



Analysis of Pharmacists' Knowledge Level on Drug Management with The Availability of Medicine in Community Health Centers in Padang City

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ABSTRACT: The availability of medicine is one of the factors that can be employed to assess the quality of community health centers and determine customer satisfaction. Pharmacists require a strong foundation in drug management knowledge to ensure the medicine availability. Proficient drug management can enhance the rational use of medications, promote rational prescription practices, and improve drug utilization efficiency. This research aims to ascertain the pharmacist's knowledge level and the availability of medicine while also exploring any potential correlations between pharmacist knowledge and medicine availability. This research adopts a non-experimental study design with cross-sectional data collection. The research sample was selected using purposive sampling techniques, employing a questionnaire to assess pharmacist knowledge levels, as well as Drug Usage Reports and Drug Request Sheets (LPLPO) to evaluate the availability of medicine levels. Data analysis involved the Chi-Square test and Spearman Rank test. The study results indicated that the majority of pharmacists possessed a high level of knowledge (73.7%), while most community health centers have a moderate level of medicine availability (73.7%). The Spearman Rank test revealed no significant correlation between pharmacist knowledge levels and the availability of medicine.

Keywords: the availability of medicine; drug management; knowledge; pharmacist; community health center.

Introduction

Healthcare services aim to improve the health and well-being of the community. To achieve this goal, healthcare facilities are established in every region, known as Community Health Centers (Pusat Kesehatan Masyarakat or Puskesmas). Community Health Centers serves as the primary healthcare provider expected to deliver high-quality and affordable healthcare services to the public [1].

One of the healthcare services offered at Community Health Centers is pharmaceutical care. Pharmaceutical care involves activities aimed at identifying, preventing, and resolving issues related to medications and health. Drug management stands as one of the quality indicators within pharmaceutical care [2]. Managing drugs encompasses a series of activities, including planning, procurement, receipt, storage, distribution, control, documentation, reporting, as well as monitoring and evaluation aspects [3].

Proficient drug management can enhance the rational use of medications, promote rational prescription practices, and improve drug utilization efficiency. Conversely, inadequate drug management can lead to a decline in the quality of healthcare services provided to the community and may increase pharmaceutical expenses due to either an excess or a shortage of drug supplies [4].

Excess or shortage of drug stocks can be attributed to several factors, namely improper drug planning, issues with the quality and quantity of drugs provided by the public health department, and the implementation of non-standard drug management [5]. According to Rusman's research (2020), drug shortages are still prevalent in community health centers due to drug requests that do not align with the planning [6]. Another study conducted by Baybo (2022) also mentions that excess or shortage of drug

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stocks in community health centers is often caused by discrepancies between the drug stock card content and the actual quantity of drug supplies [7].

Previous research at the Community Health Center in Malang City indicated that the knowledge level of the staff was at a good level, and the availability of drugs reached a moderate level. The respondents in that study were drug management personnel with educational backgrounds in both pharmaceutical and non-pharmaceutical fields [1]. Considering the pivotal role of pharmacists in pharmaceutical inventory management at health centers, this study focuses on evaluating the relationship between pharmacists' knowledge of drug management and the availability of medicine at the Community Health Center in Padang City.

Method

Study Design

This study employs a cross-sectional analytic observational approach to examine the correlation between pharmacists' knowledge levels regarding drug management and the availability of medicine among pharmacists working in community health centers in Padang City. The sampling was carried out using purposive sampling technique, with inclusion criteria consisting of

pharmacists employed in Padang City's community health centers who were willing to participate as respondents, ready to provide Drug Utilization Reports and Drug Request Sheets (LPLPO) data for the past \pm 3 months, willing to complete the research questionnaire, and possessed over 1 year of experience in drug management.

Research Instruments

To measure the level of pharmacist knowledge regarding drug management, a questionnaire consisting of 25 questions on drug management aspects including planning, requisition, receipt, storage, distribution, disposal, control, administration, and monitoring is utilized. This questionnaire has been validated by Alfian with a cornbach alpha result of 0.9675 [1]. Questions with correct answers are scored as 1, and incorrect answers receive a score of 0. Respondents' knowledge levels are classified into three categories: low if the score is \leq 55%, moderate if the score is 56% - 75%, and high if the score is 76% - 100% [1].

To assess the level of medicine availability in community health centers, data from Drug Utilization Reports and Drug Request Sheets (LPLPO) for the period from October to December 2022 are employed. The availability level is determined by calculating the stock of each drug divided by the average monthly usage of each

Table 1. Relationship between sociodemographic characteristics and respondents' knowledge levels

Sociodemographic characteristics	Respondents' knowledge levels (n=19)		p value
	High	Moderate	
Gender			
Male	2	0	1
Female	12	5	
Age (years)			
26-35	2	1	0.530
36-45	4	3	
46-55	7	1	
56-65	1	0	
Education			
Pharmacist	12	5	1
Magister Pharmacy	2	0	
Work experience (years)			
1-5	3	3	0.203
>5-10	2	1	
>10	9	1	

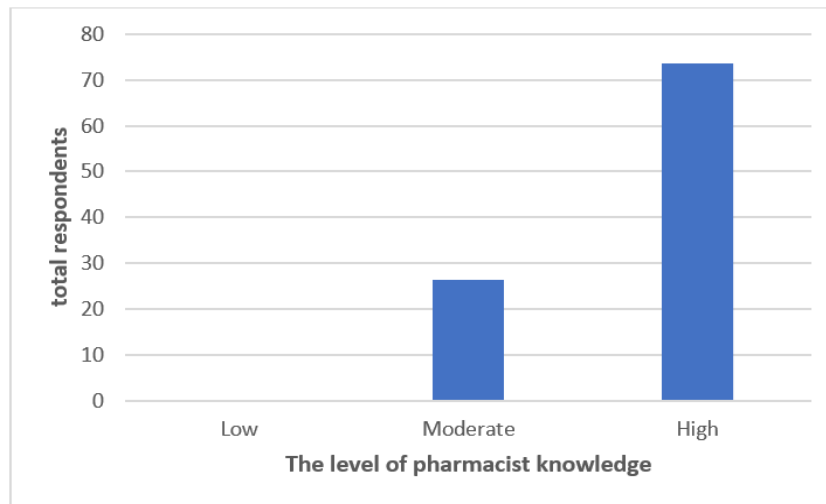


Figure 1. The level of pharmacist knowledge regarding drug management

drug. The availability of medicine is categorized into three levels: low if the score is < 52.85%, moderate if the score is 52.85% - 70.40%, and high if the score is ≥ 70.40% [1].

Data Analysis

The data obtained were analyzed using the Chi-Square test and the Spearman Rank test. The Chi-Square test was employed to examine the relationship between sociodemographic variables (gender, age, education, years of work) and the respondents' level of knowledge. Meanwhile, the Spearman Rank test was used to assess the relationship between the respondents' level of knowledge and the availability of medicine in community health centers.

Ethical Approval

The ethical clearance was obtained from the Ethics

Committee Team of the Faculty of Pharmacy, Andalas University, No. 23/UN.16.10.D.KEPK-FF/2023.

Results and Discussion

In this study, 19 pharmacists who met the inclusion criteria were identified. The demographic characteristics of the respondents and their relationship with knowledge can be seen in Table 1. Table 1 reveals that the respondents were predominantly female, with a total of 17 individuals. This finding aligns with a study by Alfian (2020), where the majority of respondents were female [1]. The predominance of females in the pharmacy profession is attributed to the precision required in the job, which is one of the feminine traits [8]. The Chi-Square test yielded a significance value of 1 ($p > 0.05$), indicating that there is no significant relationship between gender and knowledge.

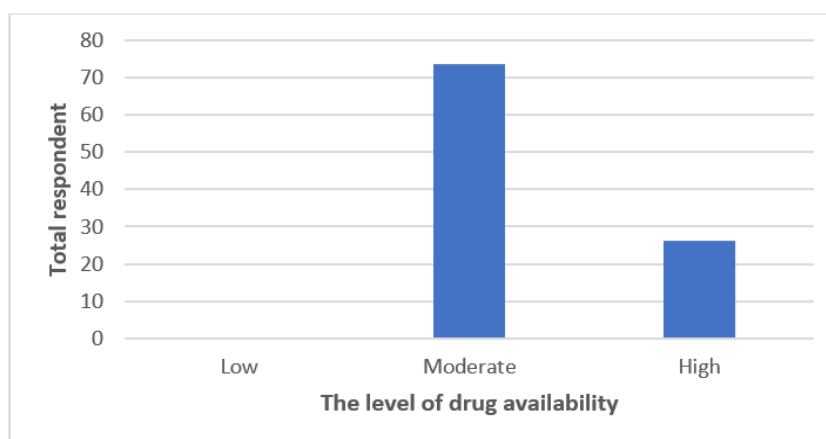


Figure 2. The level of drug availability in community health centers

Table 2. Availability of drugs at the Community Health Center based on LPLPO data

No.	The Community Health Center's code	The number of drugs with availability levels \geq Leadtime of drugs	Total Number of Drug Items	Total Available Drug Items (%)
1.	A	80	116	68.97
2.	B	64	97	65.98
3.	C	46	94	48.94
4.	D	82	125	65.6
5.	E	62	108	57.41
6.	F	48	90	53.33
7.	G	70	109	64.22
8.	H	60	109	55.05
9.	I	66	118	55.93
10.	J	82	133	61.65
11.	K	84	135	62.22
12.	L	71	92	77.17
13.	M	72	100	72
14.	N	64	121	52.89
15.	O	64	107	59.81
16.	P	64	104	61.54
17.	Q	51	100	51
18.	R	58	104	55.77
19.	S	92	113	81.42

This is due to gender equality in education, which results in no difference in knowledge between males and females [9].

The majority of the respondents fall within the age range of 46-55 years (as observed in Table 1). This age range falls within the productive age group, which means that the respondents are considered capable of fulfilling their roles in accordance with legal regulations [10,11]. Based on the results of the Chi-Square test, a significance value of 0.530 ($p > 0.05$) was obtained, indicating that there is no significant relationship between age and the level of knowledge. This is attributed to the fact that younger generations tend to have a high level of enthusiasm and eagerness to acquire information, resulting in no significant difference in knowledge compared to older generations [1].

The majority of the respondents have a background in the pharmacy profession, as evident in Table 1. Education level can influence an individual's knowledge, where the higher one's educational attainment, the broader their knowledge tends to be [12]. However, the results of the Chi-Square test showed a significance value of 1 ($p > 0.05$), indicating that there is no significant relationship

between education level and the level of knowledge. This could be attributed to the fact that pharmacists can acquire a wealth of information during their practice, so educational level may not always be the primary factor influencing a pharmacist's knowledge [9]. Additionally, with the advancement of technology today, pharmacists can also access information via the internet to enhance their knowledge [13].

The majority of the respondents have more than 10 years of work experience, as evident in Table 1. This finding aligns with the results of Alfian's study (2020), where most respondents had over 10 years of work experience [1]. As someone's tenure at work increases, they accumulate more experience, which can subsequently influence their level of knowledge. The Chi-Square test results indicate a significance value of 0.203 ($p > 0.05$), suggesting that there is no significant relationship between years of work experience and the level of knowledge. This might be due to the fact that as individuals work for longer periods, they may experience job burnout, which can reduce work productivity. With a decrease in work productivity, individuals may become less motivated to update their knowledge, ultimately leading to no significant

		knowledge	the availability	
Spearman's rho	knowledge	Correlation Coefficient	1.000	
		Sig. (2-tailed)	.217	
		N	19	
	the availability	Correlation Coefficient	.297	1.000
		Sig. (2-tailed)	.217	
		N	19	19

Figure 3. Statistical analysis of pharmacists' knowledge level regarding the availability of drugs

improvement in their knowledge [14].

Table 2 displays the knowledge outcomes of the respondents, with the lowest score reaching 74 and the highest score reaching 92. The levels of knowledge were categorized into three groups: low, moderate, and high, as seen in Figure 1. The majority of respondents possess a high level of knowledge, with 14 (73.7%) respondents falling into this category, while 5 (26.3%) other respondents have a moderate level of knowledge. These findings align with Alfian's research (2020), where the majority of respondents had a high level of knowledge, and there were no respondents with low knowledge levels [1]. The knowledge held by pharmacists can significantly impact their ability to manage drugs since there is a significant relationship between knowledge levels and a pharmacist's ability to handle medicine [15]. This finding is consistent with Aryani's study (2016), which indicates that the higher a pharmacist's knowledge, the better their ability to manage medications [16]. One of the ways to enhance knowledge is by regularly seeking and updating information from reliable sources [17,18]. This is crucial because there is a significant correlation between information sources and knowledge, where accurate information sources can enhance an individual's knowledge [17,19].

Based on the research findings, the majority of community health centers have a level of drug availability categorized as moderate, as indicated by 14 (73.7%) respondents (as seen in figure 2). This is consistent with Alfian's research (2020), where the majority of community health centers had moderate drug availability [1]. The availability of medicine plays a crucial role in achieving optimal healthcare services [20,21]. To maintain drug availability, measures can be taken, such as making special requests to the public health department in case of increased drug needs, preventing drug shortages, and addressing exceptional circumstances. If the public health department cannot fulfill these requests, another option

is to independently purchase drugs from Pharmaceutical Wholesalers.

The analysis results using the Spearman Rank test yielded a significance value of 0.217 ($p > 0.05$), as shown in Figure 3. Therefore, it can be concluded that there is no significant relationship between the level of pharmacist knowledge and the level of medicine availability. This finding is in line with Alfian's study (2020), which also found no significant relationship between knowledge and medicine availability. The reason for this is the lack of human resources working in the pharmacy department of community health centers. Ideally, the number of human resources in the pharmacy department of community health centers should be 3-4 individuals, but in reality, it is only 2 individuals. This results in a heavy workload, leading to suboptimal drug management in ensuring the availability of medicine [1].

Another factor that can influence the availability of medicine is the funding of the community health center, which plays a crucial role in procuring essential drugs to ensure the availability of medicine. Poor drug management practices can lead to increased expenditures on purchasing medications. This phenomenon is commonly found in community health centers since many of them still adhere to consumption-based drug planning, which has limitations and cannot be adapted to changes in disease patterns [23]. Additionally, the inability of the public health department to supply drugs according to demand is a significant reason for the substantial funds expended by the community health centers to address drug shortages. Typically, health centers resort to purchasing drugs from Pharmaceutical Wholesalers as an alternative when drug stocks are depleted at the public health department [24]. The purchase of drugs through Pharmaceutical Wholesalers is usually funded by the health center's own resources referred to as the Regional Public Service Agency fund, which is derived from service fees, grants,

partnerships, local government budgets, and other sources [25]. Since this fund is of a personal nature and affects drug availability, it poses a limitation for researchers in conducting their study. Therefore, it is recommended that future research consider adding funding as a factor to assess drug availability in community health centers.

Conclusion

Based on the research conducted in 19 community health centers in Padang City, it can be concluded that the majority of respondents have a high level of knowledge (73.7%), while the availability of medicine in the health centers falls into the category of moderate (73.7%). The Spearman Rank test revealed no significant correlation between pharmacist knowledge levels and drug availability

Reference

- Alfian M, Hariadini AL, Sidharta B. The Relationship between the Knowledge Level of Drug Administrators and the Availability of Drugs at Malang City Health Centers (Hubungan Tingkat Pengetahuan Petugas Pengelola Obat dengan Tingkat Ketersediaan Obat di Puskesmas Kota Malang). *Pharmaceutical Journal of Indonesia*. 2020;6(1):27–33. <https://doi.org/https://doi.org/10.21776/ub.pji.2020.006.01.5>
- Pratiwi AI, Fudholi A, Satibi. Analysis of Factors Influencing the Implementation of Pharmaceutical Services at Health Centers in Semarang City (Analisis Faktor yang Mempengaruhi Implementasi Pelayanan Kefarmasian Puskesmas di Kota Semarang). *Majalah Farmaseutik*. 2021;17(1):1–8. <https://doi.org/10.22146/farmaseutik.v17i1.46980>
- Sunandar, Salman, Sholih MG. Analysis of Drug Management at the Technical Implementation Unit of Cibuaya Health Center in Karawang Regency (Analisis Manajemen Pengelolaan Obat di Unit Pelaksana Teknis Daerah Puskesmas Cibuaya Kabupaten Karawang). *Jurnal Ilmu Kesehatan*. 2022;6(2):490–6. <https://doi.org/10.33757/jik.v6i2.614>
- Herlinawati, Lestari SA. The Relationship between Knowledge Level and Education with Drug Management at Health Centers (Hubungan Tingkat Pengetahuan dan Pendidikan dengan Pengelolaan Obat di Puskesmas). *Jurnal Kesehatan*. 2020; 11(1) :43–9. <https://doi.org/http://dx.doi.org/10.38165/jk>
- Wonda D, Makaba S, Mediyati N, Ruru Y. Analysis of Drug Management at Tingginambut Public Health Center in Puncak Jaya Regency. *International Journal of Sciences : Basic and Applied Research*. 2021;56(2):212–34.
- Rusman S. Analysis of the Drug Planning System at the Health Department of Padang Pariaman Regency (Analisis Sistem Penyusunan Perencanaan Obat di Dinas Kesehatan Kabupaten Padang Pariaman). *Human Care Journal*. 2020;5(1):411–20. <https://doi.org/10.32883/hcj.v5i1.625>
- Baybo MP, Lolo WA, Jayanti M. Analysis of Drug Inventory Control at Teling Atas Health Center (Analisis Pengendalian Persediaan Obat di Puskesmas Teling Atas). *Pharmacy Medical Journal*. 2022;5(1):7–13. <https://doi.org/10.35799/pmj.v5i1.41434>
- Ismail A. Description of Characteristics of Pharmacy Students and Alumni at FKIK UIN Alauddin Makassar: A Gender-Based Review (Gambaran Karakteristik Mahasiswa dan Alumni Farmasi FKIK UIN Alauddin Makassar: Sebuah Tinjauan Berbasis Gender). *Jurnal Sipakalebbi*. 2020;4(1):275–88. <https://doi.org/10.24252/jsipakalebbi.v4i1.14490>
- Selifani NF, Pratiwi H, Mustikaningtias I. Analysis of the Knowledge Level and Attitude of Pharmacists toward Generic Drugs in the Banyumas Regency Area (Analisis Tingkat Pengetahuan dan Sikap Apoteker terhadap Obat Generik di Wilayah Kabupaten Banyumas). *Journal of Pharmaceutical Sciences and Clinical Research*. 2022;7(2):223–37. <https://doi.org/10.20961/jpscr.v7i2.57939>
- Al Amin M, Juniati D. Classification of Human Age Groups Based on Fractal Dimension Analysis using Box Counting Method from Face Images with Canny Edge Detection (Klasifikasi Kelompok Umur Manusia Berdasarkan Analisis Dimensi Fraktal Box Counting dari Citra Wajah dengan Deteksi Tepi Canny). *Jurnal Ilmiah Matematika*. 2017;2(6):33–42.
- Wahyuni KI, Permatasari NE, Fickri DZ, Amarullah A. Evaluation of Self-Medication Services at Pharmacies in the Sidoarjo Region (Evaluasi Pelayanan Swamedikasi di Apotek Wilayah Sidoarjo). *Jurnal Pharmascience*. 2020;7(1):25–35. <https://doi.org/10.20527/jps.v7i1.8083>
- Dharmawati IGAA, Wirata IN. The Relationship between Education Level, Age, and Length of Service with the Level of Knowledge of Oral and Dental Health among Physical Education Teachers in Elementary Schools in the Tampak Siring District, Gianyar (Hubungan Tingkat Pendidikan, Umur, dan Masa Kerja dengan Tingkat Pengetahuan Kesehatan Gigi dan Mulut pada Guru Penjaskes SD di Kecamatan Tampak Siring Gianyar). *Jurnal Kesehatan Gigi*. 2016;4(1):1–5.
- Tobing SM. The Utilization of the Internet as an Information Medium in Teaching and Learning Activities in the Course of Pancasila Education (Pemanfaatan Internet Sebagai Media Informasi dalam Kegiatan Belajar Mengajar pada Mata Kuliah Pendidikan Pancasila). *Jurnal Pendidikan Kewarganegaraan*. 2019;4(1):64–73. <https://doi.org/10.31932/jpk.v4i1.376>
- Apriluana G, Khairiyati L, Setyaningrum R. The Relationship Between Age, Gender, Length of Service, Knowledge, Attitude, and the Availability of Personal Protective Equipment (PPE) with the Usage Behavior of PPE Among Healthcare Workers (Hubungan Antara Usia, Jenis Kelamin, Lama Kerja, Pengetahuan, Sikap dan Ketersediaan Alat Pelindung Diri (APD) dengan Perilaku Penggunaan APD pada Tenaga Kesehatan). *Jurnal Publikasi Kesehatan Masyarakat Indonesia*. 2016;3(3):82–7.
- Kristiani N, Melviani, Yaundari E. The Relationship Between Knowledge and Proper Medication Management in Sabaru Subdistrict, Palangka Raya City, Central Kalimantan, Indonesia (Hubungan Pengetahuan dengan Pengelolaan Obat yang Tepat di Kelurahan Sabaru Kota Palangka Raya Kalimantan Tengah). *Journal Pharmaceutical Care and Science*. 2021;2(1):58–64. <https://doi.org/10.33859/jpcs.v2i1.127>
- Aryani AF, Kusuma AM, Galistiani GF. The Relationship Between the Knowledge Level of Drug Administrators and Medication Management at the Community Health Center (Hubungan Tingkat Pengetahuan Pengelola Obat terhadap Pengelolaan Obat di Puskesmas). *Jurnal Manajemen dan Pelayanan Farmasi*. 2016 ;6(4):303–11. <https://doi.org/http://dx.doi.org/10.22146/jmpf.360>
- Yunus M, Zakaria S. Information Sources Related to Public Knowledge about Covid-19 (Sumber Informasi Berhubungan dengan Pengetahuan Masyarakat tentang Covid 19). *Jurnal Keperawatan*. 2021;13(2):337–42.
- Maria RA, Putri AYEP. Factors Leading to High Lead Time for Drug Deliveries from the Pharmaceutical and Medical Equipment Warehouse (PBF) to Cahya Kawaluyan Hospital (Faktor-Faktor yang Mengakibatkan Tingginya Lead Time Pengiriman Obat dari PBF di Rumah Sakit Cahya Kawaluyan). *Jurnal Multidisiplin Ilmu*. 2022;1(4):566–71.
- Khaerani, Haeria, Wahyuddin M, Yulianti I. Analysis of Drug Management as the Basis for Controlling Drug Safety Stock at Ganra Community Health Center (Analisis Pengelolaan Obat Sebagai Dasar Pengendalian Safety Stock Obat di Puskesmas Ganra). *Jurnal Kesehatan*. 2019;2(1):21–6. <https://doi.org/10.24252/kesehatan.v0i0.13643>

- [20]. Nopiyansyah, Purba AV, Hidayat WU. Evaluation of Drug Procurement and Distribution Management at the Bandar Lampung City Health Office for the Year 2016 (Evaluasi Manajemen Pengadaan dan Distribusi Obat di Dinas Kesehatan Kota Bandar Lampung Periode Tahun 2016). *Holistik J Kesehat*. 2020;14(1):118–28. <https://doi.org/10.33024/hjk.v14i1.2088>
- [21]. Amiruddin EE, Septarani A WI. A Study on Drug Availability at Meo-Meo Community Health Center in Baubau City (Studi tentang Ketersediaan Obat di Puskesmas Meo-Meo Kota Baubau). *Jurnal Ilmu Kesehatan*. 2019;1(2):60–76. <https://doi.org/10.36590/jika.v1i2.11>
- [22]. Prasetyo EY, Widodo GP. Evaluation of Public Drug Requirement Planning and Drug Availability at the Community Health Centers in the Work Area of the Surakarta City Health Office in 2015 (Evaluasi Perencanaan Kebutuhan Obat Publik Serta Ketersediaan Obat di Tingkat Puskesmas Se-Wilayah Kerja Dinkes Kota Surakarta Tahun 2015). *Jurnal Farmasi Indonesia*. 2016;13(2):178–90.
- [23]. Rahmawatie E, Santosa S. Information System for Drug Procurement Planning at the Boyolali District Health Office (Sistem Informasi Perencanaan Pengadaan Obat di Dinas Kesehatan Kabupaten Boyolali). *Journal of Pseudocode*. 2015; 2(1):45–52. <https://doi.org/10.33369/pseudocode.2.1.45-52>
- [24]. Fatma, Rusli, Wahyuni DF. Evaluasi Perencanaan dan Pengadaan Obat di Puskesmas Lau Kabupaten Maros. *J Farm FKIK*. 2020;8(2):9–14. <https://doi.org/10.51887/jpfi.v8i2.771>
- [25]. Surtiawaty M, Yunita J, Zaman MK, Zulheri D, Ismainar H. Evaluasi Pelaksanaan Badan Layanan Umum Daerah (BLUD) pada Puskesmas di Kota Pekanbaru. *J Kesehat Komunitas*. 2022;8(2):322–32. <https://doi.org/10.25311/keskom.vol8.iss2.1104>.



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