Journal of Scientific Insights
E-ISSN: 3062-8571
DOI: https://doi.org/10.69930/jsi.v2i4.511
Research Article

ScienceTech. Group

Vol. 2 (4), 2025
Page: 429-436

Analysis of the Patient's Level of Knowledge and Attitude about *BUD (Beyond Use Date)* in Sharia Pharmacies

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Abstract. *This study aims to analyze patients' level of knowledge and attitudes toward Beyond Use Date (BUD) at Sharia Pharmacy. BUD refers to the time limit after which a drug's stability and effectiveness can no longer be guaranteed once its original packaging is opened or the medication is compounded. Public awareness of BUD remains relatively low, which poses potential health risks due to improper drug storage and use. This research employs a descriptive cross-sectional approach with purposive sampling involving 95 respondents who completed an online questionnaire. The data were analyzed using univariate and bivariate methods, including the Chi-Square test. Results revealed that the majority of respondents were females (73%) aged 17–25 years (82%), with a high school level of education (58%). Overall, 36.8% of respondents demonstrated low knowledge of BUD, while 63.1% showed a concerned attitude toward the issue. Interestingly, no significant correlation was found between education level and knowledge ($p = 0.232$), nor between gender and attitude ($p = 0.073$), although the latter approached statistical significance. The study highlights the crucial role of pharmaceutical personnel in educating patients about proper drug storage, especially concerning BUD. Enhanced community education programs are necessary to improve knowledge and behavior, thereby ensuring safe and effective medication use at home and reducing the risk of adverse drug outcomes.*

Keywords: *BUD, public knowledge, patient attitudes, pharmaceutical education, drug storage*

1. Introduction

The availability of medicines at home is a common thing found in the community, both for routine medical purposes and as supplies. However, there are still many practices of using drugs that are not appropriate, such as the use of leftover drugs from previous treatments, the purchase of over-the-counter drugs at stalls, and the purchase of drugs with or without a doctor's prescription at the pharmacy to be stored at home (Pramestutie et al., 2021; Yurochkin et al., 2024). These practices show that public understanding of the storage of drugs in accordance with standards is still low.

Drug storage cannot be done carelessly, because the quality and effectiveness of drugs are greatly influenced by their storage conditions. This becomes even more crucial when the drugs used fall into the category of hard drugs or antibiotics that require supervision from health workers (Wiedyaningsih et al., 2017). In addition, some drugs with non-enteral routes of administration, such as suppositories and insulin, require special handling, including specific storage temperatures and conditions to maintain the stability and quality of the drug (Eltaib et al., 2020; Karima M.; Sitepu, K.; Usman, A., 2023).

One of the important indicators that can be easily recognized by the public in determining the feasibility of drugs for consumption is *BUD (Beyond Use Date),* which is the time limit for drug use after compounding, preparation, or after the main package is opened or damaged (Alfian et al., 2023; Novitri et al., 2024). Taking drugs that have passed the *BUD*

Received: 5 August 2025 / Accepted: 18 August 2025 / Available online: 31 August 2025

(Beyond Use Date) time limit, means using drugs whose stability is no longer guaranteed. This condition can result in a decrease in the effectiveness of the drug and even risk causing unwanted side effects (Nurbaety, 2022; Wondie Mekonen et al., 2024).

Providing education about *ED (Expired Date)* and *BUD (Beyond Use Date)* is the responsibility of Pharmaceutical Technical Personnel (TTK) and Pharmacists. Based on the results of previous research, it is known that the practice of storing drugs at home by the community is still not optimal. In 2020, home drug management was in the medium category, with a percentage of 66%, which indicates a lack of proper drug storage (Farhan et al., 2024; Rohmanna, 2021). The results of another study on the level of public knowledge in Oesapa Village about *BUD (Beyond Use Date)* on concocted drugs showed that only 33% of respondents understood this matter. These findings indicate that public knowledge about *Beyond Use Date* in drug storage is still relatively low (Cokro et al., 2022; Julaiha, 2024). Lack of knowledge about how to store medications can lead to a decrease in the quality of medications. A good understanding of drug management, including how to store it, will encourage the formation of appropriate treatment behaviors (Ong et al., 2020).

Conversely, a lack of knowledge can result in inappropriate treatment practices. Therefore, education from Pharmaceutical Technical Personnel (TTK) and Pharmacists is very necessary to increase public understanding (Alfian, Rendrayani, et al., 2024). In addition, in other studies, the attitude of new students of the Faculty of Pharmacy, University of Muhammadiyah Surakarta is also still lacking, with a percentage of attitudes that are not raised at 40.6%. This is triggered by one of the factors that new students do not know about the importance of BUD. (Alfian, Azzahra, et al., 2024; Puspadina, 2023).

Based on the findings of previous research, it is known that the level of knowledge and public attitudes regarding self-medication still needs to be improved. Therefore, the researcher wants to analyze the level of knowledge and attitude of patients about *BUD (Beyond Use Date)* in Sharia Pharmacy through education and questions that will be given to visiting patients.

2. Methods

The design of this study used a cross-sectional descriptive approach, with the analysis using the chi-square test to evaluate the relationship between highly knowledgeable people who were less likely to commit incorrect self-medication and looked at the correlation between education level and knowledge. The study was conducted on visitors to Sharia Pharmacies. The population of this study is the general public where the sample taken is 95 people. This study uses purposive sampling techniques in sampling, with primary data as the main source obtained through filling out an online questionnaire using Google Form.

The questionnaire scale used in this study uses the Guttman scale and data processing is carried out using the SPSS statistical application (Purohit et al., 2022; Zein Luthfiani; Ghozi, Romzi; Harahap, Erwin; Badruzzaman, Farid; Darmawan, Deni, 2019). Data processing was carried out to measure the level of knowledge of respondents, which were classified into three categories, namely: good knowledge (score above 80%), medium knowledge (score between 60% to 80%), and poor knowledge (score below 60%) (Harahap K.; Tanuwijaya, J., 2017). Meanwhile, the public's attitude towards BUD was analyzed based on the understanding of how important BUD is and the public's interest in obtaining more information. The assessment categories of drug use behavior were divided into Concerned (76%–100%), Moderate (56%–75%), and Not Caring (less than 55%) (Moges et al., 2024) (Wilgan

Arighi Veny, 2024). The data was then analyzed through two stages, namely univariate analysis to describe each variable in a single way, and bivariate analysis to see the relationship between the two variables.

3. Results and Discussion

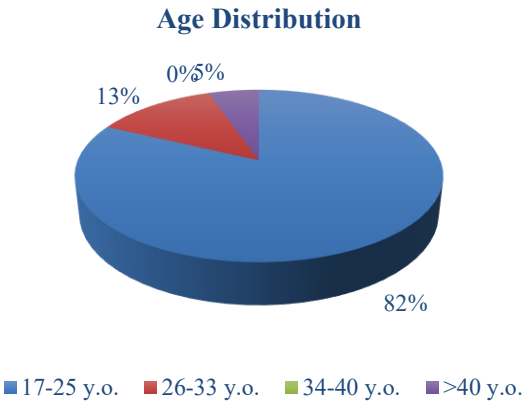

Figure 1. Age Distribution of Respondents

Respondents in this study were dominated by 78 respondents, namely 78 respondents, then 12 respondents aged 25-33 years and respondents over 40 years old there were 5 respondents

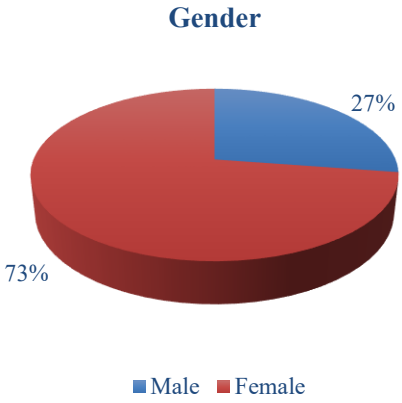

Figure 2. Gender Distribution

Respondents in this study were dominated by women with 73% of respondents, while men were only 27%.

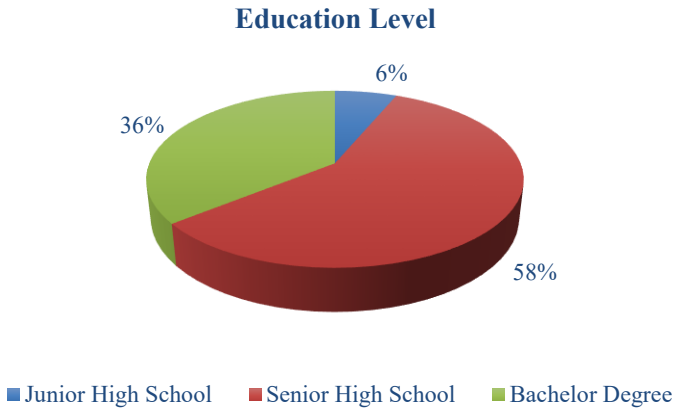

Figure 3. Distribution of Education Levels

Respondents were dominated by high school/vocational education backgrounds (58%), then Bachelor/Diploma (36%) and Junior High School Equivalent (6%).

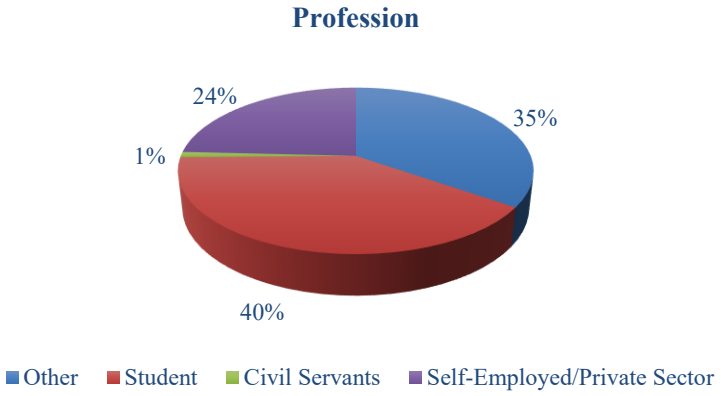

Figure 4. Respondent Occupation Type

In this study, respondents were dominated by 38 respondents. In addition, there were Self-Employed/Private employees (23 respondents) and Civil Servants (1 person) who were respondents in this study. However, as many as 33 respondents were reluctant to answer their type of work

Table 1. Distribution of the Relationship between Education Level and Knowledge Level to BUD

Types of Education	Knowledge Level			
	Low	Keep	Tall	Total
SMP	4	1	1	6
High School/Vocational School	21	15	19	55
Bachelor's/Diploma	10	6	18	34
Total	35	22	38	95

Based on table 1, Judging from the level of education, the majority of respondents are high school/vocational school graduates, covering 55 people or 57.8% of the total. Followed by Bachelor's/Diploma graduates with 34 people (35.7%), and the rest are junior high school graduates as many as 6 people (6.3%). When viewed from the level of knowledge, most of the

respondents showed a high level of knowledge, which was as many as 38 people (40%). Meanwhile, 35 people (36.8%) had a low level of knowledge, and 22 people (23.1%) were at a moderate level of knowledge.

Table 2. Distribution of the relationship between Ever getting education and attitude towards BUD

Ever Got Educated?	Knowledge Level			
	Low	Keep	Tall	Total
Ya	5	20	29	54
No	1	9	31	41
Total	6	29	60	95

Table 2 presents an analysis of the respondent's "attitude towards BUD" based on the respondent's "status of having or not received BUD education". The categories of behavior are divided into "Caring", "Moderate", and "Not Caring". Overall, around: 53.7% of people who have never been BUD-educated care about BUD, 37.0% moderate, and only 9.3% who don't care about BUD. Meanwhile, people who have received education related to BUD have a caring attitude at 75.6%, 22.0% Moderate, 2.4% Not Care. A comparison of proportions showed that the group that had received education had a much higher percentage of "Caring" attitudes (75.6%) than the group that had never received education (53.7%) against BUD. In contrast, the group that had never been educated had a higher proportion of "Moderate" and "Uncaring" attitudes towards BUD.

3.1. The Relationship between Education Level and Knowledge about BUD

The results of the Chi-Square statistical test showed that there was no significant relationship between the level of education and the level of knowledge of the respondents regarding Beyond Use Date (p-value = 0.232 > 0.05). This means that the level of education does not directly determine the extent of respondents' knowledge about BUD. Although descriptively respondents with a Bachelor's/Diploma level of education appeared to have a better proportion of knowledge, statistically this difference was not strong enough to be significant. This suggests that other factors outside of formal education, such as access to information or hands-on experience, may have a greater impact on knowledge levels.

3.2. The Relationship Between Gender and Attitudes to BUD

The Chi-Square test on the relationship between sex and attitude towards BUD yielded a p-value of 0.073. Although this number is greater than the general significance threshold (0.05), it is close enough to be considered marginally significant. There is an indication of a trend or tendency to have a relationship, although it is not strong enough to be statistically conclusive. This opens up opportunities for further exploration, considering that differences in attitudes based on gender may be influenced by social factors or gender roles in home medication management. For example, women who are more involved in household affairs, may have more attention to the storage and use of medications, including an understanding of BUD-related

Conclusions

Based on the results of the study, it can be concluded that the majority of respondents come from the young age group or 17-25 years old (82%), are female (73%), and have an equivalent high school/vocational education background (58%). The level of public knowledge about *Beyond Use Date* (BUD) is still relatively low (36.8%), although some show concern for this issue (63.1%). The results of the statistical test showed that there was no significant relationship between the level of education and the level of knowledge about BUD (p-value = 0.232), so it can be concluded that formal education does not directly affect the public's understanding of proper drug storage. In addition, the relationship between gender and attitudes towards BUD was also not statistically significant (p-value = 0.073), but close to the limit of significance, indicating an indication of differences in attitudes based on gender. These findings affirm the importance of the educational role of pharmaceutical technical personnel and pharmacists in increasing public knowledge and awareness of the importance of paying attention to *expired dates* and *beyond use dates* in order to maintain the quality and effectiveness of the drugs used

Funding

This research received no external funding.

Acknowledgments

The authors would like to express their sincere gratitude to the management and staff of Apotek Sharia for allowing and supporting the data collection process. Special thanks are also extended to all respondents who willingly participated in this study. Furthermore, the authors deeply appreciate the guidance and input from the lecturers and academic advisors at the Pharmacy Study Program, Politeknik Piksi Ganesha, which greatly contributed to the completion of this research. Their encouragement and constructive feedback were invaluable throughout this process.

Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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