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Beliefs About the Use of Nonprescribed Antibiotics Among People in Yogyakarta City, Indonesia: A Qualitative Study Based on the Theory of Planned Behavior

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Abstract

Although antibiotics are prescription-only medicine in Indonesia, they can be purchased without prescription. This qualitative study elicited beliefs about nonprescribed antibiotics use informed by the theory of planned behavior to develop a questionnaire for an expanded theory of planned behavior survey. Twenty-five (N = 25) adults with experience of using nonprescribed antibiotics were interviewed. Content analysis was applied. Participants reported that the use of nonprescribed antibiotics was advantageous in term of saving time and money and of reducing the number of medicines that need to be purchased, in contrast to a perception of what occurs with medical prescriptions. Potential adverse effects, poor health outcomes, and antimicrobial resistance were the perceived disadvantages. Facilitators of such use were the availability of over-the-counter antibiotics and successful experience in using antibiotics. Medication for children was the perceived barrier to such use. Family members and friends, especially those with health education background, approved of such use.

Keywords

antibiotics, Indonesia, nonprescribed antibiotics, qualitative study, self-medication, theory of planned behavior

Introduction

Worldwide, antibiotics are frequently used without prescription, with reports of period prevalence ranging from 41% to as high as 75% in Jordan[1] and Greece,[2] respectively. The use of

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nonprescribed antibiotics, including leftover antibiotics, raises concerns about inappropriate use, which potentially leads to negative impacts such as possibly lethal effects, adverse effects, reduced effectiveness, and financial burden.[3] A review of antibiotics use in developing countries[4] indicated inappropriate use of nonprescribed antibiotics—for example, nonprescribed antibiotics were used for the common cold, which is caused by viruses. Findings from other recent studies[5,6] are similar to those in the earlier review. Such inappropriate use also potentially increases the development of bacterial resistance,[7] as reported in the context of antimicrobial resistance in resource-limited countries[8] and other individual studies examining antimicrobial resistance in association with the use of nonprescribed antibiotics in Asian countries.[9,10]

In Indonesia, legislation mandates the presentation of a medical prescription for purchase of antibiotics.[11] However, people can purchase antibiotics without a prescription, despite this legislation. A previous Indonesian study[12] reported that 76% of 104 antibiotics transactions were without prescriptions when using a simulated client visits approach in 75 pharmacies, 10 drugstores, and 39 roadside stalls (kiosks) in East Java, Indonesia. Another study in 2001-2002[13] reported that 17% of 472 respondents who used antibiotics in the 4 weeks preceding the study had taken them without prescription. A recent population-based study in Yogyakarta City reported a 4-week period prevalence of 7.3% for self-medication with antibiotics, which indicates that more people would self-medicate with antibiotics annually.[14]

Furthermore, an Indonesia study reported that people without health insurance were more likely to use nonprescribed antibiotics.[13] Formal sector employees in Indonesia, such as those in large companies or the government, have access to health insurance ("ASKES" and "Jamsostek"), and wealthy people generally use private voluntary health insurance. Poor people are insured by social health insurance known as "Jamkesmas," which covers about 76 million (33% of Indonesians) people.[15] There is also district and provincial health insurance called "Jamkesda" and "Jamkesos" for people on a low income but who are not covered in the "Jamkesmas" quota. Medical insurance provided by the government covers the cost of the medical consultation fee as well as the prescribed medicines but only those that are listed under the health insurance criteria (Daftar Plafon Harga Obat). The role of health insurance in influencing people's behavior related to the use of non-prescribed antibiotics remains unclear.

In the Indonesia context, the use of nonprescribed antibiotics has been a neglected issue because most intervention strategies focus on improving antibiotics prescription among health care providers.[16] Therefore, this study aimed to explore people's beliefs about using nonprescribed antibiotics in Yogyakarta, Indonesia, through interviews informed by the theory of planned behavior (TPB).

The TPB is an established model that has been widely used to understand health-related behavior.[17] For example, the TPB has been used to examine behavior related to reducing childhood fever among Australian parents,[18] pharmacists' intention to dispense nonprescribed antifungals for vaginal candidiasis in Scotland,[19] and Southern Thai pharmacists' intention to dispense nonprescribed antibiotics for upper respiratory infection (URI).[20] According to the TPB, behavioral intention, which is an antecedent of behavior, is initiated by 3 constructs, namely, attitude toward the behavior, subjective norms, and perceived behavioral control. An attitude refers to a personal evaluation about advantages and disadvantages of the behavior. Subjective norms refer to beliefs about normative expectations. Perceived behavioral control refers to individuals' perception of their ability to perform the given behavior.[17] In the Thai study mentioned earlier, the TPB successfully shows that Thai pharmacists have a low intention to dispense nonprescribed antibiotics for URI as a result of their attitude regarding the disadvantages of antibiotics for URI treatment. Subjective norms, that is, beliefs and practice of physicians, other pharmacists, drug sellers, and lecturers, have a weak effect on their intention to do so. Perceived behavioral control, that is, income, standard practice guidelines, patient demand,

Table 1. The Interview Schedule of People's Beliefs About Using Nonprescribed Antibiotics in Yogyakarta City, Indonesia.

Questions About Beliefs of Using Nonprescribed Antibiotics Informed by the Theory of Planned Behavior
What do you believe about the advantages of the use of nonprescribed antibiotics?
What do you believe about the disadvantages of the use of nonprescribed antibiotics?
What factors or circumstances enable you to use nonprescribed antibiotics?
What factors or circumstances make it difficult or impossible for you to use nonprescribed antibiotics?
Are there any individuals or groups who would approve of your using the nonprescribed antibiotics?
Are there any individuals or groups who would disapprove of your using the nonprescribed antibiotics?
Are there any other issues that come to mind when you think about the use of nonPrescribed antibiotics?
Name:
Age:
Gender:
Education:
Occupation:
Income:
Number of family members living in the house since the past month:

and socioeconomic characteristics of patients, has no effect in any way in that study. Based on the TPB concept, information about common beliefs of advantages, disadvantages, persons who would approve or disapprove, and factors that facilitate or impede associated with the given behavior can be used for structuring a tool for investigating predictors of a given behavior using the TPB constructs.[17,21] Therefore, findings of this qualitative study would be useful to develop a questionnaire for an expanded TPB survey.

Methods

This qualitative study is the initial stage of a mixed-methods study examining self-medication with antibiotics based on the TPB in Yogyakarta City, Indonesia. Face-to-face interviews were used to collect data. An exploratory sequential design was applied.[22]

The study population included adults (>18 years old) who resided in urban areas of Yogyakarta and who had experience in using nonprescribed antibiotics, including leftover antibiotics. Participants were selected using a snowball sampling technique.[23] Purposive approaches were initially applied to identify 4 participants with diverse social backgrounds, that is, an undergraduate student, a housewife, a laborer, and a manager, using contacts of the first-named author. These 4 participants were asked to locate other potential participants from their own networks who met the selection criteria.

The interview schedule (Table 1) was structured based on the TPB literature[17,21] examining advantages, disadvantages and factors facilitating and impeding the use of nonprescribed antibiotics and identifying people or groups who approve or disapprove of the use of nonprescribed antibiotics. The last section of the schedule contained questions about demographics and socioeconomic characteristics of participants. The interview schedule was previously piloted with 3 adults experienced in using nonprescribed antibiotics and then modified based on the findings of the pilot. The questions and approach to sampling was approved by the Human Research Ethics Committees at the University of Adelaide and the City Government of Yogyakarta, Indonesia. Voluntary informed consent to participation, confidentiality, and anonymity were guaranteed.

The interviews were undertaken in Bahasa Indonesia (the national language of Indonesia). To ensure the quality of the interviews, a local qualified instructor trained 3 interviewers (ie, AL, SA, and the first author, AW, who speak Bahasa Indonesia). The interviewer visited potential participants at their home or office. Three documents (in Bahasa Indonesia)—an information sheet about the study, a copy of the research permit issued by the Yogyakarta City Government, and a consent form—were presented and explained to all potential participants. The interviewer also offered an opportunity to have a family member or a friend present while the project was explained to them. The interviewer made an appointment to conduct an interview once the potential participant consented to participate in the study. Interviews were recorded with participants' approval. The duration of each interview ranged from 45 to 60 minutes. Given local cultural expectations, a small gift was given to each participant on completion of the interview.

Two interviewers (AL and SA) transcribed the interview records verbatim. The first author checked the transcripts against the interview recordings and then translated the transcripts into English. The translations were checked by an Indonesian colleague (SH) who speaks English well. Data were independently coded and analysed by the first author and SH using content analysis[24,25] with the assistance of NVivo 8 software. Other authors checked and clarified data analysis and data representation.

Results

Twenty-five participants were interviewed face-to-face during November 2009. Tables 2 and 3 describe characteristics of the participants. The median age was 36 years (range = 20-60 years). The majority of participants had completed their senior high school. Two participants had a health industry background. Most participants were low-level paid workers and unpaid people (housewife and undergraduate students). The median number of family members sharing in the household since the past month was 4 (range = 2-6).

The following paragraphs describe the emergent themes under the topics of advantages and disadvantages, factors that facilitate and impede, the sources of advice (approval and disapproval), and particular issues related to the use of nonprescribed antibiotics. Using a framework informed by the TBP, the following themes assist in understanding self-medication with antibiotics behavior among people in the community as can be seen in Figure 1.

Advantages and Disadvantages

The 2 main advantages of using nonprescribed antibiotics were saving time and saving money. All participants believed that queueing for a medical consultation at a doctor's consulting rooms, particularly in a primary health care (PHC) center or a hospital, was a waste of their time. Four participants, who work during the day, considered it difficult to arrange a time to visit the PHC with the restricted opening times (usually 9:00-11:30 AM). "If we see a doctor . . . how much money must be spent for the doctor, then [another amount of money] for the medicines prescribed. It is [also] wasting time in the queue in doctor's room" (N).

Participants might be sensitive to overprescribing; therefore, using nonprescribed antibiotics was also seen as an advantage in terms of avoiding taking more medicines than they needed. "If I go to a doctor, the doctor tends to prescribe many types of medicines besides antibiotics, while I can just buy medicine that I need without prescription" (RB).

Concerns about adverse effects or side effects, antimicrobial resistance, misdiagnosing, and inappropriate antibiotic selection were seen as the disadvantages of using nonprescribed antibiotics. Most participants experienced a fear of side effects, but 3 participants did not have such

Table 2. Details of Participants of Interviews About Beliefs of Using Nonprescribed Antibiotics in Yogyakarta City, Indonesia.

Initial of Participants' Name	Gender	Age (Years)	Education Background
RB	Male	36	Master's degree
BF	Female	42	Undergraduate
C	Female	46	Senior high school
E	Male	28	Undergraduate
J	Female	60	Undergraduate
N	Female	25	Undergraduate
I	Female	40	Senior high school
R	Male	23	Senior high school
SS	Male	55	Undergraduate
T	Female	20	Senior high school
M	Female	22	Senior high school
K	Male	24	Did not mention
JAS	Male	45	Undergraduate
BS	Female	50	Senior high school
AE	Female	36	Senior high school
DAR	Male	37	Undergraduate
ST	Female	37	Undergraduate
TS	Female	32	Senior high school
L	Male	24	Elementary School
NN	Female	20	Junior high school
B	Male	20	Senior high school
T	Male	45	Senior high school
BS	Male	50	Senior high school
Y	Male	36	Undergraduate
I	Female	33	Senior high school

concerns. None had suffered such side effects. "To date no . . . I hope . . . I will never experience any side effects, I am afraid of being poisoned" (C). Nearly half of participants were concerned about antimicrobial resistance. "I am afraid . . . if [I] purchase [antibiotics] without prescription . . ., perhaps the dosage or the antibiotics chosen is wrong . . . then I may resist to the antibiotics" (TS). However, it should be noted that participants might understand the term *resistance* as referring to human resistance to an antibiotic rather than bacterial resistance. Five participants did worry about the risk of taking a consecutive course of antibiotics and too many medications. If it is no improvement, it shall be treated again . . . then the doctor will prescribe antibiotics again . . . may be another type of antibiotics. Honestly, I am scared [to use antibiotics] too much . . . If my symptoms do not improve after self-medication, then further visits to a doctor will definitely result in an increased antibiotic dosage. (BF)

Four participants were concerned about misdiagnosing their conditions and selecting an inappropriate antibiotic. Seven participants were concerned that antibiotics used without a medical prescription would possibly worsen the condition. However, 2 participants perceived that amoxicillin is a common antibiotic and is likely to be safe for self-medication despite its use by these participants without clear indications. "Because it is an "ordinary" antibiotic, in my opinion amoxicillin is okay [no problem] to be used by trial and error . . . um . . . cipro [ciprofloxacin] is for cough, it is more [potent] than amoxicillin" (BF).

Table 3. Descriptive Characteristics of Participants of Interviews About Beliefs of Using Nonprescribed Antibiotics in Yogyakarta City, Indonesia.

Descriptive Characteristics	Frequency (%)
Gender	
Male	12 (48)
Female	13 (52)
Age in years, median (range)	36 (20-60)
Education background	
University	10 (40)
Senior high school	12 (48)
Junior high school	1 (4)
Elementary school	1 (4)
Did not mention	1 (4)
Family income level (US$)	
≥800	2 (8)
150-800	9 (36)
<150	14 (56)
Number of family sharing in the household, median (range)	4 (2-6)
Current employment/position	
Low-level private employee	9 (36)
Middle- to high-level private employee	7 (28)
Middle-level government employee	2 (8)
Student of university	5 (20)
Housewife	2 (8)

The following issues were also seen by some participants as disadvantages of using nonprescribed antibiotics. Two participants declared their concerns about counterfeit antibiotics. "I was worried I might get fake antibiotics if I purchase them outside a pharmacy" (T). Two participants stated that using nonprescribed antibiotics did not benefit them as they have medical insurance that covers fees for medical consultation as well as medicines. "As my family has medical insurance called "Jamsostek" . . . actually, self-medicating with antibiotics does not benefit for me . . . [because] the insurance paid fees for medical consultation and any medicines prescribed" (T). Two participants who were workers faced problems in applying for leave of absence when they used nonprescribed antibiotics, as they did not have medical documentations provided by the doctors required for such an application.

Factors That Facilitate and Impede the Use of Nonprescribed Antibiotics

All but one of the participants purchased antibiotics from a pharmacy. They stated that it was easy to purchase antibiotics without prescription. "Purchasing antibiotics without prescription in a pharmacy is easy, even though "prescription-only medicine" was written on the package "(JAS). Using medication successfully in the past made the majority of participants very confident about self-medicating with antibiotics. "If I had similar symptoms to the previous ones which had been successfully treated using antibiotics, I will use such antibiotics again without medical consultation" (T). On the other hand, participants will seek medical advice if the symptoms appear to differ from a previous episode. Only 2 participants implied that they were likely to experiment with antibiotics for a symptom that they had not suffered before. However, most

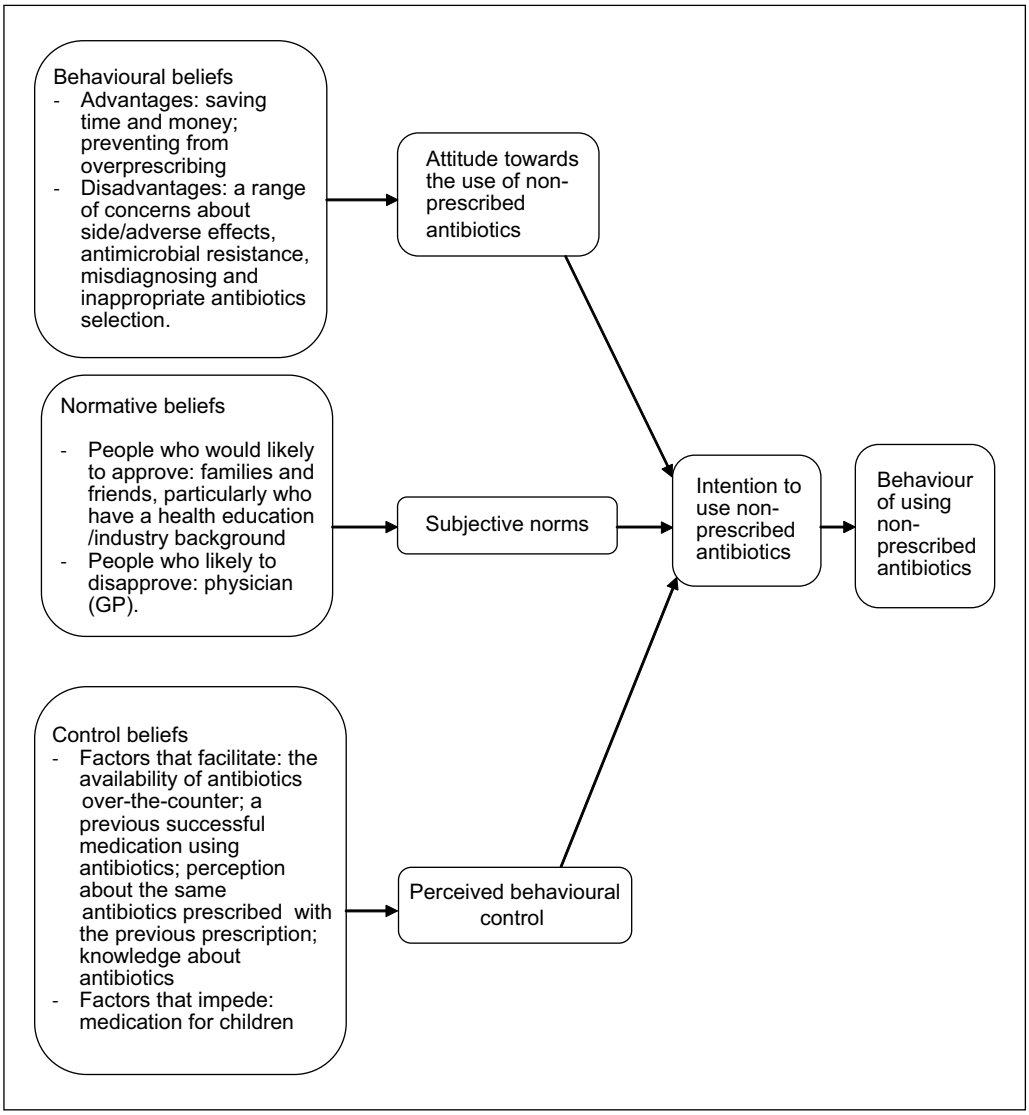

Figure 1. Schema of the theory of planned behavior framework to understand the behavior of using nonprescribed antibiotics in Yogyakarta City, Indonesia.

of the participants understood that not all symptoms or diseases are appropriate to be treated with antibiotics. They also perceived that once they have symptoms similar to those experienced previously, a doctor would be likely to prescribe the same antibiotic as used in the past. *"*Because I am sure that if I go to a doctor I will be prescribed the same antibiotic or even more types of other medicines" (DAR).

Most participants did not use nonprescribed antibiotics when the health concerns were for their children. "If it is for my child, I must take them to the doctor. Although, I may seek a loan to pay the fees" (ST). However, 1 participant said that she had made a copy of her child's prescription and used the copy to purchase antibiotics when the child next got the same symptoms.

Sources of Advice (Approval and Disapproval About Self-Medication With Antibiotics)

The majority of participants stated that family members and friends, especially those with a health education background, were more likely to approve of this behavior. "My friend who has a health education background [suggested] . . ., I believed in her as she is an official in a hospital. She runs a clinic and has an authorization to give medical treatment. I really believe in her" (C). Another participant said, "Family . . . friends . . . my wife also [gave approval for me to use nonprescribed antibiotics]. My family member who gave me advice is a GP" (RB).

Four participants reported being assisted in selecting antibiotics by a pharmacist or pharmacy assistant. "In the pharmacy, there is usually a pharmacist or person [professional] who is knowledgeable about medicines and normally they question me about the symptoms" (B).

The majority of participants declared that no one disapproved of self-medicating with antibiotics. However, 3 participants said their GP did not approve of this behavior. "When my symptom did not improve after self-medicating with antibiotics . . . my GP blamed me for such use" (C). Another participant said a family member, who was a pharmacist, suggested avoiding using antibiotics when he got a mild cough.

Particular Issues Regarding the Use of Nonprescribed Antibiotics

Seven participants suggested that pharmacies must comply with the law associated with antibiotics supply. "If antibiotics are prescription-only medicines, don't sell them as nonprescribed" (JAS). Another participant said, "If there is a risk in using non-prescribed antibiotics, the authority should make sure that pharmacies and other drug sellers follow the regulation" (BF). But, one of the participants said, "It is okay to obtain antibiotics without prescription as long as the pharmacist gave advice in the selection of the antibiotics" (B). Four participants suggested formally educating people about antibiotics; they indicated that safe use would be improved if people had a better understanding of antibiotics. "Education for people is necessary, particularly about side effects or adverse effects of antibiotics" (AE).

Discussion

This qualitative study described people's beliefs regarding the use of nonprescribed antibiotics among participants of an urban area in Indonesia. The trustworthiness of the study was ensured through various strategies. The accuracy and consistency of transcription were achieved through checking each transcript alongside the records.[26] Validity was achieved through independent coding and analyzing of data as well as clarifying the results.[21] The snowball sampling technique was applied for reasons of time and cost in accessing eligible participants. Issues of unrepresentativeness and bias of sample selection were reduced by applying purposive techniques to approach the 4 initial recruits from diverse social groups.

Generally, people in this study took a "shortcut" by expeditiously managing their recognized symptoms by using nonprescribed antibiotics. Saving time and saving money are the 2 main advantages of using nonprescribed antibiotics reported by people in this study, which are in line with those found by other previous studies particularly in the developing world.[1,4,27] On the other hand, they reported a range of concerns about misdiagnosing, wrong antibiotic selection, wrong dosage, antimicrobial resistance, and potential adverse effects as disadvantages of self-medication with antibiotics. Such concerns are the important points to increase people's attitudes toward the harmfulness of using nonprescribed antibiotics. According to the TPB,[17] when people

negatively evaluate behavior of using nonprescribed antibiotics, their intention and practice to do so can be diminished.

People in this study reported that family and friends, in particular those who have health education background, would give approval to self-medicate with antibiotics practice. Family and friends are also reported by studies in Palestine,[28] Southwest Nigeria,[6] and other developing countries[4] as sources of recommendation regarding self-medication with antibiotics. The previous studies also strongly mention people's behavior regarding copying doctor's prescription when deciding the type of antibiotics to be used without prescription. On the contrary, few participants in this study stated that their doctor would blame them for such use. These findings suggest that a high quality of communication between doctors and their patients may reduce the magnitude of such practice.

The perceived availability of over-the-counter antibiotics in pharmacies, previous experience in using antibiotics, and positive advice from relatives and friends who have health education background facilitated this behavior. These findings are consistent with a study involving 11 European countries[29] and with those in other developing countries.[4] Finding related to participants' perception about over-the-counter availability of antibiotics is in contrast with those of a study in Pakistan[30] where availability of over-the-counter antibiotics was not linked to self-medication with antibiotics. The Pakistani survey involving 2348 households using semistructured interviews with a 57% response rate found that 91% of 396 antimicrobial treatments were based on prescription of physicians/surgeons. Only 9% of antimicrobial treatments were based on a chemist's and lay advice or respondents' own initiatives. That study concluded that the free market of antimicrobials in Pakistan does not lead to self-medication with antibiotics. However, as this study was conducted over a decade ago, the situation may now differ.

Unlike a previous Indonesian study[13] and a study conducted in Thai,[31] this study interestingly revealed that participants with health insurance still preferred to use nonprescribed antibiotics rather than visit health facilities, even though they had to pay out of pocket. Consultation fees at the PHC centers in Indonesia are low (<US$ 1, in which US$ 1 ~ Rp 9.200 (Indonesian currency) in 2009), but such fees in a hospital or in a private practice with a specialist or general practitioner (GP) are considerable at about US$ 5 and US$ 2, respectively. Therefore, people on a low income (earning about US$ 5/day or less) and are without health insurance would potentially spend nearly half their daily wages for a medical consultation and associated prescribed generic medicines. On the other hand, the price of generic antibiotics is very affordable for most people; for example, the price of 10 caplets of amoxicillin is less than US$ 1. Therefore, when antibiotics are easily accesses in pharmacies and even in local shops, particularly in urban areas, obtaining nonprescribed antibiotics would seem a "quick and cheap" method for people's self-management of their self-diagnosed illness as implied by findings of this study.

Participants' perception about overprescription was also a significant issue that influenced their decisions to self-medicate with antibiotics. Pharmaceutical companies in Indonesia commonly offer financial incentives for prescribers who prescribe particular medicines, although such action is prohibited by law.[32] This phenomenon coupled with other factors, such as concerns about bad clinical outcomes and perceived patient demand, might lead to overprescription.[4] Such a perception facilitated participants to practice self-medication, in which such a practice can limit the number of types and the amount of antibiotics purchased.

There was also an interesting finding in that the participants (laypeople) in this study were familiar with the names of antibiotics, despite lacking particular knowledge about antibiotics use. It is in contrast with those of misidentifications of antibiotics found among old people in a Thai study.[33] Participants also had concerns about issues such as side/adverse effects and antibiotics resistance. Such findings require further investigation and action to promote the safe use of antibiotics in the community.

We acknowledge some limitations in this study. As the area of this study is an urban with a mostly literate population, results may be more suitable in describing people's opinion living in urban areas of Indonesia. People in rural areas may express different opinion regarding their experience in using nonprescribed antibiotics, because of disparities regarding implementation of health care system and regulation and demographic and socioeconomic characteristics. Furthermore, as the nature of the method of selecting the participants shows, generalization of the findings to the whole Indonesia population is not intended. Despite such limitations, as consequences of diversity of the participants' social backgrounds and of the nature of in-depth interview, information yielded from this study is invaluable in providing robust descriptions about common beliefs regarding the use of nonprescribed antibiotics, particularly among urban population of Indonesia. The findings can contribute to further examination of the determinants of such use based on the TPB, particularly among a randomly selected sample of the Indonesian urban population.

Conclusion

Through interviews informed by the TPB, this qualitative study has revealed new information about people's beliefs of using nonprescribed antibiotics in Yogyakarta City, Indonesia. The findings indicate that it is still important to encourage the enforcement of medicines supply regulations and equity access to health care services. Health professionals should also be encouraged to improve the safe use of antibiotics in the Indonesian community.

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