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Self-medication practices among customers at non-pharmacy outlets during COVID-19 pandemic in Indonesia

Yosi Irawati Wibowo[1], I Gusti Agung Ari Kusuma Yana[2], Gusti Ayu Putu Laksmi Puspa Sari[3], Bruce Sunderland[4], Adji Prayitno Setiadi[1]
[1]Centre for Medicines Information and Pharmaceutical Care (CMIPC) and Department of Clinical and Community Pharmacy, Faculty of Pharmacy, Universitas Surabaya, Surabaya, Indonesia
[2]Clinical and Community Pharmacy Programme, Institut Teknologi dan Kesehatan Bali, Denpasar, Indonesia
[3]Faculty of Pharmacy, Universitas Mahasaraswati Denpasar, Denpasar, Indonesia
[4]School of Pharmacy and Biomedical Sciences, Faculty of Health Sciences, Curtin University, Perth, Australia

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ABSTRACT

A cross-sectional study was performed to describe self-medication practices of customers at kiosks and minimarkets in District X, Indonesia, during COVID-19 pandemic in 2021. A sample of 98 customers from 67 kiosks, and 100 customers from 52 minimarkets were interviewed using a validated questionnaire. Descriptive statistics were used to summarise the findings. Most drugs purchased at kiosks and minimarkets were general sales drugs, i.e., analgesic-antipyretic (64.3% versus 46.0%); however, prescription drug sales were reported (3.1% vs 3.0%, respectively). Kiosk and minimarket customers purchased medications mainly based on the recommendations of non-health workers (69.4% vs. 34.0%, respectively), or electronic media (36.7% vs. 43.0%, respectively). The reasons to choose kiosks or minimarkets included accessibility, personal preferences, and service quality. Most kiosk/minimarket customers had knowledge on the drug brand names and indications, but only some knew the composition (8.16% vs. 29.0%, respectively) or side effects (9.18% vs. 35.0%, respectively). These findings indicated limited quality assurance on self-medication practices at non-pharmacy outlets.

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Corresponding Author:

Yosi Irawati Wibowo
Centre for Medicines Information and Pharmaceutical Care (CMIPC)
and Department of Clinical and Community Pharmacy, Faculty of Pharmacy, Universitas Surabaya
Surabaya, Indonesia
Email: yosi_wibowo@staff.ubaya.ac.id

1. INTRODUCTION

According to the World Health Organization, self-medication refers to the use of medicinal products by the consumer to treat self-diagnosed disorders or symptoms [1]. Self-medication is a global phenomenon, both in developed and developing countries. International studies have reported that self-medication prevalence varies between 11.2% and 93.7% [2]–[4]. Further, a systematic review of 69 studies worldwide has shown that the average incidence rate of self-medication from 2000 to 2018 was 74% in Europe, and 71% in Asia [4]. Indonesia is a South-East Asian developing country with the fourth highest world population [5]. Basic Health Survey data in 2013 reported that 35.2% of Indonesian households kept medicines for self-medication [6]. Based on Statistics Indonesia (*Badan Pusat Statistik*) data in 2022, self-medication practices among Indonesians have increased during the COVID-19 pandemic from 72.19% in 2020 to 84.34% in 2022 [7].

In Indonesia, drugs are categorized into two main types: over-the-counter (OTC) drugs (i.e., general sales, and general sales with cautionary labels), prescription drugs (i.e., potent drugs, narcotics and psychotropics); Food and Drug Control Agency (*Badan Pengawasan Obat dan Makanan*, BPOM) is the main regulatory body for drug monitoring [8], [9]. The whole range of drugs can be provided through pharmacies [i.e., community pharmacies, pharmacy units in hospitals or community health centres (*Puskesmas*)] [10]; while drug stores (which hold a drug retailer license) are only allowed to sell OTC products [11], [12]. Pharmacies as well as licensed drug stores are required to meet standards related to drug management and patient care to ensure the quality of medicines distributing across Indonesia [10]–[12]. The distribution of OTC drugs via non-pharmacy outlets, such as minimarkets or kiosks, was not regulated at the time of COVID-19 pandemic (when this study was conducted). It was just recently (in November 2023) that the government has regulated minimarkets/hypermarket/supermarket to retail OTC products [13].

Previous studies have reported that Indonesians often opt for self-treatment purchase products from non-pharmacy outlets, such as street peddlers (kiosks) and minimarkets [14]–[17]. While previous studies have shown that non-pharmacy outlets often have no adequate standards nor staff with pharmacy background [18], [19], their quality assurance required by the BPOM is questionable. The issue of counterfeit or sub-standard drugs has been a major concern in Indonesia; according to the Indonesia Anti-Counterfeiting Society (MIAP) data in 2016, counterfeit drugs constituted 25% of the country's $2 billion pharmaceutical markets [20]. The incidence of involving counterfeiting drugs was mostly from online shops or street peddlers (kiosks) [21], [22].

While the phenomenon where Indonesians have opted to use non-pharmacy outlets to obtain their medications places in jeopardy the safety and quality issues of their purchases, currently only limited evidence is available related to self-medication practices at non-pharmacy outlets. Hence, this present study was conducted to describe self-medication practices among customers purchasing medications at kiosks and minimarkets, including the profile of medications purchased, the reasons to choose kiosks/minimarkets, and their knowledge on the medications being purchased during the COVID-19 pandemic. The findings would be of importance to understand customer needs as a basis to develop strategies to improve the quality use of medicines, while at the same time keeping adequate access to medications for all Indonesians.

2. METHOD

2.1. Study design and setting

A cross-sectional study was performed between October and November 2021. This study was conducted in one of the four districts in an urban city located at central part of Indonesia. District X has an area of 2,412.93 km^2 with the highest population density district of 8,601 per km^2 [23]; and has the largest number of minimarkets, micro, small and medium enterprises in the city [24]. This research was conducted at non-pharmacy outlets, i.e., street stalls (kiosks) and minimarkets, in District X. It was conducted in accordance with the Declaration of Helsinki, and obtained approval from the Institutional Ethical Committee University of Surabaya (205/KE/XI/2021).

2.2. Participant recruitment and data collection

This study used a convenience sample of customers visiting kiosks or minimarkets in District X. Based on the data from the Central Statistics Agency or *Badan Pusat Statistik* (BPS) in 2020, there were 198 kiosks in District X [24]. Since there was no address or contact number data available, one possible approach was for the researchers to search for kiosks selling medications in District X until a minimum sample size of 67 was achieved. The minimum number was determined using Slovin's formula with a margin of error of 10% [25]. There was no recent data regarding minimarkets in District X, hence the research team surveyed the area and found 101 minimarkets selling medications. In each kiosk or minimarket, a convenience sample of 1-2 customers purchasing medicines were approached following making a purchase. Authors explain the nature of the study and invite them to participate. If they agreed to participate, they were asked to provide written informed consent and were interviewed using a questionnaire. The interviews were recorded and lasted for approximately 10 minutes.

2.3. The instrument

The questionnaire used in this study was generated from a previous study, and consisted of open/closed-ended questions to obtain data on customer characteristics, drugs purchased, reasons for purchasing medicines at kiosks/minimarkets, sources of information underlying drug purchases, and knowledge about the drugs purchased [14]–[17]. Reasons for purchasing drugs and knowledge of the drugs purchased were asked through open-ended questions. Knowledge of the drugs purchased included drug names (brand names), composition, indications, directions for use, side effects, storage, and expiration dates; all of which were considered as basic drug information [26]. The developed questionnaire was face-validated with two experts in pharmacy practice to ensure its appropriateness with the study objectives. This was followed with a pilot study with 20 laypersons where minor changes related with the use of languages was applied to improve understanding, for example 'purchase drugs'

was changed to ‘drugs purchasing’, ‘what information was received regarding the drugs purchased’ rather than ‘what information is known about the drugs purchased’.

2.4. Data analysis

Data from closed-ended questions were analysed descriptively; continuous data were presented as mean±standard deviation (SD), while categorical data were summarised in frequency and percentage (%). Data analysis was assisted using the Statistical Package Social Science (SPSS) software, version 26 (IBM Corp., Armonk, NY, USA). Responses from open-ended questions related to reasons for purchasing medications at kiosks/minimarkets were analysed using quantitative content analysis [27]. The audio-recorded responses were transcribed verbatim, and analysed by two research members. The first step of the analysis was data familiarisation by reading the transcripts repeatedly and listening to the audio recording (at least once). This was followed by categorising the relevant data into codes. If there was a disagreement, a discussion with the research team was carried out to reach a consensus about the code. The codes were grouped and organised at a broader conceptual level into themes [27]. The frequencies and percentages of the codes/themes were then calculated. Further, open-ended responses on the knowledge of each type of drug information were categorised into ‘known’ (‘Yes’) if he/she can mention or show (on the packaging or leaflet) the related information; and ‘don’t know’ (‘No’) if he/she was unable to mention or show the relevant information. The frequences and percentages of ’Yes’ and ’No’ responses for each piece of drug information were calculated.

3. RESULTS

A sample of 67 kiosks (a convenience sample) and 52 minimarkets (out of 101 minimarkets) selling medications in District X, Indonesia, were included as the study settings. All of these kiosks and minimarkets had no staff with a pharmacy background. A convenience sample of 98 customers from the 67 kiosks, and 100 customers from the 52 minimarkets were involved in this study, giving a median of 2 customers (range minimum-maximum: 1-2 customers) per kiosk or minimarket. Of 98 kiosks customers who were approached, all were willing to participate and had complete interviews (n=98); whereas of 104 minimarket customers who were approached, all were willing to participate, but 4 customers stopped/did not complete the interviews, giving a total of 100 customers from minimarkets.

3.1. Characteristics of the participating kiosk/minimarket customers

Most of the participating kiosk and minimarket customers were female (60.2% versus 54.0%, respectively) with a median age of 34.5 versus 31.5 years, respectively. The majority of the participating kiosks or minimarkets customers were senior high school or bachelor degree graduates (80.6% versus 68.0%, respectively), and had household incomes<2 million-5 million (91.8% versus 80.0%, respectively). The details of participating customers can be seen in Table 1.

3.2. Profiles of medications purchased

Of the 98 kiosk customers, the median of drugs purchased was one drug (range: 1-4); while of 100 customers at the minimarkets, the median of drug purchased was one drug (minimum-maximum range: 1-2). Most of the drugs purchased at kiosks and minimarkets were general sales drugs, i.e., analgesic-antipyretic (64.3% versus 46.0%). However, a small percentage of customers purchased prescription drugs, namely analgesics (e.g., mefenamic acid) (3.1% vs 3.0%, respectively). Details of the purchased drugs can be seen in Table 2.

Most kiosk customers purchases were based on the recommendations from other people, i.e., non-health workers (e.g., family members, neighbours, friends, kiosk/minimarket staff) (69.4%). Other sources of information were from the electronic media (such as radio or television) (36.7%), personal experience (6.1%) and social media (5.1%). While the main sources of information among minimarket customers to purchase medicine was electronic media (43.0%), and recommendations from other people, either non-health workers (34.0%) or health workers (e.g., doctors, pharmacists) (19.0%).

3.3. Reasons for purchasing medicines at kiosks/minimarkets

This study reported three main themes related to the reasons for customers to purchase medicines at kiosks or minimarkets, including: accessibility, personal preferences, and quality of service as shown in Table 3. The majority of customers chose to obtain drugs from kiosks or minimarkets because of accessibility, especially location accessibility (close distance) (86.7% versus 76.0%, respectively). Approximately 30% of customers of kiosks and minimarkets provided reasons of time accessibility (faster); financial accessibility (cheaper) was also mentioned as the reason for purchasing drugs at kiosks/minimarkets with a higher percentage

at kiosks than minimarkets (17.3% versus 5.0%, respectively). A lower percentage of customers (<10%) purchased drugs from kiosks or minimarkets due to personal factors or the service quality.

3.4. Knowledge about medications purchased

All kiosks and minimarkets customers were able to mention or point to the brand names of their purchased drugs and their indications; further, more than 80% were familiar with the directions of use, storage instructions as well as drug expiration dates as presented in Table 4. However, only a small percentage of kiosk and minimarket customers were aware of the drug composition (8.2% versus 29.0%, respectively) as well as the side effects (9.2% versus 35.0%, respectively).

Table 1. Characteristics of the participating customers

Characteristics		Kiosk (N=98) n (%)	Minimarket (N=100) n (%)
Age [median (range), in years]		34.5 (18-61)	31.5 (18-63)
Gender	Male	39 (39.8)	46 (46.0)
	Female	59 (60.2)	54 (54.0)
Highest education	No education	1 (1.0)	0 (0.0)
	Elementary school	4 (4.1)	4 (4.0)
	Junior high school	5 (5.1)	7 (7.0)
	Senior high school	40 (40.8)	39 (39.0)
	Diploma	9 (9.2)	15 (15.0)
	Bachelor	39 (39.8)	29 (29.0)
	Postgraduate	0 (0.0)	6 (6.0)
Occupation	Not working	7 (7.1)	1 (1.0)
	Student	8 (8.2)	18 (18.0)
	Housewife	15 (15.3)	11 (11.0)
	Self-employed	25 (25.5)	31 (31.0)
	Civil servant		
	Healthcare	0 (0.0)	2 (2.0)
	Non healthcare	1 (1.0)	11 (11.0)
	Private employee		
	Healthcare	0 (0.0)	1 (1.0)
	Non-Healthcare	42 (42.8)	21 (21.0)
	Others (e.g., retired, labourer, priest)	0 (0.0)	4 (4.0)
Household income (Rupiah/month)	<2 million	35 (35.7)	52 (52.0)
	2–5 million	55 (56.1)	28 (28.0)
	>5 million	8 (8.2)	20 (20.0)
Marital status	Single	32 (32.7)	38 (38.0)
	Married	61 (62.2)	58 (58.0)
	Divorced	3 (3.1)	1 (1.0)
	Living alone	2 (2.0)	3 (3.0)

Table 2. Profiles of medications purchased

Medications purchased		Kiosk customers (N=98) n (%)*	Minimarket customers (N=100) n (%)*
General sales drugs	Analgesic-antipyretic (e.g., paracetamol, paracetamol/caffeine)	63 (64.3)	46 (46.0)
	Antidiarrheal (e.g., attapulgite, attapulgite/pectin)	3 (3.1)	3 (3.0)
	Antacid (e.g., hydrotalcite, magnesium hydroxide)	6 (6.1)	1 (1.0)
	Laxative (e.g., sodium lauryl sulfoacetate/sodium citrate/sorbitol)	0 (0.0)	1 (1.0)
General sales with cautionary label drugs	Analgesic for menstrual pain (e.g., paracetamol/hyoscyamine)	0 (0.0)	3 (3.0)
	Analgesic-antipyretic (e.g., paracetamol, caffeine/propyphenazone/dexchlorpheniramine maleate)	13 (13.3)	6 (6.0)
	Antiemetic (e.g., dimenhydrinate)	2 (2.0)	0 (0.0)
	Common cold products (e.g., chlorpheniramine maleate/phenylpropanolamine HCl/paracetamol)	18 (18.4)	14 (14.0)
	Common cold-cough products (e.g., paracetamol/ pseudoephedrine HCl/dextromethorphan HBr)	1 (1.0)	2 (2.0)
	Cough products (e.g., chlorpheniramine maleate/ dextromethorphan HBr/guaifenesin)	1 (1.0)	4 (4.0)
Prescription drugs	Analgesic (e.g., mefenamic acid, methampyrone)	3 (3.1)	3 (3.0)
Herbal medicines	Antidiarrheal (e.g., psidii guajavae folium)	5 (5.1)	5 (5.0)
	Immune system products (e.g., panax ginseng extract)	4 (4.1)	1 (1.0)
Supplements	Immune system products (e.g., zinc picolinate)	1 (1.0)	1 (1.0)
	Vitamin and/or mineral (e.g., ascorbic acid)	3 (3.1)	14 (14.0)

*Each kiosk/minimarket customer can buy more than one type of drug

Table 3. Reasons to purchase medications from kiosk/minimarket

Reasons		Illustrative quotes	Kiosk customers (N=98) n (%)*	Minimarket customers (N=100) n (%)*
Accessibility	Location accessibility	"The reason is it is closer to my home, so I prefer to get medications from the kiosk rather than from the pharmacy, which is quite far from my home." (W 47.2) "I think I (usually) get my medications from the minimarket because it is close to my home." (Mini 38.1)	85 (86.7)	76 (76.0)
	Time accessibility	"As it is hot outside (I do not want to spend a longer time to reach a place), it would be quicker to get medications from there (a kiosk)." (W 43.1) "In my opinion, it's much quicker getting them (medications) from the minimarket." (Mini 4.1)	32 (32.7)	28 (28.0)
	Financial accessibility	"The medications (bought from a kiosk) are also cheaper than those in big pharmacies" (W 2.1) '(Minimarkets) often offer discounts or promotions, so it might be cheaper to get medications from there rather than pharmacies." (Mini 3.1)	17 (17.4)	5 (5.0)
Internal/ personal factors	Past experience	"Hmm well, I am used to (get medications from the kiosk)." (W13.2) "I am used to shop (including medications) at a minimarket." (Mini 26.1)	5 (5.1)	6 (6.0)
	Belief (not major ailments)	"(I prefer getting medications from a kiosk) as they are for common ailments anyway" (W 49.1) "I did not buy prescription medicines, so I can buy them from minimarkets." (Mini 5.1) "Well, medicines for common ailments are available at minimarkets. It is freely sold there, right?" (Mini 27.2)	2 (2.0)	6 (6.0)
	Trust	"Medications I bought from a kiosk can usually cure my illnesses." (W 55.1) "Minimarkets have a reputation to maintain, so I choose to buy my medications there." (Mini 31.1) "I think (minimarkets) have better quality assurance on the products (they sold), as they checked the expiration dates regularly." (Mini 17.2)	1 (1.0)	3 (3.0)
Service quality	Physical facility	"There are no parking fees" (W 6.1) "In kiosks, there are no parking attendants." (W 65.1)	4 (4.1)	0 (0.0)
	Cleanliness	"I think it I prefer (minimarkets) as it is cleaner." (Mini 17.2)	0 (0.0)	2 (2.0)
	Responsiveness	"After dark, there is no pharmacies open… but minimarkets are still open until midnight" (Mini 25.1) "There is a pharmacy close to my home, but at these hours they are already closed. Minimarkets are better since they are open until midnight." (Mini 10.2)	0 (0.0)	4 (4.0)
	Drug availability	"The medications are readily available." (W 20.1) "The medications I am looking for are usually available." (W62.2) "The reason I prefer to buy medications from minimarkets as they have got everything there." (Mini 33.2)	6 (6.1)	8 (8.0)

*Each customer was allowed to provide more than one reasons

Table 4. Customers' knowledge about medications purchased

Types of drug information*		Kiosk customers (N=98) n (%)	Minimarket customers (N=100) n (%)
Drug name	Yes	98 (100.0)	100 (100.0)
	No	0 (0.0)	0 (0.0)
Composition	Yes	8 (8.16)	29 (29.0)
	No	90 (91.84)	71 (71.0)
Indication	Yes	98 (100.0)	100 (100.0)
	No	0 (0.0)	0 (0.0)
Direction for use	Yes	84 (85.71)	93 (93.0)
	No	14 (14.29)	7 (7.0)
Storage	Yes	85 (86.74)	96 (96.0)
	No	13 (13.26)	4 (4.0)
Side effects	Yes	9 (9.18)	35 (35.0)
	No	89 (90.82)	65 (65.0)
Expiration date	Yes	81 (82.65)	78 (78.0)
	No	17 (17.35)	22 (22.0)

*Yes, if consumers could mention/point out information about all of their purchased drugs; No, if they were unable to mention/point out information about any of their purchased drugs

4. DISCUSSION

This study has provided profiles of customers purchasing medications from non-pharmacy outlets in an Indonesian urban setting during the COVID-19 pandemic. The most common reason for customers to get medications from kiosks or minimarkets during the pandemic was their accessibility, either in relation to time, distance or cost. The medications they generally purchased were general sales medications, particularly analgesic-antipyretics; although limited sales of prescription drugs were also reported. Most customers have shown limited knowledge regarding the drug composition and side effects. This finding has indicated that widespread availability of kiosks/minimarkets can be an alternative to improve medication accessibility among Indonesians, particularly during an emergency situation, such as the COVID-19 pandemic; however, these kiosks/minimarkets need to be regulated (as licensed outlets) to guarantee adequate supervisions and quality assurance in the aspects of drug management and pharmaceutical care. The new regulation in November, 2023 (after this study was conducted) has regulated supermarkets as a retailer for OTC products, but kiosks has not yet been determined.

Most kiosk or minimarket customers participating in this study were females with a wide range of age (18-61 and 18-63 years, respectively). Previous Indonesian studies reported that female gender were more likely to be involved in self-medication [16], [28]. This might be because women have more contact with family members and with the healthcare system during their pregnancy and the child-growth monitoring period. They also serve as an important role model for their children [29]. Some physiological reasons such as dysmenorrhea, premenstrual syndrome, and pregnancy complications have also made women more likely to consume medications without consulting doctors [29]–[31]. Further, findings in this present study showed quite a number of kiosk respondents with a higher level of education, i.e. university graduates (39.8%), in addition to high school graduates (45.9%). A higher level of education is usually associated with a good health literacy, which might contribute to the person's ability to practice self-medication carefully [32], [33]. This warrants special considerations as while the majority of respondents in this study had an adequate level of education, they might not be aware that only licensed outlets can sell medications.

When looking at the reasons to obtain medications from kiosks or minimarkets during the pandemic, the participating customers in this study mentioned accessibility as the main reason, either in relation with distance, time, or cost. In line with this finding, a study in Sweden (n=2,580) revealed that 80% of respondents reported distance as the main reason for buying medications at non-pharmacy outlets; another reason was the convenience of shopping for over-the-counter (OTC) drugs along with groceries, and favourable prices [2]. This finding might indicate that customers purchasing medications might be more concerned with the ease of access through non-pharmacy outlets, especially during the COVID-19 pandemic, and have a lack of awareness that these outlets had not been regulated as a drug retailer (at the time of this study was conducted). Hence, the development of strategies to increase public awareness on the importance of obtaining medications from licensed outlets should be considered. It was reported that unlicensed outlets have been associated with more incidents of counterfeiting or substandard drugs [21], [22].

Most drugs purchased from kiosks and minimarkets during the pandemic were OTC products, i.e., analgesic-antipyretic (64.29% versus 46%, respectively). In parallel, international studies at the time of the pandemic reported that analgesic-antipyretics as the most common medicine for self-medication [28], [34], [35]; this may be due to fever and headache were one of the most common symptom of COVID-19. In addition to OTC products, however, this present study reported sales of analgesics which are categorised as prescription/ pharmacy-only medications (e.g., mefenamic acid). Prior studies in non-pharmacy outlets (such as kiosks and minimarkets) also reported the sale of prescription drugs [18], [19]. This warrants special considerations as prescription or pharmacy only drugs should be dispensed/provided by pharmacists, and accompanied by adequate drug information [10], [11].

Further, this present study reported that the source of information for customers to choose a medication have mainly been based on the recommendations from other people (non-health workers) and electronic media. This finding has been comparable to those from prior studies in Indonesia and other developing countries [19], [36]–[39]. Thus, inaccuracy and incomplete information from those sources are expected; customers might not be able to choose appropriate medications for their symptoms, and generally had knowledge limited to the product name and its indication. This present study reported most kiosk/minimarket customers knew the product brand name and indication, but had limited knowledge with regards to the composition and side effects. This finding was comparable to previous studies countries [36], [38], [39]. Hence, it is of importance for a pharmacist or a pharmacy technician to facilitate a customer in choosing the right product for self-medication, and to provide adequate basic information regarding the product (i.e., the drug name, composition, indication, side effect and expiration date). It was evidenced that the lack of public knowledge on the medications they are taking has posed a risk of using the wrong products, using drugs with the same active ingredients or using excessive medications, which might lead to unwanted effects, duplication of therapy or overdose [40].

There are some limitations to this study. Firstly, the convenience sampling of customers might limit the generalisability of the finding. However, convenience sampling was considered as the only feasible option as no sampling frame of customers was available for conducting a random sampling. Secondly, most chain minimarkets refused to participate as the study settings due to the management policy; hence, this study is mostly representing customers from independent minimarkets. However, the number of minimarkets involved as the study settings was 51.2% thus this study should provide some insights on customer purchasing medicines at minimarkets in District X, Indonesia. Lastly, the qualitative data obtained from interviews could be subjected to bias if respondents are not sharing their true responses [41]. However, the respondents were provided with adequate study information at the beginning of the data collection, and explained on how their identity would be strictly protected, thus they were expected to be confident to share an honest opinion. The study did not check the quality of the purchased medications to detect counterfeit medicines as this was beyond the scope of this study.

5. CONCLUSION

While most customers accessed kiosks or minimarkets during the COVID-19 pandemic to purchase OTC products, a few prescription medication purchases were reported; this warrants special considerations. While the sources of information on medications purchased were mainly from non-health workers and electronic media, inaccuracy of some of information from such sources could occur. Further research to assess the quality of medications provided at these outlets should occur to protect the population purchasing counterfeit or poor-quality products.

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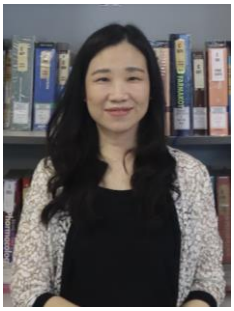
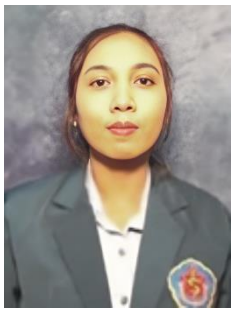
BIOGRAPHIES OF AUTHORS



Yosi Irawati Wibowo has been a drug information pharmacist at Medicines information and Pharmaceutical Care (CMPIC), and a senior lecturer in the Faculty of Pharmacy, Universitas Surabaya, Indonesia. She has been involved in numerous research projects in collaboration with the East Java Provincial Health Office to promote rational use of medicines. She has authored or co-authored multiple peer-reviewed scientific papers related to pharmacy practice, and has particular interests in optimising the role of pharmacists and quality use of medications. She can be contacted at email: yosi_wibowo@staff.ubaya.ac.id.

I Gusti Agung Ari Kusuma Yana is a junior lecturer at the Clinical and Community Pharmacy Programme, Institut Teknologi dan Kesehatan Bali, Indonesia. He was recently graduated his master degree from Universitas Surabaya, Indonesia. His research interests include optimising the role of pharmacists and social pharmacy. He can be contacted at email: gunkke17@gmail.com.



Gusti Ayu Putu Laksmi Puspa Sari is a junior lecturer at the Faculty of Pharmacy, Universitas Mahasaraswati Denpasar, Indonesia. She received her master degree in Pharmacy from Universitas Surabaya, Indonesia. She has particular research interests in social pharmacy as well as health services and policy. She can be contacted at email: ayulaksmi9999@gmail.com.

Bruce Sunderland is an academic within the Pharmacy Discipline of the Curtin Medical School. He is active in the areas of pharmacy practice especially community pharmacy-based services and drug stability. He has supervised many PhD and research Master of Philosophy theses and published more than 280 research articles in refereed journals. He can be contacted at email: B.Sunderland@curtin.edu.au.

Adji Prayitno Setiadi is an academic affiliated with Faculty of Pharmacy, Universitas Surabaya, Indonesia. He was the director of Centre for Medicines information and Pharmaceutical Care (CMPIC), Universitas Surabaya from 2015 to 2021. He has awarded several research grants to promote quality use of medications among Indonesians. He has also served an expert panel in the Ministry of Health Republic of Indonesia in developing policies and guidelines to optimise the role of pharmacists in rational drug therapy. He can be contacted at email: adji_ps@staff.ubaya.ac.id.