



Readiness Society to Enter the Era of Halal Drug Certification Mandatory in Terms of Knowledge, Perceptions, and Attitudes

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Abstract: The halal lifestyle trend is currently developing in various regions of the world, not only in areas where the majority of the population is Muslim but also where the population is Muslim minority. This study aims to determine the level and correlation of public knowledge, perceptions, and attitudes toward halal medicine and correlation with demographic data. This cross-sectional study was conducted online using a validated questionnaire, conducted in January-February 2023 on 600 respondents in six provinces of Java Island, using a purposive sampling method with inclusion criteria over 17 years old and exclusion criteria not being a doctor or pharmacist. The Spearman test was used to correlate knowledge-perception-attitude, and the Chi-square test was used to correlate demographic data with knowledge, attitude, and perception. The results showed that the level of public knowledge was sufficient (mean score 33.74 ± 2.37), the perception was sufficient (mean score 35.91 ± 3.47) and the attitude was sufficient (mean score 31.17 ± 4.25) towards halal medicine. Age, education, and place of work affect knowledge; and place of work affects perception. It is concluded that the community has sufficient knowledge, perceptions, and attitudes, knowledge-perception is significantly correlated, knowledge-attitude is weak and perception-attitude is strongly correlated.

Keywords: Drug; Halal; Islam; Knowledge of Attitude Perception

Introduction

Islam in Arabic means aslama-yuslimu. It means submitting to God the creator of the universe, creating peace, surrendering, and performing worship to get to the safety of the world and the hereafter (Ali, 2016). The term halal is known in Islamic teachings originating from the Qur'an and hadith which implies something permissible by law covering various aspects of life, such as behavior, how to earn sustenance, how to dress, and the food or drink consumed (Sutardi, 2019). Islam views health as a very important factor in human life, and the Prophet taught about procedures for a healthy life (Anam, 2021a). The Prophet Muhammad SAW specifically emphasized seeking treatment while warning not to seek treatment with haram (Anam, 2021a; Yenti, 2018) as he said: "Allah has reduced and medicine, and taking medicine for every disease;

therefore, seek treatment and do not seek treatment with unclean objects" (HR. Abu Daud (Anam, 2021b)).

Halal medicines are medicinal products originating from permissible sources, namely animals, plants, and organic or inorganic materials that follow preparation, manufacture, and extraction methods that follow Islamic rules (Rahem et al., 2021). Halal medicine must not only be free from the content of haram substances but must be thoyib (Sukoso et al., 2020). In general, thoyib refers to products that are clean, pure, and produced according to standard processes and procedures (Saha et al., 2019). So, pharmaceutical products must not only be halal but must be clean according to Islamic law (Rahem et al., 2021).

All pure and clean food and medicines are allowed for Muslim consumption except for the given category i.e. products derived from or contaminated with dead animal carcasses; congealed or flowing blood; pork and

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its by-products; animals slaughtered in the name of other than Allah; animals killed by preventing the blood from completely draining from the body; an animal that; intoxicants such as alcohol; carnivorous animals such as lions, dogs, wolves or tigers; birds with sharp claws such as eagles, eagle owls or vultures; land animals such as frogs and snakes (Sayekti, 2014). Food and medicinal products can be defined as halal or haram according to halal food and medicine laws however, some types can be categorized as makruh which means questionable and disgusting (Rahem et al., 2021).

Assessment of halal status depends not only on the sources involved but also on the synthetic process of active ingredients and excipients. If the source is halal and the process does not contain haram substances, then the product can be categorized as halal (Atiah & Fatoni, 2019). For example, for some synthetic pharmaceutical products, ethanol is used during processing. If the final product is in a solid state, then the product is categorized as halal. To become a solid preparation, it must go through several stages including heating or crystallization where the process will evaporate the ethanol (Jaswir et al., 2020). However, it is considered infeasible if the final product is in liquid form due to uncertainty regarding the presence of ethanol. The final product is considered "unclean" when the presence of ethanol is found (Rahem, 2018).

Sources taken from animals are categorized as haram because they come from pigs or animals that are not slaughtered according to Muslim procedures (Hudaefi & Jaswir, 2019). In this case, the final pharmaceutical product is also considered haram even though the synthetic process does not contain ethanol. However, other forms of alcohol such as pentanol, allyl alcohol, or cetyl alcohol are not considered haram because their chemical structure is different from ethanol. Pharmaceutical manufacturers' use of the term 'alcohol' refers to ethanol, and thus any pharmaceutical product or drug that contains alcohol will then be categorized as "haram". However, topical drugs containing alcohol are considered halal if used for external use (not for oral use) because alcohol can be lost through evaporation (Hudaefi & Jaswir, 2019).

Awareness of the use of halal medicines has increased among doctors, pharmacists, and the general public. Although Muslims are generally permitted to consume haram (forbidden) products in life-threatening situations, the demand for medicines that comply with Islamic law is still increasing (Hakim et al., 2022; Sadeeqa et al., 2015). The halalness of pharmaceutical and health products remains a concern for Muslim consumers, therefore, the global demand for halal medicines continues to increase and makes pharmaceutical and health products a major growth area in the global halal industry (Setyaningsih, 2022).

Halal guarantees in Indonesia are officially recognized and supported by the state with the issuance of Law No. 33 of 2014 concerning Halal Product Guarantee (JPH) (Kementerian Sekretariat Negara RI, 2019). The issuance of this law implies that the state officially recognizes and guarantees Islamic law in the form of the obligation to consume halal food and thoyib. In addition, the halal certification that has been carried out by the MUI has now been carried out by a government agency under the Ministry of Religion, the Halal Product Guarantee Agency (BPJPH). The implementation of this law is regulated in Government Regulation No. 31 of 2019 concerning Regulations for the Implementation of Law Number 33 of 2014 concerning Guarantees for Halal Products and their technical provisions are regulated in Government Regulation No. 39 of 2021 concerning Implementation of the Halal Product Assurance Field where goods and/or services related to food, drinks, medicines, cosmetics, chemical products, biological products, genetically modified products, as well as goods used, used, or utilized by the public must be halal certified (Kementerian Sekretariat Negara RI, 2021). Halal mandatory stage 1 takes effect October 17, 2019 (food products, slaughter drinks, and slaughter services), and phase 2 applies October 17, 2021, for all products.

Knowledge is a result of curiosity through sensory processes, especially in the eyes and ears of certain objects. Knowledge is an important domain in the formation of open behavior (Ridwan et al., 2021). Perception is the ability to distinguish, categorize, focus, and so on, which are then interpreted. Perception takes place when a person receives a stimulus from the outside world that is captured by his or her organs which then enters the brain (Hashim et al., 2020). In it, a thinking process occurs which is finally realized in an understanding. This understanding is more or less called perception. Perception is an experience of objects, events, or relationships obtained by inferring information and interpreting messages (Hakim et al., 2022). Perception is the process of giving meaning to sensations so that humans gain new knowledge, perception turns sensations into information (Sutardi, 2019).

Attitude is defined as a person's response or reaction to an object that causes a person to like or dislike the object (Xuan et al., 2022). The manifestation of attitude cannot be directly seen but can only be interpreted in advance from the behavior that is closed and the real attitude that shows the connotation of the suitability of reactions to a person's mental state involving beliefs and feelings, as well as the urge to act in a certain way with emotions that encourage certain actions in social situations (Aji, 2018).

The drug industry market in Indonesia is growing positively every year. This is in line with the growth of the halal medicine industry with an average growth of 10% in 2015-2020 (Istiqlal, 2023). This phenomenon makes drug companies compete to provide halal labels on their products, including multinational drug companies. Companies cannot only depend on the halalness of their products if they want to compete and survive in the halal drug industry. Companies need to know more about what factors can influence the intention to buy halal medicinal products to win the competition (Balques et al., 2017).

This research is important as a reference for the pharmaceutical industry to immediately carry out halal certification of its products because a good knowledge of public perceptions of halal drugs will be significant to the need for halal drugs. Indonesia has the potential to become a major player in the production of halal medicines. Early detection of problems will be a reference for policy-making where positive knowledge, attitudes, and perceptions of halal drugs will increase the halal drug market. Research on knowledge, perceptions, and attitudes towards halal medicine conducted is still limited in scope. This study aims to determine the level and correlation of knowledge, perceptions, and attitudes of the community towards readiness to enter the era of mandatory halal certification of drugs and to determine the correlation of knowledge, perceptions, and attitudes of the community based on age, gender, education and readiness efforts to enter the era of mandatory halal certification of drugs.

Method

This research is a cross-sectional study conducted online using a questionnaire regarding public knowledge, perceptions, and attitudes towards halal provisions, halal medicines, halal product guarantees, halal medicine needs, and doctor/pharmacist services related to existing halal medicines. The questionnaire was reviewed for validation by experts and tested for validation and reliability before being distributed to respondents. Knowledge statements use a Guttman scale where respondents are asked to choose the option "Yes (score 2)" or "No (score 1)" from 18 statements, perception and attitude statements, using a four-point Likert scale starting from "strongly agree (score 4)", "agree (score 3)", "disagree (score 2)", "strongly disagree (score 1)", perception 10 statements and attitude 9 statements. The validity test of the questionnaire used the Point Biserial technique for knowledge and the Pearson Product Moment correlation technique for perception and attitude. A reliability test of the knowledge questionnaire with the

Guttman scale, the Split-Half technique was applied. The examination criteria confirmed that if the Guttman Split Half coefficient ≥ 0.6 , the questionnaire was considered reliable. For perception and attitude questionnaires with the Likert scale, Crombach's Alpha technique was used. If the value of Crombach's Alpha \geq constant (0.6), then the question is declared reliable. The study was conducted in the period January - February 2023 on 600 respondents spread across the six provinces of the island of Java who were taken by purposive sampling with inclusion criteria over 17 years old and exclusion criteria not working as doctors or pharmacists. Respondents' demographic data included age, gender, latest education, and occupation. The questionnaire in the form of a Google Drive was distributed via WhatsApp. The assessment of knowledge, perception, and attitude levels was divided into three categories; good category ($X \geq \text{mean} + 1.SD$), medium category ($\text{mean} - 1. SD \leq X \leq \text{mean} + 1.SD$), and medium category ($\text{mean} - 1. SD \leq X \leq \text{mean} + 1.SD$), and poor category ($X < \text{mean}-1.SD$). The Spearman test did the correlation of knowledge-perception, knowledge-attitude, and perception-attitude, The Correlation of demographic data with knowledge, attitude, and perception scores was done by the Chi-square test. This study has received an Ethical Declaration from the Faculty of Medicine, Swadaya Gunung Jati University No. 163/EC/FKUGJ/XI/2022.

Result and Discussion

Respondent Demographics

From 600 respondents who were spread evenly across six provinces on the island of Java, data were obtained for age group, last education, and occupation.

Table 1. Description of the community demographics

Demographic	Characteristic	Frequency (%)
Age (years)	< 25	438 (73.00)
	26 – 35	100 (16.67)
	36 – 45	48 (8.00)
	46 – 55	13 (2.17)
	> 55	1 (0.17)
Gender	Male	7 (1.17)
	Female	593 (98.83)
Education	Elementary School	10 (1.67)
	Junior High School	42 (7.00)
	Senior High School	399 (66.50)
	D1/D2/D3	28 (4.67)
	S1/S2/S3	121 (20.17)
Occupation	Housewife	63 (10.50)
	Student	232 (38.67)
	Honoror	26 (4.33)
	Employee	186 (31.00)
	Civil Servant	34 (5.67)
	Entrepreneur/Merchant	59 (9.83)

Table 1 shows that the respondents were dominated by the group aged under 25 years (73%), this was influenced by how the questionnaire was filled out online. Respondents aged under 25 include the Millennial generation and Generation Z, one of the main characteristics of the Millennial generation is increased use and familiarity with digital communications, media, and technology (Budianti et al., 2018). Secondary education level is the most dominant (66.5%) followed

by higher education level (24.84%) because respondents live on the island of Java where educational facilities are sufficient up to the sub-district level and people's income is better so the need for education is a priority (Aurelia Fitriani N et al., 2021). The most dominant occupations are students (38.67%) according to the respondents' age and education level (Aurelia Fitriani N et al., 2021). The composition of this demographic data resembles previous studies (Anshari et al., 2022).

Respondent's Knowledge of Halal Drugs

Table 2. Public knowledge of halal medicines (n = 600)

Question	Respond (%)	
	Yes	No
Do you understand islamic teachings regarding the consumption of halal products?	98.33	1.67
Halal is something that is "permitted" while haram is something that is "prohibited".	99.00	1.00
Unclean are all objects that are considered dirty by Islamic law, such as carrion, blood, and animal dung.	97.67	2.33
Do you understand what foods, drinks, and products are forbidden by Islam?	97.50	2.50
Are you able to distinguish between halal and haram food, drinks, and products?	97.50	2.50
Medicines derived from haram ingredients in an emergency can be used with an MUI fatwa.	84.17	15.83
Do you know Law No. 33 of 2014 concerning guarantees for the halalness of a product?	73.33	26.67
Do you recognize the halal logo of a product?	98.83	1.17
Do you know the Halal Product Assurance Organizing Agency (BPJPH) is an institution that issues halal certificates	80.50	19.50
Are medicines included in the products that must be guaranteed as halal by the government?	91.67	8.33
All medicines gradually have to be halal certified.	95.83	4.17
Active ingredients and drug additives must be sourced from halal materials.	93.67	6.33
If an animal is slaughtered in an unIslamic way, then all parts of it cannot be eaten, including as raw material for medicine.	87.50	12.50
Cow's blood is used in the process of making medicine making the drug haram.	76.50	23.50
Pig fat used in the process of making medicine makes the drug haram.	90.50	9.50
Can alcohol from the petrochemical industry and fermentation products be used for drug production?	82.33	17.67
Did you know that gelatin capsules may be made from pork?	67.00	33.00
Did you know that syrup/elixir contains alcohol?	62.00	38.00

Table 2 shows the public's knowledge about halal provisions that have the highest value regarding the definition of halal as something that is "permitted". At the same time, haram is something that is "prohibited", such as research conducted as well as the introduction of the halal logo (Anshari et al., 2022). Public knowledge knows the critical points of halal medicine, both knowledge about raw materials for drugs, the process of making drugs, and final products, is the lowest value so research on critical points for halal medicines needs to be carried out (Atma et al., 2018). Table 5 shows that the respondents' knowledge of halal drugs has sufficient criteria with an average score of 33.74 ± 2.37 , the frequency distribution of respondents' knowledge of halal drugs, as many as 5% of respondents have good criteria, 79% have sufficient criteria and 16% have less criteria. Adequate public knowledge about halal medicines needs attention because this shows a lack of learning and preaching about halal-haram, especially about drugs when compared to public knowledge about halal food (Nurista Safa Normasilla, 2021). Socialization

of legislation regarding halal product guarantees needs to be increased. After all, not all respondents know about it, in both institutions dealing with halal guarantees and legal products, only the halal logo which is very well-known (Khoerunnisa & Puspaningrum, 2016; Ridwan et al., 2021).

Respondent's knowledge of halal medicines has a correlation with age, education, and employment where the p-value < 0.05. Education affects the process of learning, the higher a person's education, the easier it is for a person to receive information and knowledge about halal influences the attitude toward choosing halal products (Mustiko Aji, 2018). The work environment influences the process of entering knowledge into individuals who are in that environment, this occurs because of mutual interactions that will be responded to as knowledge (Septiani & Indraswari, 2018). Age affects a person's comprehension and mindset, increasing age will develop a person's mindset and understanding so that the knowledge gained will be more and more (Nengah S et al., 2020).

Respondents' Perceptions of Halal Drugs

Table 3. Public perception of halal medicines (n = 600)

Statement	Respond (%)			
	SS	S	TS	STS
Halal goods are important in my life	78.67	21.33	0	1
Consuming halal food makes me a good person	76.33	23.67	0	2
All halal-certified products are of good quality	66.83	32.17	1	3
Drug halal certification is the responsibility of the government	98.33	1.33	0.33	4
Medicines are included in products that must be halal-certified	64.33	33.50	2	5
Drugs containing haram ingredients may be used with an MUI fatwa	31.50	38	24.33	6
Drug companies must provide information about the halal status of the drugs they produce	61.17	37	1.50	7
Patients have the right to ask pharmacists for information regarding the source of medicinal ingredients	53.33	44	2.67	8
Patients have the right to obtain halal drug prescriptions from doctors	60.17	37.17	2.50	9
Patients have the right to be asked for their consent if the pharmacist hands over drugs containing haram ingredients	53.33	42	4.50	10

SS=strongly agree; S=agree; TS=disagree; STS=strongly disagree

Table 3 shows that respondents' perceptions strongly agree (98.3%) that halal drug certification is the responsibility of the Government, this is in line with Supardi's research (Sutardi, 2019). Halal certification is issued by the Government, in this case, the Halal Product Assurance Agency (BPJPH) after receiving a halal fatwa from the Majelis Ulama Indonesia by Law of the Republic of Indonesia no 34 of 2014 (Bintan Dzumirroh Ariny & Nurhasanah, 2020). The public's perception of disapproval is mostly in the statement that the drug-containing haram ingredients may be used with the MUI fatwa (30.5%), this perception was also found in other studies although the numbers were not large (Abdul Hakim et al., 2022). This respondent's perception is due to different points of view about emergency conditions that require patients to use drugs made from haram (Mustafa Afifi Ab Halim et al., 2014). In Table 5, the average perception score is 35.91 ± 3.47

with sufficient criteria. The frequency distribution of respondents' perceptions of halal drugs is 24% of respondents with good criteria, 56% with sufficient criteria, and 20% with poor criteria. Respondents showed positive perceptions of the halal status of goods and food consumed, not a single respondent disagreed with the importance of halal goods that can make a good person. Pharmacists and doctors are eagerly awaited by the community because, in public perception, 97% of respondents have the right to obtain halal drug prescriptions from doctors and have the right to ask for their approval if pharmacists hand over drugs containing haram ingredients.

Table 6 shows that respondents' perceptions of halal medicine correlate with the workplace where the p-value is < 0.05 , where the emotional atmosphere and cultural background affect perceptions (Kuntyassari & Handayani, 2014).

Respondents' Attitudes about Halal Drugs

Table 4. Public attitudes regarding halal medicines (n = 600)

Statement	Respond (%)			
	SS	S	TS	STS
I've been looking for information about the halalness of a product that I'm going to consume	50.33	47.50	2	0.17
Every time I consume a product, I make sure that the product is halal	65	34.17	0.83	0
I have asked for information regarding the halalness of the medicine prescribed by the doctor	45.83	51	3.17	0
I have asked the doctor to prescribe halal medicine for me	44.33	51.17	4.33	0.17
I have asked the pharmacist for information regarding the halalness of the medicine prescribed by the doctor	44.33	50.83	4.50	0.33
I have purchased over-the-counter drugs with the halal logo	41.17	52.33	6.50	0
I feel happy if the pharmacist provides information regarding the halal status of the drugs I receive	58.33	40.33	1.17	0.17
I am happy with the government's policy for drug manufacturers to put the "halal" logo on halal medicines	58	40.67	1.33	0
I follow the MUI fatwa which allows the use of illegal drugs in emergencies	39.17	50.17	10.67	0

SS=strongly agree; S=agree; TS=disagree; STS=strongly disagree

Table 4 shows the frequency distribution of respondents' attitudes towards halal drugs, there are 9

statements to assess respondents' attitudes. The average attitude score is 31.17 ± 4.25 , 25% with sufficient criteria,

as shown in Table 5. The frequency distribution of respondents' attitudes about halal drugs is 25% of respondents with good criteria, 68% with sufficient criteria, and 7% with poor criteria. Respondents' attitudes towards halal drugs were very positive, all statements received agree and strongly agree responses above 90% except for statements following the MUI fatwa which allows the use of illegal drugs in

emergencies. Nearly 100% of respondents stated that they would consume a product after confirming that it was halal. The attitude of the people who respond positively to halal products will grow the potential of the halal product industry (Denny Kurniawati & Sumarji, 2018). Table 6 shows that people's attitudes towards halal medicine are not related to age, final education, or employment.

Table 5. Level of knowledge, perceptions, and attitudes of society towards halal drugs

Domain	% Score	Number of Respondents (%)	Criteria
Knowledge	$X \geq 36$	30 (5)	Good
	$31.36 \leq X < 36$	473 (79)	Enough
	$X < 31.36$	97 (16)	Bad
Mean \pm Std. deviation	33.74 ± 2.37	600	Enough
Perception	$X \geq 39.38$	144 (24)	Good
	$31.36 \leq X < 39.38$	334 (56)	Enough
	$X < 32.44$	122 (20)	Bad
Mean \pm Std. deviation	35.91 ± 3.47	600	Enough
Attitude	$X \geq 35.42$	147 (25)	Good
	$26.92 \leq X < 35.42$	408 (68)	Enough
	$X < 26.92$	45 (7)	Bad
Mean \pm Std. deviation	31.17 ± 4.25	600	Enough

Table 6. The effect of respondent characteristics on the level of community readiness for halal medicines

Domain	Characteristics	P value	Correlation
Knowledge	Age	0.024	There is
Knowledge	Last education	0.005	There is
Knowledge	Work	0.009	There is
Perception	Age	0.586	There aren't any
Perception	Last education	0.487	There aren't any
Perception	Work	0.021	There is
Attitude	Age	0.433	There aren't any
Attitude	Last education	0.083	There aren't any
Attitude	Work	0.098	There aren't any

Correlation between Knowledge, Attitude, and Perception

Table 7. Inter-domain linkages in the level of community readiness for halal medicines

Domain	Domain	P value	Correlation
Knowledge	Perception	0.34	Enough
Knowledge	Attitude	0.29	Weak
Perceived	Attitude	0.78	Very strong

Tables should be submitted as editable text and not as images and should be placed separately. The correlation between knowledge, attitudes, and perceptions is depicted in Table 6. There is a moderate correlation between knowledge and perception (p-value 0.342, $p < 0.05$), a weak correlation between knowledge and attitude (p-value 0.209, $p < 0.05$), and a powerful correlation (p-value 0.784, $p < 0.05$) between attitude and perception ($r = 0.588$, $p < 0.001$). This means that the better the respondent's knowledge of halal drugs, the better the public's perception and attitude towards halal drugs (Denny Kurniawati & Sumarji, 2018).

Conclusion

The level of community knowledge is sufficient (mean score 33.74 ± 2.37), perception is sufficient (mean score 35.91 ± 3.47) and attitude is sufficient (mean score 31.17 ± 4.25) towards halal medicine There is a significant correlation between knowledge perception, a weak correlation between knowledge attitude, and a strong correlation between perception and attitude. Age, education, and workplace affect knowledge; and workplace affects perception.

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Author Contributions

Conceptualization, A.Z. and N.M.; Design, A.Z., N.M. and D.P.; Supervision, N.M. and D.P.; Resources, A.Z.; Materials, A.Z., N.M. and D.P.; Data Collection and/or Processing, A.Z. and S.P.; Analysis and/or Interpretation, A.Z., N.M. and D.P.; Literature Search, A.Z., N.M. and S.P.; Writing, A.Z., D.P. and S.P.; Critical Reviews, A.Z., N.M. and D.P. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

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