugs, medicinal ingredients, traditional medicines, and cosmetics that contain permitted ingredients and are produced according to Islamic rules and regulations. The purpose of this research was to identify the types and sources of halal pharmaceutical documents published in PubMed from 2001 to 2021, as well as the most productive halal pharmaceutical authors and the keywords and topics associated with this field. The method used is bibliometric analysis with the VOS viewer application evaluated studies with halal pharmaceutical keywords. After analyzing all of the 369 documents, it was found that 44.15% of them were articles, 39.3% reviews, 7.3% meta-analyses, and 5.7% systematic reviews. The most significant documents were from *Advancer in Experimental Medicine and Biology*, followed by *Molecules*, *Life Sciences*, and *Phytotherapy Research*. Publications increased significantly, reaching 157 in 2020 and 101 in 2021. The most published authors were Sahebkar with 221 documents, Jamialahmadit with 63 papers, and Sathyapalan with 41 documents. The most common keywords were human, animal, and male, while the trending topics were COVID-19, degenerative diseases, and curcumin.

Keywords: Halal; Pharmaceutical; Medicine; Islam.

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INTRODUCTION

Pharmaceutical products range from medicinal ingredients and traditional medicines to cosmetics (M. of H. of the R. Indonesia. 1998). Drugs are materials used to investigate physiological systems or pathological conditions to establish a diagnosis, prevention, healing, recovery, health promotion, or contraception for humans (Director General of Pharmacy and Alkes 2019). Traditional medicine has been used for generations as a means of treatment following the norms set by society. It comprises plant material, animal material, mineral material, extracts (galenic), or a mixture of these materials (Director General of Pharmacy and Alkes 2019). Cosmetics are substances applied to the body, typically for cleansing, changing appearance, improving body odor, and keeping the body in good condition (R. of Indonesia 2010).

According to the State of the Global Islamic Economy Report 2018/2019, Muslims worldwide spent USD 2.1 trillion on food and halal lifestyle products in 2017. This amount is expected to increase to over USD 3 trillion by 2023 (The and Economy 2019). The cosmetic and pharmaceutical industries have

significantly grown globally in recent years. Pharmaceuticals have exhibited faster growth in developing countries because they closely follow macroeconomic indicators than cosmetics. This puts Indonesia in third place among the ten countries with the fastest growing pharmaceutical industry markets (Development 2019).

The Euromonitor Consumer Health Report showed that the pharmaceutical market share was valued at IDR 55,874.9 billion in 2019. Furthermore, there has been significant growth in the sales of analgesic products, vitamins, dietary supplements, and herbal products. In 2017, vitamin and supplement products accounted for nearly half of all health product sales (Euromonitor, 2019). According to current data, Indonesia ranks fourth in pharmaceutical consumption and second for cosmetics after India. The pharmaceutical and cosmetic markets are both expected to grow significantly, with the former estimated to reach USD 131 billion and the latter USD 90 billion by 2023 (Development 2019).

Islam religion has significant concern for everything consumed (Aliyanti 2018): food, drink, or medicine (Marfuah 2020). It also considers two key

items: the material or substance and the acquisition method. This implies that the wealth consumed should be obtained lawfully and legally (Edwin and Aprianto 2017) this religion strictly forbids acquiring property through illegal means such as theft and corruption. Food must also meet two criteria: halal and thayyib (INAIS 2020), with the former representing religious dogma and the latter safety (Sholeh 2015). The Qur'an commands that:

يَا أَيُّهَا النَّاسُ كُلُوا مِمَّا فِي الْأَرْضِ حَلَالًا طَيِّبًا وَلَا تَتَّبِعُوا خُطُوَاتِ الشَّيْطَانِ ۖ إِنَّهُ لَكُمْ عَدُوٌّ مُبِينٌ

"O humanity! Eat from what is lawful and good on the earth and do not follow Satan's footsteps. He is truly your sworn enemy" (QS. Al Baqarah [2]: 168) (Ministry of Religion n.d.).

Islam views health as a critical aspect of human life. In line with this belief, the Prophet Muhammad taught about healthy living practices and regularly encouraged Muslims to pray for good health (Hadi 2020). Furthermore, health care professionals always emphasize the importance of nutritious food. A healthy and balanced diet helps the body stay strong and resistant to diseases (Marfuah 2020).

A solid and healthy body is less likely to contract diseases (Dr. Dimas Rahadian Aji Muhammad S.T.P. n.d.). Health problems generally occur when someone is physically weak and unable to fight infection (Sholeh 2015). The Qur'an emphasizes the importance of consuming only halal foods and avoiding those that are haram. This point is also stressed in several hadiths, for instance, according to HR Muslim, both halal and haram things are explicit. However, between these two, some things are subject to doubt. The Prophet observed that whoever is careful to avoid these doubtful matters has saved their religion and honor (Prihasmono 2007). He also emphasized the need to seek medical treatment and warned against using forbidden methods. Furthermore, he attested that Allah sent down disease and medicine for every ailment. Therefore, people should seek treatment but avoid forbidden things (Narrated by Abu Dawud) (Al-Abani 2010).

Approximately 1.6 billion people worldwide are Muslim, representing almost a quarter of the global population (Christian and Christian 2014). As the Muslim population grows, the awareness of halal medicines also grows (K. Sakinah 2018). Furthermore, halal products are becoming increasingly popular and well-regarded for their quality and safety (Saha 2019). Currently, the focus on halal products is not only limited to food but extends to all products, including medicines (Pen, Ekspor, and Juli 2015). These medicines only contain permissible ingredients and are manufactured according to Islamic law and guidelines (J. Fikri 2019). The assessment of a drug's safety and

efficacy depends on both the source of the active ingredients and the synthetic process used to create the finished product (Ranasasmita 2014). If the source material is permissible under Islamic law and no prohibited substances are used in its production, the product can be halal. For example, ethanol is used to process some synthetic pharmaceutical products. A product is only acceptable if it is in a solid state; this process involves several stages, including heating and crystallization. However, if the final product is in liquid form, it is considered a "*subhat*" due to uncertainty regarding the presence of ethanol (Abdalbasit Adam Mariod 2013).

The demand for halal products is expected to continue growing steadily, as Muslims are anticipated to make up 2.2 billion of the world population by 2030 (Religion and Life 2011). According to Gross Domestic Product at Purchase Price Parity, countries where Muslims are a minority, such as the United States, Russia, Britain, France, and Germany, still have significant purchasing power (Hunter 2012). Pharmaceutical companies, such as Novartis and GlaxoSmithKline, are looking to the potential profits from the Muslim market by making vaccines halal. With an estimated value of \$50 billion from blockbuster drugs that will soon be coming off patented (Norazmi and Lim 2015), halal vaccines could significantly boost company profits .

A quantitative method was used to assess the types and sources of halal pharmaceutical documents published in PubMed from 2001 to 2021. Therefore, the research aimed to analyze the increasing trend of published documents, the most productive authors, the emergence of keywords, and trends in halal pharmaceutical topics.

METHODS

The first step involved identifying the topic of analysis by addressing four items: the number of publications on halal pharmaceuticals, countries that have the most authors and publications on halal pharmaceuticals from 2001 to 2021, the growth of publications regarding halal pharmaceuticals, and the trend in halal pharmaceutical topics. The next step involved selecting the keywords and timeframe for analysis. The selected keywords were 'halal' and 'pharmaceutical,' and the period covered was 2001 to 2021. The third step was about selecting data, where articles were taken from the PubMed database and then exported into Pubmed-set-Notepad for further analysis. The next step involved analyzing bibliometric data using VOSviewer to obtain document types, sources, years published, authors, author productivity per year, the geographical distribution of authors, keywords, and topic trends. Finally, data was displayed in the form of tables and figures.

RESULTS

A. Document Type and Source

Table 1: Document Type and Its Frequency

Document Type	Frequency	% (N 369)
Review	145	39,3
Article	163	44,15
Editorial	3	0,8
Meta-Analysis	27	7,3
Systematic Review	21	5,7
Clinical Trial	5	1,4
Published Erratum	3	0,8
Letter	2	0,55
Total	369	100

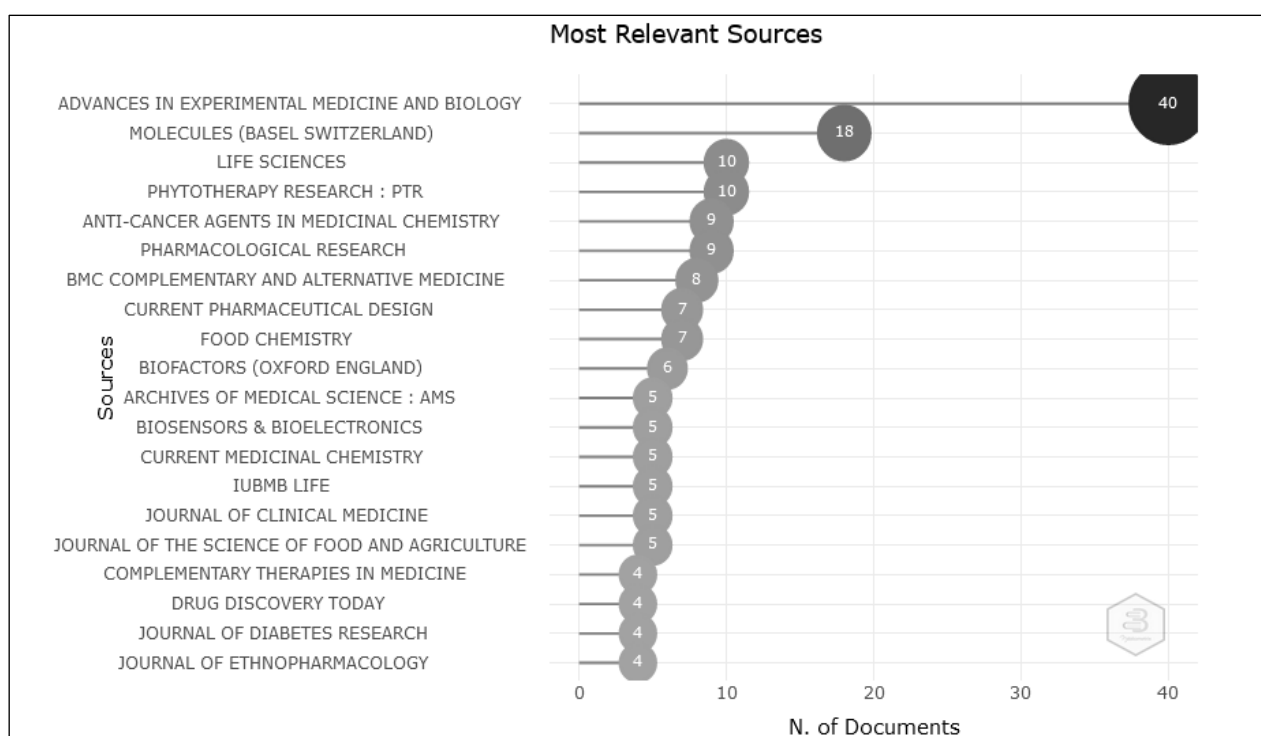


Figure 1: Document Source Name and Frequency (20 largest)

B. Publication Years

Table 2: Article Publication Year and Frequency

Year	Frequency	% (N= 369)
2011	2	0,54
2012	2	0,54
2013	2	0,54
2014	7	1,89
2015	11	2,98
2016	11	2,98
2017	10	2,71
2018	20	5,42
2019	46	12,46
2020	157	42,55
2021	101	30,08

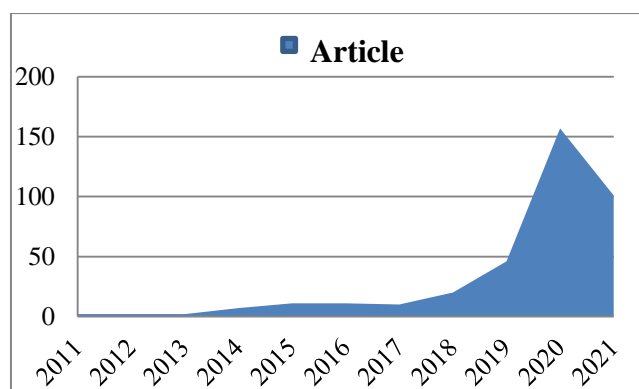


Figure 2: Number of Articles per Year

DISCUSSION

A total of 369 documents on halal pharmaceuticals were downloaded in PubMed file format, based on the requirements of VOSviewer.

A. Document Type and Source

After analyzing all of the 369 documents, it was found that 44.15% of them were articles, 39.3% reviews, 7.3% meta-analyses, and 5.7% systematic reviews. The most current articles were about degenerative diseases, hypercholesterolemia (Mashayekhi-Sardoo *et al.* 2021), cardiovascular (Yaribeygi *et al.* 2021), and diabetes mellitus (Yaribeygi *et al.* 2020). The systematic reviews compared the treatment options for respiratory tract infections (Shokri-Mashhadi *et al.* 2021) and the detection of cosmetic additives (Atiqah Ab Aziz *et al.* 2021). A meta-analysis conducted found that patients with kidney damage and who had been infected with COVID-19 did not meet the criteria for Acute Kidney Injury (AKI) (Jafari-Oori *et al.* 2021).

A total of 369 documents were published across 169 different journals on PubMed. *Advancer In Experimental Medicine and Biology* is a journal specializing in publishing halal pharmaceuticals. Since its inception in 1967, it has published 40 articles. The most recent document discusses the potential of curcumin nanomaterials for therapy (Mohajeri *et al.* 2021). *Molecules* journal, based in Basel, Switzerland, has published 18 articles on halal pharmaceuticals, with the last being a review article on encapsulating with spray drying (Mohammed *et al.* 2020). This journal was the first to publish an article titled "Tentative Identification of Volatile Flavor Compounds in Commercial Budu, A Malaysian Fish Sauce, Using GC-MS" (Mohamed *et al.* 2012). Furthermore, the journal *Food Chemistry* entitled "The use of Fourier transform mid-infrared (FT-MIR) spectroscopy for detection and quantification of adulteration in virgin coconut oil" (Rohman and Che Man 2011). Figure 1 presents the 20 journals that most frequently publish halal pharmaceuticals.

B. Publication Years

Although the data was collected from PubMed over a 20-year period, the first halal pharmaceutical publication occurred in 2011. According to the PubMed database, research on halal products began in 2002 with 5 publications (Ahmed M Halal 1 2002). This field has been widely studied in recent years, with 20 articles published in 2018 and 157 articles in 2020. In 2021, there was a slight decrease in the number of articles published due to the COVID-19 pandemic. This increase is consistent with the growing awareness and increasing global Muslim population, triggering the demand for halal drugs even though the pharmaceutical market share is currently crowded (The and Economy 2021). Furthermore, the increase in demand could be associated with the fact that Muslim consumers have special needs in medical care that are different from those of non-Muslims (Ali 2016).

CONCLUSION

After analyzing all of the 369 documents, it was found that 4.15% of them were articles, 39.3% reviews, 7.3% meta-analyses, and 5.7% systematic reviews. The most significant documents were from *Advancer In Experimental Medicine and Biology*, followed by *Molecules*, *Life Sciences*, and *Phytotherapy Research*. Publications increased significantly, reaching 157 in 2020 and 101 in 2021. The most published authors were Sahebkar with 221 documents, Jamialahmadit with 63 papers, and Sathyapalan with 41 documents. The most common keywords were human, animal, and male, while the trending topics were COVID-19, degenerative diseases, and curcumin.

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