Research Article
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Product Knowledge and Halal Certification as Determinants of Halal Pharmaceutical Purchase Behavior

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Abstract: This study examines the impact of product knowledge and halal certification on consumers' purchase decisions for pharmaceutical products in Mojorejo Village, Madiun. Using a quantitative associative approach, data were collected from 100 respondents through questionnaires and interviews, employing stratified random sampling based on educational level. The research applied multiple linear regression analysis to examine the direct and combined effects of the independent variables on purchasing behavior. Results indicate that both product knowledge and halal certification have a significant positive influence on purchase decisions, both individually and simultaneously. The regression model yielded an R^2 value of 0.542, indicating that the independent variables explain 54.2% of the variance in purchasing decisions. Classical assumption tests confirmed the validity and reliability of the regression model. These findings suggest that pharmaceutical companies and health regulators should prioritize transparent halal certification and educational outreach, while policymakers can improve access to verified halal-certified pharmaceuticals.

Introduction

In modern consumer behavior, purchasing decisions are influenced by a range of psychological and socio-cultural factors, including religious values (1). For Muslim consumers, the concept of halal, which is permissible according to Islamic law, has become increasingly central to their consumption decisions, not only in food but also in other sectors such as cosmetics, fashion, and pharmaceuticals (2, 3). The consumer decision-making process typically involves the stages of need recognition, information search, evaluation of alternatives, purchase decision, and post-purchase evaluation (4, 5). As global interest in halal products rises, this trend is evident not only among Muslim communities but also among non-Muslim consumers who associate halal certification with quality, safety, and hygiene (6, 7). According to studies, Muslim consumers are more inclined to choose products that have been officially declared halal, and this preference is driven by a combination of religious awareness and producer communication regarding halal status (8, 9).

Indonesia, with the largest Muslim population in Southeast Asia, comprising 229 million people and aS$ 279 billion halal market, is uniquely positioned in the global halal economy (10). As awareness of halal living increases, demand has extended beyond food to cosmetics, lifestyle products, and, most recently,harmaceutical goods (11-13). Halal pharmaceutical products are expected to meet religious requirements not only in terms of ingredients but also in manufacturing and handling processes. Despite the growth in consumer concern, many Indonesians remain unaware of halal logos on product packaging and often assume that products sold by Muslim vendors are automatically halal (14). This assumption can be problematic, especially when pharmaceutical products contain non-halal ingredients or are imported from countries without clear halal regulatory frameworks (15). It is estimated that more than 90% of Indonesia's pharmaceutical raw materials are imported from countries such as China and India, where halal certification is not always a priority(16).

The need for formal halal certification for pharmaceuticals has sparked policy debates and regulatory initiatives (17, 18). Indonesia’s enactment of Law No. 33 of 2014 concerning Halal Product Assurance (JPH) marked a significant step toward ensuring that all products circulating within the country are halal-certified (19). However, implementation has faced challenges, including concerns from health authorities over the availability and cost of halal-certified medical products (20, 21). Nevertheless, Islamic teachings emphasize the importance of consuming halal and tayyib (wholesome) products, even in healthcare, as underscored by prophetic traditions and Quranic verses such as Surah Al-Baqarah (2:173). This religious imperative coexists with a practical concern: the need to balance religious adherence with medical necessity, particularly in

life-threatening situations.

Globally, the halal industry continues to expand rapidly. In 2024, the demand for halal products was valued at USD 2.71 trillion and projected to grow to USD 5.91 trillion by 2033, exhibiting a CAGR of 8.92% from 2025 to 2033 (22). Despite this, the proportion of halal-certified medicines remains low (23). This discrepancy between consumer demand and product availability underscores the need for research focused on the factors influencing consumer decisions regarding halal pharmaceutical products. In this context, product knowledge and halal certification are hypothesized to play a crucial role in this process. Therefore, this study aims to investigate the impact of product knowledge and halal certification on purchasing decisions for pharmaceutical products among the Muslim community in Mojorejo Village, Madiun Regency, an area renowned for its religious diversity and traditional Islamic practices. Mojorejo Village was chosen due to its religious diversity and strong Islamic traditions, making it an ideal microcosm to explore halal-related consumer behavior in a rural Indonesian context. For this study, pharmaceutical products primarily refer to over-the-counter (OTC) medications and common health supplements available without a prescription.

Methodology or Experimental Section

Research Design

This study employed a quantitative approach grounded in the positivist paradigm, which emphasizes objective measurements and statistical analysis of data collected through instruments (24). The research was classified as associative, as it aimed to determine the relationship and influence between two independent variables, product knowledge and halal certification, on a dependent variable, namely the purchasing decision of pharmaceutical products. The relationship between the variables was assessed using multiple linear regression analysis, which allowed for the evaluation of both individual and simultaneous effects.

Research Location and Duration

The research was conducted in Mojorejo Village, Kebonsari District, Madiun Regency, over a period of two months, from November to December 2018. The primary data were gathered directly from the research site through surveys and interviews conducted with selected community members.

Population and Sampling Technique

The population of this study consisted of residents of Mojorejo Village, Kebonsari District, Madiun Regency. A stratified random sampling method was employed to ensure representation across different educational levels. This technique was selected due to the homogeneous yet stratified nature of the population. The sample excluded individuals with only elementary education, as Islamic law requires that transactions be made by individuals who are both mature (baligh) and discerning (mumayyiz). The sampling educational level included junior high school (SLTP), senior high school (SLTA), and diploma/bachelor's degree holders. From a total population of 1,158 individuals, the sample size was determined using the Slovin formula with a 10% margin of error, yielding approximately 92 participants, which was then rounded to 100 respondents for practical purposes. The sample distribution was proportional across the educational levels: 36% SLTP, 49% SLTA, and 15% DIPLOMA/STRATA.

Research Variables

This study involved both independent and dependent variables. The independent variables were product knowledge (X_1) and halal certification (X_2). Product knowledge referred to the information individuals possessed regarding pharmaceutical products, including attributes, benefits, and user satisfaction. Halal certification encompasses participants' awareness and perception of halal status based on Islamic principles. The dependent variable (Y) was the purchasing decision, defined as the individual's tendency to buy or choose pharmaceutical products based on recognition of need, product evaluation, and post-purchase behavior.

Operational Definitions

Product knowledge was operationalized as the level of awareness and understanding a consumer had regarding the features, benefits, and potential risks associated with a pharmaceutical product. It included knowledge of product attributes, functional and psychosocial benefits, and the expected level of satisfaction. Halal certification was defined as the consumer's recognition and prioritization of halal labeling in line with Islamic guidelines. It included awareness of the MUI halal logo, verification of halal status at the point of purchase, and prioritizing halal status over other product information. The purchasing decision was measured across five stages: need recognition, information search, evaluation of alternatives, purchase, and post-purchase evaluation, as conceptualized by Kotler and Armstrong.

Validity and Reliability Testing

To ensure the quality of the data collection instrument, validity testing was performed using the Pearson Product-Moment Correlation. An item was deemed valid if the calculated r value exceeded the critical r table value at a significance level of 10%. Reliability testing was conducted using the Cronbach's Alpha coefficient. A value greater than 0.6 was considered to indicate acceptable internal consistency. Only items that passed the validity test were included in the reliability assessment.

Data Sources and Collection Techniques

The data used in this study were primary data, obtained directly from respondents through the administration of questionnaires and interviews. The questionnaire consisted of closed-ended items measured on a Likert scale with five response options, ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). The questionnaire items were adapted from validated instruments used in previous halal consumer behavior study, with adjustments to fit the pharmaceutical context (25). Additionally, semi-structured interviews were conducted to supplement and verify the quantitative data and to capture more nuanced information regarding respondents' perspectives on product knowledge and halal certification. Interview responses were primarily used for data triangulation; however, key themes were identified qualitatively to provide context for the quantitative findings.

Data Analysis Techniques

This study employed a quantitative approach using multiple linear regression analysis to examine the effect of product knowledge and halal certification on consumer purchasing decisions. Data analysis was conducted to determine the

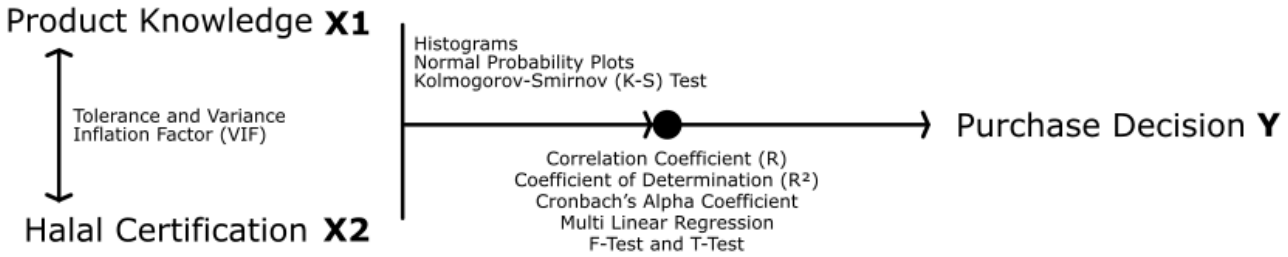

Figure 1. Conceptual framework, influence of product knowledge and halal certification on purchase decisions.

magnitude and direction of the relationship between the independent variables (product knowledge and halal certification) and the dependent variable (purchase decision), as well as the extent to which the independent variables collectively explain variations in the dependent variable.

Prior to regression analysis, classical assumption tests were performed to ensure the validity and reliability of the regression model. These included tests for normality, multicollinearity, and heteroscedasticity. The normality test was conducted using both graphical methods, such as histograms and normal probability plots, as well as the Kolmogorov-Smirnov (K-S) test. Data were deemed to be normally distributed if the residuals formed an approximately straight line in the normal probability plot and the significance level of the K-S test exceeded 0.05.

To detect multicollinearity, the Tolerance and Variance Inflation Factor (VIF) values were assessed. A tolerance value greater than 0.10 and a VIF less than 10 were considered indicative of the absence of multicollinearity among the independent variables. This ensured that the variables included in the model were not highly correlated and that their individual effects could be reliably estimated.

Heteroscedasticity was evaluated using the Glejser test, where the absolute residuals were regressed against each independent variable. A significance value above 0.05 was interpreted as evidence of homoscedasticity, implying constant variance of the residuals. Additionally, scatter plots of standardized residuals versus predicted values were examined visually to confirm the absence of systematic patterns, which would indicate a violation of the homoscedasticity assumption.

Following confirmation of the classical assumptions, further statistical tests were conducted. The correlation coefficient (R) was used to measure the strength and direction of the relationship between the independent and dependent variables, while the coefficient of determination (R^2) quantifies the proportion of variance in the dependent variable explained by the model.

Hypothesis testing was conducted using the F-test and T-test. The F-test was used to evaluate the simultaneous influence of all independent variables on the dependent variable. A significance level below 0.05 or an F-value greater than the critical F-value led to the rejection of the null hypothesis, indicating that the model was statistically significant. The t-test was employed to examine the partial effect of each independent variable. A t-value exceeding the critical t-value and a p-value below 0.05 indicated that the respective variable had a statistically significant individual effect on the dependent variable.

The relationship among the variables was modeled using the multiple linear regression as seen in **Equation 1**.

$$\mathbf{Y = a + b_1X_1 + b_2X_2}$$

Equation 1 | *Y* denotes the consumer's purchasing decision on pharmaceutical products; *a* is the regression constant, X_1 represents product knowledge, X_2 halal certification, and b_1, b_2 are the regression coefficients indicating their effects on *Y*.

This analytical framework enabled a rigorous examination of the hypothesized relationships and provided empirical evidence for evaluating the influence of product knowledge and halal certification on purchasing decisions.

Result and Discussion

Influence of Product Knowledge on Purchase Decisions

The analysis revealed that product knowledge significantly influenced consumers' purchasing decisions regarding pharmaceutical products in Mojorejo Village. Based on the partial hypothesis test (t-test), the product knowledge variable (X_1) yielded a t-value of 6.339, which exceeded the critical t-table value of 1.985 at a significance level of 0.000. This result confirms that product knowledge has a statistically significant and positive effect on purchasing behavior. In practical terms, this means that the more consumers understand about pharmaceutical products, including their attributes, uses, benefits, and potential risks, the more likely they are to make informed purchasing decisions. This finding is consistent with the theoretical perspective that consumer decision-making improves when individuals are equipped with relevant product knowledge (26). They also found that well-informed consumers are more confident and deliberate in evaluating alternatives during the purchase process. The regression coefficient for product knowledge was also positive (0.483), indicating that an increase in product knowledge is associated with an increase in the likelihood of purchasing halal pharmaceutical products.

Influence of Halal Certification on Purchase Decisions

Halal certification was also found to have a significant positive effect on consumers' purchasing decisions. The t-test showed that the halal certification variable (X_2) had a t-value of 2.393, which exceeded the t-table value of 1.985, and had a significance level of 0.019. This demonstrates that awareness and trust in halal certification are important factors in consumers' choices, particularly in a predominantly Muslim population. Consumers in Mojorejo Village place value on halal certification as a marker of religious compliance, safety, and product credibility. The

regression coefficient for halal certification was 0.249, indicating that increased consumer attention to halal certification has a positive influence on their purchase decision. This aligns with previous studies that highlight halal labeling as a key attribute in consumers' evaluation of halal products, especially when the ingredients and production processes are not easily verifiable (27, 28). While these studies focused on food and beverage products, the present study confirms that the same preference for halal labeling extends to pharmaceutical products.

Combined Influence of Product Knowledge and Halal Certification

The results of the F-test further demonstrated that product knowledge and halal certification, when considered simultaneously, have a significant effect on the purchase decision variable. The calculated F-value was 57.333, which was significantly higher than the F-table value of 3.095 at the 5% significance level. The significance value was 0.000, indicating that the combined influence of the independent variables on the dependent variable is statistically significant. This suggests that a comprehensive understanding of pharmaceutical products, combined with awareness of their halal status, plays a crucial role in shaping consumer behavior. Consumers are more likely to engage in purchase behavior when they are confident in both the functional benefits of the product and its compliance with Islamic guidelines.

Strength and Explanatory Power of the Model

The multiple correlation coefficient (R) for the model was 0.736, which indicates a strong positive relationship between the independent variables (product knowledge and halal certification) and the dependent variable (purchase decision). This high correlation suggests that the predictors used in the study are relevant and have a considerable impact on consumer decisions. Furthermore, the coefficient of determination (R^2) was 0.542, meaning that the combined influence of product knowledge and halal certification can explain 54.2% of the variation in pharmaceutical product purchasing decisions. The remaining 45.8% of the variance is likely attributable to other factors not explored in this study, such as brand reputation, peer influence, marketing exposure, or price sensitivity. Nonetheless, the explanatory power of the model is considered moderate to strong for behavioral studies in consumer research. Another possible influence is the assumption, noted by Waijittragum (2016) and Karimah & Darwanto (2021), that Muslim vendors automatically sell halal products. This may reduce the perceived need to verify certification, which partially explains why some consumers still base their decisions on heuristics rather than formal labeling(14, 15).

Table 1. Reliability test results for variables X1, X2, and Y.

No	Variable	Cronbach Alpha	Result
1	Product knowledge (X1)	0,816	Reliable
2	Halal certification (X2)	0,784	Reliable
3	Purchase decision (Y)	0,815	Reliable

Model Assumptions and Diagnostic Testing

Before analyzing the effect of product knowledge and halal certification on purchasing decisions, the validity and reliability of the research instrument were assessed to ensure its appropriateness for data collection. The reliability test was conducted using the Cronbach's Alpha coefficient. A variable was considered reliable if the Cronbach's Alpha value exceeded 0.60. The results of the reliability analysis are shown in **Table 1**.

The regression model met the necessary classical assumptions for linear regression analysis. The normality test, conducted using the Kolmogorov-Smirnov method, showed a significance value of 0.200, which exceeds the threshold of 0.05. This indicates that the residuals were normally distributed, satisfying the assumption of normality. As shown in **Figure 2A**, the data points of P-P plot closely follow the diagonal line, indicating that the residuals were approximately normally distributed. This suggests that the assumption of normality for the error terms is met. The multicollinearity test confirmed the absence of high correlations among the independent variables, as the Variance Inflation Factor (VIF) values were 1.744 and the tolerance values were 0.573, both within acceptable limits (VIF ≤ 10 and tolerance ≥ 0.10). The heteroscedasticity test, assessed using the Glejser method and scatter plot analysis, also confirmed that the residuals had constant variance, as no discernible pattern was observed and all significance values exceeded 0.05. As illustrated in **Figure 2B**, the residuals appear randomly and symmetrically scattered

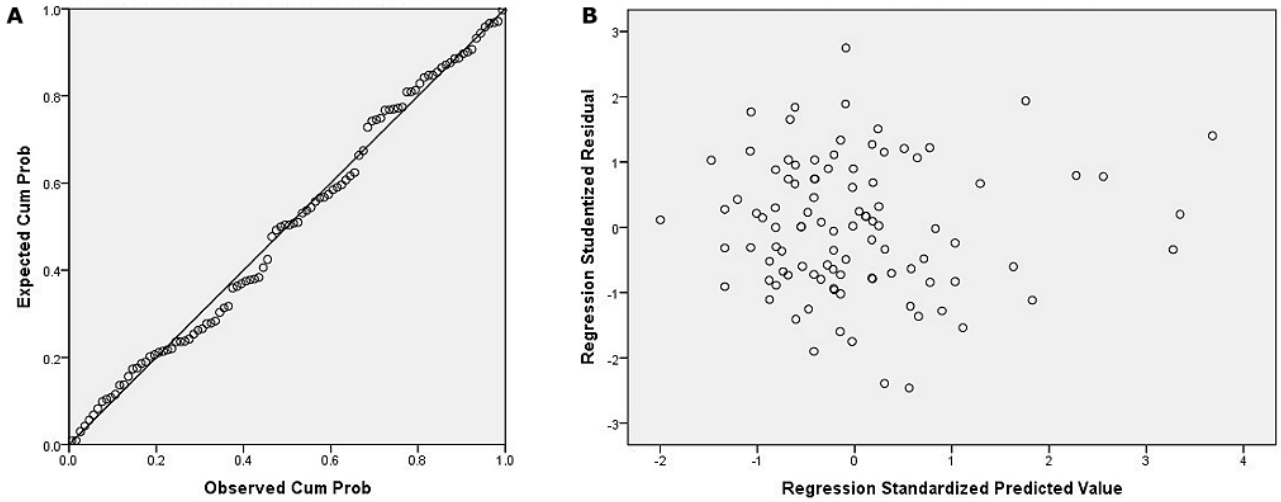

Figure 2. Model assumptions and diagnostic testing results. Note: (A) Normal P-P plot of regression standardized residual and (B) scatterplot of regression studentized residuals versus regression standardized predicted values.

around zero, without forming any clear pattern. This confirms that there is no evidence of heteroscedasticity, and the variance of the residuals is constant across all levels of predicted values. These diagnostics validate the reliability and robustness of the regression model used in this study.

Regression Equation and Interpretation

The resulting multiple linear regression equation was: $Y = 3.772 + 0.483X_1 + 0.249X_2$. This equation suggests that even in the absence of product knowledge and halal certification (when X_1 and X_2 are zero), the base value of the purchase decision (Y) is 3.772. The coefficient for product knowledge (0.483) indicates that for each one-unit increase in product knowledge, the purchase decision increases by 0.483 units, assuming halal certification remains constant. Similarly, the coefficient for halal certification (0.249) implies that a one-unit increase in halal certification perception corresponds to a 0.249-unit increase in purchase decision, holding product knowledge constant. These values reinforce the finding that both variables have a positive contribution to consumer behavior in the pharmaceutical sector.

Conclusion

This study concludes that both product knowledge and halal certification have a significant and positive influence on consumers' purchasing decisions of pharmaceutical products in Mojorejo Village. Product knowledge plays a stronger role, but halal certification also contributes meaningfully to consumer trust and decision-making. Together, these factors explain over half of the variation in purchase behavior. These results suggest that policymakers and pharmaceutical companies should invest in clearer halal labeling and community education programs to strengthen informed purchasing decisions among Muslim consumers.

Declarations

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Conflict of Interest

The authors declare no conflicting interest.

Data Availability

The unpublished data is available upon request to the corresponding author.

Ethics Statement

Not applicable.

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Additional Information

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