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Cross Sectional Study

Understanding knowledge and attitudes toward self-medication: an analysis of sociodemographic factors

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ABSTRACT

Self-medication, defined as the use of medicines without professional supervision, is a prevalent global issue that poses significant health risks, including misuse, adverse reactions, and resistance. Despite its widespread practice, limited knowledge about safe self-medication practices remains a concern. This study aimed to evaluate the knowledge and attitudes toward self-medication and explore their relationship with educational and demographic factors. A cross-sectional survey was conducted with 510 respondents, and data were analyzed using univariate and multivariate analysis. The average knowledge score was 44.4±16.7%, categorized as poor, while the attitude score was 71.7±8.5%, reflecting a generally positive outlook. Education significantly influenced both knowledge ($p < 0.05$) and attitudes ($p < 0.05$), while age affected knowledge ($p < 0.05$), and gender influenced attitudes ($p < 0,05$). A significant negative correlation ($r = -0.529$, $p < 0.001$) indicated that greater knowledge led to more cautious attitudes. The most common ailments treated through self-medication were fever, cough, and headache, with non-professional advice being the predominant source of medications. These findings highlight the critical need for targeted educational interventions to improve public awareness of safe and rational self-medication practices. Such efforts are essential to mitigate the risks associated with self-medication and promote safer health behaviors within the population.

Keywords: Self-medication, Knowledge, Attitudes, Sociodemographic factors, Education

Introduction

Self-medication is a prevalent practice worldwide, particularly in developing countries, where it is often seen as a cost-effective and accessible alternative to formal healthcare services (ref). In Indonesia, self-medication is notably widespread, with a significant portion of the population engaging in this practice. In 2023, it was reported that almost 80% of the Indonesian population engaged in self-medication, highlighting the critical need to understand the factors influencing this behavior [1]. The practice of self-medication is influenced by various factors, including knowledge, attitudes, and demographic characteristics such as educational level. Studies have shown that self-medication is common among students and young adults, who often rely on previous prescriptions and easily accessible over-the-counter medications to treat minor ailments like headaches, colds, and fevers [2, 3]. In Makassar, one of the biggest cities in Indonesia, the prevalence of self-medication is similarly high, with factors such as age, education, and income playing significant roles in influencing self-medication behaviors [4]. The ease of access to medications, coupled with the lack of comprehensive public health insurance, often drives individuals, especially those in impoverished areas, to self-medicate as a form of self-defense against health issues [5]. Furthermore, traditional medicine also plays a significant role in self-medication practices in Indonesia, with many households storing and using traditional remedies for common ailments like diarrhea and influenza [6, 7]. The knowledge and attitudes towards self-medication are crucial in determining how individuals approach this practice. For instance, a study in Denpasar (the capital city of the province of Bali) found that higher knowledge and positive attitudes towards traditional medicine were associated with more frequent use of these remedies for self-medication [7]. Similarly, in Makassar,

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the level of knowledge about non-communicable diseases and the perception of pain significantly influenced the utilization of health services, indicating a potential correlation between educational level and self-medication practices [8]. The high prevalence of self-medication in Indonesia, particularly in urban areas like Makassar, underscores the need for educational interventions to improve public knowledge about the risks and benefits of self-medication. Such interventions could help mitigate the potential negative consequences of self-medication, such as drug resistance and adverse side effects, which are often exacerbated by the misuse of antibiotics and other medications [2, 9].

This study aims to explore the knowledge and attitudes regarding self-medication in Makassar, focusing on how educational level and demographic factors influence these behaviors. By investigating these correlations, the research seeks to provide insights that could inform public health strategies and educational interventions, promoting safer self-medication practices and reducing associated risks. These findings will contribute to shaping public health policies and fostering informed decision-making, particularly in regions where self-medication is prevalent.

Materials and Methods

Study design and sample

This study employed a cross-sectional design and was conducted in Makassar City, Indonesia, which has a total population of 1.474 million people. To determine the minimum required sample size, Slovin's formula was applied. Given a margin of error of 5%, the calculation yielded a minimum sample size of 400 participants. Purposive sampling was used to ensure that the sample population met the following inclusion criteria: residents of Makassar aged 18 years and above, able to read, proficient in the Indonesian language, and residing in Makassar. The exclusion criteria were individuals who worked in the healthcare sector or lived with someone who was a healthcare worker, to avoid potential bias due to higher knowledge levels or different health behaviors related to self-medication. This research obtained ethical approval from the relevant institutional review board (No.: 0211/M/KEPK-PTKMS/III/2024).

Study setting

Data collection was carried out over three months, from March to May 2024. The questionnaire was developed based on validated tools from previous studies and was pretested to ensure clarity and relevance to the target population [10]. Respondents were approached through direct visits to households, community centers, and other accessible public areas. During the recruitment process, the researchers explained the study's objectives and provided informed consent forms to eligible participants. Data collection was facilitated using printed questionnaires, which were distributed and completed on-site to ensure high response rates and reduce the risk of incomplete answers. Trained data collectors assisted respondents who required clarification or support in understanding the questions. To maintain consistency and reduce bias, all data collectors were provided with standardized guidelines for administering the questionnaire. Additionally, strict confidentiality protocols were implemented, ensuring that no identifying information was collected, and responses were anonymized for analysis. The collected data were reviewed daily to ensure completeness and accuracy before being entered into a secure database for further analysis.

Data collection and analysis

Data were gathered using a structured questionnaire, which consisted of four sections. The first section collected sociodemographic data, including age, gender, education, occupation, and income. The second section focused on the self-medication profile, covering the types of illnesses treated, the duration of self-medication, medications used, sources of medications, leftover medication management, distance to healthcare facilities, sources of information, reasons for self-medication, experienced side effects, and actions taken when side effects occur. This section included both closed- and open-ended questions to capture detailed self-medication behaviors. The third section assessed respondents' knowledge of self-medication across four domains: obtaining, using, storing, and disposing of medications. Respondents answered "True" or "False," with correct answers scoring 1 point, while incorrect responses scored 0. A total score was calculated for each respondent and converted into a percentage, which was then categorized into three levels: Poor (0-59%), Fair (60-75%), and Good (76-100%).

The fourth section measured attitudes towards self-medication using 17 questions spanning six domains: obtaining, choosing, using, storing, disposing of medications, and overall self-medication practices. Responses were rated on a 5-point Likert scale, with higher scores indicating a more positive attitude. A total attitude score (T) was calculated, and respondents with scores above the mean were categorized as having a positive attitude.

Data analysis utilized descriptive statistics to summarize the distribution of knowledge and attitudes across different demographic variables. Following normality testing, which indicated that the data were normally distributed, parametric tests were employed. Pearson's correlation was used to examine the relationship between age and knowledge/attitudes. An independent samples t-test was conducted to compare knowledge and attitudes between genders. One-way ANOVA was applied to assess differences in knowledge and attitudes across education, occupation, and income groups. In addition to univariate analyses, multivariate analysis was conducted to identify independent predictors of knowledge and attitudes toward self-medication. Multiple linear regression was used to assess the combined effects of sociodemographic factors, such as age, gender, education, occupation, and income, on knowledge and attitudes. This approach allowed for the identification of

factors that significantly influenced self-medication behaviors while controlling for potential confounding variables.

Results and Discussion

Demographic profile of participants

The average age of participants was 38.5 ± 15.1 years. Gender distribution was slightly imbalanced, with 256 male respondents (50.2%) and 254 female respondents (49.8%). As shown in **(Table 1)**, the majority of participants (59.2%) had completed high school. More than half (60.2%) of the respondents were employed, while 12.0% were students. Additionally, 36.5% of the participants reported an income below 1 million rupiah. The findings indicate a diverse demographic, which may influence perceptions and practices regarding self-medication.

Table 1. Sociodemographic Characteristics of Respondents (N=510)

Characteristics	No.(%)
Age (years)	
18 - 24	121 (23.7)
25 – 44	189(37.1)
45 – 64	180 (35.3)
> 65	20 (3.9)
Gender	
Male	256 (50.2)
Female	254 (49.8)
Education	
Elementary School	55 (10.8)
Junior High School	55 (10.8)
Senior High School	302 (59.2)
Higher Education	98 (19.2)
Occupation	
Employed	307 (60.2)
Unemployed	142 (27.8)
Students	61 (12.0)
Income (Indonesian million rupiahs)	
< 1	186 (36.5)
1 – 2	127 (24.9)
>2 – 3	94 (18.4)
>3 – 4	65 (12.7)
> 4	38 (7.5)

Profile of self-medication

Data in **(Table 2)** shows the most common self-medicated conditions: fever (44.5%), cough (38.8%), flu (38.4%), and headache (30.8%). Most respondents (71.4%) used medications for an average of three days. Analgesic-antipyretics were the most purchased drugs, with 20.4% obtaining prescription-only medications without proper prescriptions. Alarmingly, 83.7% kept unused medications until they expired, highlighting gaps in medication safety awareness. These findings underscore the need for public health initiatives to educate individuals on the risks of self-medication and the importance of consulting healthcare professionals.

Table 2. Profile of Self-Medication

Profile of Self-Medication	No (%)
Type of illnesses treated by self-medication (respondents can select more than one answer)	
Fever	227(44.5)
Cough	198(38.8)
Flu	196(38.4)
Headache	157(30.8)
Pain	101(19.8)
Ulcer	75(14.7)
Diarrhea	51(10.0)
Others	50(9.8)
Duration of Self-Medication	
3 days	364(71.4)
1 week	106(20.8)
> 1 week	40(7.8)
Type of medicine that respondents usually buy for self-medication (respondents can select more than one answer)	
OTC for Analgesics and Antipyretics	344(67.5)
OTC for Common Cold and Cough	119(23.3)
OTC for Ulcer	54(10.6)
OTC for Diarrhea	19(3.7)
Other OTCs	43(8.4)
Non-OTC Medicines	104(20.4)
Traditional Medicines	25(4.9)
Action taken on the remaining medication	
Throw it away	68(13.3)
Keep it until Expired	427(83.7)
Use it up or give it to others	15(2.9)
Where to buy Medicine (respondents can select more than one answer)	
Pharmacy	413(81.0)
Supermarket	73(14.3)
Warung	59(11.6)
Drug Store	5(1,0)
Distance between residence and healthcare facility (Hospital, Public Health Centre(Puskesmas))	
< 1 km	251(49.2)
1-2 km	170(33.3)
> 2 km	89(17.5)
Reason for practicing Self Medication (respondents can select more than one answer)	
Minor ailments	246(48.2)
Saving time	155(30.4)
Cheaper	132(25.9)
Emergency	78(15.3)
Other reasons	20(3.9)
Experience of Side Effects during practicing self-medication	
Yes	109(21.4)
No	401(78.6)
Action taken when experiencing side effects (respondents can select more than one answer)	
Stopping medication	254(49.8)
Consulting a doctor	162(32.8)
Consulting a pharmacy	29(5.7)
Action taken if the illness does not improve after self-medication (respondents can select more than one answer)	
Going to the public health centre (Puskesmas)	167(32.7)

Going to the hospital	99(19.4)
Going to the practicing doctor	99(19.4)
Going to the clinic	92(18.0)
Going to the Pharmacy to buy medicine	68(13.3)
Going to the practicing midwife/nurse	11(2.2)
Sources of information regarding the medication commonly used for self-medication	
Friend	291(57.1)
Literature	74(14.5)
Advertisement	75(14.7)
Family	33(6.5)
Others	37(7.3)
History of Chronic Disease	
Yes	99(19.4)
No	411(80.6)

The study found that pharmacies were the primary source of medications (81.0%), but most respondents (57.1%) relied on friends for advice rather than pharmacists. This gap highlights the need to strengthen pharmacist-patient interactions through community outreach, proactive counseling, and regulatory measures to ensure the dissemination of essential medication-related information. Such efforts align with global initiatives to enhance medication literacy and promote safer self-care practices. The main reason for self-medication was the perception of ailments as minor (48.2%), followed by saving time, lower costs, emergencies, and trust in personal judgment. Notably, 21.4% of respondents reported side effects, including drowsiness, nausea, vomiting, and itching, with 61.6% discontinuing medications in response. These side effects may result from a lack of professional guidance, misuse of medications (e.g., incorrect dosages or combinations), and reliance on non-professional advice, which often overlooks critical health factors like medical history and allergies [9, 11]. Additionally, the use of over-the-counter drugs prone to side effects, such as antihistamines and analgesics, further contributes to these risks.

These findings underscore the importance of public health initiatives to address self-medication risks and improve medication safety.

For unresolved conditions, 32.7% of respondents preferred visiting a community health center. Additionally, 19.4% of participants reported having a chronic illness, which may explain why some resorted to purchasing prescription-only medications from pharmacies. Furthermore, the data indicated that a significant portion of individuals lacked awareness regarding the potential risks associated with self-medication, highlighting a need for better education on safe practices.

Knowledge and attitude towards self-medication

(Figure 1) dan **(Figure 2)** describes the distribution of respondents' answers regarding knowledge and attitudes toward self-medication. The data presented in Figure indicate a concerning trend, with an average knowledge score of 44.5±16.8, categorized as "Poor" **(Table 3)**. This finding is consistent with the results of a previous study, which reported low levels of knowledge among Indonesian populations, with 67.8% of respondents demonstrating irrational self-medication behaviors due to a limited understanding of proper medication use [12]. The low knowledge scores observed in this study suggest that significant gaps remain in public education concerning safe self-medication practices, particularly in how medications are obtained, used, stored, and disposed of. This finding suggests that many respondents lack sufficient understanding of crucial aspects related to self-medication, such as how to obtain, use, store, and dispose of medications properly. The low level of knowledge highlights the urgent need for public educational interventions aimed at enhancing understanding of safe and rational medication practices.

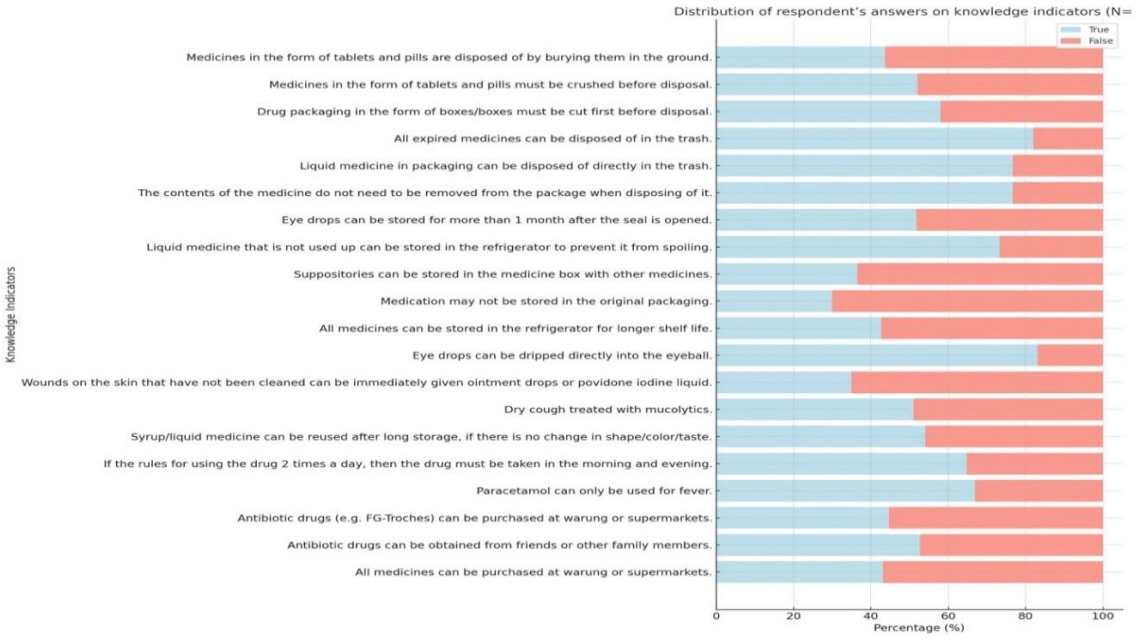

Figure 1. Distribution of respondent's answer on knowledge indicators

On the other hand, findings from other regions contradict this result. For example, a study in Central Java found that a higher percentage of respondents (62.3%) exhibited "Fair" or "Good" knowledge of self-medication [6]. This discrepancy could be attributed to differences in local healthcare initiatives, access to educational resources, or socioeconomic factors, indicating that certain regions may have more effective public health outreach programs. Similarly, research in Iran showed that a majority of respondents had adequate knowledge regarding the safe use of medications, particularly antibiotics and analgesics [9]. These contrasting findings highlight that while self-medication is a widespread behavior, the level of understanding and awareness varies significantly across different populations and regions. The conflicting results underscore the importance of addressing local contextual factors that may influence public knowledge of self-medication. In regions like Makassar, where knowledge is demonstrably lower, targeted health interventions, community education programs, and improved healthcare access could play a crucial role in bridging these gaps. Meanwhile, studies from regions with better knowledge outcomes suggest that comprehensive educational strategies have the potential to mitigate the risks associated with poor self-medication practices. Therefore, the findings of this study point to the need for localized public health strategies that take into account the sociodemographic and cultural factors influencing knowledge and attitudes toward self-medication.

Table 5 reveals that the attitudes of the community towards self-medication are more favorable, with an average score of 71.7±8.5 **(Table 5)**. This indicates that respondents generally agree that self-medication can save time and is easier to carry out, particularly for minor ailments. Such positive attitudes suggest that individuals are comfortable with self-managing their health conditions despite their limited knowledge. Factors such as convenience, lower costs, and easy access to medications appear to contribute to this positive sentiment. This higher attitude score suggests that despite lacking adequate knowledge, many respondents may perceive self-medication as a positive and acceptable behavior. This discrepancy between knowledge and attitude is not uncommon in health behavior studies, where individuals may exhibit positive attitudes towards behaviors they practice frequently, even if they do not fully understand the associated risks.

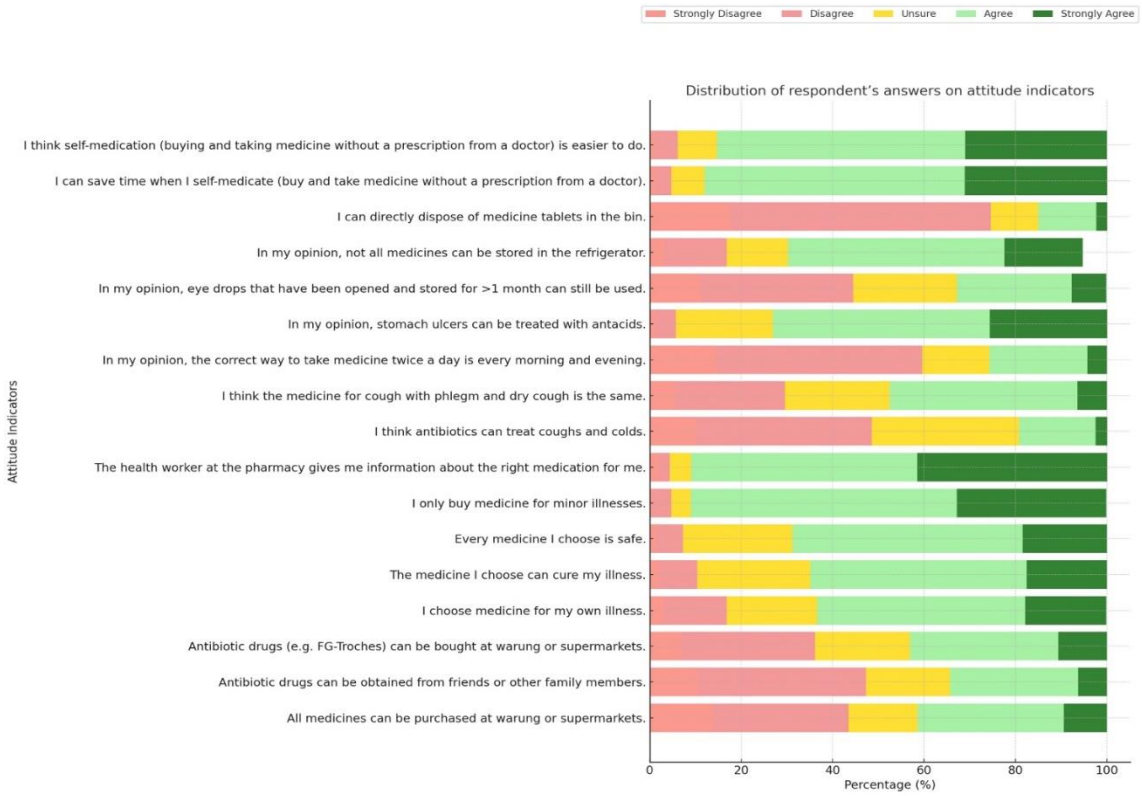

Figure 2. Distribution of respondent's answers on Attitude indicators

Research has shown varying relationships between knowledge and attitudes toward self-medication across regions. For instance, studies in Ethiopia and Malaysia reported positive attitudes toward self-medication despite poor knowledge, reflecting confidence in managing minor ailments independently [13, 14]. However, a study in Nepal observed lower attitude scores among participants with poor knowledge, suggesting more cautious self-medication behaviors when awareness is limited [15]. These differences may stem from cultural and healthcare access variations. The positive attitudes observed in this study, despite low knowledge levels, highlight potential overconfidence in self-medication practices. This aligns with findings from other studies, where individuals frequently engage in self-medication without fully understanding the associated risks [16]. Conversely, higher knowledge levels have been linked to more cautious attitudes, indicating the complexity of this relationship [9]. These findings emphasize the need for targeted

educational programs to bridge the knowledge gap and promote safer self-medication practices.

(Table 3) highlights the associations between sociodemographic factors and self-medication knowledge and attitudes ($p<0.005$). Age is a significant determinant, with younger and middle-aged individuals (21–40 years) more likely to engage in self-medication, as shown in studies from Iran and Saudi Arabia [17, 18], suggesting a need for age-specific interventions. Gender also influences attitudes, with females more inclined to self-medicate than males, as noted in studies from Pakistan and Saudi Arabia [18, 19]. Education level strongly impacts self-medication behaviors; individuals with higher education are more likely to self-medicate, as seen in China and Saudi Arabia [18, 20], while those with no formal education, such as in Iran, are less likely [17]. These findings underscore the need for tailored educational campaigns and public health strategies to improve awareness and promote safe self-medication practices.

Table 3. Sociodemographic factors in correlation with Knowledge and Attitude

Sociodemographic factors	Knowledge Level				Attitude		
	Poor	Fair	Good	P-Value	Negative	Positive	P-Value
Age (years)							
18 - 24	92 (18.0)	25 (4.9)	4(0.8)	**0.001**	70(13.7)	51 (10.0)	**0.015**
25 – 44	146 (28.6)	35 (6.9)	8 (1.6)		114 (22.4)	75 (14.7)	
45 – 64	148 (29.0)	26 (5.1)	6 (1,0)		97 (19)	83 (16.3)	
> 65	18 (3.5)	2 (0.4)	0(0.0)		7 (1.4)	13 (2.5)	
Gender							
Male	206 (40.4)	43 (8.4)	7 (1.4)	0,321	136 (26.7)	120 (23.5)	**0,036**
Female	198 (38.8)	45 (8.8)	11 (2.2)		152 (29.8)	102 (20.0)	
Education							
Elementary School	49 (9.6)	6 (1.2)	0(0)	**0.000**	24 (4.7)	31 (6.1)	**0.001**
Junior High School	50 (9.8)	5 (1.0)	0(0)		23 (4.5)	32 (6.3)	
Senior High School	237 (46.5)	53 (10.4)	12 (2.4)		176 (34.5)	126 (24.7)	
Higher Education	68 (13.3)	24 (4.7)	6 (1.2)		65 (12.7)	33 (6.5)	
Occupation							
Employed	239 (46.9)	57 (11.2)	11 (2.2)	0.301	169 (33.1)	138 (27.1)	0.705
Unemployed	118 (23.1)	19 (3.7)	5 (1.0)		80 (15.7)	62 (12.2)	
Students	47 (9.2)	12 (2.4)	2 (0.4)		39 (7.6)	22 (4.3)	
Income (IDR in millions)							
< 1	153 (30.0)	28 (5.5)	5 (1.0)	**0.034**	109 (21.4)	77 (15.1)	0.498
1 – 2	104 (20.4)	19 (3.7)	4 (0,8)		66 (12.9)	61 (12.0)	
>2 – 3	69 (13.5)	22 (4.3)	3 (0.6)		50 (9.8)	44 (8.6)	
>3 – 4	47 (9.2)	13 (2.5)	5 (1.0)		42 (8.2)	23 (4.5)	
> 4	31 (6.1)	6 (1.2)	1 (0.2)		21 (4.1)	17 (3.3)	

Economic factors significantly influence self-medication behaviors. Middle-income groups in China prefer over-the-counter medications, while lower-income individuals often use prescription-only drugs without prescriptions [20]. In Indonesia, income levels and sources are linked to antibiotic self-medication [21]. Cost of healthcare and time constraints are common reasons for self-medication, as reported in India and Pakistan [22, 23]. Living arrangements, such as living alone, also contribute to higher self-medication rates, as observed in Spain [24]. These findings highlight the complex interplay of demographic, socioeconomic, and contextual factors driving self-medication practices [25-29].

A multivariate analysis was conducted to explore the independent effects of socio-demographic factors on self-medication knowledge and attitudes, controlling for confounders [29-34]. This method enhances the validity of findings in complex behavioral studies [35-39]. The results **(Table 4)** show that age significantly influences knowledge ($p<0.05$), emphasizing the need for age-specific educational interventions to address knowledge gaps. Gender was significantly associated with attitudes ($p<0.05$), indicating differing perceptions and behaviors between males and females, which supports the necessity for gender-sensitive public health campaigns. Education significantly affected both knowledge and attitudes ($p<0.05$), underscoring the role of educational attainment in shaping informed self-medication practices, as higher education likely improves access to health information and critical thinking skills. These findings highlight the importance of tailored interventions, such as foundational knowledge campaigns for younger populations and gender-specific strategies to address unique

attitudes and behaviors. Multivariate analysis strengthens the study's methodological rigor and provides actionable insights for developing targeted public health strategies [40-45].

Table 4. Multivariate analysis

Sociodemographic factors	Knowledge	Attitude
Age	**0.021**	0.061
Gender	0.130	**0.014**
Education	**<0.001**	**0.002**
Occupation	0.098	0.128
Income	0.999	0.721

Furthermore, the data reveal a significant correlation between knowledge and attitudes **(Table 5)**, with a correlation coefficient of -0.529 and a p-value less than 0.001. This negative correlation suggests that as knowledge regarding self-medication increases, attitudes towards self-medication become less positive. This counterintuitive result may indicate that individuals with higher knowledge are more aware of the potential risks and complications associated with self-medication, leading them to adopt a more cautious or critical stance [46]. These findings are consistent with previous research indicating that individuals with better knowledge of medication practices are less likely to engage in self-medication, as they may understand the importance of consulting healthcare professionals for guidance [12, 16]. Thus, while positive attitudes towards self-medication are prevalent, they may not always translate into safe practices, particularly when knowledge levels are low. This underscores the necessity for targeted educational initiatives to bridge the gap between knowledge and attitudes, ultimately fostering a more informed approach to self-medication in the community.

Table 5. Knowledge and attitude correlation

	Mean	Correlation Coefisien	Sig
Knowledge	44.4±16.7	-0.529	<0,001
Attitude	71.7±8.5		

Community engagement significantly enhances the impact of educational initiatives on improving knowledge and attitudes toward self-medication by addressing socio-economic and cultural barriers. Participatory approaches, such as community-based participatory research (CBPR), have been effective in fostering discussions and awareness about medication management, as seen in a program near Ottawa that promoted safe practices among older adults [47]. In Indonesia, the Healthy Living Community Movement (GERMAS) in West Lombok emphasized direct community interactions to disseminate information on proper drug use, successfully encouraging rational self-medication behaviors [25]. Community engagement is particularly valuable in reaching underserved populations facing barriers such as healthcare costs and accessibility. For instance, tailored programs in San Jose Del Monte addressed socio-economic challenges influencing self-medication, offering practical solutions to promote safer practices [26]. Combining community-driven approaches with targeted, culturally relevant educational initiatives ensures a broader and sustainable impact. Efforts such as peer-based education and interactive discussions not only enhance knowledge dissemination but also drive long-term behavioral change, empowering communities to make informed health decisions.

This study has several limitations. First, the cross-sectional design provides a snapshot of the population at a single point in time, limiting the ability to draw causal inferences about the relationships between sociodemographic factors, knowledge, and attitudes toward self-medication. Longitudinal studies would offer better insights into how these variables change over time. Additionally, the use of self-reported data may introduce response bias, as participants might overestimate or underestimate their knowledge and attitudes, potentially affecting the accuracy of the findings. The purposive sampling method, while suitable for targeting specific groups, may limit the generalizability of the results to the broader population of Makassar or other regions. Lastly, the exclusion of health workers or individuals living with health workers, while necessary to avoid professional bias, may have excluded individuals with valuable insights into self-medication practices.

Despite its limitations, this study has several strengths. First, it provides valuable insights into self-medication practices in an urban Indonesian context, contributing to the limited body of research on this topic in the region. The study also considers multiple sociodemographic factors, offering a comprehensive analysis of how education, occupation, and income influence self-medication behaviors. Moreover, the inclusion of both knowledge and attitude assessments allows for a more nuanced understanding of how these dimensions interact and influence self-care practices. Another key strength is the culturally relevant approach taken in designing the survey, ensuring that questions reflect the local context, which enhances the applicability of the findings for public health interventions in Makassar. Finally, by excluding health workers and those living with them, the study avoids potential bias from individuals with specialized knowledge, ensuring that the results more accurately reflect the general public's understanding and behaviors.

This study underscores the pivotal role of education in shaping knowledge and attitudes toward self-medication in Makassar. While attitudes were generally positive, knowledge gaps, particularly among those with lower educational attainment, highlight the need for targeted public health interventions to promote safer self-medication practices. To address these gaps, a multifaceted strategy is recommended. Community-based education programs can raise awareness about proper medication use and the risks of self-medication through localized workshops and campaigns. Medication literacy integration in school curricula can instill lifelong safe medication practices among younger populations. Pharmacist-led counseling at the point of purchase can enhance patient understanding of medication safety, complemented by mass media campaigns leveraging television, radio, and social media to disseminate key messages widely. Collaborations with local leaders and organizations can build

trust and increase participation, while monitoring and evaluation mechanisms can assess the effectiveness of these initiatives over time. These combined strategies aim to empower individuals with knowledge and skills, fostering a health-conscious population and mitigating the risks of inappropriate self-medication [25, 26, 47].

Conclusion

This study highlights significant gaps in knowledge (average score: 44.4±16.7, classified as 'Poor') and generally positive attitudes (71.7±8.5) toward self-medication among Makassar residents. Education emerged as a key factor influencing both knowledge and attitudes, while age impacted knowledge, and gender shaped attitudes. A negative correlation between knowledge and attitudes indicates that greater awareness of self-medication risks leads to more cautious behaviors. The findings emphasize the importance of targeted interventions to improve knowledge and address attitudinal factors. Integrating community engagement through participatory approaches, such as peer education and discussions, can help address socio-economic and cultural determinants of self-medication. These strategies are crucial in bridging knowledge gaps and promoting safer practices. In conclusion, fostering informed decision-making and combining educational initiatives with community-driven efforts are essential to reducing risks and improving public health outcomes related to self-medication in Makassar.

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