Quest Journals
Journal of Research in Pharmaceutical Science
Volume 10 ~ Issue 4 (2024) pp: 50-54
ISSN(Online) : 2347-2995
www.questjournals.org

Research Paper

Knowledge Level of Pharmacy Students Towards Beyond Use Date Drugs

Hansen Nasif [1]*, Dwisari Dillasamola[1], Dian Ayu Juwita[1], Yelly Oktavia Sari[1] , Movira[2], Sara Surya[2]

[1](*Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Andalas University Indonesia)*
[2](*Department of Pharmacy, Dharma Andalas University Padang Indonesia)*
Corresponding Author: Hansen Nasif (hansennasif@phar.unand.ac.id)

ABSTRACT: *Beyond Use Date (BUD) is the time limit for using a medicinal product after it has been formulated/prepared or after its primary packaging has been opened/damaged. Meanwhile, the expiration date (ED) is the time limit for using the medicinal product after it has been produced by the manufacturer or before the packaging is opened. ED is written by the manufacturer on the packaging while BUD is not always listed. Understanding BUD is very important for students in drug storage because BUD is related to the stability and quality of drugs to avoid negative impacts such as the occurrence of medication errors that affect the effectiveness of drug therapy and unwanted events. This study aims to determine the level of knowledge of Pharmacy students at Dharma Andalas University on drug BUD. This study is a descriptive study with a cross-sectional design that uses purposive sampling techniques. Data were obtained by distributing online questionnaires that had passed validity and reliability tests. The total number of research respondents was 251 people and the results obtained were the level of knowledge of Pharmacy students at Dharma Andalas University Padang on BUD of manufactured drugs 85.7% and concocted drugs 81.7% so that for both types of drugs it was declared to have a good level of knowledge category.*

KEYWORDS: *Knowledge Level, Pharmacy Students, Beyond Use Date, Drug*

R*eceived 12 Apr., 2024;* ***R****evised 22 Apr., 2024;* ***A****ccepted 25 Apr., 2024 © The author(s) 2024.*
P*ublished with open access at* ***www.questjournals.org***

I. INTRODUCTION

Medicine storage behavior is something that is commonly done by the community. Based on the results of the Basic Health Research (Riskesdas) 2013, 35.2% of households in Indonesia store drugs for self-medication, including hard drugs (35.7%), over-the-counter/restricted drugs (82%), antibiotics (27.8%), traditional medicines (15.7%) and unidentified drugs (6.4%). The status of drugs used in self-medication was leftover prescription drugs (47.0%), drugs for stock (42.2%), and drugs currently in use (32.1%). In general, leftover prescription drugs should not be stored because they can be *misused* or misused or damaged/expired (Kemenkes RI, 2013). [1] Currently, people are still often wrong in terms of obtaining, using, storing, and disposing of drugs properly. This can cause unwanted things to happen in treatment such as drugs that cannot function optimally [2] (Devi et al, 2020). People should not be careless in storing medicine. Moreover, these drugs need the supervision of health workers during their use such as hard drugs and antibiotics (Shantanu and Vijaya, 2016) [3]. If the storage is not correct, the medicine can be damaged faster before the expiration date (Puspita and Syahida, 2020) [4].Quality control of pharmaceutical preparations is one of the pharmaceutical jobs that is closely related to drug stability. Drug stability is expected to be guaranteed not only at the time of delivery of the drug to the patient or health worker but also until it is stored at home or in the hospitalization room and used by the patient. Therefore, anyone who receives drugs must understand the things that need to be considered to maintain drug stability. Providing information to patients and health workers regarding how to store and the time limit for using drugs after the packaging is opened is one of the responsibilities of pharmaceutical personnel which is important to know. (Herawati, 2012).[5]

In the pharmaceutical world, the *Expiration Date* (ED) of a medicine after it has been opened is called *Beyond use date* (BUD). BUD is the time limit for the use of a medicine after it has been compounded or prepared or after its primary packaging has been opened or damaged. Primary packaging is packaging that

comes into direct contact with the drug, such as bottles, ampoules, vials, blisters, and so on. The definitions of BUD and ED are of course different because ED describes the time limit for the use of a medicinal product after it has been produced by a pharmaceutical manufacturer. The BUD can be equal to or shorter than the ED. ED is listed by the pharmaceutical manufacturer on the packaging of the drug product, while BUD is not always listed. Ideally, BUD and ED are determined based on the results of stability tests of medicinal products and are listed on the packaging (Sari et al, 2020) [6].The term BUD in drug storage is still rarely known by the public due to limited research on BUD. The research of Priyoherianto et al (2023) [7] stated that the level of patient knowledge of BUD for compounded drugs at Kimia Farma Pharmacy 180 Pahlawan was categorized as sufficient. Where BUD is not always listed on the packaging of medicinal products, it is necessary to know about the level of patient knowledge of drug BUD. In addition, juliyanto et al (2015) [8] on the use and storage of topical preparations conducted on housewives in the Surabaya area showed that only 30% of respondents knew the BUD of eye drops.

In a study by Kusuma et al (2020)[9], the people of Kecepit village, Punggelan sub-district, Banjarnegara district did not understand the drug BUD. Research on the level of knowledge about BUD is still limited to households. Whereas drug storage is not only done by housewives but also by students. In addition, research by Pertiwi et al (2021) showed that only 18.12% of FK UNRAM Pharmacy students considered ED to be a benchmark for a drug to stop using. If the drug has been used, the benchmark for drug use is no longer on ED but on BUD.In the research of Alnahas et al (2020)[10], it was found that in a local survey at the University of Saarland, most of the students kept prescribed medicines from before expiration until the expiration date. And some students still use the medicine after the medicine has expired. So, there are still many students who lack knowledge about the expiration of medicines that have been opened primary packaging.

II. RESEARCH METHODS

The Research Design

This research was conducted from May to June 2023 at Dharma Andalas University Padang in the Pharmacy Study Program. This research is a type of descriptive survey research using a *cross-sectional* approach method. The population in this study were pharmacy students of Dharma Andalas University class of 2019 to 2022, totaling 281 people, but data were only obtained from 251 respondents because there were students who were not willing and did not fill out the questionnaire completely.The questionnaire was distributed to respondents *online* using *Google Form* which was distributed via *WhatsApp.* The *link* was distributed to the pharmacy student group of each generation with a span of 1 week to fill it in. The *Google Form link is* as follows: https://forms.gle/nc786pKrQhzhWDjd6

There are 20 statements with 2 parts, namely 10 statements about BUD of manufactured drugs and 10 statements about BUD of concocted drugs. The questionnaire has also been tested on 30 respondents outside the research population, namely pharmacy students at the College of Pharmacy (STIFARM) Padang.

Table 1. Questions Asked to Respondents

Beyond Use Date manufactured drugs

NO	STATEMENT	CORRECT	FALSE
1.	The time limit for using the medicine before the primarypackaging is opened is called the expiration date.		
2.	The expiration date is the benchmark for a drug to stop being used.		
3.	The time limit for the use of a medicinal product after its primary packaging has been opened for compounding or preparation is called the beyond-use date.		
4.	Expiration date and beyond use date are the same terms in medicine storage.		
5.	Pharmacists play a role in providing counseling to the public about the beyond-use date of drugs.		
6.	Tablets/capsules that have been opened and packed in plastic medicine clips can be used for up to 2 months.		
7.	Beyond use, the date of suppository medicine is by the expiration time and date stated on the leaflet/package.		
8.	Beyond use date of solid drugs such as tablets or capsules is longer than that of liquid or suspension drugs.		

9.	There is information on the product packaging after the minidose eye drop preparation is opened, so the maximum use is by the information listed on the product packaging.		
10.	Opened multidose eye drops can be used repeatedly for up to 1 month.		

B. Beyond Use Date of Concoction Drugs

NO	STATEMENT	CORRECT	FALSE
1.	Poultices will have a maximum beyond-use date of 6 months if the expiration date of the medicine is more than 6 months.		
2.	Pharmacists are in charge of notifying the beyond-use date of compounded drugs.		
3.	Poultices that have coagulated can still be used.		
4.	Beyond use date of compounded drugs is calculated from the date of compounding.		
5.	The beyond-use date for liquid concoctions is shorter than that of solid concoctions.		
6.	The beyond-use date of compounded drugs may differ depending on the storage method.		
7.	If there is more than one drug in a concoction, use the shortest beyond-use date among them.		
8.	Dry syrup-like preparations can be used 30 days after dilution.		
9.	Concoctions such as ointments, creams, pastes, and gels can be used up to day 30.		
10.	Beyond use date for compounded preparations that do not contain water (nonaqueous), can be determined based on the expiration date of each ingredient or 6 months after compounding.		

In data analysis using the Guttman scale by giving score to each answer with the following categories:Correct with a score of 1, and False with a score of 0. The formula used to measure the percentage of answers obtained according to Arikunto, 2010 [11], namely:

$$P = \frac{\text{Correct score}}{\text{Total score}} \times 100\%$$

According to Arikunto (2006), the assessment criteria are as follows:

A. Good: 76% - 100%
B. Fair: 56%-75%
C. Less: < 56%.

III. RESULTS AND DISCUSSION

In this study, the content validity test was carried out by 3 experts, namely 2 pharmaceutical experts and 1 linguist using the content validity index (CVI) method, which involved a team of experts to determine whether each item on the scale was appropriate or relevant. In the content validity test for the BUD knowledge questionnaire statement of non-recombinant drugs/factory drugs and also on the BUD knowledge of concocted drugs, it was found that each question item was valid and worth 1 from the CV-I test results, using 3 experts in each questionnaire question item.

The construct validity test was carried out by distributing questionnaires to 30 respondents outside of the population that was used as a sample. In this study, researchers conducted a validity test at the Padang College of Pharmacy (STIFARM) Padang by distributing questionnaires via Google Forms. After obtaining the results from filling out the questionnaire, the data was processed using the SPSS program using the Pearson Product Moment method. The validity test is carried out on each question item with an error rate of 5%. if r count> r table then the question item is declared valid or reliable.

There are 10 statement items and knowledge of BUD concoctions there are 10 statement items that have a value of r count> r table (0.361) so that it is declared valid as a whole and can be used for research.

The reliability test is measured using the Cronbach Alpha method. It is said to be reliable if the Cronbach alpha value is greater (>) than 0.7 from the trial questionnaire distributed after the reliability test using the SPSS program (Riwidikdo, 2009). [12]. Based on the test data on BUD knowledge of non-recombinant drugs/factory drugs, it can be seen that 10 statement items are declared reliable because they have a Cronbach's Alpha value of 0.882. On BUD knowledge of non-recombinant drugs, it is known that 10 statement items are declared reliable because they have a Cronbach's Alpha value of 0.801 so the questionnaire can be used as a data collection tool in research.

Pharmacy students of Dharma Andalas University (Unidha) who filled out the research questionnaire were 251 respondents. With a percentage of male students totaling 31 respondents (12.4%) less than female students totaling 220 respondents (87.6%). Respondents who filled out this questionnaire, the majority of the samples obtained were female. This is due to the data obtained from the academic University and the conditions that exist in Dharma Andalas Pharmacy pharmacy students are dominated by women.There are 4 batches of pharmacy students who were sampled in the study. Based on the primary data obtained, the final number of students from batches 2019 to 2022 totaled 251 respondents who were sampled in the study based on the specified inclusion and exclusion criteria. From the data above it can be seen that the number of students in the 2019 and 2021 batches is more than in the 2020 and2022 batches, meaning that the high interest of students to take pharmacy majors lies in 2019 and 2021.

Pharmacy students of Dharma Andalas University in the class of 2019 to 2022 who have and who have not received pharmaceutics courses totaled 251 respondents. A percentage of students who have amounted to 198 respondents (78.9%) more than students who have not amounted to 53 respondents (21.1%). This shows that the respondents used in this study were not in the same proportion, because the respondents used were more dominated by respondents who had received pharmaceutics courses. Where the Pharmaceutics 1 course is in semester 4 so Pharmacy students in the batches of 2019 to 2021 have received pharmaceutical courses while those in the batch of 2022 have not received pharmaceutical courses.

In this study, the knowledge category was measured based on the reference. Arikunto (2010) [11] which categorizes a person's knowledge level into three levels based on the percentage value, namely as follows:

a. Good category knowledge level if the score is ≥ 76-100%
b. The knowledge level of the category is sufficient if the score is ≥ 56-75%
c. The knowledge level is categorized as lacking if the score is ≤ 56%.

Table 2. Category of Knowledge of Unidha Pharmacy Students on BUD of manufactured Drugs

Category	**Respondents (n)**	**Percentage (%)**
Good	215	85.7%
Simply	30	12%
Less	6	2.4%
Total	251	100%

Based on Table 2 above, it can be seen that Unidha Pharmacy Students have a good level of knowledge of BUD of manufactured drugs, namely 215 respondents (85.7%).

Table 3. Category of Knowledge of Unidha Pharmacy Students on BUD of Concoction Drugs

Category	**Respondents (n)**	**Percentage (%)**
Good	205	81.7%
Simply	39	15.5%
Less	7	2.8%
Total	251	100%

Based on Table 3 above, it can be seen that Unidha Pharmacy Students have a good level of knowledge of BUD of non-recombinant drugs/factory drugs, namely 205 respondents (81.7%). This is in line with research conducted by Pertiwi et al (2021) [13] stated that the level of knowledge of UNRAM Pharmacy students about the drug BUD, students a sufficient level of knowledge, as well as research conducted by Sari et al (2020) [6] also stated that the description of community knowledge in Sugio Lamongan Housing is categorized as good towards drug BUD.The percentage of the level of knowledge of BUD of compounded drugs is lower than that of BUD of non-recombinant drugs/factory drugs. This is in line with the research of Priyoherianto et al (2023) [7] which states that the level of patient knowledge of BUD of compounded drugs at Kimia Farma Pharmacy 180 Pahlawan is categorized as sufficient. Given that BUD is not always listed on the packaging of medicinal products. The level of knowledge in pharmacy students who have received courses understand more about BUD because these students have studied pharmaceutics courses. This study is in line with research conducted by Yefrisyam (2018) [14], which states that there are differences in respondents' knowledge between before and after education. Other research conducted by Wibowo and Dyah (2014) [15], also said that providing education can influence respondents' knowledge. The researcher assumes that this is the basis for the relationship between the factors of pharmaceutics courses and knowledge about BUD of manufactured drugs and concocted drugs.

IV. CONCLUSION

Based on the results of research obtained related to the level of knowledge of Pharmacy students of Dharma Andalas University on drug BUD, it can be concluded that the level of knowledge of Pharmacy students of Dharma Andalas University about BUD of manufactured drugs is 85.7% and concocted drugs is 81.7% so that for both types of drugs it is declared to have a good level of knowledge category

REFERENCES

[1] Kementerian Kesehatan Republik Indonesia. Riset Kesehatan Dasar. Jakarta: Direktorat Jendral Kefarmasian Dan Alat Kesehatan; 2013.

[2] Devi, R., Susanti I., Bintang, S., Mahaputra, S., Negara, K., Lamongan, U. M., dan Kesehatan, F. I. Peningkatan Pengetahuan Masyarakat Tentang Penggunaan Dan Pengelolaan Obat Yang Rasional Melalui Penyuluhan Dagusibu. Jurnal Pengabdian Kepada Masyarakat. 2018; 4(1):23–39.

[3] Shantanu, D. P., and Vijaya, L. C. Cross sectional study of factors associated with home storage of medicines. Journal of chemical and pharmaceutical research. 2016; 8(8): 1114-1120.

[4] Puspita, N., dan Syahida, F. 2020. Perbandingan Motion Graphic dan Leaflet terhadap Peningkatan Pengetahuan Ibu Rumah Tangga dalam Menyimpan Obat. Jurnal Kesehatan. 2020; 11(1): 61.

[5] Herawati, F. Beyond Use Date. Buletin Rasional. 2012; 10(3): 16–24.

[6] Sari, W. R., Yuliandhari, R., dan Ummah, F. Gambaran Pengetahuan Masyarakat Tentang Beyond Use Date Di Perumahan Sugio Kabupaten Lamongan. Journal Farmasi. 2020.

[7] Priyoherianto, A., Valiandri, P., dan Merry, P. C. Tingkat Pengetahuan Pasien Terhadap Beyond Use Date (Bud) Obat Racikan Di Apotek Kimia Farma 180 Pahlawan Sidoarjo. Jurnal Farmasi Indonesia. 2023; IV(1): Hal. 6-11.

[8] Juliyanto, T., Bibi, W. C. M., Chatarina, W., Feri, S. A., Khusnul, P., Nandia, A. F., Ratih, S. S., Ratna, L. F., Riswandi, I., Stefani, R. A., dan Ulya, M. Penggunaan dan penyimpanan sediaan topikal multidose untuk mata. Jurnal Farmasi Komunitas. 2015; 2(2): 52–56.

[9] Kusuma, I. Y., Peppy, O., Cecep, D. M., Afnida, D. L., Fina. R., dan Halimatu. S. Upaya Peningkatan Pemahaman Masyarakat Terhadap Beyond Use Date di Desa Kecepit Kecamatan Punggelan Kabupaten Banjarnegara. Jurnal Pelita Abdi Masyarakat. 2020; 1(1): 22-29.

[10] Alnahas, F., Yeboah, P., Fliedel, L., Abdin, A. Y., and Alhareth, K. Expired medication: Societal, regulatory and ethical aspect of a wasted opportunity. Int J Environ Res Public Health. 2020; 17:787.

[11] Arikunto. Prosedur Penelitian. Jakarta: Rineka Cipta; 2010.

[12] Riwidikdo, H. Statistik Kesehatan. Mitra Cendikia Press: Jogjakarta; 2009.

[13] Pertiwi, G.S., Siti, R. A., dan Wahida, H. Tingkat Pengetahuan Mahasiswa Program Studi Farmasi Fakultas Kedokteran Universitas Mataram Tentang Beyond Use Date Obat. Jurnal Kedokteran. 2021; 10(2): 435-440.

[14] Yefrisyam. Perbedaan Metode Audio Visual dan Metode Buku Saku Terhadap Pengetahuan Pencegahan Penyakit Diare Pada Siswa Kelas V di SDN 18 Kampung Baru. Jurnal Politeknik Kesehatan Kemenkes, 2018.

[15] Wibowo, S., dan Suryani D. Pengaruh Promosi Kesehatan Metode Audio Visual dan Metode Buku Saku Terhadap Peningkatan Penggunaan Monosodium Glutamat (MSG) pada Ibu Rumah Tangga. Jurnal Kesmas. 2014; 7: 55.

.