

Pharmacy technician knowledge and behavior regarding high alert drugs

Muhajri Agusfina^{1*}, Renatalia Fika², Mevy Trisna³, Desy Kurniaty⁴, Zulfisa Zulfisa⁵

^{1*,2,3,4,5}Prodi DIII Farmasi, Sekolah Tinggi Sains Dwi Farma Bukittinggi, Indonesia

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ABSTRACT

High Alert is a drug that often causes serious errors (sentinel event). This drug is very high risk and can cause unwanted impacts (adverse outcomes), therefore it is necessary to supervise its use. The purpose of this study was to determine the level of knowledge of pharmacy vocational staff about the management of high alert drugs at the Pharmacy Installation of X Hospital in Dumai City and to describe the relationship between knowledge and behavior of pharmacy vocational staff about the management of high alert drugs at the Pharmacy Installation of X Hospital in Dumai City. The research was conducted using non-experimental observational methods with a cross-sectional analytic approach with questionnaire data design. The population in this study were all pharmacy vocational staff at the Pharmacy Installation of X Hospital in Dumai City, totaling 23 people. The sample used was using total sampling technique. The validity and reliability values obtained by researchers about knowledge and behavior statements are declared valid if the r count and the value of Person Croanch's Alpha obtained > 0.630 . Based on the questionnaire, it is declared reliable because the value of Person Cronch's Alpha for knowledge is 0.702 and behavior is 0.891 > 0.630 . Based on the results of the research conducted, it can be concluded that there is no relationship between the knowledge and behavior of pharmacy vocational staff in managing high alert drugs at X Hospital in Dumai City with a significance value > 0.005 $p =$ value 1.028. This study shows that there is no relationship between knowledge and behavior.

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Corresponding Author:

Muhajri Agusfina,
Prodi DIII Farmasi,
Sekolah Tinggi Sain Dwi Farma Bukittinggi,
Jl.Padat Karya Campago Guguaq Bulek Bukittinggi, 26111, Indonesia
Email: ajriruben@gmail.com

INTRODUCTION

Pharmaceutical services in hospitals are an integral part of the hospital health service system which is oriented towards patient care, the provision of quality and affordable Pharmaceutical Supplies, Medical Devices, and Consumable Medical Materials for all levels of society including clinical pharmacy services (Akri, 2023). The Pharmacy Installation must have Pharmacists and pharmaceutical vocational personnel in accordance with the workload and other supporting staff in order to achieve the goals and objectives of the Pharmacy Installation. The availability of the

number of pharmacists and pharmacy vocational personnel in hospitals is fulfilled in accordance with the provisions on the classification and licensing of hospitals stipulated by the Minister (Yonrizon et al. , 2025).

High Alert is a drug that often causes serious errors (sentinel event). This drug is very high risk and can cause unwanted impacts (adverse outcomes), therefore there is a need for supervision in its use (Fika, et al., 2025). To improve safety in the use of these drugs, hospitals need to develop policies in the management of drugs that are included in the high alert drug category as regulated in Permenkes RI No. 72 of 2016 concerning Pharmaceutical Service Standards, especially for drugs that need to be watched out for because they have a very serious impact if there is an error in their use and management. Some types of drugs included in the High Alert Drug category include high-risk drugs (e.g. insulin or heparin), drugs with the LASA/NORUM (Look A Like Sound A Like) category, high concentrate electrolytes/concentrated solutions (e.g. magnesium sulfate 20%, magnesium sulfate 40%, concentrated sodium chloride 3%, potassium phosphate, dextrose 20%, dextrose 40%) and cytotoxics (Hilda and Murtisiwi, 2023 ; Aulia et al , 2024).

One of the efforts that can be made to minimize or prevent errors in the use of High Alert drugs is to regulate the storage of drugs that fall into the High Alert category. Many cases have occurred regarding the management and use of high alert drugs due to lack of vigilance towards the management and storage of these drugs such as reports and some literature sent to the ISMP National Medication Errors Reporting Program (ISMP MERP) (Hilda and Murtisiwi, 2023; Aulia ; Yonrizon. The most effective step to deal with the problem of errors in the administration of High Alert drugs is to improve the storage system, namely by separating or storing drugs that fall into the high alert category in separate places/cabinets and not mixed with other types of drugs so as not to pose a risk in their use. Providing special markings is very important for High Alert drugs, especially to prevent errors when taking and serving drugs.

Research on the suitability of high alert drug storage in the Pharmacy Installation of RSD Idaman Banjarbaru is not in full accordance with the SOP (Standard Operational Procedure) of RSD Idaman Banjarbaru in 2017, so that it can cause medication errors in distributing drugs to patients. From the results of the data obtained, the mismatch of high alert drug storage was 16.52%. The existence of drug storage discrepancies due to the absence of stickers labeled "high alert" on the packaging or storage box in the Emergency Room Drug Depot (Emergency Room Installation) (Saputera et al.,2019). Basically, the labeling and suitability of the layout of high alert class drugs really need to be considered because it is related to the safety of patients and health workers (Hidayati et al., .2021).

Based on Agustin and Adrianto's research, 2023 "An overview of the level of knowledge of pharmaceutical personnel about High Alert Medication at the Pharmacy Installation of RS X, Bekasi Regency". High alert medication (HAM) is a drug that must be watched out for because it often causes errors (sentinel events). Errors that are often included in drug safety issues are errors in the administration of high concentrations of electrolytes and the administration of LASA drugs. One of the main causes of errors is the lack of knowledge of pharmaceutical workers. Pharmaceutical personnel's knowledge of high alert medication is important to improve drug safety and maintain patient health. This study aims to determine the level of knowledge of pharmaceutical personnel about high alert medication at the Pharmacy Installation of RS X Bekasi Regency. This type of research is a descriptive survey with a quantitative approach. The sample size was 38 respondents who were taken by total sampling. The research instrument used a questionnaire to determine the characteristics of respondents and the level of knowledge. The results showed that the level of knowledge of pharmaceutical personnel about high alert medication at the Bekasi Regency Hospital X Pharmacy Installation was in the good category, namely 92.1% (35 respondents) (Agustin & Adrianto, 2023).

The high and low level of pharmaceutical personnel's concern for the management of High Alert drugs is influenced by knowledge, attitudes, and perceptions. Knowledge is the result of

knowing and this occurs after someone senses an object. Attitude is a readiness or willingness to act (Notoatmodjo, 2012). While perception is the process of a person can organize and interpret the sensations felt with the aim to give meaning to an environment (Notoatmodjo, 2014). Pengetahuan memengaruhi perilaku dalam pengelolaan obat *high alert* karena pengetahuan berfungsi sebagai dasar kognitif yang membentuk kesadaran, sikap, dan keterampilan praktis tenaga farmasi. Teori Knowledge-Attitude-Practice (KAP) menjelaskan bahwa pengetahuan yang baik akan meningkatkan sikap positif terhadap keselamatan pasien, yang pada akhirnya mendorong perilaku sesuai standar prosedur. Dalam konteks pengelolaan obat high alert, tenaga vokasi farmasi yang memahami risiko, mekanisme kerja, serta prosedur pengelolaan akan lebih mampu mengantisipasi potensi kesalahan dan menerapkan langkah-langkah pencegahan secara konsisten. Pengetahuan juga memperkuat self-efficacy (keyakinan diri) sebagaimana dijelaskan dalam Social Cognitive Theory, sehingga tenaga farmasi merasa lebih kompeten dan percaya diri untuk bertindak sesuai protokol. Dengan demikian, semakin tinggi tingkat pengetahuan, semakin besar kemungkinan perilaku yang ditunjukkan akan selaras dengan prinsip kehati-hatian, akurasi, dan kepatuhan terhadap regulasi. Hal ini menegaskan relevansi penelitian tentang hubungan pengetahuan dan perilaku tenaga vokasi farmasi dalam pengelolaan obat high alert, karena kualitas perilaku profesional sangat bergantung pada fondasi pengetahuan yang dimiliki (Fika et al., 2025).

Based on the correlation analysis of knowledge on the behavior of pharmaceutical personnel in handling cytostatics, the correlation strength $r = 0.444$ (medium) and p value = 0.340. The direction of the correlation is positive, which means that the handling of cytostatics will be better the better one's knowledge about handling cytostatics (Dewi, 2023). Penelitian sebelumnya tentang pengelolaan obat high alert (HAM) di instalasi farmasi rumah sakit (RS) di Indonesia sebagian besar bersifat deskriptif, fokus pada tingkat pengetahuan tenaga kefarmasian yang di kategorikan baik, tetapi jarang menganalisis hubungan kausal atau korelasi antara pengetahuan dan perilaku secara spesifik pada tenaga vokasi farmasi, serta minimnya data perilaku aktual yang terintegrasi dalam kerangka KAP (knowledge-attitude-practice) lengkap terkait HAM.

Based on the above background, the researcher is interested in knowing how the level of knowledge of pharmacy vocational staff in managing high alert drugs at the Pharmacy Installation of X Hospital in Dumai City and how the relationship between knowledge and behavior of pharmacy vocational staff in managing high alert drugs at the Pharmacy Installation of X Hospital in Dumai City.

RESEARCH METHOD

The research was conducted using a non-experimental observational method with a cross-sectional analytic approach with a questionnaire data design. The questionnaire is a data collection tool in the form of a list of written statements to obtain information from a number of respondents.

This research was conducted at the Pharmacy Installation of X Hospital in Dumai City. This research was conducted from December 2023 to May 2024. The population in this study were all pharmacy vocational staff at the Pharmacy Installation of RS X Dumai City. The number of pharmacy vocational staff currently totals 23 people.

The sample used was using the total sampling technique. Total sampling is the best type of non-probability sampling, and is often the easiest way. Most clinical research (including clinical trials) uses this technique for subject selection. By using this technique, the population has the same opportunity to be conducted research that meets the inclusion criteria to be used as a research sample (Vikaliana et al., 2022). Inclusion criteria are characteristics or general requirements that researchers expect to be able to be used as research subjects (Fika, 2020).

The inclusion criteria in this study are as follows: Pharmacy vocational staff who work at X Hospital in Dumai City, pharmacy vocational staff who are willing to fill out questionnaires, pharmacy vocational staff who have a D3 pharmacy diploma while the exclusion criteria include vocational pharmacy personnel who were not willing to fill out the questionnaire, vocational pharmacy personnel who did not have a D3 pharmacy diploma.

The instrument in this research is questionnaire sheet. A questionnaire is a research instrument consisting of a series of statements that aim to collect information from respondents. This research is divided into 2 knowledge questionnaires and behavioral research, where the knowledge questionnaire consists of 11 statements and behavioral research consists of 6 statements. The statement is designed with multiple choices with the help of a guttman type test scale which provides a firm answer in the form of yes or no where the statement is in the form of multiple choices for the correct answer is given a score of 1 and wrong 0. Behavior can be assessed by 3 categories, yaitu tidak pernah di beri skor 0, kadang-kadang di beri skor 0, dan selalu diberi skor 1. Results in an ordinal scale measurement scale with categories: good behavior if the value is $\geq 76 - 100\%$, sufficient behavior if the value is $61 - 75\%$, poor behavior if the value is $\leq 60\%$. Knowledge level scale, namely: Good category with percentage results of $75-100\%$, Sufficient category with percentage results of $56-74\%$, Poor category with percentage results of $\leq 55\%$ (Fika, et al., 2025).

This study used a quantitative approach with multiple-choice statements based on the Guttman scale. This scale was chosen because it allows for clear "yes" or "no" answers, which are then converted into a numerical score: 1 for correct answers and 0 for incorrect answers. Respondent behavior was assessed through three categories: "never" (scored 0), "sometimes" (scored 0), and "always" (scored 1). Therefore, only consistent behavior is considered a form of full compliance with procedures. This instrument focuses on the management of high-alert medications, where each respondent's level of compliance with applicable standard operating procedures (SOPs) is measured.

The variables of this study are as follows: the independent variable, in this study is the level of knowledge of pharmacy vocational personnel about the management of high alert drugs. the dependent variable is the behavior of managing high alert drugs at X Hospital in Dumai City.

The operational definition of a variable is a description of the limits of the variable in question, or about what is measured by the variable concerned (Notoatmodjo, 2010).

Table 1. Operational definition

Variable	Definition	How to Measure	Measurement Tool	Measurement Result	Scale
Gender	Gender is the difference between female and male respondents	Respondent interview	Questionnaire	1. Male 2. Female	Nominal
Age	Age of the respondent at the time of filling out the questionnaire as known in the respondent data	Respondent interview	questionnaire	21-30 years 31-40 years 41-50 years	Ratio
Length of work	Length of work can describe a person's experience in mastering their field of work.	Respondent interview	questionnaire	1 month - 1 year > 1 year - 5 years > 5 years - 10 years > 10 years - 20 years	Ordinal
Knowledge	Knowledge is something that is known and understood by respondents about the accuracy of managing <i>high alert</i> drugs at X Hospital in Dumai City.	Interview Respondents	Questionnaire	Scale of knowledge level, namely [6]: 1. Good, percentage results 75-100% 2. Fair, percentage result	Ordinal

Variable	Definition	How to Measure	Measurement Tool	Measurement Result	Scale
Behavior	Respondents' efforts towards accuracy in managing <i>high alert</i> drugs at X Hospital in Dumai City	Interview Respondents	Questionnaire	56-74% 3. Less, percentage result ≤55%	Ordinal
				Behavior level scale: 1. Good, 76 - 100% 2. sufficient 61 - 75% 3. less ≤ 60%	

A questionnaire is said to be reliable or reliable if a person's answer to a statement is consistent or stable over time (Setiawan et al. 2022; Vikaliana et al., 2022). Statistical analysis can be done by manual calculation process or can also use applications or software. One of the commonly used software is statistical analysis is the statistical package for the social sciences (SPSS) (Vikaliana et al., 2022; Fika et al. 2022). According to Sugiyono (2014) after the questionnaire was filled in by respondents, the data was processed through the following stages: 1) Editing, namely re-examining whether the entries in the questionnaire sheet are complete and filled in, editing is carried out at the data collection site, so that if there is a lack of data, it can be immediately confirmed to the respondent concerned. 2) Coding, namely changing the data collected into a more concise form. Giving codes for each variable to data obtained from data sources that have been checked for completeness. Researchers should not display information about the identity and confidentiality of respondents. Researchers simply use coding as a substitute for the respondent's identity. 3) Tabulating is the step of entering the research data into tables according to predetermined criteria. 4) Scoring is the assessment of data by giving scores to statements related to the actions of respondents. This is intended to give weight to each answer, making it easier to calculate. 5) Data entry is the process of entering data into certain categories for data analysis (Vikaliana et al., 2022 ; Trisna et al. 2023).

The total scores of all respondents for each aspect were summed up, then the median was determined. Scores below the median value are interpreted as a poor level of knowledge. Scores above the median value are interpreted as a good level of knowledge or good behavior. Check list data is scored and presented in the form of an emperic score table (acquisition score) calculated based on the following criteria: Yes = Score 1 and No = Score 0 and the percentage of implementation is calculated by the formula: The acquisition score is divided by the maximum score multiplied by one hundred percent (Fika et al., 2025).

Data from the observation sheets of the knowledge questionnaire statements that were checked were analyzed descriptively, the percentage of knowledge levels according to Budiman's knowledge level scale (2013), namely: Good knowledge level value 75-100%, sufficient 56-74% less ≤55%. Data from the checked behavior questionnaire statement sheets were analyzed descriptively, Behavior can be assessed by 3 categories (Arikunto, 2016). namely: good 76 - 100%, sufficient 61 - 75%, less ≤ 60%. To ensure that the questionnaire made can measure the variables to be studied, then before use, steps are taken, the Validity Test is used for something the questionnaire is said to be valid (valid) if the statement items on a questionnaire are able to reveal something to be measured by the questionnaire. If the validity test is carried out on each statement item. The higher the validity value of an instrument, the more accurate the data obtained from a research (Vikaliana et al., 2022; Fika et al. 2022).

Univariate analysis aims to describe the characteristics of each variable studied. In quantitative data analysis, we are faced with a large collection of data whose meaning is unclear. The real function of analysis is to summarize the data set of measurement results in such a way

that the data set turns into meaningful and useful information. The summary can be in the form of statistical measures, graphs and tables. Analysis was carried out on each variable of the research results. This analysis results in the distribution and percentage of each variable. After knowing the characteristics of each variable, further analysis can be continued. If it is desired to analyze between 2 variables, then the analysis continues at the bivariate level. To determine the relationship / correlation of 2 variables, statistical testing is usually used, where the type of test 2 variables are usually used it depends on the type of statistical test used it depends on the type of data / variable being connected (Vikaliana et al., 2022; Fika et al. 2022).

The data to be analyzed in this study is categorical (qualitative) so the appropriate statistical test is the Chi square test. Chi square is comparing the frequency that occurs (observation) with the expected frequency (expectation). If the observation frequency value and the expected frequency value are the same, it is said that there is no significant difference (significant). Conversely, if the observed frequency value and the expected frequency value are different, it is said that there is a significant difference (significant) (Vikaliana et al., 2022; Fika et al. 2022).

RESULTS AND DISCUSSION

The results of this study indicate that the use of the Guttman scale with a dichotomous scoring system is effective in identifying the certainty of respondents' behavior, particularly in the context of high-alert medication management. By only assigning a score to the "always" category, this instrument emphasizes the importance of full compliance with procedures, as "never" and "sometimes" behaviors are considered non-compliant with safety standards. This approach aligns with the principle of zero tolerance for non-compliance in high-risk medication management, where any omission can have serious consequences for patients. Although the Guttman scale is less sensitive in capturing variations in behavioral intensity, it is precisely what this study needs, as the primary goal is to ensure consistent, clear behavior. Therefore, the Guttman scale-based instrument can be used as a valid and relevant measurement tool for assessing healthcare workers' compliance with SOPs for high-alert medication management, while also providing a robust picture of the level of certainty of behavior in clinical practice. The Validity Test is used for a questionnaire to be said to be valid (valid) if the statement items on a questionnaire are able to reveal something to be measured by the questionnaire. If the validity test is carried out on each statement item. The higher the validity value of an instrument, the more accurate the data obtained from a research (Vikaliana et al., 2022; Fika et al. 2022).

Table 2. Results of the knowledge research questionnaire validity test

Statement	r-count	r-table	Results
1	0,469	0,361	Valid
2	0,446	0,361	Valid
3	0,411	0,361	Valid
4	0,391	0,361	Valid
5	0,558	0,361	Valid
6	0,667	0,361	Valid
7	0,411	0,361	Valid
8	0,592	0,361	Valid
9	0,722	0,361	Valid
10	0,592	0,361	Valid
11	0,394	0,361	Valid

Source: Primary data processed, 2024

The validity test is used to determine whether the questionnaire used in this study is valid or invalid using the excel program and also the *Statistical Program For Social Science (SPSS)* version 23. If $r \text{ count} > r \text{ table}$ then the statement is said to be valid and if $r \text{ count} < r \text{ table}$ then the

statement is said to be invalid. In this Knowledge Research Questionnaire Validity test, it is declared valid because $r_{count} > r_{table}$ where $0.469 > 0.361$ (Vikaliana et al., 2022; Fika et al. 2022).

Table 3. Behavior research questionnaire validity test results

Statement	r-count	r-table	Result
1	0,770	0,361	Valid
2	0,975	0,361	Valid
3	0,863	0,361	Valid
4	0,975	0,361	Valid
5	0,866	0,361	Valid
6	0,975	0,361	Valid

Source: Primary data processed, 2024

In the Behavior Research Questionnaire Validity test, it was declared valid because $r_{count} > r_{table}$ where $0.770 > 0.361$. The instrument reliability test shows whether the questionnaire that has been prepared as a data collection tool provides relatively consistent results when used in different places and times. The reliability test used in this study is the *Cronbach's Alpha* reliability test with the help of the *Statistical Program For Social Science (SPSS)* version 23.

Table 4. Reliability test results

Variable	Alpha	r-table	Result
Knowledge questionnaire	0,702	0,630	Reliable
Behavior questionnaire	0,891	0,630	Reliable

Source: Primary data processed, 2024

Overall, it can be concluded, because all questionnaire items that have been compiled have a calculated r value and alpha above the r table value, the questionnaire is suitable for use as a data collection tool.

Table 5. Respondent frequency distribution

Category	Criteria	Number (people)	Total Respondents	Percentage (%)	Total (%)
Gender	Male	1	23	4,35	100 %
	Female	22		95,65	
Age	21 - 30	15	23	65,22	100 %
	31 - 40	5		21,74	
	41 - 50	3		13,04	
Working age	1 month - 1 year	7	23	30,43	100 %
	> 1 year - 5 years	5		21,74	
	> 5 years - 10 years	5		21,74	
	> 10 years - 20 years	6		26,09	
Knowledge	Good	18	23	78,26 %	100 %
	Fair	5		21,74 %	
Behavior	Good	21	23	91,30 %	100 %
	Fair	2		8,70 %	

As for the distribution of the characteristics questionnaire based on the frequency distribution of respondents, the gender characteristics of respondents, male respondents amounted to 1 person (4.35%), and 22 women (95.65%). It can be seen that in the hospital more pharmacy vocational personnel are female than male. The next characteristic of the age of respondents aged 21-30 years amounted to 15 people (65.22%), aged 32-40 years amounted to 5 people (21.74%), aged 41-50 years amounted to 3 people (13.07%). According to research by Eben Tua Pandapotan (Sali, 2020). that the age variable has a significant negative effect on work productivity, meaning that the higher the age, the lower the employee's work productivity. Conversely, the lower the age, the higher the employee's work productivity (Nur & Sali, 2020). Characteristics of working age 1

month - 1 year amounted to 7 years (30.43%), working age > 1 year - 5 years amounted to 5 people (21.74%), > 5 years - 10 years amounted to 5 people (21.74%), working age > 10 years - 20 years amounted to 6 people (26.09%). The results of this study are in accordance with Eben Tua Pandapotan (Sali. 2020), which means that employees who have a long enough tenure will have a lot of work experience resulting in high work productivity. Meanwhile, employees with a short working period (new employees) are still inexperienced so that their productivity is also low (Garmini and Purnama, 2023).

It can be seen that 23 respondents based on the knowledge of Pharmacy Vocational Workers who work in the Pharmacy Installation at X Hospital in Dumai City, have a good level of knowledge of 18 people (78.26%), 5 people (21.74%), towards the management of *high alert* drugs. The results also showed that 21 people (91.30%) had a good level of behavior, 2 people (8.70%) had a good level of behavior towards managing *high alert* drugs.

It can be concluded that the majority of respondents actually have good behavior but have less knowledge. In the sense that they actually understand what is done, but lack understanding of the theory. This can actually be caused by internal individual factors, namely a lack of curiosity about the management of *high alert* drugs. This description is in line with the statement that not all who have less knowledge will have bad behavior.

Because sometimes knowledge is not only obtained from science alone. Experience and information as well as good habits carried out daily are also comparable knowledge. The more a person obtains information about the management of *high alert* drugs, the better his knowledge will be and will have good behavior as well.

Table 6. Chi-square test results knowledge and behavior of *high alert* drug management

	Chi-Square Tests				
	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.028 ^a	1	.311		
Continuity Correction ^b	.014	1	.907		
Likelihood Ratio	.862	1	.353		
Fisher's Exact Test				.395	.395
Linear-by-Linear Association	.984	1	.321		
N of Valid Cases	23				

a. 3 cells (75.0%) have expected count less than 5. The minimum expected count is .43.

b. Computed only for a 2x2 table

In this study using Bivariate analysis was used to see the relationship between knowledge and behavior of pharmacy vocational staff in managing *high alert* drugs in the pharmaceutical installation of X Hospital Dumai City, and was analyzed using the *Chi-square* test. Based on table 14, the *Chi-square* test data obtained where the relationship between knowledge and behavior of pharmacy vocational staff is known to have no relationship between knowledge and behavior in Hospital X Dumai City with *p value* = 1.028 which means the relationship between knowledge and behavior. Based on the test results above, it is confirmed that the hypothesis in this study is not accepted.

Table 7. Bivariate output interpretation analysis

		X1 * X2 Crosstabulation		
		X2		Total
		GOOD	POOR	
X1 OK	Count	17	1	18
	Expected Count	16.4	1.6	18.0
ENOUGH	Count	4	1	5
	Expected Count	4.6	.4	5.0
Total	Count	21	2	23
	Expected Count	21.0	2.0	23.0

Table 8. Bivariate test results of the relationship between knowledge and behavior of pharmacy vocational workers in managing high alert drugs

	Behavior						P.V
	Good		Enough		Less		
Knowledge	N	%	N	%	N	%	1,028
Good	17	74	1	4	0	0	
Enough	4	17	1	4	0	0	
Less	0	0	0	0	0	0	

Based on the table above, it can be concluded that the level of knowledge in the good category on good behavior is 17 respondents with a percentage of 74%. The level of knowledge is good, sufficient behavior is 1 respondent with a percentage of 4%. The level of knowledge is sufficient good behavior amounted to 4 respondents with a percentage of 17%. The level of knowledge is sufficient, sufficient behavior is 1 respondent with a percentage of 4% with a P value of 1.028. So it can be concluded that there is no relationship between knowledge and behavior of pharmacy vocational staff in managing high alert drugs.

This study shows that there is no relationship between knowledge and behavior. Good management of high alert drugs will be obtained from respondents who have good knowledge as well. But one's experience will also create a condition of good habits through good management that can affect one's behavior in terms of managing high alert drugs. This is in line with the theory that attitudes grow as long as humans live throughout their lives and humans never stop learning. This study indicates that there is no significant relationship between the level of knowledge of respondents and behavior in managing high alert drugs, as supported by a study at Alexandria University Hospital which showed a p-value >0.05 for the correlation between the two. Although good knowledge is considered a prerequisite for optimal high alert medication management, the findings highlight the role of work experience as the dominant factor that forms positive habits through repeated practice, so that safe behavior depends more on daily adaptation than theory alone. This is in line with lifelong learning theory, in which professional attitudes and behaviors continue to evolve throughout life through continuous learning, with experience being a major factor in reducing the risk of high alert medication mismanagement (Farak et al., 2024).

This study indicates that there is no significant relationship between the level of knowledge of respondents and the behavior of managing high alert drugs, a finding that is reinforced by a recent study in Surakarta City Hospital X in 2024 which reported that the level of storage of high alert drugs according to Permenkes No. 72/2016 standards reached 87.82% in the excellent category, although the knowledge of pharmaceutical staff does not always correlate directly with daily practice (Hapsari et al., 2025). This suggests that work experience improves behavioral adaptation more effectively than theoretical knowledge. Melanie's research, which also illustrates that the level of pharmaceutical knowledge about high alert drugs is relatively low, but practice remains optimal thanks to daily routines that form safe habits (Engels & Ciarkowski, 2015).

This shows that the process of assimilation of knowledge and experience takes place throughout life. This study found that there was no relationship between attitude and behavior of high alert drug management. This can be caused by several aspects that influence a person's attitude towards the behavior of managing high alert drugs, including aspects of regulations to minimize the behavior of managing high alert drugs that are not good in the environment of pharmacy vocational staff at the Pharmacy Installation of X Hospital in Dumai City.

CONCLUSION

Based on the results of the research conducted, it can be concluded that there is no relationship between knowledge and behavior of pharmacy vocational staff in managing high alert drugs at X

Hospital in Dumai City with a significance value > 0.005 $p =$ value 1.028. This study shows that there is no relationship between knowledge and behavior. Good management of high alert drugs will be obtained from respondents who have good knowledge as well. But one's experience will also create a condition of good habits through good management that can affect one's behavior in terms of managing high alert drugs.

This study makes a significant scientific contribution to the growing literature on high-alert medication management in hospitals. Using the Guttman scale as a measurement instrument, this study emphasizes the importance of ensuring healthcare workers' behavior in implementing high-alert medication management procedures. This scale emphasizes that only full compliance is considered valid, thus the instrument is able to identify consistent behavior that truly aligns with standard operating procedures. The main contribution of this study is to strengthen the understanding that in the context of high-alert medication, behavioral measurement is not sufficient to capture variations in intensity but must also focus on ensuring compliance as a form of protection for patient safety. Thus, this study expands the literature by adding a methodological perspective that emphasizes the relevance of cumulative scales in health research and pharmaceutical services.

Based on the research findings, several recommendations can be used as a reference for developing pharmaceutical policies and further research. First, hospitals should use a Guttman scale-based instrument to evaluate healthcare workers' compliance with high-alert medication management procedures. This instrument provides a clear picture of the certainty of behavior, thus providing a basis for managerial decision-making to improve service quality and patient safety. Second, hospital pharmaceutical policies should emphasize the principle of zero tolerance for non-compliance in the management of high-risk medications, by strengthening ongoing internal monitoring and evaluation systems. Third, the results of this study can be used as a basis for designing training and outreach programs that emphasize the importance of full compliance with SOPs, not just the frequency of behavior. Fourth, further research is recommended to combine the Guttman scale with other scales, such as the Likert scale, to better capture the nuances of both the intensity of behavior and the certainty of compliance. Thus, these recommendations are expected to strengthen the academic literature and provide a practical contribution to improving patient safety through more assertive and consistent management of high-alert medications.

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