

Self-medication profiles in school-age adolescents in Surabaya city, Indonesia

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Abstract

Background: It has been reported that children are already practicing self-medication. Indeed, at the children's age, they are not allowed to self-medicate due to limited knowledge regarding self-medication, leading to inappropriate drug therapy or self-toxicity becoming problems in public health

Objective: This study aimed to determine how school-age adolescents carry out self-medication behavior.

Methods: The study was designed as a cross-sectional in which data were collected using questionnaire methods. There were 195 students recruited in this study, consisting of SDN Keputih-245 Elementary School students, SMPN 19 Surabaya Junior High School, and SMAN 11 Surabaya Senior High School.

Results: The results showed that most of the students had purchased medicine independently without a doctor's prescription. The primary source of information regarding self-medication by school students is family. Although most of the respondents stated they always inform their parents or doctors, it has been found that the practice of self-medication by school-age teenagers without informing their parents or doctors exists. Moreover, less than 50% of student respondents believe that self-medication is safe.

Conclusion: The role of pharmacists is urgently needed to provide proper education related to drug information and self-medication to increase school-age students' knowledge.

Introduction

The World Health Organization (WHO) defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Following the vision of the Ministry of Health, to create an independent community for a healthy life and to achieve optimal health status for the community, it is necessary to make health efforts including preventive, promotive, curative, and rehabilitative between the government and the community.¹

Currently, health problems that occur in the community are still a significant problem for the government,² which includes Indonesia.³ Therefore, various efforts have been made to increase public awareness of healthy living behavior and equitable distribution of health services. One of the reasons is technological advances and changes in people's lifestyles that tend to pay less attention to health,² thus encouraging people to look for alternative treatments that are therapeutically effective and cost-efficient. In this regard, self-medication is an alternative taken by the community,⁴ known as self-medication.

Self-medication is an effort to select and use drugs or health products by individuals to treat the disease or symptoms they are experiencing or continue prescription drugs to treat chronic condi-

tions or signs of infection.⁵ The increase in self-medication behavior is based on several factors, including socioeconomic factors, limited costs, limited access to health services, and others.⁶ Self-medication is carried out for a quick and effective response to illnesses that do not require medical consultation, reducing the burden of health services on limited resources and increasing the affordability of health services for people far from the health centers.⁷ Complaints and minor illnesses are experienced by many people, such as fever, pain, dizziness, cough, influenza, stomach ulcers, worms, diarrhea, skin diseases, and others. Self-medication practices include taking medication on their initiative, using old prescriptions to buy new drugs, and sharing remedies with friends, peers, family, and relatives in their areas.⁸ The Indonesian Ministry of Health has launched the “Gerakan Masyarakat Cerdas Menggunakan Obat (GeMa CerMat)”.⁹ Its implementation involves all provincial Health Offices throughout Indonesia, the Indonesian Pharmacists Association, and academics.¹⁰

Self-medication practices in Indonesia are relatively high. Study stated that 35.2% of families in Indonesia stock medicines for self-medication.¹¹ However, self-medication behavior using over-the-counter (OTC) drugs can be a health problem.⁸ The intense drug advertisements in electronic and internet media, especially television and gadgets, in addition to the lack of knowledge about drugs may produce potential harms. Previous study reported that the knowledge level about self-medication is still low,^{12,13} which becomes the source of medication errors. Various problems are often encountered in drugs, such as inappropriate, irrational use of drugs, excessive over-the-counter medications, and inappropriate drug disposal behavior.¹⁴

Adolescence is a crucial period; this period is a transitional stage in physical and psychological development that is generally confined to puberty to legal adulthood which individuals take their first steps in making decisions in their life.¹⁵ WHO defines adolescence as the age of 10-19 years.¹⁶ This period is vital because most self-medication practices are reported to have been started during adolescence. It has been known that adolescence is one of the critical transitions in the human life cycle; this period is a crucial stage in human life that needs utmost parental care, guidance, and empathy.¹⁵ It is known that there is a mental adjustment and the formation of attitudes, which are very vulnerable to the cultivation of values and information in the health sector, especially in medicine.¹⁷ In particular, adolescents are trying to develop their own identities. They cannot fully understand complex concepts, the relationship between behavior and consequences, or the level of control in making health-related decisions. Consequently, adults have a unique opportunity to influence young people.¹⁸ However, children and adolescents' involvement in activities closely related to increasing knowledge in the pharmacy area is still limited.

Self-medication has been reported to occur in all age groups. In the study by Homod, Alawwad, & Aldueb (2017), it was reported that the level of self-medication in adolescents aged 13-18 years was very high. However, they do not have sufficient knowledge regarding self-medication behavior in their teenage years. Therefore, education about drugs and health is needed. Knowledge of drugs and their use in cases of self-medication is essential for all community levels, including children and adolescents.

This study exposes the behavior of self-medication performed by school-age adolescents. The study collected data related to self-medication in adolescent students who attend SDN Keputih-245 Surabaya Elementary School, SMPN 19 Surabaya Junior High School, and SMAN 11 Surabaya Senior High School. Previously, no similar research related to self-medication behaviour patterns was conducted on school-age adolescents in Surabaya. There has never been a similar activity held at this selected school. With a

large number of students, the existence of a strategic location, as well as the socio-economic background of school members who belong to the upper middle class, this activity has the potential to be carried out.

Materials and Methods

Ethical considerations

This research was conducted in schools and obtained the permission from the principal and was authorized by teachers. Before the study, a detailed explanation of the aim and objectives of the study was given to the students to obtain their consent and to ensure confidentiality under the supervision of the teachers and facilitators.

Study design

This research is a descriptive study with a cross-sectional design aimed to determine the behavior of school-age children related to self-medication behavior. The research was conducted at Sukolilo and Tandes sub-districts in Surabaya, the two sub-districts with good access to education and technology services. In this area, there are several universities, such as the Ten November Institute of Technology, Surabaya, and Hang Tuah University, Surabaya. In addition, this area also has close access to Airlangga University.

The study used a non-random sampling method to evaluate the self-medication behavior among the students in SDN Keputih-245 Surabaya Elementary School, SMPN 19 Surabaya Junior High School, and SMAN 11 Surabaya Senior High School. Respondents were elementary, middle, and high school students, with the sample size according to the number of students in the selected class. The number of students in each school is relatively the same. The study population was teenage students aged 10-19 years old who attended SDN Keputih-245 Surabaya Elementary School in Keputih Village, SMPN 19 Surabaya Junior High School in Klampis-Ngasem Village, and SMAN 11 Surabaya Senior High School located in Tandes. All respondents have agreed to participate in this study. These schools have been identified as favorite schools of the surrounding community. Previously, there had never been a similar activity held at these schools.

Instrument and data collection

This research is a quantitative study using an instrument, a questionnaire. The questionnaire used uses a question model arranged in multiple-choice options. The questionnaire contains primary data, including student biographical and self-medication behavior. The information of sex/gender, age, domicile, and parents' occupation were collected. The self-medication behaviors including experience of purchasing drugs, types of drug therapy, information source of self-medication, frequency of purchasing drugs by type of therapy, duration of drug use, informing about self-medication behavior, and opinions on self-medication safety were identified from the respondents. Before being used, the questionnaire was tested on individuals who have criteria under prospective respondents.

Results

Demographic data

Questionnaires were distributed to 195 respondents from SDN

Keputih 245, SMPN 19 Surabaya, and SMAN 11 Surabaya. The number of respondents at the elementary school level was 71 students, the Junior High School was 60 students, and the Senior High School was 64 students. The demographic data of the respondents can be seen in Table 1. Respondents are grouped by age range. It is known that most respondents are 11-16 years old. Based on the data obtained, most respondents (98.92%) live in Surabaya, and a small proportion of the rest live in Sidoarjo, a sub-urban area, as shown in Table 1. Of these respondents, 123 of 195 students have parents who work as private employees, 24 of 195 student's parents work as civil servants, and 4.97% as laborers or manual labor.

Drug purchase experience at the pharmacy

The students were asked to fill in several question items related to whether or not they had experienced buying drugs independently. Based on the results of this study, most school-age adolescents stated that they had purchased drugs alone. The results show that 59 out of 60 junior high school students have purchased drugs independently at pharmacies, the highest number among elementary and high school students, as shown in Figure 1.

Self-medication behavior in school-age adolescents

Types of drug therapy

From each respondent who stated that they had purchased medicine independently, it is known that the distribution of the type of drug therapy that school-age students had purchased is shown in Figure 2A. The highest percentage of drug purchases made aimed to treat problems in the respiratory tract such as coughs, colds, and others, with a rate of 66.67% for elementary students, 89.83% for junior high school students, and 83.33% for high school students. Nutritional supplements and vitamins are the seconds most commonly purchased drugs by school-age students. Meanwhile, drugs for the treatment of obesity, anxiety and sleep disorders, and problems with the ears were relatively not chosen by the respondents.

Information source of self-medication

Based on data sources of information on the behavior of the students in buying drugs independently, the family, namely the mother and father, is an important figure regarding drug purchase decisions by school-age adolescents. The complete distribution of data can be seen in Figure 2B. These results indicate that the family

influences the primary source of self-medication behavior carried out by school students. In addition, previous doctor's prescriptions also have a reasonably high percentage as a source of information in purchasing drugs. Finally, information sourced from television is known to have a relatively significant influence on elementary school students compared to junior and senior high school students.

Frequency of purchasing drugs by type of therapy

According to the results, it is known that cough, flu, and cold medicines are the most purchased medicines every week to several times a year. Some students stated they bought medicine every few weeks to several times a year. Anti-allergic drugs are drugs of choice that are rarely purchased. The frequency of buying drugs by type of therapy is shown in Figure 2C.

Duration of drug use

Based on the data, most of the respondents stated that they used the drug until they recovered, and if they did not recover, they would go to a doctor or hospital, as shown in Figure 3A. In practice, self-medication is used for anti-allergic drugs, cough medicine for flu and colds, fever reducers, and pain relievers, which can be used until healed. However, some respondents stated that they would consult a doctor if their symptoms do not improve.

Informing about self-medication behavior

Respondents stated that they always inform their parents or doctor about the self-medication during examination visits, as shown in Figure 3B. However, it is still found that school-age teenagers buy drugs without informing their parents or doctors during examination visits.

Opinions on self-medication safety

Even though more than 75% of the respondents had purchased medicine independently, as described previously, only some respondents believed the action was safe, as shown in Figure 3C. About 9.32% of the total respondents stated that it was unsafe, and some respondents indicated they did not know. In addition, although almost all junior high school level respondents indicated that they had purchased drugs independently without a doctor's prescription, about 52.24% of respondents at the junior high school level indicated that they did not know about the safety of self-medication practice.

Table 1. Demographic data of respondents who are students of SDN Keputih 245, SMPN 19, and SMAN 11 Surabaya, Indonesia.

Data	SDN Keputih 245 (elementary school)	SMPN 19 Surabaya (junior high school)	SMAN 11 Surabaya (senior high school)
Gender, n (%)			
Male	34 (48)	16 (27)	20 (31)
Female	37 (52)	44 (73)	44 (69)
Age (in years)			
11-13	70 (99)	25 (42)	0 (0)
14-16	1 (1)	35 (58)	55 (86)
17-19	0 (0)	0 (0)	9 (14)
Domicile, n (%)			
Surabaya	71 (100)	60 (100)	62 (97)
Sidoarjo	0 (0)	0 (0)	2 (3)
Parents occupation, n (%)			
Civil Servant	4 (6)	8 (13)	12 (19)
Private Sector Worker	20 (28)	51 (85)	52 (81)
Laborer	9 (13)	0 (0)	0 (0)
Entrepreneur	25 (35)	0 (0)	0 (0)
Others	13 (18)	1 (2)	0 (0)

Discussion

Based on questionnaires data by 195 students, it is known that currently not only adults practicing self-medication. Most school-age teenagers have purchased medicines. This fact follows the research of Homod *et al.* (2017) that children are already practicing at a young age. Based on the distribution of demographic data, the age of respondents is still under the age of 17 years. Legally, teenagers at the elementary and junior high school levels are still

not allowed to self-medicate since their lack knowledge about drugs and its safety.¹⁹

Based on this finding, self-medication still is a worldwide issue. There are several regulations that are used as the basis for the practice of self-medication. In the Regulation of the Minister of Health Number 73 of 2016 concerning Pharmaceutical Service Standards in Pharmacies, it is regulated regarding the services provided by pharmacists in pharmacies, one of which is drug dispensing.²⁰ Pharmacists are responsible for preparing, presenting and

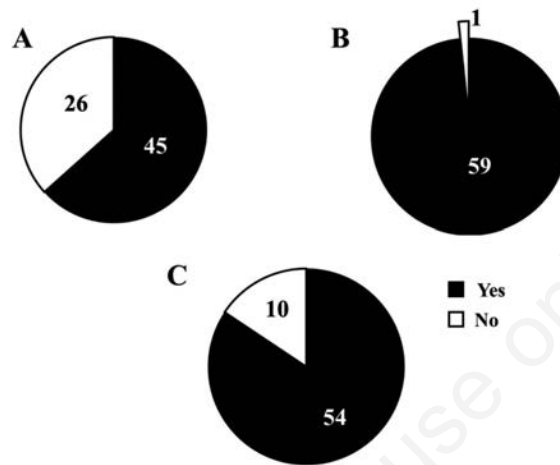


Figure 1. Number of respondents based on the experience of purchasing drugs independently from each group. A) Students of SDN Keputih 245; B) SMPN 19; C) SMAN 11 Surabaya, Indonesia.

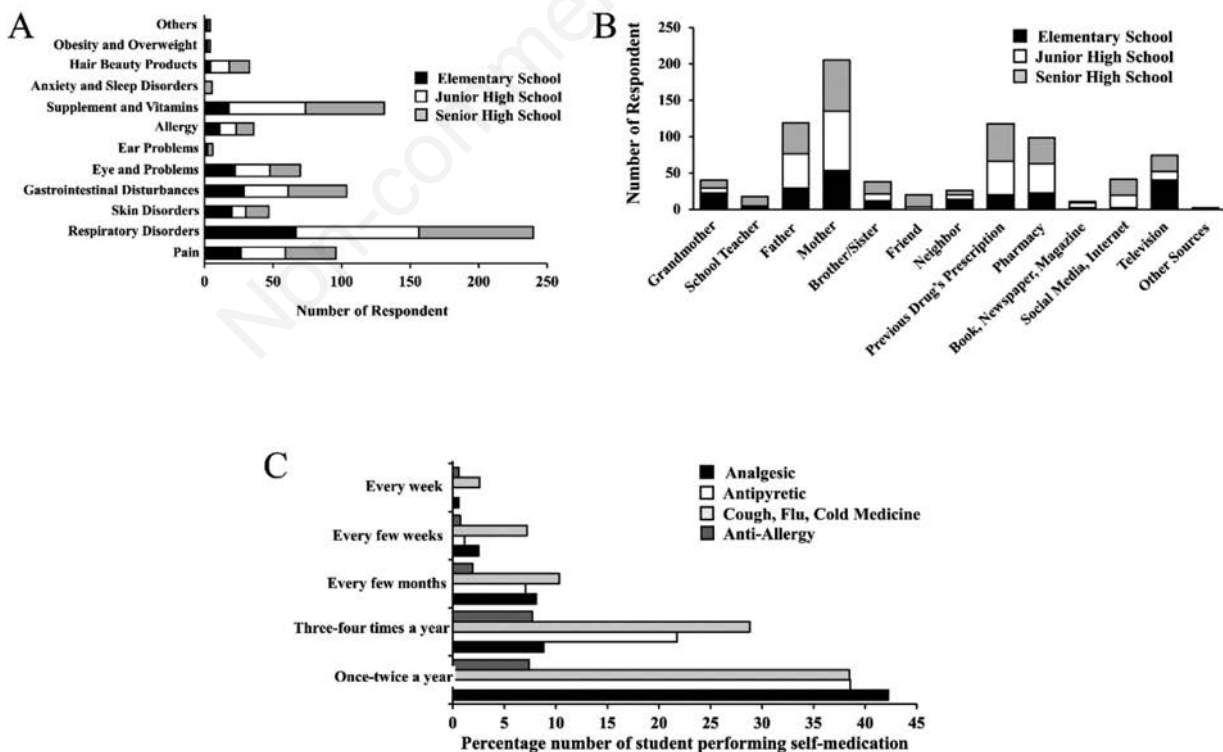


Figure 2. School adolescence behaviors regarding drug. A) Types of drug therapy chosen by school-age adolescents. Respondents could choose more than one option; B) Sources of non-prescription drug buying behavior by school-age adolescents. Respondents could choose more than one option; C) Frequency of purchasing anti-allergic drugs, cough and cold medicines, fever reducers, and pain relievers/pain relievers independently by school-age adolescents.

presenting drug information to patients. In addition, the Organizational Regulation Number PO.002/PP.IAI/1418/VII/2015 concerning guidelines for the practice of Indonesian pharmacists explains that one of the services that can be performed by a pharmacist is self-medication services.²¹ Related to the practice of self-medication, there are also regulations regarding the guidelines for the use of over-the-counter and limited-free drugs issued by the Ministry of Health in 2006.²² Where these guidelines can be used as a reference for pharmacists and the community in the practice of self-medication. Some of these regulations can be used as the legal basis for the practice of self-medication.

There are several regulations that are used as the basis for self-medicating practices. In the Regulation of the Minister of Health of Republic of Indonesia Number 73 of 2016 concerning Pharmaceutical Service Standards in Pharmacies, it is regulated regarding services carried out by pharmacists in pharmacies, one of which is drug dispensing. Pharmacists are responsible for preparing, delivering and providing drug information to patients. In addition, in the Organizational Regulation Number PO.002/PP/IAI/1418/VII/2015 concerning guidelines for the practice of Indonesian pharmacists which explains that one of the services that can be done by a pharmacist is self-medicated services.²¹ Related to the practice of self-medication, there is also a regulation on the guidelines for the use of limited over-the-counter and free drugs issued by the Ministry of Health of Republic of Indonesia in 2006.²² These guidelines can be used as a reference for pharmacists and the public in self-medication practices, thus providing the basis for the legality of self-medication practices.

Most of the behaviors of buying drugs independently without a doctor's prescription carried out by the students aim to treat respiratory problems. From the questionnaires, it is known that cough, flu, and cold medicines are the drugs most purchased by school-

age teenagers, which is every week up to 3-4 times a year, while anti-allergic drugs are a choice of drugs that are rarely bought. This result is in line with Gohar *et al.* (2017) research, which reported that the most common disease, about 94%, for self-medication was fever. Other common conditions for which self-medication are routinely used includes coughs, colds, flu, vomiting, and diarrhea. Also, based on research, Gohar *et al.* (2017) stated that the typical conditions for self-medication include fever, cough, vomiting, diarrhea, and allergies. In addition to medical purposes, about 45.57% of students choose nutritional and vitamin supplements for self-medication. This result well correlates to the research of Wegbom, Edet, Raimi, Fagbamigbe, & Kiri (2021), which reported that vitamins were also most often used when performing self-medication. The most common reasons for using multivitamins were supplementation and general health maintenance.

These results indicate that the primary source of self-medication behavior carried out by school students is influenced by the parents/family. Previous research also obtained that most self-medication behaviors were based on information sources from personal/family experiences. Children's drug purchases are still under parental supervision because they are more dependent on their parents' advice. Usually, parents ask for help from their children to buy medicine in the pharmacy.^{19,23} Family, friends, neighbors, pharmacists, previously prescribed medications, or suggestions from advertisements in popular newspapers or magazines are familiar sources of information on self-medication behavior.²⁴ Regarding drug advertisements, there is already regulation for drug advertisements established by Indonesian Food and Drug Agency (Badan Pengawas Obat dan Makanan) Number 2, 2021 about Guidelines for Supervision of Drug Advertising.²⁵ This regulation regulates about the criteria and requirements for advertising a drug.

School-age children can obtain drug information from various

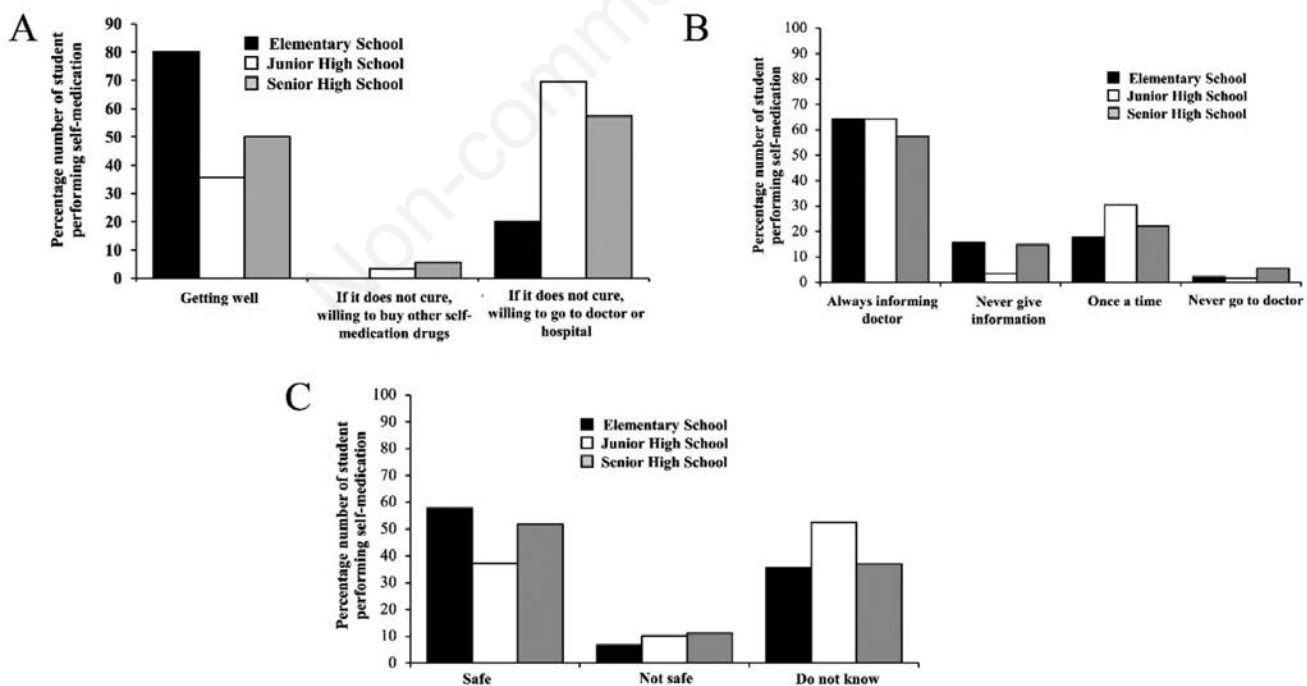


Figure 3. School adolescence behaviors regarding drug. A) Duration of drug use in self-medication practice by respondents, students of SDN Keputih 245, SMPN 19, and SMAN 11 Surabaya, Indonesia; B) Self-medication behavior by school-age adolescents in informing self-medication behavior carried out to doctors or parents by respondents, students of SDN Keputih 245, SMPN 19, and SMAN 11 Surabaya, Indonesia; C) Opinions on the safety of self-medication by respondents, students of SDN Keputih 245, SMPN 19, and SMAN 11 Surabaya, Indonesia.

sources such as parents, teachers, or health professionals such as pharmacists and doctors. In addition, it can also be obtained from media such as television, Internet, or directly from drug packaging. Some often perceive medicine based on their physical appearance only.¹⁹ However, the information they get is still minimal and partial, so it has not improved children's understanding of medicine.¹⁹ They also mostly do not get knowledge about medicine in their school.

In addition, the influence of drug advertisements on television also has a reasonably strong impact on students' decisions to buy drugs, with a percentage of 40%. Besides advertisements on television, the influence of the internet, such as social media and the physical packaging of medicine, also influences children to buy medicine.¹⁹ Children can be exposed to advertisements through billboards and signs, television, radio or podcasts, social media, mobile applications (apps), or even an online search. Another way that advertisements can influence children is by exposure to products they have not tried. Seeing images of happy people using a product can affect children to know that product is attractive, desirable, or a normal thing that people do. This strategy is applied to medicine advertising. Children who see these advertisements are more likely to ask their parents to buy those items.²⁶ The number of drug advertisements circulating in electronic media, especially television, is accompanied by a lack of knowledge among children and adolescents about drugs and their potential biological toxicities. Advertising can cause the selection pattern of community needs, such as drug selection, however it can be supposed that it is not followed by adequate knowledge. In that case, the choice of drugs under the influence of advertising will harm the community, such as not recovering from disease symptoms to the emergence of drug side effects.²⁷

In implementing self-medication, health workers, especially pharmacists, provide information related to the length of treatment for patients. Therefore, it is essential to provide counseling regarding the duration of therapy in self-medication patients, the importance of consulting a doctor, and if symptoms persist.²⁸ Based on data on self-medication behavior in elementary school-aged children, only nine people think they need to go to a doctor or hospital if they do not recover. Meanwhile, other respondents prefer to use drugs until they recover. Therefore, it is essential to provide counseling to elementary school students and parents regarding self-medication. Limited education to elementary students and parents regarding self-medication is possible because of the low level of community service activities carried out by a pharmacist. The development and empowerment of health education programs and services at school age, especially at the elementary school level, has recently developed. For example, many health programs have been implemented by elementary schools in Indonesia.²⁹ Unlike the anti-drug socialization program, the National Narcotics Agency (BNN) of the Republic of Indonesia has a program for the Prevention and Eradication of Narcotics Abuse and Illicit Trafficking (P4GN), which is a community service program for schools as a strengthening effort by inviting the community to help and support BNN in its efforts break the chain of illicit drug trafficking.

School-age teenagers buying drugs are still found without informing their parents or doctors during examination visits. The previous study reported that 11.5% of children had accepted their over-the-counter medicines at pharmacies or drugstores without their parents knowing and 31.4% of children had taken drugs at home without their parents knowing.¹⁹ This fact can cause problems and the potential for medication errors due to the knowledge of school-age adolescents regarding drug information being still very limited and confusing for them.¹⁸

Although self-medication is considered safe for most people, it can cause health problems and harm patients if the proper knowledge and information are not accompanied. The role of pharmacists in self-medication is to provide information and objective advice on medicines and their use and promote the concept of pharmaceutical care. In addition, pharmacists can advise about the safe use of OTC medicines for self-medication. Potential risks of self-medication practices include incorrect self-diagnosis, delays in seeking medical advice when needed, severe adverse reactions, drug interactions, inappropriate drug administration, inadequate or over drug doses, and incorrect choice of therapy.³⁰ The frequency of medication error is between 19% and 59% with the elderly and the preschooler population constituted fewer errors than others. The most common were: incorrect dosage, forgetting, mixing up medications, failing to recall indications, and taking out-of-date or inappropriately stored drugs.³¹ Therefore, it is necessary to explain self-medication, including the correct use of drugs, possible side effects of these drugs, the allowed duration use of drugs, and the importance of referring to health workers if there is no improvement. Moreover, pharmaceutical care has become the central concept of pharmaceutical services in the community, in which the pharmacists are directly responsible to patients to improve the quality of services or patient-oriented services. Therefore, pharmacists should provide correct information regarding drug use.³² Furthermore, pharmacists have essential roles in every pharmaceutical care activity, including assessing patient needs at the beginning of the self-medication process.³³ Thus, optimal therapeutic results can be obtained to improve the quality of life.

Conclusions

Most school-age adolescents at SDN Keputih 245, SMPN 19, and SMAN 11 Surabaya have purchased medicine independently without a doctor's prescription. Therefore, the primary source of information on self-medication behavior carried out by school students is obtained from the family. When buying medicine, the majority stated that they always inform their parents or doctor during examination visits. However, it has also been found that the practice of self-medication by school-age adolescents without informing their parents or doctor exists. Although many students have stated that they have done self-medication, less than 50% of students believe that self-medication is safe. Therefore, the role of pharmacists is needed to provide education related to self-medication.

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