

COMMUNITY PHARMACY PROFILE IN TEMANGGUNG REGENCY BASED ON NUMBER OF VISITORS, NUMBER OF PRESCRIPTIONS, SELF-MEDICATION SERVICES AND INCOME

HENI LUTFIYATI, PRASOJO PRIBADI*, ELMIAWATI LATIFAH, CUT DEWI BUNGA

Departement Pharmacy, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Magelang, Indonesia

*Corresponding author: Prasojo Pribadi; *Email: prasojopribadi@unimma.ac.id

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ABSTRACT

Objective: Pharmacy is a location for carrying out pharmaceutical tasks for pharmacists. Pharmacy also acts as a business entity that requires the application of appropriate management techniques to operate profitably and still comply with the principles of pharmaceutical service standards. The purpose of this study was to determine the profile of community pharmacies based on the number of visitors, the number of prescriptions, self-medication services and income.

Methods: This study uses a quantitative approach with descriptive and correlational research designs. Descriptive aims to describe the profile of the pharmacy, the number of visitors to the pharmacy, the number of prescriptions, the number of self-medication services and the trend of pharmacy income over time. Correlational: aims to identify the relationship between the length of establishment and the ratio of pharmacies to the number of visitors and income; the relationship between the number of pharmacies and the ratio of pharmacies to the number of prescriptions.

Results: Results of 57 pharmacies spread across 20 sub-districts. The largest number of pharmacies is in Temanggung District, namely 13 pharmacies with a percentage of 22.81%. However, there are still 3 sub-districts that do not have a pharmacy. Most pharmacies have an average of 30-50 patients per day and 72.73% provide self-medication services for 10-50 patients. Most pharmacies serve prescriptions <1 sheet per day. As many as 40% of pharmacies have a low income (more than Rp. 464,260 and less than Rp. 1,617,088). The results of the bivariate analysis showed that the length of establishment was related to the average income and the number of pharmacies was related to the number of prescriptions served.

Conclusion: Factors related to the amount of income and the number of prescriptions are the length of establishment of the pharmacy and the number of pharmaceutical service facilities in the form of pharmacies.

Keywords: Pharmacy, Prescription, Self medication, Income

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INTRODUCTION

Temanggung Regency, based on its geographical position, is in the north bordering Kendal Regency and Semarang Regency; in the south bordering Magelang Regency; in the west bordering Wonosobo Regency; in the east bordering Semarang Regency and Magelang Regency. Temanggung Regency consists of 20 sub-districts with 266 villages and 23 sub-districts. Based on the Report of the Central Statistics Agency (BPS) of Temanggung Regency in 2023, shows that the number of health facilities in the form of pharmacies continues to increase, it was reported in 2019 that the number of pharmacies spread across Temanggung Regency was 34 and in 2021 it showed a fig. of 41 [1]. Public awareness of the importance of health continues to increase, which has an impact on the increasing need for health advice. Law Number 36 of 2009 concerning health emphasizes that every human being has equal rights in the health sector, including access to health resources, and obtaining safe, quality and affordable health services to achieve optimal health [2].

Pharmacies function as locations for pharmacists to carry out pharmaceutical tasks. On the other hand, pharmacies also act as business entities that require the application of appropriate management techniques to operate profitably and still comply with the principles of pharmaceutical service standards [3]. In the era of National Health Insurance, pharmacies have become one of the most frequently visited health service facilities by the public. However, their locations remain uneven, with a higher concentration in city centers. Therefore, a system is needed to analyze the distribution of pharmacies, considering both their locations and the accessibility of the surrounding population to pharmacy services. When pharmacies are clustered too closely together, it can lead to decreased business income, reduced profit margins, and threaten the sustainability of these businesses. Moreover, this clustering can negatively impact the quality of service, available facilities, innovation, and technology, which in turn affects competitiveness, job creation, and social and economic growth. Conversely, if a pharmacy is located too far away,

public access to pharmaceutical services can become a challenge [4-6]. The research for community pharmacies according to the number of visitors, prescriptions, self-division and income services is essential to understand their role in health systems and identify areas that will be improved. The main reason why this study is important is because community pharmacies are the first point of contact for health care, especially in underserved areas and from the data on the number of visitors, the number of prescriptions, the number of self-medication services helps assess access and need for pharmaceutical services, so that it can be used for planning and resource allocation [7].

MATERIALS AND METHODS

This study employs a quantitative approach with both descriptive and analytical research designs. This method was selected to gather data that can be measured and analyzed statistically. The descriptive research aims to outline the pharmacy profile, including the number of visitors, prescriptions, self-medication services, and trends in pharmacy income over time. Correlational: aims to identify the relationship between the length of time of establishment and the ratio of pharmacies to the number of visitors and income; the relationship between the number of pharmacies and the ratio of pharmacies to the number of prescriptions and the ratio of pharmacies to the amount of self-medication. Ratio of pharmacies is the comparison of the number of pharmacies to the number of residents in a sub-district.

Research data consists of primary and secondary data. Primary data includes pharmacy profile. Secondary data includes population data and pharmacy data. The population of this study is all pharmacies in the Regency area of Temanggung. The Faculty of Health Science at Universitas Muhammadiyah Magelang Ethics Commission gave approval with reference number 0161/KEPK-FIKES/II.3. AU/F/2024. In Temanggung Regency, Central Java, Indonesia, study participants were requested to complete an online informed consent

form using a Google Form. Throughout the gathering of data, every participant was forced to complete an online consent form as the first step to accessing their questionnaire. The form was provided with detailed information of the research, the freedom of the person's right to stop the study whenever they wanted, and assured data confidentiality. The pharmacy data were collected without mentioning the specific identity of the pharmacy or the owner. Furthermore, the information was kept in a safe environment secure internal server, with only the principal investigator being the person with access and it was used only for a specific analytical reason.

The total number of pharmacies in temanggung regency is 67 units based on data from the local Health Office in 2023. Thus, the sample size of 57 pharmacies represents approximately 85% of the total population, which is quite representative. Samples were randomly selected from these pharmacies, with the sample size determined using the slovin formula to ensure representativeness. Data were collected through questionnaires, which were designed to gather information from respondents. The questionnaires were administered online. The questionnaire was carefully crafted to collect accurate and relevant data. The questions were clear, unambiguous, and easy for respondents to understand. Pharmacies that did not respond within a specified period were contacted by telephone and visit to ensure maximum and representative involvement.

The data obtained from the questionnaire will be analyzed using descriptive statistics to describe the characteristics of respondents

and pharmacy profiles and inferential statistics to test the hypothesis. Linear regression tests can be used to determine the effect of independent variables on dependent variables. If the P value < 0.05 indicates that there is a statistically significant relationship between the independent variable and the dependent variable. To ensure the validity and reliability of the research instrument, a pilot test of the questionnaire was conducted with a group of respondents prior to the main study. Cronbach's Alpha analysis was utilized to assess the reliability of the questionnaire.

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RESULTS

Fig. 2 illustrates the ages of the pharmacies among the 55 that are distributed across 20 sub-districts. The data reveals a variety of establishment lengths. Pharmacies that have been in operation for five years or less (≤ 5 y) and those that are over ten years old (>10 y) each comprise 40% of the total. In contrast, pharmacies that have been established for more than five years but less than ten years ($>5-10$ y) represent 20%. This trend aligns with prior research indicating that the average age of pharmacies among respondents is typically between one to five years [8].

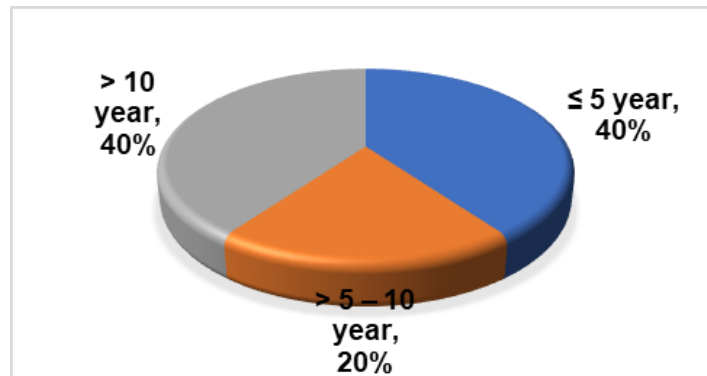


Fig. 1: Length of establishment of pharmacy

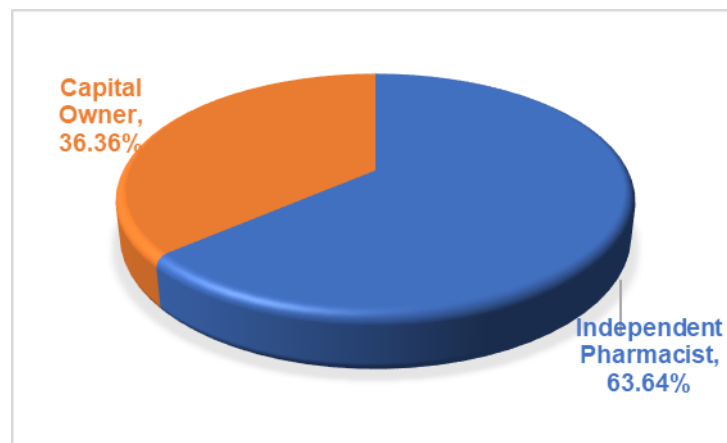


Fig. 2: Pharmacy facility owners

In 2021, the government enacted Regulation of the Minister of Health Number 14 of 2021, which outlines standards for business activities and products in the implementation of risk-based business licensing within the health sector. This regulation stipulates that a pharmacy must be owned by a pharmacist. If the pharmacy is not owned by a pharmacist, the capital owner must partner with a

pharmacist based on a notarial agreement [9]. According to fig. 3, among the 57 pharmacies spread across 20 sub-districts, 63.64% are owned by pharmacists, while 36.36% are owned by non-pharmacists. This finding is consistent with previous research, which indicated that 65.4% of pharmacy facilities were owned by the pharmacist in charge [8].

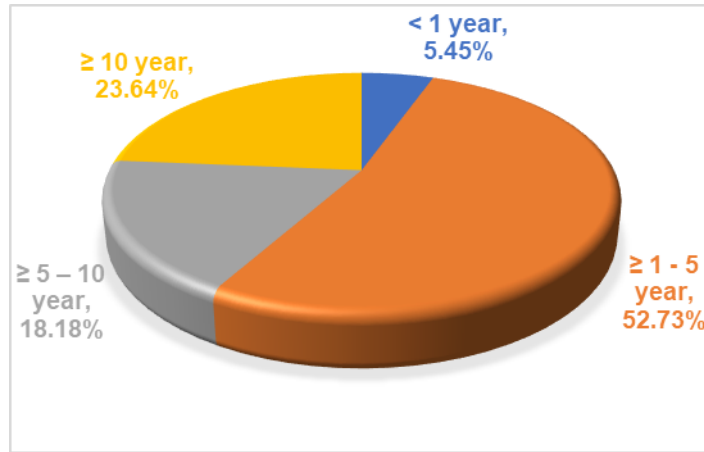


Fig. 3: Length of practice pharmacists

The experience of respondents as responsible pharmacists in providing pharmaceutical services at pharmacies varies significantly, as illustrated in fig. 3. The majority of respondents, 52.73%, have served as responsible pharmacists for 1 to 5 y. Following this, 23.64% have over 10 y of experience, while 18.18% have practiced for 5 to 10

y. Only 5.45% of responsible pharmacists have less than 1 year of experience. This data indicates that the number of responsible pharmacists has increased over the past 5 to 10 y. The experience of a pharmacist in managing or serving as a responsible pharmacist directly impacts drug management at the pharmacy [10].

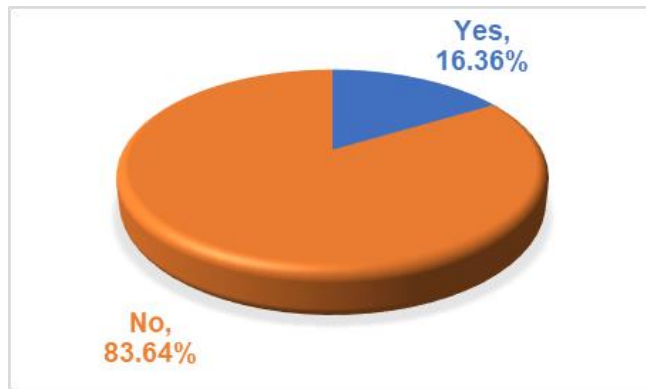


Fig. 4: Availability of companion pharmacists

According to fig. 4, it was found that 83.64% of pharmacists in pharmacies across 20 sub-districts do not have companion pharmacists. This lack of companion pharmacists can be linked to the low pharmacy income, which indicates that 20% of pharmacies in Temanggung Regency report a daily income of less than IDR 1,000,000. As a result, it is not feasible to hire additional

pharmacists in these pharmacies. According to Government Regulation R1 Number 51 of 2009 concerning Pharmaceutical Work, Article 20 states that in order to perform pharmaceutical work in service facilities, a responsible pharmacist may be assisted by a companion pharmacist or pharmaceutical technical personnel [2].

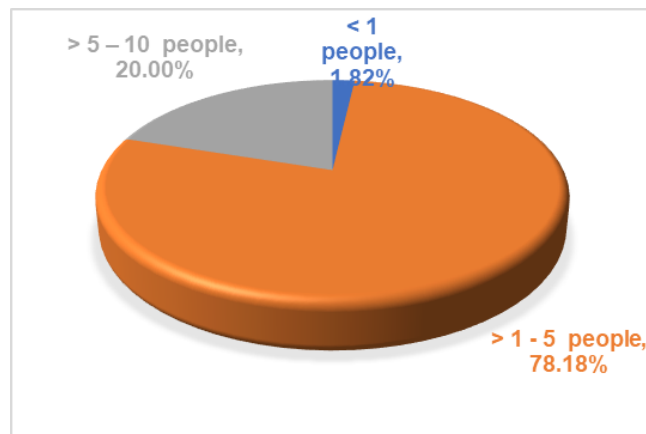


Fig. 5: Number of pharmacy employees

Based on the number of pharmacy employees spread across Temanggung Regency, fig. 5 shows that 43 pharmacies have more than 1-5 employees, a percentage of 78.18%. Then, followed by

Pharmacies with more than 5-10 employees (>5-10) with a percentage of 20% and there is 1 (one) Pharmacy with a percentage of 1.82% that has less than 1 (one) employee [10].

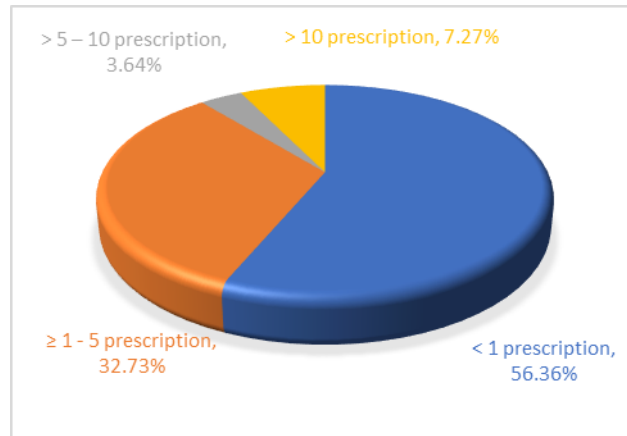


Fig. 6: Average number of prescriptions served each day

Fig. 6 illustrates average number of prescriptions served each day. Most pharmacies do not provide prescription services because no prescriptions are coming in.

for 30.91% of the surveyed pharmacies among 55 locations in the 20 sub-districts of Temanggung Regency. Following this, 23.64% of pharmacies report an average of 50 to 80 visitors, while 16.36% of pharmacies see more than 100 visitors per day. The number of visitors can serve as an indicator of public satisfaction with the quality of service provided by the pharmacies [8].

Fig. 7 presents the daily visitor statistics for pharmacies. The average number of visitors per day ranges from 30 to 50, accounting

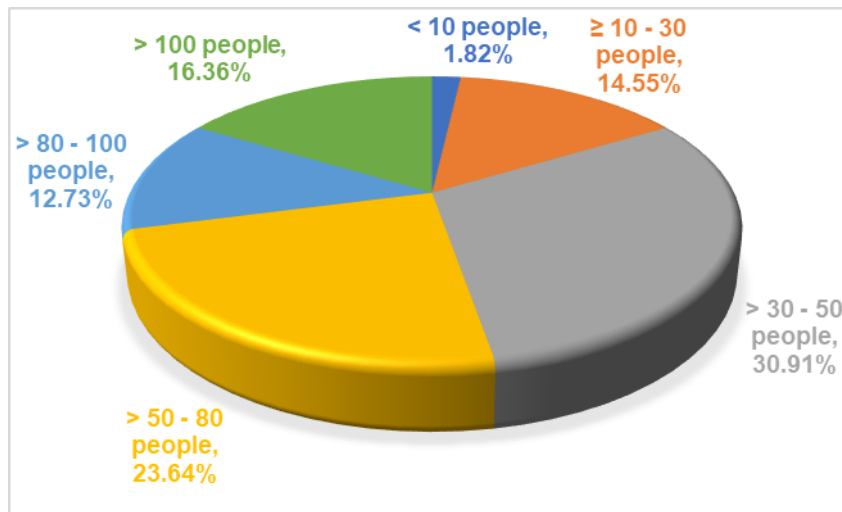


Fig. 7: Average number of pharmacy visitors per day

Table 1: Average income per day

Category	Income	Percentage
Very low	<-Rp464.246	0%
Low	Rp464.246<X ≤ Rp1.617.088	40.00%
Medium	Rp1.617.088<X ≤ Rp3.698.422	38.18%
High	Rp3.698.422<X ≤ Rp5.779.756	12.73%
Very High	X>Rp5.779.756	9.09%

Table 1 illustrates the daily income of pharmacies in Temanggung Regency. It shows that 40% of pharmacies fall into the low-income category, with earnings ranging from Rp464, 246 to Rp1, 617, 088. Additionally, 9.09% of pharmacies are classified as having a very high income, earning more than Rp5, 779, 756. Various factors can influence

the daily income of pharmacies, including location, quality of service, product availability, pricing and promotions, operating hours, and collaboration with practicing doctors. Pharmacies serving National Health Insurance (NHI) participants have seen increased customer visits, sometimes up to six times more than before joining the program [11].

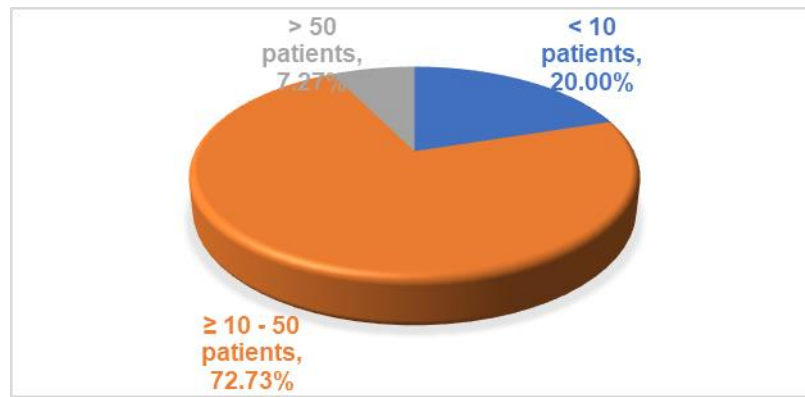


Fig. 8: Average number of self-medication patients per day

Fig. 8 presents the average daily number of patients engaging in self-medication at pharmacies. A significant 72.73% of pharmacies report an average of 10 to 50 self-medication patients daily. In contrast, 20% of pharmacies see fewer than 10 patients, while only 7.27% report an average exceeding 50 patients engaging in self-medication.

The ratio of residents to pharmacies is highest in Gemawang District, followed by Tembarak District, Kedu District, Kledung District, and

Kandangan District. This situation is influenced by a large population in these areas, coupled with a relatively low number of pharmacies. For instance, the average ratio of residents to pharmacies in Gemayang District is 33,697. If we assume that each pharmacy employs one pharmacist, this data indicates that one pharmacist serves over 30,000 residents. This ratio is significantly higher than the global median ratio of 4,182 and the World Health Organization's recommendation of 2,000 [12, 13].

Table 2: Bivariate analysis results

Variable independent	Variable dependent	p-value
Length of Establishment	Average visitors	0.226
	Average income	0.008*
Pharmacy Ratio	Average visitors	0.802
	Average income	0.741
Number of Pharmacies	Number of prescriptions	0.012*
	Number of prescriptions	0.914
Availability of Companion Pharmacists	Number of self-medication	0.632
	Number of self-medication	0.913

Bivariate analysis is utilized in research that examines the relationship between two variables to draw hypothetical conclusions about their interaction. This analysis aims to determine the meaning and strength of the relationship between the dependent and independent variables. A relationship between the two variables is considered significant if the alternative hypothesis (H_a) is accepted and the null hypothesis (H_0) is rejected, indicated by a significance value (Sig.) or p-value of less than 0.05. Conversely, if the significance value is greater than 0.05, it suggests that H_a is rejected and H_0 is accepted, implying there is no relationship between the independent and dependent variables [14]. The analysis presented in table 3 reveals a significant relationship between the dependent variable and the independent variable, specifically the length of time a pharmacy has been established and the number of pharmacies. The findings indicate a significant relationship between the length of time a pharmacy has been operating and its average daily income, with a significance value of 0.008, which is below the threshold of 0.05. Additionally, the number of pharmacies, regardless of their size, shows a significant relationship with the number of prescriptions received from other health facilities, with a significance value of 0.012, also below the threshold of 0.05.

DISCUSSION

The findings indicate that several factors influence the selection of pharmacy locations, particularly their proximity to other health facilities. This strategy is designed to attract a greater number of visitors and increase the volume of prescriptions processed at the pharmacies. There is a correlation between the number of other health facilities and the number of pharmacies-the greater the number of health facilities, the more pharmacies tend to be established in the Temanggung District area. The presence of other

health service facilities can benefit pharmacies, especially in cases where these facilities lack their own pharmaceutical installations. In such situations, prescriptions written by doctors are often filled at nearby pharmacies, demonstrating a collaborative effort with other health service providers [8]. This study aligns with previous research, which has indicated that pharmacies are typically located near health service units such as hospitals, physicians' offices, clinics, and health centers operating within the health sector [3]. The widespread distribution of pharmacies aims to meet the growing demand for pharmaceutical services in Temanggung Regency. However, these pharmacies frequently face challenges, particularly due to increasingly intense competition.

The correlation test or relationship between the pharmacy profile and the average number of visitors to the pharmacy. Based on the bivariate test, it shows that the factors related to the length of time the pharmacy has been established and the average number of visitors to the pharmacy do not show a significant relationship. This is because the p-value is $0.226 > 0.05$. This is influenced by several factors, where the increase or decrease in visitors to the pharmacy can be caused by the strategic location of the pharmacy. In addition, the satisfaction of visitors to the pharmacy also influences the decision of visitors or consumers to return or not to the pharmacy to buy a needed drug product. Based on research conducted by [15] states that the number of patient visits to the pharmacy is based on the satisfaction given during the patient's purchase transaction at the pharmacy. The characteristics that measure the relationship between patient satisfaction are location factors and price factors. In addition, other characteristics such as drug availability, speed of service and provision of drug or product information during service. When consumers are satisfied with the service provided, consumers will return and provide

recommendations to relatives or colleagues to come to the pharmacy. In addition, the average number of consumer visits to pharmacies is also related to the number of health service units around the pharmacy. The availability of health service units around the pharmacy allows patients to come to the pharmacy with a prescription from the health service unit, thus increasing the number of consumer visits to the pharmacy with the presence of other health service units around the pharmacy [8]. Thus, it can be concluded that the factor of the length of time the pharmacy has been established has no relationship with the number of visits or visitors to the pharmacy, and no theory supports this variable.

The correlation test examining the relationship between pharmacy characteristics and average income. The bivariate analysis indicates a significant relationship between the length of establishment of the pharmacy and average income. This finding aligns with previous research that suggests newer pharmacies tend to be less well-known to the public, resulting in fewer customers compared to those that have been in business for five years or longer. Pharmacies established for five years or more generally perform better in terms of income, as they benefit from a larger customer base. This increased customer count is also influenced by collaborations with practicing doctors, which further supports income growth [16]. An Iranian paper conducted a study that concluded that the lifespan of a pharmacy has a direct correlation with income, among other variables like the number of pharmacists, licensed prescriptions of OTC pharmaceuticals, and staff employed in the pharmacy. Bivariate analysis showed that the longer the pharmacy has been established, the higher the average revenue generated, which proves the benefits of customer loyalty and location strategy [17].

The correlation test investigating the relationship between pharmacy profiles and the number of prescriptions. The bivariate analysis indicates that factors related to the number of pharmacies and the number of prescriptions are statistically significant, with a p-value of 0.012, which is less than the threshold of 0.05. This finding aligns with data in fig. 1, which indicates that several sub-districts lack pharmacies, consequently impacting the number of prescriptions generated from other healthcare facilities. This study supports previous research, which suggests that the number of prescriptions received by pharmacies is significantly influenced by the number of healthcare service units in proximity to the pharmacies. Prescriptions are a vital source for pharmacists, enabling them to provide professional services. The study revealed that, on average, pharmacies receive only 5 to 6 prescriptions per day [8]. The results of this study are consistent with previous research conducted in Malang, which found that most pharmacies handle fewer than 10 prescriptions per day [18].

The correlation test examining the relationship between pharmacy profiles and the frequency of self-medication. The bivariate test indicates that there is no significant relationship between the availability of companion pharmacists and the number of self-medication, as evidenced by a p-value of 0.632, which is greater than 0.05. This finding aligns with data, which shows that the number of Companion Pharmacists is relatively low, distributed across 57 pharmacies in 20 districts. This limited availability likely contributes to the suboptimal provision of self-medication services to patients. Previous studies reinforce this observation, indicating that only 10.3% of pharmacies have Assistant Pharmacists, while vocational high school graduates are predominantly employed as Assistant Health Workers and in other pharmacy roles [8]. This research is also consistent with findings from [16], which suggest that increasing the number of assistant pharmacists can enhance service quality, resulting in shorter wait times and more effective, efficient care for the community. In the community, self-medication is more prevalent, particularly among students and hostellers. The ease of access to medications and the lack of stringent laws are the main causes of self-medication [19]. Limited access to facilities and an increase in information sources are the primary reasons why people resort to self-medication. The main focus should be on improving methods for making medical treatment for both acute and chronic infections available [20].

The correlation analysis exploring the relationship between the pharmacy ratio and several factors: average visitors, average income, number of prescriptions, and number of self-medication instances. The findings indicate that there is no significant relationship among these factors, as the p-values are 0.802, 0.741, 0.914, and 0.913, all exceeding the significance threshold of 0.05.

The ratio of residents to pharmacies is highest in Gemawang District, followed by Tembarak District, Kedu District, Kledung District, and Kandangan District. This situation arises from a large population and a relatively small number of pharmacies in these areas. For instance, in Gemawang District, the average ratio of residents to pharmacies is 33,697. Assuming that each pharmacy has one pharmacist, this means that one pharmacist serves more than 30,000 residents. This ratio significantly exceeds the global median ratio of 4,182 and the World Health Organization's (WHO) recommended ratio of 2,000 [12, 13]. In conclusion, the insufficient pharmacy ratio, which does not meet WHO recommendations, contributes to the pharmacies' inability to provide optimal self-medication services. This limitation, in turn, affects the number of pharmacy visitors. A lower number of visitors corresponds to reduced income for the pharmacies.

Several factors can significantly affect a pharmacy's revenue, including location, products offered, and economic conditions [21]. The main factors that affect a pharmacy's revenue are fixed and variable costs. Fixed costs include the cost of the property and building, while variable costs include human resources, consumables, energy, rent, taxes, insurance, medication retention, and the potential for human error [21]. Pharmacies located on major thoroughfares or near hospitals, clinics, or doctor's offices tend to generate more revenue [22]. The pharmaceutical market in nations such as Brazil and India is seeing significant growth. But the distribution of drugstores is not uniform yet, thus many people still remain drugless [23]. Pharmacies that sell exclusive or rare medications or have the right to sell certain items often experience economic growth [21] and other factors.

This study's limitation is that it has not applied visual-spatial analysis due to limited data on pharmacy location coordinates. Therefore, for further studies, a geographic information system should be used to map the spatial distribution of pharmacies and identify gaps in access to pharmaceutical services more visually and strategically. The potential for selection bias due to online survey methods and data collected post-pandemic may reflect transitional and not yet fully stable conditions. In this study, it is still limited to bivariate analysis due to limited resources and access to detailed socio-demographic data for the area, and suggestions for further studies using multivariate analysis.

CONCLUSION

Based on the research conducted, it can be concluded that the 57 pharmacies located across 20 sub-districts in Temanggung Regency do not meet the recommended ratios set by the WHO and global standards, which are 2,000 and 4,182, respectively. This shortfall can negatively impact the pharmacy services provided to patients. Moreover, it contributes to the pharmacies' inability to offer optimal self-medication services, which in turn affects the number of visitors to these pharmacies. Policy recommendations from the government are needed so that the public can easily reach pharmacies and pharmacies established in sub-districts without pharmaceutical facilities can be licensed easily. This would motivate pharmacists from their home areas to be willing to serve in the region. A lower number of visitors results in reduced income for the pharmacies. Factors influencing income and the number of prescriptions include how long the pharmacy has been established and the number of pharmaceutical service facilities available in the area.

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AUTHORS CONTRIBUTIONS

In addition to conceptualizing the study, HL and PP also conducted data analysis and interpretation. The initial manuscript was written and data were gathered by PP and HL. CDB assisted in the development of the methodology and writing the manuscript. HL aided the literature review. In addition to reviewing the work, EL helped with the Discussion section. The final draft of the manuscript has been approved for submission by all authors who have contributed intellectually to the work. Heni Lutfiyati (henilutfiyati@unimma.ac.id, ORCID ID: 0000-0003-4423-256X), Prasojo Pribadi (prasojopribadi@unimma.ac.id, ORCID ID: 0000-0001-7408-2924), Elmiawati Latifah (elmiawatilatifah@unimma.ac.id, ORCID ID: 0000-0002-3328-3700), Cut Dewi Bunga (cutdewibunga2@gmail.com, ORCID ID: 0009-0002-8836-1494).

CONFLICT OF INTERESTS

Declared none

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