

The Relationship Between Knowledge of the Medical Code of Ethics and the Attitudes of Internship Doctors in Improving the Safety of High-Alert Medications with Look-Alike, Sound A-like (LASA)

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Abstract: Medication errors involving Look-Alike Sound-Alike (LASA) drugs pose a critical risk to patient safety, particularly among less experienced internship doctors. Mastery of the Indonesian Medical Code of Ethics (KODEKI) serves as an essential moral foundation to promote vigilance in clinical practice. To evaluate the correlation between KODEKI knowledge and the attitudes of internship doctors toward improving LASA medication safety in Jambi City. Methods: This quantitative analytic research adopted a cross-sectional approach. Utilizing purposive sampling, 55 internship doctors at hospitals and health centers in Jambi City were enrolled from May to June 2026. Data were gathered through questionnaires and analyzed using the Pearson product-moment correlation test. Results: Most respondents demonstrated 'Good' KODEKI knowledge (76.4%) and a 'Positive' attitude toward LASA drug safety (78.2%). Bivariate analysis confirmed a strong, statistically significant correlation between ethical awareness and professional attitude ($r = 0.795$; $p = 0.000$). Conclusion: A strong, significant positive relationship exists between medical ethics knowledge and internship doctors' attitudes. Enhanced ethical understanding directly fosters a more proactive stance in reinforcing LASA drug management safety to preserve patient well-being

Keywords: Internship Doctors; Medication Safety; KODEKI; LASA Drugs; Patient Safety

1. Introduction

Patient safety is one of the primary goals of modern healthcare. In medical practice, one of the greatest threats to patient safety is medication errors, which often occur due to the use of Look-Alike Sound-Alike (LASA) medications. LASA medications refer to drugs with similar names or packaging, which can cause confusion among healthcare professionals and increase the risk of errors.

The implementation of patient safety principles in medication use requires adherence to the medical code of ethics and the practice of rational drug use, because a sound understanding of ethics encourages physicians to exercise greater caution in managing high-

risk medications, in line with the importance of appropriate prophylactic antibiotic use to reduce the risk of infection and improve patients' clinical outcomes (Harahap et al., 2020).

The Indonesian Code of Medical Ethics (KODEKI) provides ethical guidelines for all physicians to practice responsibly, based on the fundamental principle of protecting patient safety from avoidable risks. An understanding of KODEKI is expected to foster more professional and cautious attitudes among physicians in handling LASA medications. This is particularly crucial for internship doctors who are new to the world of clinical practice and often face challenges related to limited experience and heavy workloads.

Knowledge of the medical code of ethics serves as a foundation for shaping the professional attitudes of healthcare professionals to prioritize patient safety, while competency development through the Project-Based Learning method has also been proven to enhance medical students' ability to think innovatively, solve problems, and create solutions in the healthcare sector, thereby producing graduates who are competent both professionally and adaptable to the evolving healthcare landscape (Humaryanto; et al., 2025).

Although some studies indicate that knowledge of the code of ethics can influence clinical attitudes and behavior, there are still differing views regarding the importance of the relationship between knowledge of the code of ethics and physicians' proactive attitudes in preventing medication errors. Therefore, this study aims to analyze the relationship between knowledge of the medical code of ethics and the attitudes of internship doctors toward improving the safety of high-alert LASA medications in Jambi City.

Knowledge is an important factor influencing the formation of a person's attitudes and behaviors. Therefore, increasing knowledge through counseling or training can encourage positive behavioral changes. This is consistent with the study by Humaryanto et al., which showed that counseling and training were able to improve teachers' knowledge, thereby supporting behavioral changes in maintaining health during the COVID-19 pandemic. Likewise, knowledge of the medical code of ethics is expected to shape doctors' professional attitudes in improving patient safety (Humaryanto; et al., 2021).

Many patient safety incidents (PSIs) and medication errors in primary healthcare services are actually preventable. Gradual education, training, and the creation of anonymous/user-friendly reporting systems can increase staff knowledge from 52% to 94% (Guspianto; et al., 2025).

A positive perception of the learning environment is associated with the use of deeper learning strategies among medical students. These findings support this study by indicating that the development of physicians' professional attitudes is influenced not only by knowledge but also by an educational environment that effectively facilitates the learning process, enabling knowledge of the medical code of ethics to be applied in clinical practice, including efforts to improve the safe use of LASA medications (Shafira et al., 2014)..

2. Methods

This study is a quantitative study using a descriptive-analytic approach. The research design employed was a cross-sectional study, conducted at community health centers (Puskesmas) and hospitals in Jambi City from May to June 2026. The study population consisted of internship doctors who were actively on duty. Using a purposive sampling technique, a sample of 55 respondents who met the inclusion criteria was obtained.

Data were collected through a validated questionnaire consisting of 10 statements to measure knowledge of the KODEKI and 10 statements to evaluate attitudes toward LASA

medications using a 5-point Likert scale. The instrument was tested and proven to be valid (calculated $r = 0.807-0.946 > \text{table } r = 0.444$) and highly reliable (Cronbach's Alpha = 0.984). The data were analyzed using univariate and bivariate analyses, beginning with the Kolmogorov-Smirnov normality test, followed by the Pearson product-moment correlation test to examine the hypothesis of the relationship between the variables.

3. Results and Discussion

3.1. Result

3.1.1. Characteristics and Distribution of Respondents

The majority of respondents were female, totaling 38 individuals (69.1%). Most were from public universities (63.6%), completed their internship at Community Health Centers (Puskesmas) (52.7%), and had been serving for 5–8 months (50.9%).

Regarding the KODEKI knowledge variable, 42 respondents (76.4%) had a **Good** level of knowledge, 13 respondents (23.6%) were in the **Fair** category, and none were in the **Poor** category. For the attitude variable, the majority of respondents, namely 43 individuals (78.2%), demonstrated a **Positive** attitude toward LASA medication safety, while 12 respondents (21.8%) had a **Neutral** attitude. The normality test results indicated that the data were normally distributed, with a significance value of $p = 0.169$ ($p > 0.05$) (Markose et al., 2016).

3.1.2. Bivariate Analysis Results

To examine the relationship between knowledge of the KODEKI and the attitudes of internship doctors toward improving the safety of LASA medications, the Pearson product-moment correlation test was conducted. The test results are presented in Table 1.

Table 1. Pearson Correlation Between KODEKI Knowledge and Attitudes Toward LASA.

Variabel	r	Sig.(p)	n
Knowledge of the KODEKI and Attitude Toward LASA	0,795	0,000	55

Based on Table 1, the Pearson correlation coefficient (r) was 0.795, with a significance value (p) of 0.000 ($p < 0.01$). This result indicates a strong positive and statistically significant relationship between internship doctors' level of knowledge regarding the Indonesian Medical Code of Ethics (KODEKI) and their attitudes toward maintaining the safety of LASA (Look-Alike, Sound-Alike) medication management.

3.1.3. Differences in the Level of Knowledge of Internship Doctors in Hospital and Community Health Centers (Puskesmas)

The average KODEKI knowledge score among internship doctors assigned to Community Health Centers (40.79 ± 3.41) was slightly higher than the average score among those assigned to Hospitals (39.42 ± 3.83). In terms of category distribution, respondents with a **Good** level of knowledge were also more prevalent in the Community Health Center group (86.2%) than in the Hospital group (65.4%), whereas the proportion of respondents with a **Fair** level of knowledge was higher in the Hospital group (34.6%) than in the Community Health Center group (13.8%). No respondents in either group were classified as having a **Poor** level of knowledge.

Nevertheless, the results of the independent samples t-test showed that the difference in the mean knowledge scores between the Hospital and Community Health Center

(Puskesmas) groups was not statistically significant ($p = 0.166$; $p > 0.05$). In other words, statistically, there was no significant difference in the level of knowledge (cognitive domain) between internship doctors assigned to hospitals and those assigned to community health centers. The tendency for slightly higher scores in the Community Health Center group may be interpreted as normal variation resulting from differences in case characteristics, the intensity of interaction with LASA medications, and the clinical supervision received at each healthcare facility. However, this variation was not large enough to be considered a systematic difference between the two types of facilities. These findings indicate that internship doctors' ethical knowledge regarding the Indonesian Code of Medical Ethics (KODEKI) is relatively uniform, regardless of the type of healthcare facility where they undertake their internship, and is influenced more by educational background and individual learning before and during the internship period (Forouzadeh et al., 2018).

3.1.4. Distribution of Respondents Based on Their Attitudes Toward LASA Medication Safety

The attitudes of internship doctors toward LASA medication safety were also measured using 10 statements on a Likert scale (score range: 10–50), which were then converted into percentages and categorized as Positive ($\geq 76\%$), Neutral (56–75%), and Negative ($< 56\%$).

Table 2. Distribution of Respondents Based on Their Attitudes Toward LASA

Attitude Category	n	%
Positive ($\geq 76\%$)	43	78,2
Neutral (56-75%)	12	21,8
Negative ($< 56\%$)	0	0,0
Total	55	100

It is known that the mean attitude score of the respondents was 39.69 (SD = 2.83) out of a maximum score of 50, equivalent to a mean percentage score of 79.4%. The majority of respondents, 43 individuals (78.2%), demonstrated a ****Positive**** attitude toward LASA medication safety, while 12 respondents (21.8%) were categorized as ****Neutral****, and no respondents exhibited a ****Negative**** attitude (0%). These findings indicate that most internship doctors have demonstrated a vigilant attitude and a patient safety-oriented approach in the management of medications that are at risk of being confused due to similarities in their names, spelling, or packaging (Tuomisto et al., 2026).

3.1.5. Distribution of Respondents Based on Knowledge of the KODEKI Related to LASA

The KODEKI knowledge variable regarding LASA medication safety was measured using 10 statements on a Likert scale (score range: 10–50), then converted into percentages and classified into three categories: Good ($\geq 76\%$), Fair (56–75%), and Poor ($< 56\%$), in accordance with the operational definitions in Chapter III.

Table 3. Distribution of Respondents Based on Their Knowledge of the KODEKI Regarding LASA

Knowledge Category	n	(%)
Good ($\geq 76\%$)	42	76,4
Fair (56-75%)	13	23,6
Poor ($< 56\%$)	0	0,0
Total	55	

The mean respondent knowledge score was 40.15 (SD = 3.64) out of a maximum score of 50, equivalent to a mean percentage score of 80.3%. The majority of respondents, 42 individuals (76.4%), had a Good level of knowledge of the KODEKI related to the safety of LASA medications. A total of 13 respondents (23.6%) were in the Fair category, and no respondents were found to have a Poor level of knowledge (0%).³⁵ These results indicate that, overall, the internship doctors in this study had a good understanding of the ethical principles of the KODEKI, including non-maleficence, beneficence, autonomy, justice, and interprofessional collaboration in the context of preventing medication errors involving LASA medications.

The research results by Lipinwati et al. showed that 86% of participants experienced an increase in knowledge after receiving health education on hypertension, and this increase in knowledge is expected to enhance awareness and encourage positive behavioral changes. These findings are consistent with the results of this study, which indicate that knowledge of the medical code of ethics plays a role in shaping the attitudes of internship doctors to improve the safe use of LASA medications and patient safety (Kusdiyah et al., 2025).

3.2. Discussion

This study found that a good understanding of medical ethics enables internship doctors to practice vigilance when prescribing and verifying LASA medications. This is consistent with the theoretical concept that the cognitive component serves as an important foundation for shaping an individual's emotional and behavioral components. Internship doctors who understand ethical principles such as non-maleficence and beneficence tend to demonstrate a high level of vigilance.

The research findings of Lipinwati et al., which show that increasing knowledge through educational outreach leads to improved understanding, awareness, and behavioral change, are consistent with the findings of this study, which demonstrate a relationship between knowledge of the medical code of ethics and the attitudes of internship doctors in enhancing the safe use of LASA medications. Thus, it can be concluded that knowledge is one of the factors that plays a role in shaping the professional attitudes of healthcare workers (Lipinwati, Istarini, Halim, et al., 2024).

A strong positive correlation ($r = 0.795$) indicates that the better physicians' understanding of the KODEKI, the more proactive their attitude is in preventing medication incidents. This positive attitude is reflected in the respondents' willingness to recheck prescriptions, support double-checking, and report near-miss incidents. These findings reinforce previous studies showing that ethics education influences clinical decision-making (Harch et al., 2024).

The majority of respondents had completed internships lasting 5–8 months (50.9%) and 9–12 months (29.1%), meaning that nearly 80% of the respondents had accumulated a relatively substantial period of clinical experience. A longer internship duration allows internship doctors to gain more direct experience in managing clinical situations, including the handling of high-risk medications such as LASA (Look-Alike, Sound-Alike) drugs, thereby contributing to the development of more comprehensive knowledge and more mature attitudes regarding patient safety (Neelakantan et al., 2024).

The study results showed that 86% of participants experienced an increase in knowledge after receiving health education on hypertension, and this increase in knowledge is expected to enhance awareness and encourage positive behavioral changes. This finding is consistent with the results of the present study, which indicate that knowledge of the medical code of ethics plays a role in shaping the attitudes of internship doctors toward improving the safe use of LASA medications and ensuring patient safety (Lipinwati, Istarini, Dewi, et al., 2024).

However, this study has several limitations. The cross-sectional design cannot explain causal relationships. In addition, the use of self-report questionnaires carries the risk of subjective bias, and the sample being limited to Jambi City means that the generalization of the findings should be made with caution.

Conclusions

There is a strong and statistically significant relationship between knowledge of the Indonesian Code of Medical Ethics (KODEKI) and the attitudes of internship doctors in improving the safety of LASA medications ($r = 0.795$; $p = 0.000$). The majority of internship doctors have Good knowledge of KODEKI (76.4%) and demonstrate a Positive attitude (78.2%). The better a doctor's understanding of ethics, the more proactive their attitude is in maintaining the safety of LASA medication management.

This good ethical knowledge is important because the Indonesian Medical Code of Ethics (KODEKI) serves not only as a normative guideline but also as the basis for physicians' considerations in everyday clinical decision-making, including prescribing, writing prescriptions, and verifying medications that may be confused due to similarities in names, handwriting, or packaging (LASA). A good understanding of the medical code of ethics can help physicians recognize the importance of patient safety, particularly in the administration of high-risk medications, as explained in the literature review in Chapter II of this study. Nevertheless, 23.6% of respondents still fell into the Fair category, indicating variations in understanding among individuals that require attention, for example through strengthening medical ethics and medication safety content in orientation programs as well as continuing training for internship doctors.

Education delivered through a hybrid seminar significantly improved participants' knowledge of TORCH infections, as demonstrated by an increase in the median score from 70 to 100 ($p < 0.001$). These findings reinforce that enhancing knowledge through educational processes is an important step in shaping attitudes and behaviors that support safe health practices, just as knowledge of the medical code of ethics plays a role in shaping the attitudes of medical interns to improve the safe use of look-alike, sound-alike (LASA) medications and patient safety (Ekaputri et al., 2025).

The finding that students with a higher level of knowledge tend to have better prescription-writing skills is consistent with the results of this study, which show that

knowledge of the medical code of ethics plays a role in shaping the attitudes of internship doctors. This indicates that improving knowledge serves as an important foundation for the development of professional competence, both in terms of clinical skills and attitudes that support patient safety.

Doctors who practice lifelong learning, self-reflection, and self-evaluation will develop into reflective practitioners who consistently maintain and enhance their professionalism. These findings reinforce the results of this study that knowledge of the medical code of ethics not only serves as a foundation of knowledge but also forms the basis for shaping the professional attitudes of internship doctors in providing safe healthcare services, including improving the safety of the use of LASA medications (Shafira, 2015). LASA drugs may lead to significant medication errors and could quite conceivably result in harm to the patients.

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional study design only describes the relationships among variables at a single point in time and therefore cannot establish a causal relationship between knowledge of the KODEKI and attitudes toward LASA (Bryan et al., 2021). Second, data collection using self-report questionnaires may introduce subjective response bias, as participants assess their own knowledge and attitudes. Third, the sample was limited to a single region (Jambi City), which means that the findings cannot yet be broadly generalized to the population of internship doctors in other regions with different healthcare facility characteristics and educational curricula. Based on the study's limitations, internship doctors are advised to maintain a vigilant attitude through self-directed learning, and educational institutions need to strengthen the clinical simulation curriculum related to LASA medications. Healthcare facilities are recommended to conduct periodic evaluations and implement labeling support systems. Future researchers are encouraged to use a longitudinal design with triangulation methods (such as direct observation) to avoid self-report bias and to expand the regional sample coverage.

Conflicts of Interest

The authors declare no conflict of interest.

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