Submitted : 18 Februari 2025
Revised : 25 Maret 2025
Accepted : 05 Mei 2025
Published : 15 Juli 2025

Generics : Journal of Research in Pharmacy
Vol 5, Edisi 2, Tahun 2025
e-ISSN : 2774-9967

THE ASSOCIATION BETWEEN THE KNOWLEDGE AND SELF-MEDICATION PRACTICES FOR UPPER RESPIRATORY TRACT INFECTION (URTI) IN THE DKI JAKARTA POPULATION

Hubungan Antara Pengetahuan dan Praktik Mengobati Diri Sendiri untuk Infeksi Saluran Pernapasan Atas (ISPA) pada Populasi DKI Jakarta

Kevin Nathanael[1], Anggi Gayatri[2*], Reganedgary Jonlean[3]
[1]Undergraduate Program, Faculty of Medicine, University of Indonesia
[2]Departement of Pharmacology and Therapeutics, Faculty of Medicine, University of Indonesia
[3]Pediatric Hematology-Oncology and Hematopoieitc Stem Cell Transplantation, Tzu Chi Hospital, Jakarta
*Corresponding author: gayatri.anggi@ui.ac.id

ABSTRAK

Sebagian besar kasus Infeksi saluran pernapasan atas (ISPA) disebabkan oleh virus dan dapat sembuh dengan sendirinya (*self-limiting disease*). Praktik pengobatan mandiri yang tepat perlu didukung dengan tingkat pengetahuan yang baik. Penelitian ini bertujuan untuk menilai hubungan antara tingkat pengetahuan dan praktik pengobatan mandiri pada ISPA di populasi DKI Jakarta. Penelitian potong lintang ini menggunakan kuesioner daring berisi pertanyaan mengenai pengetahuan dan praktik pengobatan mandiri pada ISPA. Kuesioner ini dikembangkan oleh tim peneliti dan telah diuji validitas dan reliabilitasnya. Uji Chi Square dilakukan untuk menganalisis hubungan antara tingkat pengetahuan dan ketepatan praktik pengobatan mandiri, dengan nilai p = 0,05. Sebanyak 102 partisipan dianalisis pada akhir penelitian. Informasi dari teman sebaya cenderung menjadi sumber informasi bagi sebagian besar partisipan, dengan 73,5% dari teman dan tetangga dan 84,3% dari anggota keluarga. Hanya 21,6% partisipan yang mencari informasi dari tenaga medis. Sebanyak 91,2% partisipan mengonsumsi antibiotik untuk meredakan gejala ISPA tanpa resep dokter. Sebagian besar subjek memiliki tingkat pengetahuan yang cukup (51%) dan hanya sedikit subjek yang memiliki tingkat pengetahuan yang kurang (4,9%). Meskipun sebagian besar partisipan memiliki tingkat pengetahuan yang cukup, namun tidak terdapat hubungan yang bermakna antara tingkat pengetahuan dengan ketepatan pemilihan obat untuk mengatasi demam, batuk dan pilek pada penelitian ini.

Kata Kunci: ISPA, perilaku, *self-medication,* tingkat pengetahuan

ABSTRACT

Most upper respiratory infections (URTIs) are caused by viruses and self-limiting, thus requiring appropriate self-medication based on sufficient knowledge. This cross-sectional study aimed to evaluate the association between the level of knowledge and self-medication practices for URTIs in the DKI Jakarta population. Data were collected using an online questionnaire regarding

knowledge and self-medication practices in URTI, which had been validated and tested for reliability. Chi-Square analysis was used to assess the association with p-value = 0.05. A total of 102 participants were analyzed at the end of this study. Information from peers tends to be the source of information for most participants, with 73.5% from friends and neighbors and 84.3% from family members. Only 21.6% of participants sought information from medical professionals. As many as 91.2% of participants took antibiotics to relieve their symptoms of URTI without prescription. Most subjects had an adequate level of knowledge (51%) and only a few subjects had a poor level of knowledge (4.9%). Even though most participants have an adequate level of knowledge, but there was no significant association between the level of knowledge and the appropriateness of selecting drugs to treat fever, cough, and rhinorrhea in this study.

Keywords: level of knowledge, practice, self-medication, URTI

INTRODUCTION

Upper respiratory tract infection (URTI) is generally characterized by the inflammation of the upper airway with relevant cough. This infection occurs in the higher respiratory anatomical structures such as the sinuses, pharynx, larynx, and nasal. In general, URTI is the most frequent disease amongst adults with an incidence of around 2-3 times annually. Infants, children, and adolescents can have up to 8 cases of acute URTI a year (Wang *et al.*, 2021). The prevalence of upper respiratory tract infection or its related symptoms in Indonesia was 23.5% based on 2023 *Survei Kesehatan Indonesia* data by Indonesia's Ministry of Health (Kementrian Kesehatan, 2023).

The etiology of URTI is mainly comprised of bacteria and viruses, with virus as the more prevalent cause (Mori *et al.*, 2022). The bacterial cause of URTI includes but not limited to *Moraxella catarrhalis, Streptococcus pneumoniae,* and *Haemophilus influenzae*, which are also commensals residing in the respiratory tract. Viral etiology of URTI includes coronavirus, parainfluenza virus, respiratory syncytial virus (RSV), rhinovirus, human metapneumovirus (hMPV), influenza virus, and adenovirus (Hulme, 2023).

The term "self-medication" refers to the consumption of medication by individuals while being absent from any medical supervision. In 2013, the prevalence of self-medication practices in Indonesia was more than 90% (Ambarwati, Setiawaty and Wibowo, 2018; Ahmed *et al.*, 2021). However, incorrect self-medication practice may ends in several negative consequences, including but not limited to postponing seeking the necessary medical attention, hazardous drug interactions, incidence of iatrogenic comorbidities, and drug abuse (Behzadifar *et al.*, 2020). In addition, resources are misallocated and wasted as people who self-medicate may be taking medications that are not necessarily needed, which can lead to severe consequences such as nephrotoxicity, hepatotoxicity, and even antimicrobial resistance (Ambarwati, Setiawaty and Wibowo, 2018; Ahmed *et al.*, 2021). Antibiotics, albeit unrecommended, are still being used in self-medication attempts to treat upper respiratory tract infections; which

inflict unnecessary side effects and bring about antibiotic resistance. Furthermore, patterns and habits of self-medication is changing in the COVID-19 pandemic era, making it more commonly done in attempt to self-treat URTI symptoms (Gaviria-Mendoza *et al.*, 2022; Zheng *et al.*, 2023). The correct self-medication practice must be supported with robust evidence base on the use of drugs for personal use.

Assessing the self-medication habits of populations and the associated factors may help form a robust recommendation and best practice in accordance with scientific medicine literature for self-medication. Past study found the correlation of erroneous self-medication habit with low knowledge level (Pavydė *et al.*, 2015; Druică *et al.*, 2021). In developing countries, such as Indonesia, the practice of self-medication was usually conducted in the context of inadequate knowledge, yet the practice was still perceived positively (Aslam *et al.*, 2020). To our knowledge, only study done by Widayati et al (Widayati *et al.*, 2011) provided insight on the self-medication practice of Indonesian population, specifically in Yogyakarta. However, the data is outdated as it is released in 2011, and there is no data on DKI Jakarta population, Indonesia's capital and most population dense region. A study conducted by Sinuraya et al (Sinuraya *et al.*, 2023) in 2023 noted that 60% of Indonesia population knew that cough or headache is not an indication of antibiotics, however almost 50% of the population thought that antibiotics can be used to treat fever, and that common cold can quickly be cured with antibiotics. To address this gap of knowledge, this study aims to assess the self-medication practice of DKI Jakarta population and its association with level of knowledge. Assessment of knowledge, perception, and practice of what is known and done regarding self-medication may obtain data on cognitive and other aspects related to the practice (Kang *et al.*, 2020). We hope that the result of this study can be used as a basis to educate and improve DKI Jakarta citizens on the scientifically correct self-medication practice.

METHODS

This was a cross-sectional study involving adult subjects more than 18 years old in DKI Jakarta who had self-medicated when experiencing URTI. The number of subjects in this study was calculated using the one group proportion formula. Assuming the Z score was determined by a confidence level of 95%, the prevalence of self-medication for symptoms of URTI is 0.5, and the absolute value for the margin of error is 0.1. Thus, minimum sample size for this study was 96 participants (Bujang, 2021).

The primary data collection was done using an online questionnaire which was developed by the study team based on supporting literature. The questionnaire was divided into 3 parts, for collecting demographic data, self-medication patterns and level of knowledge regarding self-medication in URTIs. In second section, there were questions about the choice of medication for the fever, cough and rhinorrhea symptoms, the use of antibiotics without a doctor's prescription, sources of information about self-medication, habits of reading drug labels, actions if adverse effects occur, the duration of self-medication and indication for

Table 1. Demographic Characteristics of Study Participants

Variables	N	%
Gender		
Male	61	59.8
Female	41	40.2
Marriage status		
Unmarried	18	17.1
Married	87	82.9
Age		
18-20	3	2.9
21-30	20	19.6
31-40	21	20.6
41-50	27	26.5
51-60	16	15.7
61-70	14	13.7
More than 70	1	1.0
Latest education		
Secondary and high school (SMP and SMA)	36	34.3
Undergraduate (S1)	45	42.9
Graduate (S2 + S3)	24	22.9
Occupation status		
Healthcare worker	5	4.8
Non-healthcare worker	49	46.7
Housewife	21	20.0
Pension	18	17.1
Unemployed	12	11.4
Monthly income		
Above minimum wage	43	41
Below minimum wage	2	1.9
Around minimum wage	20	19.0
No income	40	38.1

seeking medical help. In the third section, there were 14 questions to evaluate the subjects' level of knowledge. The questions mainly inquired about the participant's knowledge of the appropriateness, availability, types, dose, storage, and interaction of medications. Each question is given the options: "True," "False," and "I do not know." The correct answer, "True" or "False," was given one point and wrong answer was rewarded 0 points. The scores of each participant were then tallied and given a grading. A poor score is around 0 to 5, an adequate is 6 to 11, and a good score is 12 to 14. The questionnaire had been tested for validity and reliability before being used for data collection. The validity test used the Pearson test, whereas the reliability test used the Cronbach's test conducted on 30 non-study participants. Descriptive statistic test was performed to analyze the subject demographic information. The Chi-Square test was aimed to analyze the association between knowledge level and self-medication appropriateness by the participants. Fisher analysis was conducted to test for association as alternative test.

RESULTS AND DISCUSSION

Subjects Characteristics

A total of 102 participants were collected for this study. The characteristics of the study subjects can be observed in Table 1.

Pattern of Self-medication Practice

Table 2 details the self-medication practices by the study subjects. All the

participants who were eligible for analysis had admitted to self-medication when they were once experiencing URTI. The table below shows information regarding the number of subjects with certain URTI symptoms and various self-medication practices. experiencing side effects from a medication, all participants usually stop using the medication or consult a doctor. Most of participants also usually read the medication label, which is a positive habit. Drug labels provide crucial information such as the intended dosage, expiry date, composition and active substance, drug distribution classification, indications, toxicity, adverse drug effects, and interactions with other substances. Therefore, medication labels act as instructions and details to use the medication correctly and safely (Marathe *et al.*, 2020). Drug labels and packaging helps protect against unintended use of medications, educate and provide knowledge on the contained drug. In Indonesia, over-the-counter drugs were labeled with green colored circle, signifying that the drug is classified as an over-the-counter medication that can be bought without medical prescription. This drug distribution classification sign may help inform people to buy medicine safe for use without any doctor's direction (Nurliana *et al.*, 2023).

Most of our participants obtained information about self-medication from family and friends. The correctness of the information obtained from these sources needs to be re-checked (Marsh, *et al*., 2024). If not convincing, participants can look for more appropriate sources of information from health workers, such as by reading popular scientific health articles or listening to health education provided by health workers. When participants have received information from trusted sources, they can also share this information to family and friends. This spectrum of capacity is coined as health literacy skills, which include the capability of individuals to obtain access, understand, and apply information to maintain and promote good health (Rusu *et al.*, 2022).

There was a significant portion of participants who bought medication from small stores, and some even used leftover medicines. Purchasing from unlicensed stores, termed non-pharmacy outlets, might be a potential safety risk for those who are seeking to self-medicate for their symptoms which can be harmful. Several examples of non-pharmacy outlets are kiosks, gas stations, supermarkets, and public shops (Moura and Barros, 2020). Loose regulations of pharmaceutical markets were one of the reasons why drugs can be bought in non-pharmacy outlets, and self-medication habit is one of the consequences of such arrangement (Oleszkiewicz *et al.*, 2021). A study in rural Eastern Uganda revealed that unlicensed drug shops tend to sell unlicensed and expired drugs for treatment (Buchner *et al.*, 2019).

Almost all the participants have taken antibiotics without a doctor's prescription before to relieve the common symptoms of URTI, which can be attributed to the high accessibility of antibiotics in Indonesia (Mori *et al.*, 2022). WHO defined incorrect antibiotic use as the consumption of antibiotics in incorrect manners, including the use of poor-quality antibiotics, prolonged use, wrong dosage, inappropriate indication, and poor

Table 2. Detail of Aspects Related To Self-Medication Practices as Reported by The Subjects (N = 102)

Self-medication practices	N	%
Frequency of experiencing URTI within a year		
1-2 times	15	14.3
3-4 times	12	11.4
5-6 times	41	39.0
More than six times	37	35.2
Symptoms of URTI frequently experienced by participants		
Nasal congestion	52	51.0
Rhinorrhea	73	71.6
Sneezing	43	42.2
Coughing	98	96.1
Sore Throat	37	36.2
Pain when swallowing	42	41.2
Fever	74	72.5
Duration of self-medication for URTI		
1-3 days	48	47.1
1-7 days	46	45.1
More than seven days	8	7.8
History of taking antibiotics without a doctor's prescription		
Yes	93	91.2
No	9	8.8
Reading the labels of medications		
Read	90	88.2
Did not read	11	10.8
Missing data	1	1
Courses of action taken if their URTI symptoms persist after self-medication		
Purchase another medication instead	9	8.8
Leave the symptoms to resolve on their own	48	47.1
Seek alternative medicine	7	6.9
Go to a doctor	38	37.3
How do you usually get information for self-medication?		
A doctor or other healthcare professional	22	21.6
Social media	25	24.5
Internet	50	49.0
Words of friends and neighbors	75	73.5
Family members	86	84.3
Personal experience	21	20.6
Where do you usually get your medication to treat your URTI symptoms?		
Buy from the pharmacy	96	94.1
Buy from a local market	79	77.5
Leftover medication	82	80.4
Getting it from others	10	9.8

Purchasing it online	1	1.0
Reasons for self-medication		
Lower costs	75	73.5
More convenient	85	83.3
Difficulty in reaching a medical facility	47	46.1
Suggestions from others	9	8.82
Doubt in medical care by healthcare professionals	2	1.96

URTI = Upper respiratoty tract infection

adherence (Nwokike, Clark and Nguyen, 2018). WHO also estimated that 80% of antibiotics consumption are done outside the correct clinical context, and 20-50% of it can be categorized as incorrect antibiotic use (Yeika *et al.*, 2021), The widespread use of antibiotics to treat symptoms that requires no antibiotic is the leading reason of the development of bacterial resistance as a pressing problem in the world (Salam *et al.*, 2023).

More common reasons why participants chose to self-medicate were lower costs and higher convenience. As an example, consuming painkillers without appropriate clinical consultation was thought to be more cost-effective, even with the lack of awareness and knowledge of potential hazards and side-effects associated with incorrect use of painkillers (Moonajilin, 2020). Although participants indicated that private clinics were frequently open 24 hours a day, the higher costs of private clinics still discouraged them from seeking medical consultation. Difficulty in reaching a medical facility for treatment was a common reason to turn to self-medication in our study, in line with literature (Sokang, Westmaas and Kok, 2019).

Level of Knowledge of Self-medication for URTI

The questionnaire to assess the level of knowledge consists of 14 questions. Most of the questions were answered correctly, with most of the participants getting the correct answer in each question. Table 3 below shows how many participants had poor, adequate, and good scores. Based on the score most participants have good knowledge regarding self-medication for URTI, with only as little as 4.9 percent showing poor knowledge. The mean score across all participants for this test is 10.8, which means that the level of knowledge is adequate overall.

Most participants have shown a sufficient understanding of the availability of medications, over-the-counter medications, instructions for consuming the medicines throughout the day, storage of drugs, and medication for different ages. Additionally, an overwhelming portion of participants answered almost all the questions correctly. This result was different with the available data on the existing study (Ahmed *et al.*, 2021).

Only a few questions were not as one-sided. One such question was regarding whether one must consume antibiotics whenever they experience symptoms of URTI. The answers to that question were significantly divided, with 59.8% of the participants answering that correctly and 40.2% of them wrong. A possible explanation is the lack of understanding of the pharmacological properties and indications of

antibiotics. This explanation is consistent with a study in East Indonesia, whereby only 18% of their participants knew that antibiotics do not influence infections caused by viruses (Kurniawan, Posangi and Rampengan, 2017). This is because viruses are the more prevalent etiology of URTI; thus, antibiotics are mostly unnecessary. (Kwiyolecha *et al.*, 2020) Past study revealed the statistically significant positive correlation between knowledge, attitude, and correct practice on the use of antibiotics for URTI (Lakshmi, Geetha and Vijayasamundeeswari, 2021), indicating the importance of knowledge on the correct self-treatment practice using antibiotic for URTI. Comparatively, our study might show that our participants better understand this aspect of antibiotic use, but it is still unsatisfactory overall.

It is known that certain foods may interact with certain drugs which may affect the drugs' pharmacokinetic and pharmacodynamics, even though usually data on specific food-drug interaction are quite scant. (López-Yerena *et al.*, 2020) However, it was estimated that food may affects the pharmacokinetic properties of around 40% of oral medications (Riedmaier *et al.*, 2020). This is more of a concern when considering common over the counter drugs used to relieve symptoms of URTI, such as pseudoephedrine a pharmacologic substance commonly found in over-the-counter drugs used to treat common cold. Pseudoephedrine along with caffeine can cause undesirable effects such as hyperglycemia, elevated body temperature, and insulinaemia (Głowacka and Wiela-Hojeńska, 2021).

Association of Level of Knowledge and Appropriateness of Drugs Selection

The association between the level of knowledge and the appropriateness of drug selection in self-medication toward various symptoms of URTI, such as fever, cough, and rhinorrhea, was analyzed. Table 4 above shows the results of the tests. From the table above, we concluded that there was no association between the level of knowledge and the appropriateness of drug selection in self-medication.

This finding was different from current literature. A study suggests a strong association between level of knowledge and self-medication practices (Mufarrihah *et al.*, 2023). One explanation is that the appropriateness of self-medication in this study only considered the indications of the medications used. Other considerations such as contraindications and dosage were not considered in measuring appropriateness. Therefore, the level of appropriateness might be overestimated, thereby affecting the results of the analysis for the association of both factors. URTI symptoms are generally common and usually used as a point of selling in the drug's advertisements. In the advertisements, indications of the medicine are clearly stated. Therefore, this makes it very easy for participants to choose medication according to the symptoms they are experiencing. However, participants should still pay attention to contraindications or the risk of adverse effects when using over-the-counter drugs.

Table 3. The level of knowledge about self-medication for URTI (N = 102)

Level of knowledge	N	%
Good	45	44.1
Adequate	52	51.0
Poor	5	4.9

Table 4. The association between the level of knowledge of URTI and the appropriateness of drugs selection

Symptoms	Level of knowledge	Appropriateness of self-medication for URTI		p-value
		Appropriate	Inappropriate	
Fever (Fisher's exact test, N=101)	Good	43	1	0.384
	Adequate and poor	53	4	
Cough (N=102)	Good	40	5	0.660
	Adequate and poor	49	8	
Rhinorrhea (N=101)	Good	25	19	0.837
	Adequate and poor	31	26	

CONCLUSION

In general, most of the participants have an adequate level of knowledge on self-medication for URTI symptoms and most of them can choose the appropriate drug for URTI symptoms. However, there was no association between the level of knowledge and the appropriateness of drug selection for URTI symptoms. Education regarding the self-medication practice to treat viral URTI is still needed, especially regarding the indications for the use of antibiotics in URTI.

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