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Practices, Perceptions, and Trust of The Public Regarding Online Medication Purchasing In Jakarta In 2026

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ABSTRACT
The rapid growth of digital technology has increased the use of online platforms for purchasing medicines, offering greater convenience while raising concerns regarding medicine safety, product authenticity, and public trust. This study aimed to analyze the practices, perceptions, and trust of the public regarding online medication purchasing in Jakarta in 2026 and to examine their relationships with respondents' demographic characteristics. A quantitative observational study with a cross-sectional design was conducted among 385 respondents selected through purposive sampling. Data were collected using a structured online questionnaire consisting of practices, perceptions, and trust domains measured with a five-point Likert scale. Descriptive statistics were used for univariate analysis, while Spearman's rank correlation, Mann–Whitney U, and Kruskal–Wallis tests were applied for bivariate analysis at a significance level of $p < 0.05$. The results showed that 70.6% of respondents demonstrated good practices, 68.3% had positive perceptions, and 74.0% reported high trust toward online medication purchasing. Educational level and frequency of internet use were significantly associated with practices, perceptions, and trust ($p < 0.001$), whereas age and gender showed no significant association. Significant positive correlations were also observed among practices, perceptions, and trust. These findings indicate that higher educational attainment and greater internet use contribute to more favorable behaviors, perceptions, and trust regarding online medication purchasing. Strengthening digital health literacy and promoting the use of authorized online pharmacy platforms are essential to support safe and rational online medicine purchasing.
Keyword: *Online medication purchasing; Practices; Perceptions; Trust; Digital pharmacy.*

Introduction

The rapid advancement of digital technology has transformed healthcare services, including the increasing use of online platforms for purchasing medicines. Online medication purchasing offers convenience, faster access, and time efficiency, making it an attractive alternative for consumers. However, this convenience is accompanied by significant challenges, including the circulation of counterfeit and illegal medicines, limited pharmacist involvement, and inadequate public awareness regarding safe medicine purchasing practices (Alfin & Muhammad, 2024; Hartuti & Sasongko, 2023; Khwaileh & Kazić-Çakar, 2025). These issues raise concerns about medication safety and rational drug use, particularly in developing countries where digital health services continue to expand.

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Previous studies have shown that digital health applications and e-commerce platforms have become increasingly popular for purchasing medicines, particularly after the COVID-19 pandemic. The adoption of these services is influenced by perceived convenience, accessibility, and consumer trust in digital platforms (Sari et al., 2022; Wulandari et al., 2021). Other studies reported that online pharmacy services can improve access to pharmaceutical information and patient education when supported by licensed pharmacists (Ekadipta et al., 2022). Nevertheless, concerns remain regarding product authenticity, seller verification, and the quality of pharmaceutical services provided through online platforms (Pratama & Nugroho, 2023).

Public behavior toward online medication purchasing is commonly explained through three interrelated constructs: practices, perceptions, and trust. Practices describe consumers' purchasing behaviors, perceptions reflect their evaluation of the benefits and risks of online medication purchasing, while trust represents confidence in the safety, credibility, and reliability of online pharmacy platforms. Previous evidence suggests that higher trust increases consumers' intention to purchase medicines online, whereas higher perceived risk reduces trust and purchasing intention (Ersöz et al., 2023; Ferawaty et al., 2024; Limbu & Huhmann, 2024).

Despite these findings, important research gaps remain. Most previous studies focused on specific digital health services, such as telemedicine, COVID-19-related medicine purchases, or individual determinants of online purchasing behavior. Few studies have simultaneously examined practices, perceptions, and trust within a comprehensive quantitative framework, particularly among urban populations with high digital technology adoption. Moreover, evidence regarding the relationships between demographic characteristics and these three behavioral constructs remains limited in Indonesia, especially in Jakarta.

Therefore, this study aimed to analyze the practices, perceptions, and trust of the public regarding online medication purchasing in Jakarta and to examine their relationships with respondents' demographic characteristics. The findings are expected to provide evidence for promoting rational online medication purchasing and to support the development of safer digital pharmaceutical services and public health policies.

Methods

This quantitative observational study employed a cross-sectional design and was conducted in Jakarta, Indonesia, from June to July 2026. The study population comprised adults who had purchased medication online. Participants were recruited using purposive sampling based on the following inclusion criteria: aged 18–59 years, residing in Jakarta, and having purchased medication online at least

once in 2026 through digital platforms, including e-commerce marketplaces, telemedicine applications, online pharmacies, websites, or social media. Respondents who did not complete the questionnaire were excluded.

The minimum sample size was calculated using the Lemeshow formula for an unknown population with a 95% confidence level, 5% margin of error, and 50% estimated proportion, resulting in a minimum of 385 respondents.

Data were collected using a structured self-administered online questionnaire distributed through Google Forms via social media platforms. The questionnaire consisted of four sections: respondent characteristics, practices, perceptions, and trust regarding online medication purchasing. The three main constructs were each assessed using 10 items measured on a five-point Likert scale. Total scores ranged from 10 to 50 and were categorized using the Modified Bloom's cut-off point into good/moderate/poor for practices, positive/moderate/negative for perceptions, and high/moderate/low for trust.

Content validity was evaluated by three experts in clinical pharmacy. Construct validity was assessed using the Pearson Product-Moment correlation test, while internal consistency reliability was determined using Cronbach's alpha, with a value of ≥0.70 considered acceptable. A pilot study involving 15–30 respondents was conducted before the main survey to evaluate the questionnaire's reliability.

Descriptive statistics were used to summarize respondents' characteristics and study variables. Data normality was assessed using the Kolmogorov–Smirnov test. Depending on data distribution, Pearson's correlation or Spearman's rank correlation was applied to examine relationships among practices, perceptions, trust, and respondents' characteristics. The Mann–Whitney U test was used for dichotomous variables, whereas the Kruskal–Wallis test was used for variables with more than two categories. Statistical significance was established at $p < 0.05$. All analyses were performed using IBM SPSS Statistics.

Ethical principles were implemented by obtaining electronic informed consent from all participants before questionnaire completion. Respondents' identities remained anonymous, data confidentiality was maintained, and the study protocol complied with the Declaration of Helsinki and institutional ethical requirements.

Result and Discussion

This study employed a quantitative observational approach with a cross-sectional design to analyze the practices, perceptions, and trust of the public regarding online medication purchasing in Jakarta. Data were collected from June to July 2026 using a structured online questionnaire distributed through Google Forms to respondents who met the study inclusion criteria. A total of 394 responses

were received, and after data cleaning to ensure completeness and eligibility, 385 questionnaires were included in the final analysis.

The collected data were analyzed using IBM SPSS Statistics. Univariate analysis was performed to describe respondents' characteristics and the distribution of practices, perceptions, and trust toward online medication purchasing. Furthermore, bivariate analysis was conducted to examine the associations between respondents' characteristics and the study variables. The findings of these analyses are presented in the following tables.

A total of 385 respondents who met the inclusion criteria were included in the final analysis. Respondents' characteristics were analyzed to provide an overview of the study population. The variables included age, gender, educational level, occupation, frequency of internet use, preferred platform for online medication purchasing, and the type of medication purchased online. The distribution of respondents' characteristics is presented as frequencies and percentages in **Table 1**.

Table 1. Spearman Rank Correlation Analysis Results

Characterictics	**Category**	**N**	**%**	**Practices p-value**	**Perceptions p-value**	**Trust p-value**
Age	18	2	0.5	0.247	0.085	0.308
	19	3	0.8	(rs= 0.059)	(rs = 0.088)	(rs = 0.052)
	20	10	2.6			
	21	11	2.9			
	22	15	3.9			
	23	15	3.9			
	24	29	7.5			
	25	37	9.6			
	26	28	7.3			
	27	32	8.3			
	28	19	4.9			
	29	23	6.0			
	30	19	4.9			
	31	23	6.0			
	32	14	3.6			
	33	16	4.2			
	34	13	3.4			
	35	14	3.6			
	36	8	2.1			

	37	5	1.3			
	38	3	0.8			
	39	8	2.1			
	40	6	1.6			
	41	3	0.8			
	42	4	1.0			
	43	1	0.3			
	45	4	1.0			
	46	3	0.8			
	47	1	0.3			
	48	3	0.8			
	49	3	0.8			
	51	1	0.3			
	52	3	0.8			
	53	3	0.8			
	55	2	0.5			
	56	1	0.3			
Total		**385**	**100**			
Education Level	Elementary School	1	0.3	0.000 (rs = 0.392)	0.000 (rs = 0.365)	0.000 (rs = 0.373)
	Junior High School	3	0.8			
	Senior High School	124	32.2			
	Diploma	67	17.4			
	Bachelor's Degree	187	48.6			
	Postgraduate	3	0.8			
Total		**385**	**100**			
Daily Internet Use Frequency	Very Rarely	2	0.5	0.000 (rs = 0.483)	0.000 (rs = 0.472)	0.000 (rs = 0.461)
	Rarely	3	0.8			
	Occasionally	23	6.0			

	Frequently	132	34.3			
	Very Frequently	225	58.4			
Total		**385**	**100**			
Practices	Good	272	70.6	x	0.000 (rs = 0.784)	0.000 (rs = 0.765)
	Moderate	90	23.4			
	Poor	23	6.0			
Total		**385**	**100**			
Perceptions	Positive	263	68.3	0.000 (rs = 0.784)	x	0.000 (rs = 0.810)
	Moderate	97	25.2			
	Negative	25	6.5			
Total		**385**	**100**			
Trust	High	285	74.0	0.000 (rs = 0.765)	0.000 (rs = 0.810)	x
	Moderate	80	20.8			
	Low	20	5.2			
Total		**385**	**100**			

Table 2. Mann–Whitney Test Results by Gender

Characteristics	**Category**	**n**	**%**	**Practices *p*-value**	**Perceptions *p*-value**	**Trust *p*-value**
Gender	Male	124	32.2	0.221	0.243	0.202
	Female	261	67.8			

Table 3. Kruskal–Wallis Test Results

Characteristics	**Category**	**n**	**%**	**Practices p-value**	**Perceptions p-value**	**Trust p-value**
Occupation	Unemployed	2	0.5	0.000	0.001	0.001
	Student	94	24.4			
	Private Employee	178	46.2			
	Government Employee	73	19.0			
	Entrepreneur	16	4.2			
	Homemaker	22	5.7			
Purchasing Platform	General Marketplace	88	22.9	0.028	0.019	0.080
	Telemedicine	146	37.9			

	Application					
	Social Media	114	29.6			
	Pharmacy Website	37	9.6			
Type of Medicine Purchased	Over-the-Counter (OTC) Medicines	130	33.8	0.369	0.230	0.031
	Limited Over-the-Counter Medicines	46	11.9			
	Prescription Medicines	53	13.8			
	Vitamins/Supplements	156	40.5			

1.1 Univariate Analysis

A total of 385 respondents were included in the analysis, with no missing data. Most respondents were young adults aged 24–31 years, female (67.8%), held a bachelor's degree (48.6%), worked as private employees (46.2%), and reported frequent daily internet use (58.4%). Telemedicine applications were the most frequently used platform for purchasing medicines (37.9%), followed by social media, marketplaces, and official pharmacy websites. Vitamins and supplements were the most commonly purchased products (40.5%), while most respondents demonstrated good practices (70.6%), positive perceptions (68.3%), and high trust (74.0%) toward online medicine purchasing.

These findings suggest that online medicine purchasing is predominantly adopted by digitally literate individuals with high internet engagement and educational attainment. Similar findings have been reported by Fittler et al. (2022), who found that online pharmacy users are generally younger and better educated, enabling them to access and critically evaluate digital health information. Furthermore, Nurhaida et al. (2024) emphasized that digital health adoption is influenced by perceived ease of use, privacy, and security. The high utilization of telemedicine observed in this study also indicates increasing public acceptance of integrated digital healthcare services that provide medical consultation, medication information, and electronic prescription services, thereby contributing to positive practices, perceptions, and trust toward online medicine purchasing.

1.2 Association Between Respondent Characteristics and Practices, Perceptions, and Trust

Spearman correlation analysis showed that age was not significantly associated with practices ($r = 0.059$, $p = 0.247$), perceptions ($r = 0.088$, $p = 0.085$), or trust ($r = 0.052$, $p = 0.308$) toward online medicine purchasing. The absence of significant associations may be explained by the relatively homogeneous age distribution of respondents, who were predominantly young adults with high digital engagement. This finding suggests that digital literacy and familiarity with online technologies may play a more important role than chronological age in shaping consumer behavior toward online pharmaceutical services. Similar findings have been reported by Fittler et al. (2022) and Nurhaida et al. (2024), who concluded that technology acceptance is primarily influenced by perceived usefulness, ease of use, and digital health literacy rather than demographic characteristics such as age.

In contrast, educational level demonstrated significant positive correlations with practices ($r = 0.392$, $p < 0.000$), perceptions ($r = 0.365$, $p < 0.000$), and trust ($r = 0.373$, $p < 0.000$). Respondents with higher educational attainment were more likely to exhibit safer purchasing practices, more favorable perceptions, and greater trust toward online medicine purchasing. Higher education may enhance health literacy, critical thinking, and the ability to evaluate the credibility of online pharmacies and medication information. These findings agree with previous studies indicating that education facilitates the adoption of digital health services by improving consumers' capacity to assess the quality, safety, and legitimacy of online healthcare platforms (Fittler et al., 2022; Nurhaida et al., 2024).

Similarly, internet use frequency was positively associated with practices ($r = 0.483$, $p < 0.000$), perceptions ($r = 0.472$, $p < 0.000$), and trust ($r = 0.461$, $p < 0.000$), representing moderate positive correlations. Frequent internet users are more likely to access health information, compare medicine prices, verify the legitimacy of online pharmacies, and become familiar with digital healthcare services, which may contribute to safer purchasing behaviors and stronger trust. These findings are consistent with Ayunda et al. (2023), who reported that greater internet use promotes more informed online medicine purchasing decisions, and with Gharaibeh et al. (2023), who emphasized that digital health information can improve consumer decision-making when accompanied by adequate evaluation of information credibility.

1.3 Association Between Gender and Practices, Perceptions, and Trust

The Mann–Whitney U test showed no significant differences between male and female respondents in practices ($p = 0.221$), perceptions ($p = 0.243$), or trust ($p = 0.202$) regarding online medicine purchasing. These findings indicate that gender

was not a significant determinant of respondents' behaviors, perceptions, or trust toward online pharmaceutical services. Although female respondents represented the majority of the study population, this demographic predominance did not translate into significant differences in attitudes or purchasing practices between genders.

The absence of gender differences may reflect the widespread accessibility of digital technologies and online healthcare services, which provide both men and women with similar opportunities to obtain health information and purchase medicines online. Consequently, consumer behavior appears to be influenced more by digital literacy, previous experience with online platforms, and access to reliable health information than by gender itself. These findings are consistent with Fittler et al. (2022), who reported that demographic characteristics such as gender play a limited role in online pharmacy utilization compared with health literacy and digital competence. Similarly, Nurhaida et al. (2024) found that acceptance of digital health services is primarily driven by perceived ease of use, perceived usefulness, and system security rather than demographic factors.

Overall, the findings suggest that interventions aimed at promoting safe online medicine purchasing should focus on improving health literacy, digital literacy, and awareness of safe purchasing practices rather than adopting gender-specific strategies. Strengthening consumer education and enhancing the quality and security of digital pharmaceutical services are likely to improve practices, perceptions, and trust across all user groups.

1.4 Association of Occupation, Purchasing Platform, and Type of Medicine with Practices, Perceptions, and Trust

The Kruskal–Wallis analysis demonstrated that occupation was significantly associated with practices ($p < 0.000$), perceptions ($p = 0.001$), and trust ($p = 0.001$) toward online medicine purchasing. These findings suggest that occupational characteristics may influence individuals' experiences and attitudes toward digital pharmaceutical services. Respondents with occupations requiring greater mobility, such as private-sector employees, may prefer online medicine purchasing because of its convenience, accessibility, and time efficiency. Moreover, occupation is often associated with socioeconomic status, digital exposure, and access to health information, which may contribute to differences in online purchasing behaviors. Similar findings have been reported by Ayunda et al. (2023) and Gharaibeh et al. (2023), who found that occupational demands and modern lifestyles encourage the adoption of digital healthcare services while emphasizing the importance of safe and reliable online pharmaceutical platforms.

Purchasing platform was significantly associated with practices ($p = 0.028$) and perceptions ($p = 0.019$), but not with trust ($p = 0.080$). Respondents using

telemedicine applications may demonstrate better practices and more positive perceptions because these platforms commonly provide integrated healthcare services, including physician or pharmacist consultations, electronic prescriptions, and comprehensive medication information. However, trust did not differ significantly across platform types, suggesting that consumer trust depends more on service quality, transaction security, platform reputation, and confidence in medicine authenticity than on the platform itself. This finding is consistent with Ersöz et al. (2023), who reported that trust in online medicine purchasing is primarily influenced by perceived security, seller credibility, and perceived risk rather than by the type of digital platform.

The type of medicine purchased was significantly associated with trust ($p = 0.031$) but not with practices ($p = 0.369$) or perceptions ($p = 0.230$). This finding indicates that consumers generally apply similar purchasing behaviors regardless of medicine category, while their level of trust varies according to the perceived risk of the product. Prescription medicines require greater confidence in the legitimacy of the platform, the authenticity of medicines, and the availability of professional pharmaceutical support than over-the-counter medicines or dietary supplements. Similar observations were reported by Ekadipta et al. (2022), who emphasized that consumer trust in digital pharmaceutical services is strengthened by accurate medication information, pharmacist involvement, and assurance that medicines originate from licensed and authorized providers. Overall, these findings highlight that experiential factors related to online healthcare services play a greater role than demographic characteristics in shaping practices, perceptions, and trust toward online medicine purchasing.

1.5 Association between Practices, Perceptions, and Trust in Online Medicine Purchasing

Spearman correlation analysis demonstrated strong positive relationships among practices, perceptions, and trust toward online medicine purchasing. Practices were strongly correlated with perceptions ($r = 0.784$, $p < 0.000$) and trust ($r = 0.765$, $p < 0.000$), indicating that respondents with more positive perceptions and greater trust were more likely to engage in appropriate online medicine purchasing practices. Positive perceptions regarding the convenience, usefulness, and safety of online pharmacy services may encourage consumers to make more informed and responsible purchasing decisions. These findings are consistent with Adelina et al. (2024), who reported that favorable perceptions of online pharmacy applications increase service utilization, and with Ersöz et al. (2023), who highlighted that lower perceived risk promotes safer online purchasing behaviors.

The strongest correlation was observed between perceptions and trust ($r = 0.810$, $p < 0.000$), suggesting that positive consumer perceptions are fundamental to

the development of trust in online pharmaceutical services. Consumers who perceive online platforms as easy to use, secure, informative, and professionally managed are more likely to trust these services. This finding supports previous studies indicating that perceived usefulness, service quality, transaction security, and perceived risk are major determinants of consumer trust in digital healthcare (Ekadipta et al., 2022; Ersöz et al., 2023). Trust is particularly important in online medicine purchasing because consumers cannot directly verify medicine quality or seller credibility before completing a transaction.

Overall, these findings indicate that perceptions, trust, and practices form an interconnected framework that influences the acceptance of online medicine purchasing. Positive perceptions enhance consumer trust, while increased trust promotes safer and more appropriate purchasing practices. Therefore, strengthening digital pharmaceutical services should focus on improving the quality of medication information, ensuring transaction security, increasing pharmacist involvement, and maintaining regulatory compliance. These strategies may enhance consumer confidence and encourage responsible online medicine purchasing behavior.

1.6 Research Implications

This study provides important implications for policymakers, pharmacists, digital health service providers, and the public. The high levels of practices, perceptions, and trust indicate that the community has generally accepted online medicine purchasing, highlighting the growing role of digital pharmaceutical services.

For policymakers, the findings emphasize the need to strengthen regulations and monitoring of online medicine sales to prevent the distribution of counterfeit, illegal, or prescription-only medicines without proper authorization. Public education on purchasing medicines only from licensed online pharmacies should also be enhanced.

For pharmacists, the results underline the importance of expanding pharmaceutical care through digital platforms by providing reliable drug information, patient education, and online consultation to promote the safe and rational use of medicines.

For telemedicine providers and online pharmacies, maintaining high-quality services, ensuring medicine authenticity, protecting personal data, and improving access to professional consultation are essential to sustaining public trust.

Finally, for the public, these findings highlight the importance of purchasing medicines responsibly by choosing authorized platforms, carefully reviewing medicine information, and consulting healthcare professionals when necessary to ensure safe and appropriate medicine use.

1.7 Study Limitations

This study has several limitations. First, its cross-sectional design only reflects respondents' conditions at a single point in time, preventing causal inferences between variables. Second, the use of purposive sampling and an online questionnaire may have introduced selection bias, as only individuals with internet access and willingness to participate were included, limiting the generalizability of the findings.

In addition, this study focused only on the associations between respondents' characteristics and practices, perceptions, and trust regarding online medicine purchasing. Other factors, such as income, health literacy, previous experience with digital health services, service quality, platform promotion, and psychological factors, were not examined.

Future studies should employ longitudinal or cohort designs, include larger and more diverse populations, and investigate additional determinants to provide a more comprehensive understanding of the factors influencing practices, perceptions, and trust in online medicine purchasing.

Conclusion

This study found that most respondents were young adults, female, held a bachelor's degree, worked as private-sector employees, frequently used the internet, primarily purchased medicines through telemedicine applications, and most commonly purchased vitamins or dietary supplements. Overall, respondents demonstrated good practices, positive perceptions, and high trust toward online medicine purchasing. Education level and frequency of internet use were significantly associated with practices, perceptions, and trust, while age, gender, occupation, purchasing platform, and type of medicine purchased were not significantly associated with the three study variables. These findings suggest that educational attainment and digital engagement may play an important role in shaping practices, perceptions, and trust toward online medicine purchasing. Strengthening health literacy and digital literacy, as well as improving access to reliable pharmaceutical information, may further promote safe and responsible online medicine purchasing.

Recommendations

The public is encouraged to purchase medicines through licensed pharmacies or officially authorized digital platforms, verify the legality of products and sellers, and consult healthcare professionals before purchasing or using certain medicines to ensure their safety and effectiveness. Pharmacists and digital healthcare providers are encouraged to continuously improve service quality by

providing complete, accurate, and easy-to-understand medicine information and strengthening public education on rational medicine use to increase trust in digital pharmaceutical services. The government, the Food and Drug Authority (BPOM), and relevant institutions are encouraged to strengthen supervision of online medicine distribution, improve public education on safe medicine purchasing, and take firm action against the online distribution of illegal medicines. Future research is recommended to involve larger sample sizes and broader study areas to improve generalizability, include additional variables such as health literacy, income level, experience with digital services, service quality, and user satisfaction, and consider longitudinal research designs to provide a deeper understanding of relationships among the variables.

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