Community Knowledge, Attitude and Practice toward Self-Medication and Its Influencing Factor in Central Java: A Cross-Sectional Study

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ABSTRACT

Background: Self-medication refers to people selecting and using medications to treat self-identified diseases or symptoms. Self-medication practices vary between communities and are impacted by a variety of factors. Understanding self-medication knowledge, attitude, and practice is essential to minimize risks and negative consequences.

Objectives: This study aims to analyze the community's knowledge, attitude, and practice (KAP) concerning self-medication and the factors that influence it.

Methods: A cross-sectional study was undertaken among the general community in Central Java, Indonesia. In this study, 396 participants were recruited and interviewed using a validated Knowledge, Attitudes, and Practices questionnaire focused on self-medication. The sociodemographic variables and levels of knowledge, attitudes, and practices were represented using descriptive statistics in the statistical analysis. Bivariate and multivariable logistic regression analysis tests were employed to determine the relationship between socio-demographic characteristics and levels of knowledge, attitudes, and practices.

Results: The results showed that the age group of 36-45 years had the most significant percentage of participation, with 103 individuals. The sample consisted of 235 females, 59.3% of the total participants. Respondents had a sufficient level of knowledge (39.6%), good attitudes (51.8%), and good practice (75%).

Conclusion: There was a significant correlation between age, education, and income regarding the knowledge around self-medication with a p-value <0.05. There also remained a significant correlation between knowledge, attitude, and practice.

Keywords: attitude; knowledge; self-medication; practice

INTRODUCTION

The World Health Organization (WHO) defines self-medication as individuals selecting and using drugs to address illnesses or symptoms they have identified themselves. Self-medication is taking medicines without a physician's advice, and it has become more common in developing countries.[1] The root cause could be anything from a shortage of physicians to financial factors. However, most people are not aware of the ill effects and drug reactions brought on by self-medication. Medication also relates to the act of excessively utilizing prescribed medicine for oneself or other family members, particularly in the case of young people or the elderly. Self-medication is managing minor ailments without seeking medical advice to promptly and efficiently alleviate symptoms. This practice is commonly employed to minimize strain on healthcare facilities, particularly in remote locations that lack sufficient medical personnel and accessibility.[2] The use of self-medication has the potential to decrease the amount of time patients have to wait for doctor's appointments. It may also reduce medical costs by conserving limited medical resources for less severe conditions. Nevertheless, engaging in untimely self-

medication practice can lead to health hazards such as inaccurate self-diagnosis, adoption of wrong therapy, prolonged and excessive usage, detrimental side effects, adverse drug reactions, the inability to seek appropriate medical guidance promptly, and polypharmacy.[3,4] Moreover, engaging in self-medication can result in drug interactions that could have been avoided if the patient had sought treatment from a qualified healthcare professional.[5]

Self-medication is a global phenomenon, and its prevalence has varied across different countries; for example, in developing countries, such as India, 60%[6], Vietnam 83.3%[7], Nepal 38.2%[8], Ethiopia 78.2%[9]. Based on Central Bureau of Statistics (BPS), self-medication in Indonesia reached 61.35% in 2015 and increased to 84.23% in 2021. [10] The increasing prevalence of self-medication can be ascribed to a multitude of variables, including the desire for self-care, concern for ill family members, limited access to healthcare facilities, and unavailability of medications, as well as time and financial limitations. Ignorance, misconceptions, widespread advertising, and the accessibility of drugs in non-pharmacy establishments further contribute to this rising phenomenon.[11]

To be able to do good self-medication, one of the things needed is sufficient knowledge. Some research results show that knowledge about self-medication still needs to be improved. For example, a study in Saudi Arabia showed that the level of community knowledge of self-medication was 49.3%[12], while Ahmad's research in rural India showed similar results; the level of community knowledge was 24%.[13] Data in Indonesia also shows that knowledge still needs to improve. There are still few studies in rural areas of Central Java, so this research is necessary.

This study examined medication knowledge, attitude, and practice among residents in Grobogan district, Central Java Province, Indonesia. Our goal was to identify the factors that influence knowledge among residents. Additionally, we aimed to support pharmacists, particularly in the community, by enabling them to provide appropriate pharmacy services and conduct public education activities on rational drug use.

METHODS
Study design
A quantitative, cross-sectional study was conducted in Grobogan District, Central Java, between November 2022 and January 2023.

Population, samples and data collections
The sample was obtained by convenience sampling, based on the following inclusion criteria: individuals who have engaged in or are currently practicing self-medication during the past 6 months, are seeking to participate as a respondent, and are at least 18. The exclusion criteria include those employed in the healthcare field or with a healthcare background and those with visual, auditory, or communication problems.

The sample size was determined using Raosoft[14] software with a population size of Grobogan citizents is 1.5 million[15], power of 80%, response distribution of 50%, and confidence interval and margin of error set at 95% and 5%, respectively. The minimum required sample size was 385. The number of samples obtained through this study was 396 respondents.

The sampling process was conducted in person by visiting respondents directly, and questionnaires were distributed to each eligible participant who met the inclusion criteria of this study. Individuals who expressed willingness to participate in the study were requested to complete and sign an informed consent form. Before this, the research goal was clarified to the participant, and the confidentiality of the respondents' identities was guaranteed.

Study instruments
This study employed a questionnaire research instrument with four sections: demographic information, knowledge, attitudes, and practice. The initial segment (six questions) concentrated on sociodemographic traits such as gender, age, educational attainment, monthly income, and prevalent illnesses managed through self-medication. The second, third, and fourth sections contain 15 questions to assess knowledge, attitude, and behavior about self-medication. The questionnaire was based on previous research[12,16] and the Ministry of Health Indonesia Guidelines[17].

The knowledge variable question is a closed-ended inquiry with response alternatives of "True," "False," and "Don't Know." The questionnaire measures the respondent's attitude towards self-medication using a Likert scale format. Scales ranging from strongly disagree, disagree, neutral, agree, and strongly agree, with scores ranging from 1 to 5. Inquiries regarding practice variables with "Yes" and "No" response choices.

The questionnaire's validity was assessed using Pearson's Product Moment correlation coefficient. The validity test was conducted using a sample size of 40 respondents. The validity test findings for the knowledge, attitude, and practice questionnaire indicated that all 15 statement questions were valid. This determination was based on the estimated r value, which exceeded the critical r table value of 0.312.

The reliability of the questionnaire in this study was assessed using the Cronbach's Alpha test method. The Cronbach's Alpha values obtained during reliability testing for each statement's knowledge, attitude, and practice variables are 0.728, 0.745, and 0.734, respectively. Based on this result, it can be inferred that the questionnaire utilized in this study yields reliable and consistent outcomes. Cronbach's Alpha value is more significant than 0.6, meaning all questions are reliable.

Data Analysis

The collected data was inputted into a Microsoft Excel spreadsheet and afterward exported to the statistical analysis software (SPSS, 25 version). Both descriptive and analytical methods were used to evaluate the data. The knowledge, attitudes, and practice level is classified as "High" for knowledge or "Good" for attitude and practice if the total score reaches 75%. If the score is below 75%, it is labeled "poor" for knowledge and "bad" for attitude and practice. Descriptive analysis described demographic data, self-medication knowledge, attitudes, and practice. Bivariate and multivariable logistic regression analyses were employed to determine genuinely linked components and manage confounding influences. Independent variables with a p-value of less than 0.25 were chosen for multivariable logistic regression analysis. The odds ratio (OR) with a 95% confidence interval (CI) and the associated P-value were calculated for each variable. A P value less than 0.05 has been considered statistically significant.

RESULTS AND DISCUSSION

Characteristic of respondents

During this study, 396 participants met the inclusion criteria and agreed to follow the research. Data was collected by directly visiting community residences or attending community groups. Out of all the participants, the age group of 36-45 years had the most significant proportion, with 102 individuals accounting for 25.8% of the total. The average age of the participants recruited in this study was 40.30±14.80. More than half are female, with 235 (59.3%) individuals. Regarding the education level, 154 participants (38.9%) had completed high school, while 94 participants (3.5%) had only attended primary school. By occupation, according to the data, 116 individuals (29.3%) were classified as housewives, while 93 individuals (23.5%) were categorized as privately employed. There were only 9 individuals whom the government hired. Of the participants, 364 individuals, accounting for 91.4%, had a monthly income equal to or below IDR 1,800,000. IDR 1,800,000 is the regional minimum wage in the Grobogan District. Table I displays the distribution of participants based on their general characteristics.

The prevalence of self-medication is higher among individuals aged 36-45 compared to those in older age groups. This finding aligns with a study conducted in India [11], China[18], Ethiopia[19], and Iraq[20], which reported that self-medication is more prevalent among young than older people. Women and homemakers predominantly engaged in self-medication in this study. This finding is consistent with previous studies.[21] Housewives responsible for the family's well-being are more inclined to engage in self-medication to save time and reduce doctor visits.

The mean knowledge score about medication among Grobogan residents, Central Java province, was 70.24±15.96, with "high" knowledge levels. The scores were classified as "high" in 150 (37.9%) participants and "poor" in 246 (62.1%) participants. The disparities in medication scores were statistically significant. Meanwhile, the overall attitude and practice scores were "good" according to the scoring standard, averaging 75.35±9.85 and 83.04±11.43, respectively. The majority of respondents, 223 (56.3%) in total, assessed the attitude as "good," while 173 (43.7%) respondents scored it as "bad." Thus, regarding self-medication practice, 297 (75%) respondents were assessed as having a "good" score, and 99 (25%) respondents were rated as having a "poor" score.

Illness treated by self-medication

The most prevalent ailment managed through self-medication among the population is illustrated in Figure 1. According to the study findings, the most pervasive ailments for which self-medication is practiced are headache, influenza, and cough. The number of participants who engaged in self-medication were 142, 117,
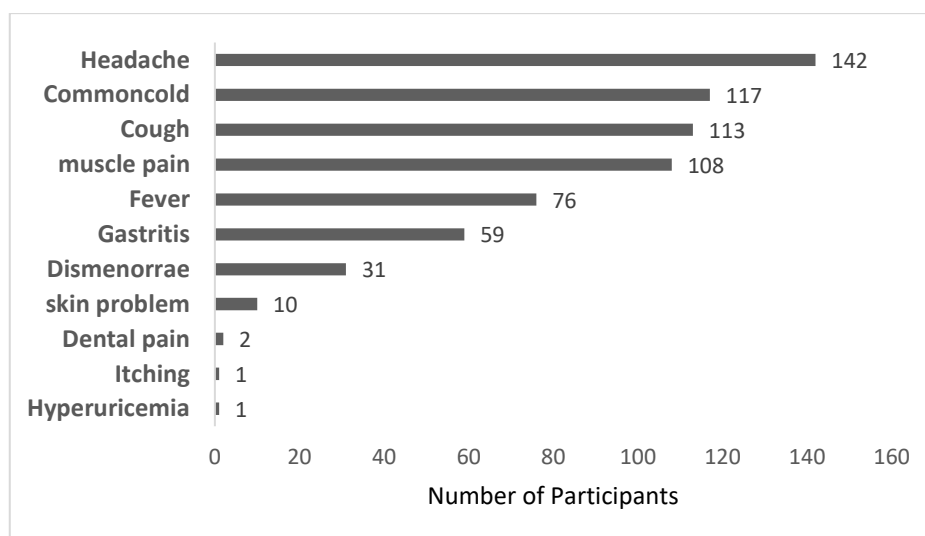
Figure 1. The most common disease treated with self-medication in the community

Table I. Socio-demographic Characteristics of Studied

Variables	N = 396	Percentage (%)
Age group (years)		
18-25	81	20.5
26-35	77	19.4
36-45	102	25.8
46-55	59	14.9
56-65	60	15.2
>65	17	4.3
Gender		
Male	161	40.7
Female	235	59.3
Education level		
Primary school	94	23.7
Junior high school	103	26.0
High school	154	38.9
Undergraduate/Post	45	11.4
Employment status		
Unemployed	45	11.4
Government employee	9	2.3
Private employee	93	23.5
Trader	75	18.9
Housewife	116	29.3
Farmer	58	14.66
Monthly income		
≤ IDR 1,800,000	364	91.9
> IDR 1,800,000	32	8.1

and 113, respectively. It is essential to mention that several participants practiced self-medication for different illnesses.

This study's primary reasons for self-medication were headaches, common colds, and coughs. Based on a systematic review of self-medication in Ethiopia, headache is also identified as the primary reason for individuals

engaging in self-medication, followed by gastrointestinal tract diseases and respiratory diseases.[22] Previous studies have also shown that headache is the primary reason for self-medication.[8,21,23,24] Although the motivations behind self-medication were not examined in this study, prior research suggests that treating the symptoms of minor illnesses is one of the motivations.[18] Headaches are common illnesses that can be self-treated without a visit to the doctor. Patients may be deterred from obtaining medical consultation due to these illnesses' benign and self-limiting characteristics. According to the findings of Berha et al. (2017), the majority of those who self-medicated for the sole reason of obtaining instant alleviation did so due to the non-serious nature of the illness (70.3%).[25] Patients should not, nevertheless, overlook the fact that protracted or recurrent occurrences of these illnesses/symptoms warrant further examination by medical professionals, as they could potentially indicate more severe conditions.

The presence of self-medication in the healthcare system is now widely acknowledged. The awareness of individuals' accountability for their well-being and the realization that seeking professional assistance for minor ailments is often unnecessary have influenced this perspective.[1] While using over-the-counter medicine intended for self-medication and known to be effective and safe, it can have severe consequences if misused due to a lack of understanding of their side effects and interactions.[26]

Knowledge, Attitude, and Practice Domains

Figures 2, 3, and 4 define knowledge, attitudes, and practice separately, categorized into six domains: the definition of self-medication, therapeutic class, drug storage, drug indication, side effects, and drug expiration date. Based on this study, it is evident that the population needs to gain sufficient knowledge of drug usage and drug therapy categories, including information on specific drug names. Like knowledge, it was discovered that individuals encountered difficulties in medicinal names regarding their attitude and practice. Meanwhile, the drug storage domain could be higher at the practice level.

Inadequate knowledge about self-medication might result in the incorrect choice of medications for self-treatment, hence leading to unsuccessful treatment. The question "All classes of drugs can be purchased without a doctor's prescription" still gets a low score. Presuming universal availability of all pharmaceuticals without prescription can result in complications, such as the purchase of antibiotics without prescription, potentially contributing to the development of drug resistance.[27]

Influencing Factors with Knowledge, Attitude, and Practice of Self-Medication

Multivariable binary logistic regression determined that knowledge about self-medication was associated with age, education level, and employment status. At the same time, gender and monthly income did not show any statistically significant influence, as shown in Table II. Education level affects high knowledge 3 times while age affects good knowledge 0.78 times, with an AOR value of respectively; AOR at 95%CI: 3.145 (2.199-4.497) and 0.785 (0.660-0.935). Self-medication was linked to various kinds of variables. Wu et al. (2018) revealed that the variables that significantly influenced medication knowledge were age, medical insurance coverage, and education level.[28] The remaining variables showed no statistical significance (P>0.05). In the same year, Shafie et al. found a significant relationship between self-medication and female respondents who were married, had a secondary education, and belonged to the low monthly income category.[23] From these findings, the lack of affordability of medicine expenses may contribute to self-medication.

Age, gender, level of education, employment status, monthly income, and level of knowledge were identified as bivariate correlates of attitude toward self-medication and incorporated into the multivariate regression analysis, as shown in Table III. In this analysis, a good attitude is significantly impacted by both level of education and level of knowledge. In addition, participants with a good level of knowledge are 47 more likely to have a positive attitude, and the AOR at 95% CI: 47.109 (17.459-127.117). This study's results differ from research in China, which shows that only the level of knowledge affects attitudes.[28] In contrast, research in Ethiopia shows that only a place of residence, which is living in a rural area, affects attitudes.[29]

In the practice of self-medication, as shown in Table IV, factors performed in multivariate regression analysis from bivariate correlative are age, degree of education, employment status, monthly income, level of knowledge, and attitude. Individuals who possessed adequate knowledge scores and good attitude were 3.12 and 3.35 times more likely to have good practice with self-medication compared to those who scored low on the knowledge scale and bad attitude (AOR at 95%CI: 3.129 (1.297-7.551) and 3.356 (1.726-6.524), respectively).
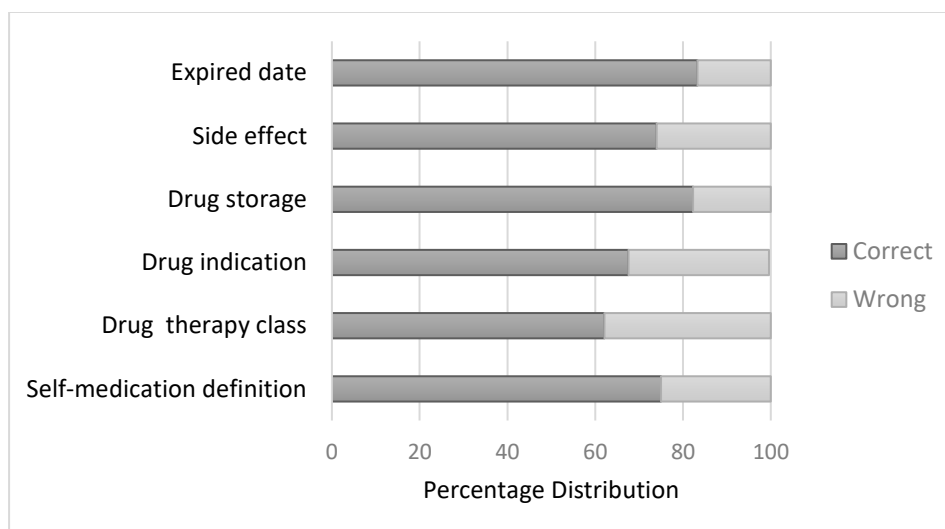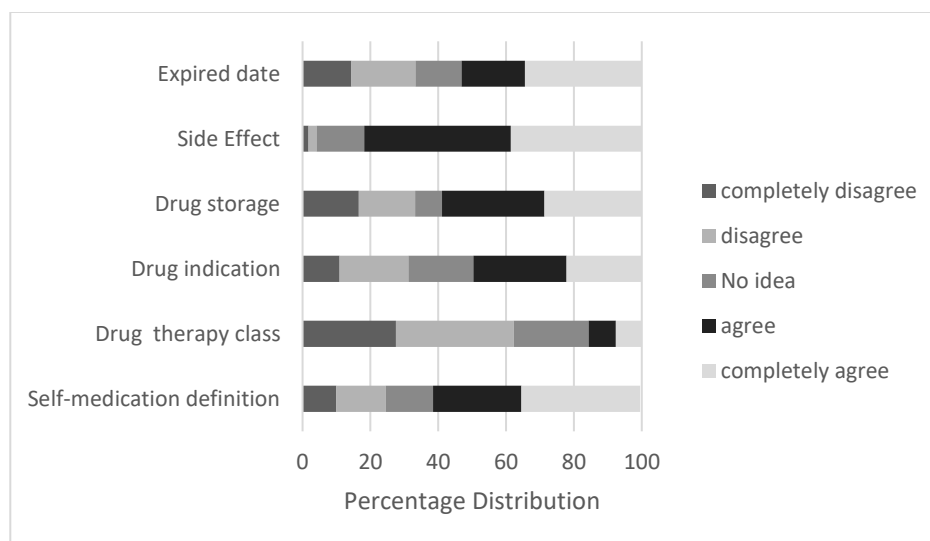
Figure 2. Percentage distribution of knowledge level in 6 domains

Table II. Associated Independent Variables with Knowledge About Self-Medication

Variabel	Knowledge		AOR	95% CI		P Value
	High	Poor		Lower	Upper	
Age group (years)						
18-25	52	29				
26-35	36	41				
36-45	36	66	0.793	0.649	0.970	0.024*
46-55	17	42				
56-65	6	54				
>65	3	14				
Gender						
Male	53	108	1.663	0.979	2.826	0.060
Female	97	138				
Education level						
Primary school	10	84				
Junior high school	26	77	3.145	2.199	4.497	0.000*
High school	70	84				
Undergraduate/Post	44	1				
Employment status						
Unemployed	22	23				
Government employee	7	2				
Private employee	45	48	0.785	0.660	0.935	0.007*
Trader	30	45				
Housewife	36	80				
Farmer	10	48				
Monthly income						
≤ 1,800,000	126	238	2.363	0.899	6.214	0.081
< 1,800,000	24	8				

*Statistically significant

Figure 3. Percentage distribution of attitude level in 6 domains

Table III. Associated Independent Variables with Attitude About Self-Medication

Variabel	Attitude		AOR	95% CI		P Value
	Good	Bad		Lower	Upper	
Age group (years)						
18-25	62	19				
26-35	51	26				
36-45	63	39	0.971	0.767	1.229	0.805
46-55	28	31				
56-65	13	47				
>65	6	11				
Gender						
Male	80	81	1.145	0.628	2.087	0.659
Female	143	93				
Education level						
Primary school	21	73				
Junior high school	49	54	2.116	1.387	3.226	0.001*
High school	109	45				
Undergraduate/Post	44	1				
Employment status						
Unemployed	26	19				
Government employee	7	2				
Private employee	52	41	1.218	0.987	1.504	0.066
Trader	51	24				
Housewife	66	50				
Farmer	21	37				
Monthly income						
≤ 1,800,000	197	167	0.484	0.124	1.887	0.296
< 1,800,000	26	6				
Knowledge						
Good	78	158	47.109	17.459	127.117	0.000*
Poor	145	5				
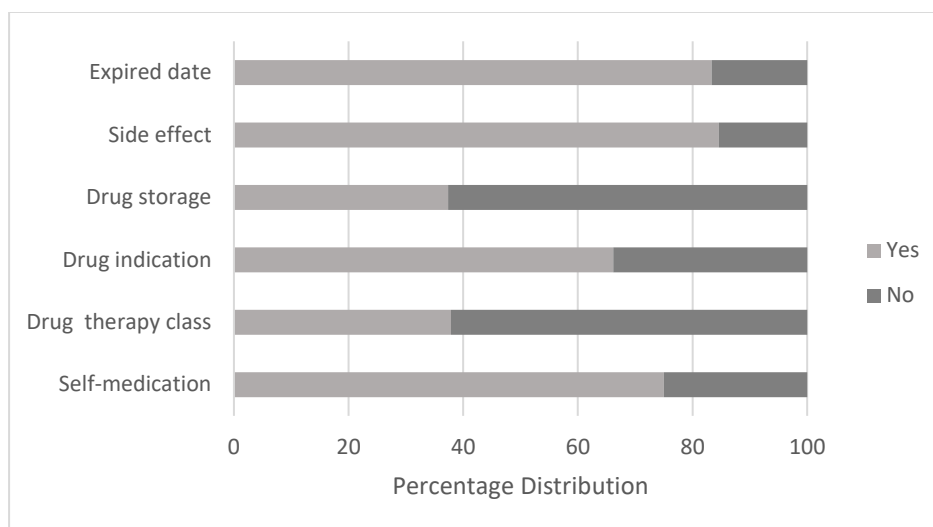
Figure 4. Percentage distribution of practice level in 6 domains

Table IV. Associated Independent Variables with Practice About Self-Medication

Variabel	Practice		AOR	95% CI		P Value
	Good	Bad		Lower	Upper	
Age group (years)						
18-25	69	12				
26-35	65	12				
36-45	80	22	0.797	0.646	0.985	0.035*
46-55	43	16				
56-65	30	30				
>65	10	7				
Education level						
Primary school	56	38				
Junior high school	73	30	0.911	0.620	1.338	0.634
High school	127	27				
Undergraduate/Post	41	4				
Employment status						
Unemployed	35	10				
Government employee	8	1				
Private employee	69	24	1.054	0.884	1.257	0.561
Trader	63	12				
Housewife	82	34				
Farmer	40	18				
Monthly income						
≤ 1,800,000	270	94	0.858	0.370	2.731	0.796
< 1,800,000	27	5				
Knowledge						
High	140	10	3.129	1.297	7.551	0.011*
Poor	157	89				
Attitude						
Good	200	23	3.356	1.726	6.524	0.000*
Bad	97	76				

Limitation

This study did not provide specific details regarding the substances utilized for self-medication, nor did it investigate the underlying motivations for engaging in self-medication. Self-medication by respondents was done in the last 6 months, so the risk of bias could occur in this study. Additional research is required to look further into the practice of self-medication.

Due to the absence of multicentre research, the current study has limitations regarding its capacity to be applied to a broader population. The study employed an easy way of sampling from around rural regions. Future research will further update the survey style and increase the sample size to know more effectively about the residents' needs for self-medication.

CONCLUSION

Self-medication is a prominent healthcare practice among residents of Grobogan District in Central Java. Socio-demographics show it is more prevalent among younger people, females, those with high school education, private employees, and those with low income. Age, educational level, employment status, and monthly income affect knowledge. There is a significant correlation between knowledge, attitude, and practice.

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STATEMENT OF ETHICS

This study was approved by the health research ethics committee of Dr. Moewardi General Hospital Surakarta, No. 1.367/X/HREC/2022.

REFERENCES

1. WHO. Guidelines for the Regulatory Assessment of Medicinal Products for Use in Self Medication. Published online 2000.
2. Bennadi D. Self-medication: A current challenge. *J Basic Clin Pharm*. 2013;5(1):19-23. doi:10.4103/0976-0105.128253
3. Hughes CM, McElnay JC, Fleming GF. Benefits and Risks of self-medication. *Drug Saf*. 2001;24(14):1027-1037. doi:10.2165/00002018-200124140-00002
4. Panda A, Pradhan S, Mohapatra G, Mohapatra J. Drug-related problems associated with self-medication and medication guided by prescription: A pharmacy-based survey. *Indian Journal of Pharmacology*. 2016;48(5):515. doi:10.4103/0253-7613.190728
5. Selvaraj K, Kumar SG, Ramalingam A. Prevalence of self-medication practices and its associated factors in Urban Puducherry, India. *Perspect Clin Res*. 2014;5(1):32-36. doi:10.4103/2229-3485.124569
6. Rathod P, Sharma S, Ukey U, et al. Prevalence, Pattern, and Reasons for Self-Medication: A Community-Based Cross-Sectional Study From Central India. *Cureus*. 2023;15(1):e33917. doi:10.7759/cureus.33917
7. Ha TV, Nguyen AMT, Nguyen HST. Self-medication practices among Vietnamese residents in highland provinces. *J Multidiscip Healthc*. 2019;12:493-502. doi:10.2147/JMDH.S211420
8. Paudel S, Aryal B. Exploration of self-medication practice in Pokhara valley of Nepal. *BMC Public Health*. 2020;20(1):714. doi:10.1186/s12889-020-08860-w
9. Kifle ZD, Mekuria AB, Anteneh DA, Enyew EF. Self-medication Practice and Associated Factors among Private Health Sciences Students in Gondar Town, North West Ethiopia. A Cross-sectional Study. *INQUIRY*. 2021;58:00469580211005188. doi:10.1177/00469580211005188
10. Badan Pusat Statistik. Makin Banyak Orang Indonesia Pilih Berobat Sendiri saat Sakit. Published 2022. Accessed December 7, 2023. https://dataindonesia.id/kesehatan/detail/makin-banyak-orang-indonesia-pilih-berobat-sendiri-saat-sakit
11. Rathod P, Sharma S, Ukey U, et al. Prevalence, Pattern, and Reasons for Self-Medication: A Community-Based Cross-Sectional Study From Central India. *Cureus*. 15(1):e33917. doi:10.7759/cureus.33917

12. Almalki ME, Almuqati FS, Alwezainani MO, et al. A Cross-Sectional Study of the Knowledge, Attitude, and Practice of Self-Medication Among the General Population in the Western Region of Saudi Arabia. *Cureus*. 14(10):e29944. doi:10.7759/cureus.29944

13. Ahmad A, Khan M, Srikanth A, et al. Evaluation of Knowledge, Attitude and Practice about Self-medication Among Rural and Urban North Indian Population. In: ; 2015. Accessed February 23, 2024. https://www.semanticscholar.org/paper/Evaluation-of-Knowledge-%2C-Attitude-and-Practice-and-Ahmad-Khan/eb3d9d054bee815764b47b619f1ad2eb067aaf96

14. Raosoft. http://www.raosoft.com/samplesize.html.

15. Grobogan DK. Data Agregat Kependudukan Tahun 2023 Semester I. https://dispendukcapil.grobogan.go.id/. Accessed May 4, 2024. https://dispendukcapil.grobogan.go.id/detail/data-agregat-kependudukan-tahun-2023-semester-i

16. AlShibly DMNR, Hasan LA, Abdulsada AR. Knowledge and practices of Self-medication among sample of outpatients attendant to Baghdad teaching hospital,2019. *Journal of Population Therapeutics and Clinical Pharmacology*. 2021;28(2). doi:10.47750/jptcp.2022.863

17. DepKes RI. Pedoman Penggunaan Obat Bebas dan Bebas terbatas. Published online 2006.

18. Lei X, Jiang H, Liu C, Ferrier A, Mugavin J. Self-Medication Practice and Associated Factors among Residents in Wuhan, China. *Int J Environ Res Public Health*. 2018;15(1):68. doi:10.3390/ijerph15010068

19. Mamo S, Ayele Y, Dechasa M. Self-Medication Practices among Community of Harar City and Its Surroundings, Eastern Ethiopia. *J Pharm (Cairo)*. 2018;2018:2757108. doi:10.1155/2018/2757108

20. Al Shibly MNR, Hasan LA, Abdulsada AR. Knowledge and practice of self-medication. *J Popul Ther Clin Pharmacol*. 2022;28(2):e62-e70. doi:10.47750/jptcp.2022.863

21. Thenmozhi B, Sharmil SH. Self-medication Practices of the Rural Community People: A Cross-Sectional Study. *Indian J Community Med*. 2023;48(4):619-622. doi:10.4103/ijcm.ijcm_842_22

22. Ayalew MB. Self-medication practice in Ethiopia: a systematic review. *Patient Preference and Adherence*. 2017;11:401-413. doi:10.2147/PPA.S131496

23. Shafie M, Eyasu M, Muzeyin K, Worku Y, Martín-Aragón S. Prevalence and determinants of self-medication practice among selected households in Addis Ababa community. *PLoS One*. 2018;13(3):e0194122. doi:10.1371/journal.pone.0194122

24. Ogwuche P, Adepoju A, Bah A. Knowledge, Attitude and Practice of Self-medication Among People of Central Monrovia, Liberia. Published online November 2, 2023. Accessed February 24, 2024. https://papers.ssrn.com/abstract=4621385

25. Berha A, Getachew E, Doboch A, Poulos E, Abdurahman K, Woldu M. Knowledge, Attitude and Practice of Self Medication among Pharmacy Students of Rift Valley University, Abichu Campus, Addis Ababa, Ethiopia. *Journal of Health & Medical Informatics*. 2017;08. doi:10.4172/2157-7420.1000269

26. Kazemioula G, Golestani S, Alavi SMA, Taheri F, Gheshlagh RG, Lotfalizadeh MH. Prevalence of self-medication during COVID-19 pandemic: A systematic review and meta-analysis. *Frontiers in Public Health*. 2022;10. Accessed December 8, 2023. https://www.frontiersin.org/articles/10.3389/fpubh.2022.1041695

27. Bogale AA, Amhare AF, Chang J, et al. Knowledge, attitude, and practice of self-medication with antibiotics among community residents in Addis Ababa, Ethiopia. *Expert Rev Anti Infect Ther*. 2019;17(6):459-466. doi:10.1080/14787210.2019.1620105

28. Wu YX, Wang EH, Zhao XJ, et al. Knowledge, attitude, and practice of medication among Haikou residents. *Annals of Palliative Medicine*. 2021;10(6):6883891-6886891. doi:10.21037/apm-21-1295

29. Siraj EA, Yayehrad AT, Kassaw AT, et al. Self-Medication Prevalence and Factors Associated with Knowledge and Attitude Towards Self-Medication Among Undergraduate Health Science Students at GAMBY Medical and Business College, Bahir Dar, Ethiopia. *Patient Prefer Adherence*. 2022;16:3157-3172. doi:10.2147/PPA.S390058