

Self-Medication using Chlorpheniramine Maleate in Karanganyar Regency, Central Java, Indonesia

Rifqilya Nurul Fathoni,¹ Tamara Gusti Ebtavanny,¹ Ema Pristi Yunita^{1,2}

¹Department of Pharmacy, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia

²Research Center for Smart Molecule of Natural Genetics Resources (SMONAGENES), Universitas Brawijaya, Malang, Indonesia

Abstract

Self-medication refers to the use of medications by a person without consulting health professionals and prescription. One of the common drugs used for self-medication is chlorpheniramine maleate (CTM), a drug indicated to relieve symptoms of allergy. However, the lack of knowledge about the indications of CTM leads to its significant misuse. Long-term effects of CTM misuse include heart rate regularity disorder, central nervous system disorders, and even coma. The purpose of this study was to analyze the correlation between sociodemographic factors and the appropriateness of CTM use for self-medication from the perspective of the experience of using CTM for self-medication. This cross-sectional study was performed in Karanganyar Regency, Central Java, Indonesia, from October to November 2022 on 117 respondents sampled randomly using cluster sampling method. A questionnaire that was already proven as valid and reliable was used. Results for the appropriateness of CTM use showed that 95.7% of respondents were in good category, 3.4% were in fair category, and 0.9% were in poor category. The hypothesis tests, which were the Somers's d test and the contingency coefficient, showed no correlation between age ($p=0.242$), gender ($p=0.307$), income level ($p=0.789$), experience ($p=0.176$), and the appropriate use of CTM for self-medication. However, there is a correlation between education level ($p=0.048$) and the appropriate use of CTM for self-medication, albeit very weak ($r=0.065$). Therefore, only the level of education affects the appropriate use of CTM for self-medication.

Keywords: Chlorpheniramine maleate, drug misuse, appropriate use of medication, self-medication, sociodemographic

Introduction

Self-medication refers to the practice of individuals using medicines, treatments, and/or substances without a physician's prescription.¹ According to a survey conducted by the Central Bureau of Statistics (*Badan Pusat Statistik/BPS*), 82.55% of the population in Central Java Province engaged in self-medication.² One of the medications possibly used for self-medication is chlorpheniramine maleate (CTM), which belongs to over-the-counter (OTC) drugs or can be purchased without a physician's prescription.³ CTM is indicated to relieve allergic symptoms,

such as hay fever, urticaria, food allergies, and drug reactions. Besides, CTM can also relieve itching associated with chickenpox.⁴

However, a lack of public knowledge regarding the appropriate indications for CTM has resulted in widespread misuse during self-medication. Research conducted by Pratama et al.³ at Pesanggrahan Village, Batu City, Indonesia, revealed that the level of public knowledge about the use of CTM is relatively low. Frequently, CTM is mistakenly regarded as a sleep aid due to its potential to cause drowsiness as a side effect.^{3,5} Nevertheless, it should be exclusively employed as directed, primarily as an antihistamine, rather than relying on its side effects. A significant determinant of the efficacy of self-medication therapy lies in the self-medication behaviors within the community.³ Prolonged usage of CTM by individuals dealing with insomnia may entail health hazards.⁵ Long-term effects of CTM misuse can cause tachycardia, hyperthermia, urinary

Corresponding Author:

Ema Pristi Yunita,
Department of Pharmacy, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia; Research Center for Smart Molecule of Natural Genetics Resources (SMONAGENES), Universitas Brawijaya, Malang, Indonesia
Email: emapristi@ub.ac.id

This is an Open Access article licensed under the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author and source are properly cited.

retention, confusion, altered coordination, agitation, hallucinations, seizures, and even unconsciousness (coma).⁶

While self-medication can be a convenient way to address mild illnesses and complaints, it is essential to adhere to rational medication criteria. However, in the actual situation, medication consumption in self-medication still contains many errors, especially inappropriate selections and dosages. Continuous errors in self-medication can pose significant health risks over time.⁷ Therefore, pharmacists play an essential role in the application of self-medication by providing counseling on drug information according to their expertise and knowledge.⁸

Based on research conducted by Soroush et al.⁹ at Kermanshah University of Medical Sciences, personal experience, other people's experience, and educational background affect the appropriate use of self-medication. Another study by Sulistyowati et al.¹⁰ in Malang City stated that education is the sociodemographic factor influencing self-medication behavior, while other factors, such as age, gender, and economic status, have no effect. Since, however, the sociodemographic characteristics of respondents in each region may vary, the researchers insisted on continuing to examine these sociodemographic factors.¹¹

Based on data from BPS in the year 2011, allergies rank sixth as the most common disease experienced by the citizens of Karanganyar Regency, Indonesia.¹² Therefore, this study aimed to determine the factors that influence the use of CTM for self-medication among the citizens of Karanganyar Regency, Indonesia, so it is expected to minimize drug misuse.

Methods

The research was conducted using a cross-sectional method. The research instrument was an electronic questionnaire distributed randomly to respondents for two months, from October to November 2022. The respondents were given information about the research objectives, and the decision to participate in the research was voluntary. This research has been declared ethically feasible by the Health Research Ethics Commission, Faculty of Medicine, Universitas Brawijaya (Ethical Clearance Number 221/EC/KEPK-S1-FARM/10/2022).

The questionnaire consisted of three parts. The first part included sociodemographic information, the second part inquired about

CTM for self-medication experiences, and the third part questioned the appropriate use of CTM for self-medication (Attachment 1, 2, 3). The questionnaire on experience was adapted from previous research by Sulistyowati et al.¹⁰ while the questionnaire on appropriate use was adapted from research by Hariadini et al.¹³ and Sulistyowati et al.¹⁰ The questionnaire underwent necessary editing to align with the research topic and was subjected to validity and reliability testing. The Pearson correlation test was used to analyze the validity of each questionnaire item, and it was declared valid if the r count $>$ r table at p -value < 0.05 . The Cronbach's Alpha method was used to test the reliability of the questionnaire, and it was declared reliable if Cronbach's Alpha value was > 0.60 . The results of the validity test for the experience of CTM for self-medication questionnaire indicated that the r count for the 9 questionnaire items were greater than the r table (0.349). These r counts were as follows: 0.388 ($p=0.028$); 0.500 ($p=0.004$); 0.480 ($p=0.005$); 0.454 ($p=0.009$); 0.513 ($p=0.003$); 0.519 ($p=0.002$); 0.386 ($p=0.029$); 0.793 ($p<0.001$); 0.715 ($p<0.001$). Similarly, the validity test results for the appropriate use of CTM for self-medication questionnaire also showed that the r count for the 5 questionnaire items were greater than the r table (0.349). These r counts were: 0.810 ($p<0.001$); 0.810 ($p<0.001$); 0.688 ($p<0.001$); 0.723 ($p<0.001$); 0.698 ($p<0.001$).

Meanwhile, the reliability test results for the experience of CTM for self-medication questionnaire indicated a Cronbach's Alpha value of 0.638, while the Cronbach's Alpha value for the appropriate use of CTM for self-medication questionnaire was 0.755.

The experience and appropriate use of CTM for self-medication questionnaires were constructed using a Thurstone scale, where a score of 1 was assigned for correct answers and a score of 0 for incorrect answers. The usage experience of CTM for self-medication questionnaire consists of 9 close-ended multiple-choice questions related to previous self-medication with CTM, which can be answered by selecting one of the available options. On the other hand, the appropriate use of CTM for self-medication questionnaire contains 6 close-ended dichotomous choice questions with two answer options, "Yes" or "No." Subsequently, the questionnaire results were converted into percentages (%) by calculating the number of correct answers divided by the total number of questions and then multiplied by 100%. These results were interpreted into three categories:

“good” if the respondents could answer $\geq 76\%$ of the questions in the questionnaire, “fair” if they could answer 56–75% of the questions, and “poor” if they could answer $< 56\%$ of the questions.^{14,15}

The sample in this study was the citizens of Karanganyar Regency, Central Java Province, Indonesia, who did self-medication using CTM and met the inclusion and exclusion criteria. The sampling technique was carried out by random sampling using cluster sampling in 17 sub-districts in Karanganyar Regency. The inclusion criteria in this study were respondents who were willing to participate by filling out informed consent, were aged at least 18 years old, and had used CTM for self-medication. Within the questionnaire, a specific question was included: “Have you ever engaged in self-medication using a single dose of Chlorpheniramine Maleate (CTM)?” (Attachment 1 for question number 8). Respondents who answered affirmatively were deemed to meet the inclusion criteria and were directed to proceed with answering the subsequent questionnaire items. Conversely, if respondents answered negatively, the questioning concluded at this juncture. This inquiry served the purpose of validating whether respondents had ever employed CTM as a self-medication modality. Meanwhile, those who were unable or faced difficulties using gadgets to fill out questionnaires via Google Forms and had or were currently using CTM with a physician’s prescription were excluded from the study. The electronic questionnaire was distributed via WhatsApp and Instagram. The sample size was calculated using the Slovin formula with a 10% margin of error.¹⁶ Considering the total population of 931,963 people in Karanganyar Regency, the minimum sample size for this study is 100 respondents.

Data were analyzed using IBM SPSS version 25. Variables were presented as frequencies and percentages. The Somers’ d test was used to analyze the correlation between age, income level, educational level, experience, and the appropriate use of CTM for self-medication. The contingency coefficient test was used to analyze the correlation between gender and the appropriate use of CTM for self-medication. A p-value < 0.05 was considered statistically significant.

Results

This study obtained 117 respondents who

met the inclusion and exclusion criteria. The distribution of sub-districts where each respondent lives can be seen in Table 1, covering 17 sub-districts. Most of the respondents were in Gondangrejo District (12.0%).

Based on Table 2, most of the respondents (59.8%) belong to the old adult age group. Most respondents (52.1%) were female, had low income (68.4%), worked as a private sector employee (28.2%), and had secondary-level education (42.7%).

The levels of experience and appropriate use of CTM for self-medication of most respondents were classified in the good category, 75.2% and 95.7%, respectively, as shown in Table 3. The respondents’ level of experience and appropriate use of CTM for self-medication usage were categorized into three groups: good, fair, and poor.

There is a correlation between education level and the appropriate use of CTM for self-medication ($p=0.048$; $r=0.065$), as seen in Table 4. It shows that the higher the respondent’s education level, the better the appropriate use of CTM for self-medication. However, other sociodemographic factors (age, gender, and economic status) and the level of CTM for self-

Table 1 Number of Respondents

Sub-districts	Total Respondent n=117	Percentage (%)
Jenawi	3	2.6
Jatipuro	4	3.4
Jatiyoso	4	3.4
Jumapolo	4	3.4
Kerjo	4	3.4
Ngargoyoso	4	3.4
Karangpandan	5	4.3
Matesih	5	4.3
Tawangmangu	5	4.3
Jumantono	6	5.1
Tasikmadu	7	6.0
Mojogedang	8	6.8
Colomadu	10	8.5
Jaten	10	8.5
Kebakkramat	11	9.4
Karanganyar	13	11.1
Gondangrejo	14	12.0

Table 2 Sociodemographic Data of Respondents (n= 117)

Characteristics	Frequency	Percentage (%)
Age (years)		
18–25 (young adult)	41	35.0
26–60 (old adult)	70	59.8
>60 (elderly)	6	5.1
Gender		
Male	56	47.9
Female	61	52.1
Monthly Income (IDR)		
<2,600,000 (low)	80	68.4
2,600,000–6,000,000 (medium)	29	24.8
>6,000,000 (high)	8	6.8
Employment Status or Employment Sector		
Private sector employee	33	28.2
Entrepreneur	30	25.6
Housewife	28	23.9
University student	9	7.7
Civil servant	6	5.1
Student	4	3.4
Farmer	2	1.7
Unemployed	2	1.7
Daily wage worker	1	0.9
Teacher	1	0.9
State-owned enterprise employee	1	0.9
Level of Education		
Primary School, Junior High School, <i>Madrasah Tsanawiyah</i> (primary)	20	17.1
Senior High School, <i>Madrasah Aliyah</i> , and Vocational High School (secondary)	50	42.7
Vocational Degree, Undergraduate, Master, Specialist, Doctorate (high)	47	40.2

medication experience did not correlate with the appropriate use of CTM for self-medication ($p=0.242$; $p=0.307$; $p=0.789$; $p=0.176$).

Discussion

In this study, most respondents (59.8%) were aged 26–60 years old and classified as the old adult category. Along with increasing age, a person's experience also increases, which can influence his or her knowledge.¹⁷ This statement

is in line with the theory that the maturity of thinking often accompanies increasing age. Someone can be said to be mature based on the factor of increasing age so that the experience gained also increases. However, with advancing age, the ability to recall knowledge will eventually decrease.¹⁸

Most respondents (52.1%) who participated in this study were female. Research by Orlando et al.¹⁹ stated that women generally self-medicate more often than men. Women have a higher tendency to use medications related to gastric acid

Table 3 Level of Experience and Appropriate Use of CTM for Self-Medication (n=117)

Category	Frequency	Percentage (%)
Experience		
Good	88	75.2
Fair	21	17.9
Poor	8	6.8
Appropriate Use		
Good	112	95.7
Fair	4	3.4
Poor	1	0.8

disorders, primarily due to their more frequent usage of nonsteroidal anti-inflammatory drugs and antirheumatic drugs. This can be attributed to the elevated prevalence of musculoskeletal

and rheumatic disorders among women. Furthermore, approximately 21% of women consume vitamins, particularly vitamin D, as a result of their utilization of anti-osteoporosis medications. Women also experience depression more frequently than men, influenced by hormonal factors and serotonin activity, which leads them to use psychoanaleptic medications. Additionally, women often rely more on over-the-counter analgesics compared to men due to their monthly menstrual cycles, which can cause menstrual pain or dysmenorrhea.

Based on their income level, most respondents (68.4%) had low income, which is less than IDR 2,600,000 per month. This result is in accordance with the Decree of the Governor of Central Java Number 561/39 of 2021 that the Minimum Wage for Karanganyar Regency is IDR 2,064,313.20 per month, so it can be concluded that most of the average income of citizens in Karanganyar Regency remains relatively low. Income level is one of the factors used for assessing

Table 4 Correlation of Sociodemographic Factors and CTM for Self-Medication Experience Level on the Appropriate Use of CTM for Self-Medication

Category	Appropriate Use of CTM for Self-Medication			Total	p-value	Coefficient Correlation
	Poor	Fair	Good			
Age						
Young adult	1	2	38	41	0.242	-
Old adult	0	2	68	70		
Elderly	0	0	6	6		
Gender						
Male	1	3	52	56	0.307	-
Female	0	1	60	61		
Income Level						
Low	0	4	76	80	0.789	-
Middle	0	0	29	29		
High	1	0	7	8		
Level of Education						
Primary	1	1	18	20	0.048*	0.065
Secondary	0	3	47	50		
High	0	0	47	47		
Level of CTM for Self-medication Experience						
Poor	1	0	7	8	0.176	-
Fair	0	2	19	21		
Good	0	2	86	88		

*Statistically significant if p-value <0.05

an individual's economic status, along with education and occupational status. Economic status is one of the factors that influence health status since people in high-income groups are more likely to fulfill their daily needs and obtain better health services than those in low-income groups.²⁰ In addition, people with higher income would have better community empowerment and education level, thus facilitating access to information on appropriate drug use.¹⁰

Most of the respondents in this study (42.7%) had secondary education (Senior High School, *Madrasah Aliyah* and Vocational High School). The Central Bureau of Statistics for Karanganyar Regency stated that the highest education of the people of Karanganyar Regency is dominated by high school education or its equivalent, reaching 32.5%.²¹ People with a higher level of education tend to seek more information and receive knowledge in the health sector, including knowledge about self-medication, so that they can understand health information and think rationally.²² Individuals with higher education levels are more likely to understand health information and think rationally, leading to better self-medication practices. Therefore, the appropriate use of medication by people with a high level of education will be better than those with secondary and primary education.¹⁰

The questionnaire results of the CTM for self-medication experience showed that the majority (75.2%) of respondents had a good experience. Previous success in self-medication can influence a person to continue this practice, resulting in a good medication usage experience.²³

Furthermore, from the questionnaire, the appropriate use of CTM for self-medication by the majority (95.7%) of the respondents was in a good category. One of the factors that can affect the appropriate use of medication is the level of knowledge.²⁴ Knowledge is the dominant factor influencing a person's decision to self-medication using OTC drugs. A higher level of knowledge about medical and pharmaceutical sciences leads to more careful use or recommendation of medications.²⁵ The practice of self-medication with OTC drugs can be beneficial if the individual is knowledgeable about the medication and the nature of the disease. In contrast, a lack of knowledge when self-medicating using OTC drugs will potentially lead to inappropriate medication practices, worsening health status, and endangering health concerning medication errors, such as adverse side effects, allergic reactions, drug interactions, and even drug overdose.²⁶

In this study, age did not correlate with the appropriate use of CTM for self-medication. This is following with research conducted by Sulistyowati et al.¹⁰ that there was no significant correlation between age and the appropriate use of medication. Knowledge is one of the factors that influence the appropriate use of self-medication. Respondents of older ages do not always have a better understanding than younger ones, and vice versa. Therefore, attitudes toward making self-medication decisions will also vary. Research by Elsous et al. stated that gender did not significantly influence patient adherence and appropriate use of medication. It is by this study showed no correlation between gender and the appropriate use of CTM for self-medication. Information can be obtained regardless of gender.¹⁰ This study also did not find a correlation between the economic status and the appropriate use of CTM for self-medication. These results are by research conducted by Sulistyowati et al.¹⁰ that there was no correlation between economic status and medication appropriateness. In addition, there was no correlation between the experience of using CTM and the appropriate use of CTM for self-medication. This statement is in line with research by Martin et al. that showed no correlation between experience and the appropriate use of medication.²⁸ Experience is obtaining correct knowledge by repeating the knowledge acquired in solving a problem. Appropriate use in taking CTM does not correlate with experience because a person gains experience based on the knowledge repeatedly obtained from various sources of information.²⁹

The sociodemographic factor correlated with the appropriate use of CTM for self-medication was educational level ($p=0.048$; $r=0.065$). The results of this study follow research by Sulistyowati et al.¹⁰ that there was a correlation between education level and the appropriate use of medication. Knowledge is related to the number of sources of information obtained and depends on how much information is received. Formal education significantly influences a knowledge level since a highly educated person also tends to have a high knowledge level.

This study has several limitations in its research design since the data obtained were only based on self-reports from the respondents. In addition, the responses to the electronic questionnaire may not entirely reflect the actual conditions, attitudes, and behavior of the participants. Another limitation is that this study did not include respondents who did not use social media. Despite these limitations, the

study results can provide a valuable contribution to the literature on CTM for self-medication in Karanganyar District, Indonesia.

There is no significant correlation between age, gender, economic status, CTM for self-medication experience, and the appropriate use of CTM for self-medication. However, there is a weak but significant correlation between education level and the appropriate use of CTM for self-medication, with a correlation strength of 0.065.

Further research is needed regarding other factors that have not been examined but may affect the appropriate use of CTM for self-medication, particularly the knowledge level and information sources. The role of pharmacists in educating the public regarding self-medication is vital because pharmacists have a significant role in providing information about how to choose the correct medication according to clinical conditions and patient complaints of medical problems.

References

1. Brandt N. Encyclopedia of behavioral medicine: self-medication. New York: Springer; 2013.
2. BPS; Badan Pusat Statistik. Persentase penduduk yang mengobati sendiri selama sebulan terakhir (persen), 2020–2022. [Internet] 2022 [cited 2023 January 19]. Available from: <https://www.bps.go.id/indicator/30/1974/1/persentase-penduduk-yang-mengobati-sendiri-selama-sebulan-terakhir.html>.
3. Pratama ARFA, Puspitasari AA, Hidayati IR, Yunita SL, Titani M, Atmadani RN. Factors affecting the level of public knowledge about the use of chlorpheniramine maleate in Pesanggrahan Village. Proceeding of The 2nd International Conference on Medical and Health Sciences; 2022 September 24; Indonesia. Malang; 2022. p. 383–92.
4. British National Formulary (BNF). British National Formulary. 76th ed. London: BMJ Group; 2018. p. 283–4.
5. Tuarissa S, Wullur AC, Citraningtyas G. Profil penggunaan obat klorfeniramin maleat pada masyarakat di kelurahan Bailang dan kelurahan Karombasan kota Manado. *Pharmacon*. 2014;3(4):22–37.
6. Aytha S, Dannaram S, Moorthy S, Sharma A. A case of acute psychosis secondary to coricidin overdose. *Prim Care Companion CNS Disord*. 2013;15(6):PCC.13101549.
7. Pratiwi Y, Rahmawaty A, Islamiyati R. Peranan apoteker dalam pemberian swamedikasi pada pasien BPJS. *Jurnal Pengabdian Kesehatan*. 2020;3(1):65–72.
8. Yunita EP. Penyuluhan waspada swamedikasi pada penyakit degeneratif serta identifikasi tanda-tanda vital dan gaya hidup masyarakat terhadap risiko penyakit degeneratif. *Jurnal Tri Dharma Mandiri*. 2021;1(1):34–44.
9. Soroush A, Abdi A, Andayeshgar B, Vahdat A, Khatony A. Exploring the perceived factors that affect self-medication among nursing students: a qualitative study. *BMC Nursing*. 2018;17(35):1–7.
10. Sulistyowati E, Indria DM, Sari YN. Correlation between sociodemographic and attitude of Malang citizens about self medication on urticaria. *Bali Med. J*. 2022;11(1):272–8.
11. Suardita IKR, Subanada IB. Hubungan antara faktor sosio-demografi dan faktor lingkungan dengan kejadian diare pada balita di desa tiga Kecamatan Susut Kabupaten Bangli tahun 2016. *JMU*. 2020;9(9):37–45.
12. Badan Pusat Statistik (BPS) Kabupaten Karanganyar: Karanganyar Regency in figures 2011. Karanganyar: Badan Pusat Statistik Kabupaten Karanganyar; 2011.
13. Hariadini AL, Sidharta B, Ebtavanny TG, Minanga EP. Correlation between hypercholesterolemic patient's knowledge and simvastatin use in Malang retail pharmacies. *PJI*. 2020;5(2):91–6.
14. Debora V, Oktarlina RZ, Perdani RRW. Perbedaan tingkat pengetahuan, persepsi, dan pengalaman terhadap penggunaan obat generik pada mahasiswa kedokteran dan non kedokteran di Universitas Lampung. *Majority*. 2018;7(2):24–33.
15. Notoatmodjo S. Metodologi penelitian kesehatan. Jakarta: Rineka Cipta; 2018.
16. Imran HA. The role of sampling and data distribution in communication research quantitative approach. *JSKM*. 2017;21(1):111–26.
17. Simamora RH. A strengthening of role of health cadres in BTA-positive tuberculosis (TB) case invention through education with module development and video approaches in Medan Padang bulan Community Health Center, North Sumatera Indonesia. *Int J Appl Eng Res*. 2017;12(20):10026–35.
18. Firth J, Torous J, Stubbs B, Firth JA, Seiner GZ, Smith L, et al. The “online brain”: how the internet may be changing our cognition. *World Psychiatry*. 2019;18(2):119–29.

19. Orlando V, Mucherino S, Guarino I, Guerriero F, Trama U, Menditto E. Gender differences in medication use: a drug utilization study based on real world data. *Int. J. Environ. Res. Public Health*. 2020;17(3926):1–10.
20. Williams DR, Priest N, Anderson NB. Understanding associations among race, socioeconomic status, and health: patterns and prospects. *Health Psychol*. 2016;35(4):407–11.
21. Badan Pusat Statistik (BPS) Kabupaten Karanganyar: Karanganyar Regency in figures 2022. Karanganyar: Badan Pusat Statistik Kabupaten Karanganyar; 2022.
22. Landsheer CD, Walburg V. Links between rational and irrational beliefs, trait anxiety and fear of COVID 19. *Psychol Française*. 2022;67(3):305–16.
23. Muth C, Blom JW, Smith SM, Johnell K, Gonzalez-Gonzalez AI, Nguyen TS, et al. Evidence supporting the best clinical management of patients with multimorbidity and polypharmacy: a systematic guideline review and expert consensus. *J Intern Med*. 2019;285(3):272–88.
24. Anker J, Reed MD, Allegaert K, Kearns GL. Developmental changes in pharmacokinetics and pharmacodynamics. *J Clin Pharmacol*. 2018;58(1):S10–25.
25. Hashemzaei M, Afshari M, Koohkan Z, Bazi A, Rezaee R, Tabrizian K. Knowledge, attitude, and practice of pharmacy and medical students regarding self-medication, a study in Zabol University of Medical Sciences; Sistan and Baluchestan province in south-east of Iran. *BMC Med Educ*. 2021;21(49):1–10.
26. Dzulkharnain FBSB, Shafqat N, Hermansyah A, Tan CS, Koh D, Goh KW. et al. Knowledge, attitude and practice towards the use of over-the-counter medicines: an online survey among Bruneian adults amid the COVID-19 pandemic. *Sustainability*. 2022;14(9033):1–14.
27. Elsous A, Radwan M, Al-Sharif H, Mustafa AA. Medications adherence and associated factors among patients with type 2 diabetes mellitus in the Gaza Strip, Palestine. *Front. Endocrinol*. 2017;8(1):1–9.
28. Martin LA, Neighbors HW, Griffith DM. The Experience of symptoms of depression in men vs women: analysis of the national comorbidity survey replication. *JAMA Psychiatry*. 2013;70(10):1100–6.
29. Rikomah SE. *Farmasi klinik*. Sleman: Deepublish; 2018.