Pharmacy Education (2024) 24(2) 93 - 98
https://doi.org/10.46542/pe.2024.242.9398

IAI SPECIAL EDITION

RESEARCH ARTICLE

The effects of DAGUSIBU education on the level of community knowledge in obtaining, using, storing, and disposing of drugs in West Java, Indonesia

Lusy Noviani[1], Putriana Rachmawati[1], Catleya Febrinella[2]

[1] Department of Pharmacy, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia
[2] Indonesian Pharmacist Association of West Java Regional, Indonesia

Keywords
DAGUSIBU
Education
Knowledge
Online platform

Correspondence
Lusy Noviani
Department of Pharmacy
School of Medicine and Health Sciences
Atma Jaya Catholic University of Indonesia
Jakarta
Indonesia
Lusy.noviani@atmajaya.ac.id

Abstract

Background: In 2022, health products were the best-selling category in the marketplace. Over-the-counter medicines are the only types of drugs that can be sold online. However, in reality, many prescription drugs are being traded online. A lack of public awareness about purchasing drugs online can have negative consequences, such as buying counterfeit and hazardous medicines and drugs without distribution permits. A community health initiative for public education, DAGUSIBU, is being powered by pharmacists and must be encouraged. **Objective**: To educate the public about the DAGUSIBU and measure the changes in public knowledge after the education process. **Methods**: A quasi-experimental one-group pre-test and post-test method was used to design the study. Univariate and bivariate Wilcoxon tests were used to analyse the data. **Results**: The level of public knowledge before education was 49.41% in the poor category, 36.72% in the good category, and 13.87% in the adequate category. Following education, the respondents' level of knowledge was classified as good (48.46%), adequate (41.12%), and poor (10.42%). The *p*-value of the level of knowledge before and after education was < 0.05, according to the Wilcoxon test. **Conclusion**: DAGUSIBU education in digital platforms to obtain drugs had a significant impact on public knowledge.

Introduction

The market potential for pharmacies in Indonesia is still very large, especially given the rapid development of technology as a facility that allows people to get medicines and medical devices without leaving their homes. Medicines, vitamins, and health supplements are among the products that consumers frequently purchase in the marketplace. According to Tokopedia's Head of External Communications, Ekhel Chandra Wijaya, the health category was one of the best-selling throughout the first half of the year 2022 (Jamaludin, 2022). Health products can also be purchased at marketplaces, through social media platforms, and online pharmacies such as the K24 Pharmacy, GoApotik, Kimia Farma Mobile, and Lifepack.id. According to previous research, there are several reasons why buyers prefer to shop online, including the elimination of the need to travel, the ability to compare items, and the availability of discounts (Joewono *et al*., 2020).

Based on the BPOM RI's explanation regarding the distribution of drugs, the classes of drugs that are permitted to be sold online are those that fall into the categories of "*over-the-counter drugs*", and "*prescription drugs*" with the provisions of statutory regulations. In 2018, no less than 2,217 sites/accounts selling drugs that did not comply with the regulation were recommended to be taken down and/or blocked (BPOM RI, 2019). Inadequate supervision of the online drug trading process can result in undesirable outcomes, such as the distribution of counterfeit drugs, drugs without a registration number, and drugs that are dangerous if consumed without the supervision of a health professional.

Furthermore, consumers' lack of understanding in purchasing medicinal products is one of the reasons why many medicines are still freely traded. According to Hijawati's research, some consumers had varying levels of understanding, which was influenced by the differences in each consumer's sociodemographic profile, such as age, gender, and level of knowledge (Hijawati, 2020). The buyer's level of understanding ultimately has an impact on the buyer's attitude toward obtaining and using the drug properly, as well as how the drug is stored and disposed of as a leftover drug (Kumar *et al.*, 2019). The Indonesian Pharmacist Association has launched a drug awareness education program called DAGUSIBU (obtain, use, store, dispose of), which teaches people how to properly obtain, use, store, and dispose of drugs. DAGUSIBU is one of the community health initiatives carried out by pharmacists through health service activities. However, the rise of online sales with convenience and appealing promotions, as well as a lack of information and education, leads to people using drugs inappropriately. As a result, public education through DAGUSIBU must be re-encouraged to control the problems and incidents caused by drug use. This research aimed to educate the public by tracking changes in people's knowledge about DAGUSIBU medicine while using online platforms to obtain drugs.

Methods

This was a one-group, pre-test, and post-test design quasi-experimental research. The pre-test was administered before education, and the post-test was administered following education. In this study, leaflets and counselling media were used for education, and a questionnaire was used to assess public knowledge (Table I). This research took place from March to July 2022 in West Java, Indonesia.

Table I: The questionnaire of pre-test and post-test for DAGUSIBU education evaluation

Indicator	Number	Question	Percentage (%)	
			Pre	Post
Obtain	1	A pharmacy is the right place to buy medicine	24.32	33.46
	2	Apart from on-site pharmacies, medicines can also be redeemed at online pharmacies	24.71	40.19
	3	To get potent drugs at online pharmacies, it must be done with a doctor's prescription	69.46	81.35
	4	Online pharmacies do not sell all types of prescription drugs such as narcotics and psychotropics	75.29	82.50
	5	Online prescriptions can only be validated once to be redeemed at an online pharmacy	58.95	73.37
Usage	6	There are instructions for using the drug on the package	11.28	11.35
	7	Before using the drug, the rules for use and information on drug use must be read	22.96	43.46
	8	Drugs have drug use limits, namely beyond the use date and expiration date	71.79	74.04
	9	Medicines must be used according to the instructions of the doctor and pharmacist	91.44	93.46
	10	Antibiotic drugs must be taken until they run out	73.54	85.58
Storage	11	Drug storage affects drug stability and safety	90.86	93.46
	12	Drugs are stored according to the instructions on the package or the pharmacist's instructions	87.94	91.92
	13	While storing the drug, it should be protected from direct sunlight	40.27	54.62
	14	Drugs that are stored should have the original packaging to maintain drug stability	79.96	87.31
	15	Stored medicine should be out of reach of children	60.12	68.27
Disposal	16	Leftover drugs must be disposed of correctly by removing the identity on the packaging	85.02	88.65
	17	Antibiotic tablets that will be disposed of must be crushed first and then buried in the ground	48.44	66.15
	18	Medicines in the form of liquid need to be disposed of first, part of the contents into the waterways, then the bottles can be thrown directly into the trash	52.14	68.85
	19	Drugs in the form of tablets and pills must be crushed before being disposed	53.70	68.08
	20	Drugs in a tablet dosage form that are damaged or expired must be disposed of by burying in the ground	67.12	75.38

The respondents were administered a pre-test and a post-test for any changes before and after the treatment. Pre-test and post-test values were then categorised into the "*poor*" category if the value was less than 7.5, the "*adequate*" if the value was 7.5, and the "*good*" if the value was more than 7.5. The research design that was utilised can be described as follows:

O1--------X--------O2

Note: O1: initial test (pre-test); O2: final test (post-test); X: treatment (providing education)

Research Instruments

The data collection instrument was in the form of a validated questionnaire with content and construct validity. The content validity was determined using expert opinions regarding the contents of the questionnaire used as a data collection instrument. The validity of the measure was determined by distributing questionnaires to people who were not research subjects. Instructions on how to obtain, use, store, and dispose of drugs are provided in the form of leaflets. The leaflet's content and layout were previously validated by experts, specifically pharmacists at the Indonesian Pharmacist Association of West Java Regional.

Research variable

The dependent variable was community knowledge about DAGUSIBU (obtaining drugs using an online platform) in West Java. The educational process was an independent variable. The study's population is part of the Indonesian Pharmacist Association of West Java region that gathered in a webinar on DAGUSIBU education in July 2023. The inclusion criteria were people aged below 60 years, could read and write, and were actively shopping in the marketplace. The total number of respondents was 613. The sample from respondents was calculated using the Lwanga & Lemeshow formula (Lwanga & Lameshow, 1991), yielding 320 respondents as a result of the sample calculation (CI 99%, margin of error 5%). Purposive sampling was used to collect data. Figure 1 depicts the scope of the study.

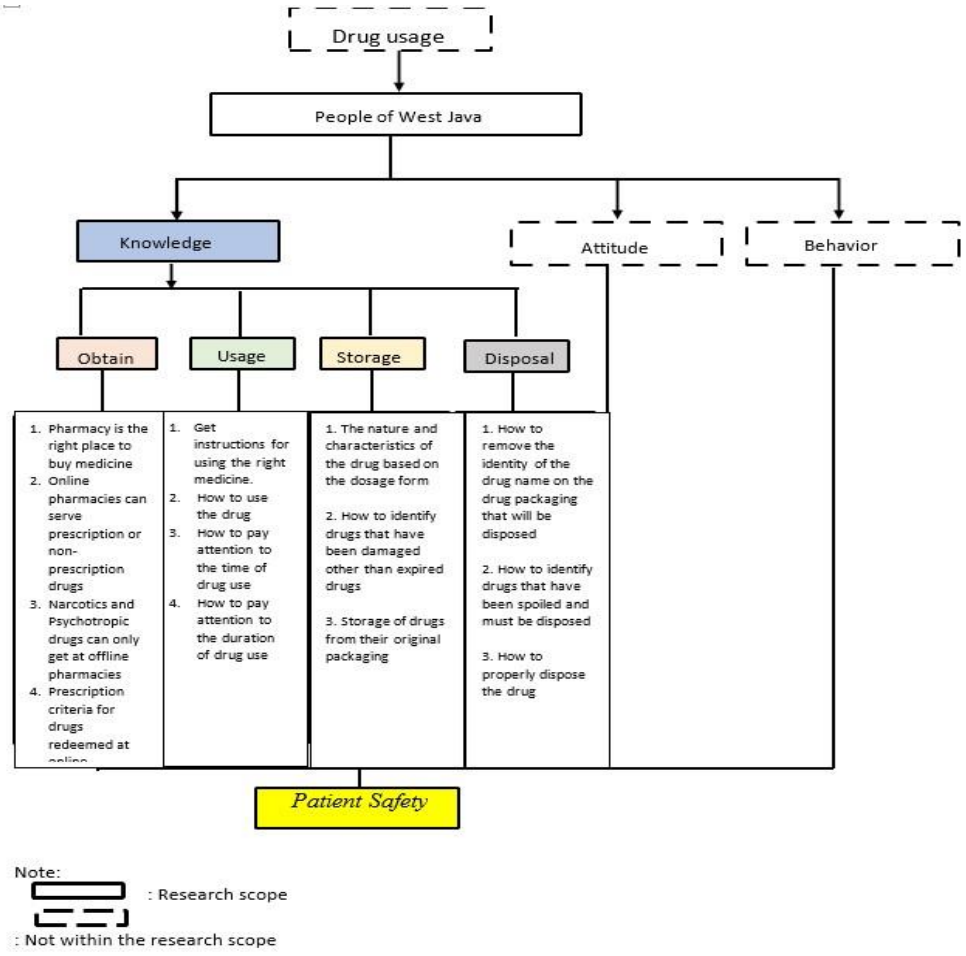

Figure 1: Research scope diagram

Results

The characteristics of adult respondents (17-45 years old) were 89%, early elderly respondents (46-55 years old) were 7%, and elderly respondents (> 55 years old) were 4%. Respondent characteristics are based on education level; 96% have a university graduate, and 13% have a senior high education. Gender distribution was 82% were female and 18% were male. Table II shows the detailed distribution.

Table II: Distribution of respondent's characteristics

Characteristics	Frequency	(%)
Age		
Adults (17-45 y.o)	285	89.06
Middle-aged adults (46-55 y.o)	23	7.19
Elderly aged (>55 y.o)	12	3.75
Latest education		
Elementary education	0	0
Junior high education	0	0
Senior high education	13	4.06
University	307	95.94
Gender		
Male	58	18.12
Female	262	81.88

A pre-test and post-test, as well as the Wilcoxon test, were used to determine the effect of education on increasing knowledge. Figure 2 depicts the test results, which show that 93% of respondents had a post-test value greater than the pre-test value, and 7% of respondents had the same pre-test value as the post-test.

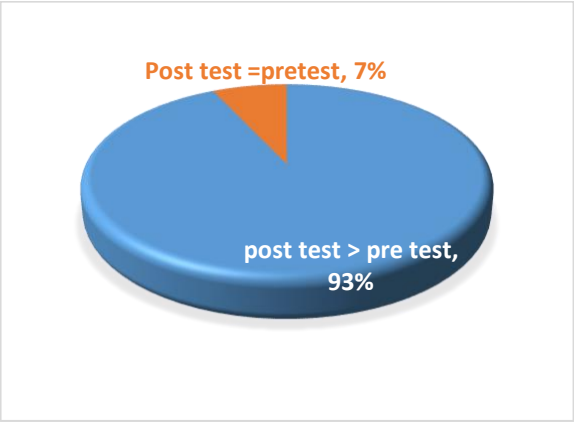

Figure 2: Distribution of the pre-test score compared to the post-test score based on the questionnaire

The statistical findings revealed a significant difference in knowledge before and after education with an asymp.sig p = 0.001. According to the results of the questionnaire during the pre-test and post-test to measure the level of public knowledge about DAGUSIBU, the highest percentage of knowledge level before treatment was in the "*poor*" category of 49.41%, which fell to 10.42% after education, and the highest post-education category was in the "*good*" category of which was 48.46% (Table III).

Table III: Level of knowledge

Categories	Before education	After education
Poor	49.41	10.42
Adequate	18.87	41.12
Good	36.72	48.46

Discussion

According to the age factor, the category with the highest level of "*good*" knowledge was between the ages of 17-45, with as many as 89% of respondents falling into this category. This is consistent with Pratiwi's report that respondents at the productive age (≤ 45 years) had a higher level of knowledge than the elderly (Pratiwi *et al.*, 2016). This was because, at the productive age, respondents usually can understand more due to better sensory functions (Pratiwi *et al.*, 2016).

Individual cognitive abilities, including the ability to read and receive information, are influenced by education level in addition to age. According to the characteristics of the respondents, 96% were highly educated. Education influences the mindset, learning process, and level of understanding of information. The higher a person's education, the easier it is to process information and the more rational and careful he/she is in drug selection (Rawas *et al.*, 2021). A person's knowledge enables them to do things that can benefit them from the information obtained (Suarningsih *et al.*, 2018). Especially in the various online platforms that are available, where access to buying and selling across borders is easy, public knowledge is critical for drug safe use and efficacy (Ayunda *et al.*, 2023).

In general, the findings from this study show that education is extremely effective at increasing public knowledge. Increased knowledge can influence people's attitudes and behaviours in using technology wisely when shopping for drugs online. As a result, more research on the effect of DAGUSIBU education on

people's attitudes and behaviour when deciding to buy drugs from online pharmacies is required. It is estimated that nearly 78% of Indonesians, or approximately 215.6 million people, use the internet, indicating the market's high potential. Indonesia is also the world's fourth–largest internet user country (APJII, 2023). Unfortunately, data also shows that almost 50% of all drug sellers in the marketplace do not request a doctor's prescription (APJII, 2023). When respondents purchase prescription drugs with no supervision from either a doctor or pharmacist regarding their use, they put themselves at risk (Pratama *et al*., 2022). This can occur due to the lack of public knowledge regarding drug classification and society's habit of freely purchasing prescription drugs without a doctor's prescription but only by recommendations from relatives (Nieuwlaat *et al*., 2014). According to a study conducted by Long *et al*. (2022), consumers purposefully purchase hard drugs from illegal pharmacies without a doctor's prescription. Even if a prescription for these drugs exists, the buyer is likely to send the prescription to several online pharmacies (Long *et al*., 2022). As a result, more research into the behaviour of people who have received DAGUSIBU education regarding online drug purchases is required.

Conclusion

The process of education has a significant influence on public knowledge regarding DAGUSIBU medicine which uses online platforms to obtain the drugs.

Acknowledgement

The authors appreciate the Indonesian Pharmacist Association of West Java Regional for partnering in implementing the DAGUSIBU education process. The authors are also grateful to the LPPM department of the Atma Jaya Catholic University of Indonesia for providing the funds for this study.

Source of funding

The study was funded by the LPPM department of the Atma Jaya Catholic University of Indonesia.

References

APJII. (2023). *The APJII survey of internet users in Indonesia reached 215 million people*. Asosiasi Penyelenggara Jasa Internet Indonesia. https://apjii.or.id/berita/d/survei-apjii-pengguna-internet-di-indonesia-tembus-215-juta-orang

Ayunda, T. S., Prastiwi, M., & Maheswari, A. I. (2023). Knowledge about the legality of drugs and actions to purchase drugs online for COVID-19. *Jurnal Farmasi Komunitas*, **10**(1), 34–38.

BPOM RI. (2019, March 8). *Explanation from BPOM RI regarding the distribution of hard drugs sold online.* BPOM RI. https://www.pom.go.id/penjelasan-publik/penjelasan-bpom-ri-tentang-peredaran-obat-keras-yang-dijual-online-daring

Hijawati. (2020). *The distribution of illegal drugs is reviewed from the Consumer Protection Law*. *Solusi*, **18**(3), 394–406.

Jamaludin, F. (2022). *These products are said to be the best sellers throughout 2022 on Tokopedia*. Merdeka.com. https://www.merdeka.com/teknologi/produk-produk-ini-disebut-paling-laris-sepanjang-2022-di-tokopedia.html

Joewono, T. B., Rizki, M., Belgiawan, P. F., & Irawan, M. Z. (2020). Why do shoppers keep making online shopping trips? Learning from evidence in Bandung, Indonesia. *Asian Transport Studies*, **6**, 100016. https://doi.org/10.1016/j.eastsj.2020.100016

Kumar, S. L., Logeshwaran, L. L., Vanitha Rani, N., Thennarasu, P. T., Keerthana, M. K., & Lavanya, M. L. (2019). Assessment of knowledge and awareness on the disposal of expired and unused medicines among medication consumers. *Journal of Young Pharmacists*, **11**(4), 410–416. https://doi.org/10.5530/jyp.2019.11.84

Long, C. S., Kumaran, H., Goh, K. W., Bakrin, F. S., Ming, L. C., Rehman, I. U., Dhaliwal, J. S., Hadi, M. A., Sim, Y. W., & Tan, C. S. (2022). Online pharmacies selling prescription drugs: Systematic review. *Pharmacy,* **10**(2), 42. https://doi.org/10.3390/pharmacy10020042

Lwanga, S., & Lameshow, S. (1991). *Sample size determination in health studies. A practical manual*. World Health Organisation.

Nieuwlaat, R., Wilczynski, N., Navarro, T., Hobson, N., Jeffery, R., Keepanasseril, A., Agoritsas, T., Mistry, N., Iorio, A., Jack, S., Sivaramalingam, B., Iserman, E., Mustafa, R. A., Jedraszewski, D., Cotoi, C., & Haynes, R. B. (2014). Interventions for enhancing medication adherence. *Cochrane Database of Systematic Reviews*, **2014**(11). https://doi.org/10.1002/14651858.CD000011.pub4

Pratama, I. kadek D. deva, Habibi, H., & Suarna, I. N. (2022). Legal measures against the sale of hard drugs without a doctor's prescription (Review of Consumer Protection Laws and Hindu Law). *Jurnal Hukum Agama Hindu*, **5**(2).

Pratiwi, H., Nuryanti, N., Fera, V. V., Warsinah, W., & Sholihat, N. K. (2016). The influence of education on knowledge, attitudes and ability to communicate drug information. *Kartika Jurnal Ilmiah Farmasi*, **4**(1). https://doi.org/10.26874/kjif.v4i1.51

Rawas, G. M., AlAhmadi, S. F., & Mufti, A. H. (2021). Evaluation of public knowledge and attitude toward how to use, store, and discard expired pharmaceutical drugs in Saudi Arabia. *International Research Journal of Medicine*

and Medical Sciences, **9**(3), 103–112. https://doi.org/10.30918/IRJMMS.93.21.022

Suarningsih, K., Suyasa, I. G. P. D., & Rismawan, M. (2018). The influence of health education using leaflet media on parents' knowledge about chronic suppurative otitis media at the ENT Polyclinic of Klungkung District Hospital. *Jurnal Riset Kesehatan Nasional*, **1**(1), 8–16. https://doi.org/10.37294/jrkn.v1i1.31