Research article

Determining Factors in Self-medication with Non-prescribed Antibiotics: A Preliminary Qualitative Study in Cambodian Pharmacy Students based on the Theory of Planned Behavior

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Abstract

Objectives: To explore Cambodian pharmacy students' behavior in relation to self-medication with non-prescribed antibiotics and to adopt the Theory of Planned Behavior (TPB) to elicit determining factors, i.e., their attitudes toward using non-prescribed antibiotics for self-medication, perceived subjective norm of self-medication with antibiotics and perceived behavioral control of self-medication without antibiotics. **Method:** This was a qualitative study. Twenty pharmacy students year 3 to year 5 from the Faculty of Pharmacy of one university in Cambodia were interviewed online. Data analysis was conducted using content analysis. **Result:** Sixteen participants used antibiotics for self-medication. The symptoms that they self-treated with antibiotics were sore throat (n=6), diarrhea (n=5), cough (n=3), flu (n=6), infected wound (n=2) and severe acne (n=2). The common sources of antibiotics were from pharmacies and existing supplies at home. Most participants indicated that using antibiotics was beneficial as it saved time and money and helped the symptoms to be cured quickly. However, few participants were of the view that using antibiotics could cause antibiotic resistance. Family members and close friends were their main references in self-medication practice. Most of their reference group self-medicated with antibiotics and suggested that they do so. However, most participants did not feel pressured to follow their reference's suggestions. They were confident that they can control themselves not to self-medicate with antibiotics if they felt that was preferable. The findings from this study also suggested a hypothesis that, in Cambodian pharmacy students, their positive attitudes toward using antibiotics for self-medication may discourage them from practicing self-medication without antibiotics; subjective norm may not have influence on their practice, where their perceived behavioral control may encourage them to self-medicate without antibiotics. **Conclusion:** In the next study, we suggest conducting a quantitative study to test this proposed hypothesis. In addition, the findings of this qualitative study elicited useful themes that can be used to develop a scale to measure each component of the TPB for the next quantitative study.

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บทความวิจัย

ปัจจัยที่กำหนดการใช้ยารักษาตนเองด้วยยาปฏิชีวนะที่แพทย์ไม่ได้สั่งจ่าย: การศึกษาเชิงคุณภาพเบื้องต้นในนักศึกษาเภสัชศาสตร์ชาวกัมพูชาโดยใช้ทฤษฎีพฤติกรรมตามแผน

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บทคัดย่อ

วัตถุประสงค์: เพื่อสำรวจพฤติกรรมของนักศึกษาเภสัชศาสตร์ชาวกัมพูชาที่เกี่ยวกับการใช้ยารักษาตนเอง ด้วยยาปฏิชีวนะที่แพทย์ไม่ได้สั่งจ่าย และเพื่อนำทฤษฎีพฤติกรรมตามแผน (theory of planned behavior: TPB) มาใช้เพื่อศึกษาปัจจัยที่กำหนด เช่น ทัศนคติต่อการใช้ยาปฏิชีวนะที่แพทย์ไม่ได้สั่งจ่าย การรับรู้ถึงบรรทัดฐานของการใช้ยารักษาตนเองด้วยยาปฏิชีวนะ และการรับรู้ถึงการความยากของการใช้ยารักษาตนเองโดยไม่ใช้ยาปฏิชีวนะ **วิธีการ**: การศึกษานี้เป็นการศึกษาเชิงคุณภาพ นักศึกษาเภสัชศาสตร์ชั้นปีที่ 3 ถึงชั้นปีที่ 5 จำนวน 20 คนจากคณะเภสัชศาสตร์ของมหาวิทยาลัยแห่งหนึ่งในกัมพูชาได้รับการสัมภาษณ์ทางออนไลน์ การวิเคราะห์ข้อมูลใช้การวิเคราะห์เนื้อหา **ผลการวิจัย:** ผู้เข้าร่วมการวิจัย 16 คนใช้ยาปฏิชีวนะสำหรับการใช้ยารักษาตนเองอาการที่รักษาตนเองด้วยยาปฏิชีวนะ ได้แก่ เจ็บคอ (n=6) ท้องเสีย (n=5) ไอ (n=3) ไข้หวัด (n=6) แผลติดเชื้อ (n=2) และสิวรุนแรง (n=2) แหล่งที่มาของยาปฏิชีวนะที่พบบ่อย คือ ร้านขายยาและยาที่มีอยู่ที่บ้าน ผู้เข้าร่วมการวิจัยส่วนใหญ่ระบุว่า การใช้ยาปฏิชีวนะนั้นมีประโยชน์เพราะช่วยประหยัดเวลาและเงิน และช่วยให้อาการหายได้อย่างรวดเร็ว อย่างไรก็ตาม มีผู้เข้าร่วมการวิจัยเพียงไม่กี่รายที่เห็นว่า การใช้ยาปฏิชีวนะอาจทำให้เกิดการดื้อยาปฏิชีวนะ สมาชิกในครอบครัวและเพื่อนสนิทเป็นกลุ่มอ้างอิงหลักในการการใช้ยารักษาตนเองกลุ่มอ้างอิงส่วนใหญ่ใช้ยารักษาตนเองด้วยยาปฏิชีวนะและแนะนำให้ผู้ให้ข้อมูลทำเช่นนั้น อย่างไรก็ตาม ผู้เข้าร่วมส่วนใหญ่ไม่รู้สึกกดดันว่าต้องทำตามคำแนะนำของกลุ่มอ้างอิง ผู้ให้ข้อมูลมั่นใจว่าตนเองสามารถควบคุมตนเองโดยไม่ใช้ยาปฏิชีวนะรักษาตนเองด้วยหากรู้สึกว่าทำเช่นนี้จะให้ผลดีกว่า ข้อค้นพบจากการศึกษานี้ทำให้ตั้งสมมติฐานว่า ในนักศึกษาเภสัชศาสตร์ชาวกัมพูชา ทัศนคติเชิงบวกของพวกเขาต่อการใช้ยาปฏิชีวนะ สำหรับการใช้ยารักษาตนเองอาจทำให้พวกเขารักษาตนเองด้วยยาปฏิชีวนะ บรรทัดฐานที่รับรู้อาจไม่ส่งผลต่อพฤติกรรมของผู้เข้าร่วมการวิจัยขณะที่การรับรู้ถึงความง่ายของพฤติกรรมอาจสนับสนุนให้ผู้ร่วมการวิจัยรักษาตัวเองโดยไม่ใช้ยาปฏิชีวนะ **สรุป:** การศึกษาครั้งต่อไปควรเป็นการวิจัยเชิงปริมาณเพื่อทดสอบสมมติฐานที่ตั้งไว้จากการศึกษานี้ นอกจากนี้ ผลการศึกษาเชิงคุณภาพครั้งนี้ทำให้พบประเด็นที่เป็นประโยชน์ซึ่งสามารถนำไปใช้ในการพัฒนาแบบวัดเพื่อประเมินตัวแปรใน TPB สำหรับใช้ในการศึกษาเชิงปริมาณครั้งต่อไป

คำสำคัญ: การใช้ยารักษาตนเอง ยาปฏิชีวนะ ทฤษฎีพฤติกรรมตามแผน กัมพูชา

Introduction

Self-medication was described as the use of medicines by someone who wants to treat self-recognized symptoms by themselves without prescribed medication. It also involves obtaining medicines from relatives or friends or use of leftover medicines stored at home (1). If self-medication is practiced appropriately, it might relieve the symptoms at an early stage which prevents symptoms from worsening. Self-medication is also beneficial for individuals who do not need medical attention, or whose illness is not serious enough to seek medical care. On the other hand, inappropriate self-medication may cause harm to individuals due to delaying medical visit or increasing the danger of medication abuse and misuse (2). Among inappropriate self-medication practice, using non-prescribed antibiotics was commonly reported (3).

Based on literature reviews, self-medication with antibiotics is common in both developed and developing countries. The prevalence is from 3 to 75% (4). Previous studies in Jordan, Lao People's Democratic Republic, and in European countries showed that non-prescribed antibiotics were mainly used for treating the common cold (5,6). Evidence shows that even in the developed part of the world almost 60% of the people are unaware that antibiotics are ineffective against viruses (7).

Appropriate self-medication, such as not using non-prescribed antibiotics or steroids, is one of the main goals of a rational drug use program. Health sciences students, particularly pharmacy students who are future health care personnel, must be a role model in appropriate drug use behavior. The previous studies had shown self-medication to be a common problem among college students especially in developing countries where strict legal enforcement on dispensing of prescription-only medicines is lacking. A study conducted among final year of medical students in Slovenia showed that 94.1% of students self-medicated

and 48% of health science students in an Indian university reported having consumed antibiotics in their self-treatment in the preceding three months (8,9).

Self-medication is one type of behavior. In psychology, several behavioral models are used to understand human thoughts, emotions, and behaviors. Among those behavioral models, the Theory of Planned Behavior (TPB) is popular as it has advantages over other models in that it can be used both to understand behavior and to develop interventions for behavioral change (10,12). The TPB proposes that there are three core components, i.e., attitude, subjective norm, and perceived behavioral control, which affect an individual's behavior via intention (11).

Cambodia is one country that people can gain access to prescription-only medicines without prescription. The information on the size of the problem related to antibiotic misuse or abuse in the country was still limited. In one study, it was reported that the use of non-prescribed antibiotics was commonly found in respiratory tract infections and diarrhea (13). In another previous study, it was found that antibiotics were freely available at grocery shops in small villages in remote regions of Cambodia (14). According to the Medicine Policy of Cambodia, no medicines will be provided through unauthorized outlets, medicines are to be supplied in pharmacies with trained pharmacists, and patients will not be able to access restricted drugs, such as antibiotics without a prescription. However, due to weak legal enforcement, antibiotics were easily accessible from pharmacies and drug outlets and dispensed by both trained pharmacists and unofficial suppliers (15). Although the consequence of antibiotic resistance is less likely to occur in pharmacy students or healthcare professionals as they are knowledgeable in medicine, these pharmacy students will soon become pharmacists and be a role model in appropriate practice of medicine use. They should adhere to appropriate practice, i.e., not using non-prescribed antibiotics to self-

medicate when having minor symptoms which do not require antibiotics.

Based on our intensive literature review, no study about self-medication practice among Cambodian pharmacy students was found. In this study, we also employed the TPB as a framework to elicit pharmacy students' attitude toward using antibiotics for self-medication, their perceived subjective norm regarding self-medication, their motivation to comply with the subjective norm, and their perceived behavioral control of self-medication without antibiotics.

Method

The research protocol was approved by the Ethics Committee in Human Research based on the Declaration of Helsinki and the ICH Good Clinical Practice Guidelines (HE 632196) and National Ethics Committee for Health Research in Cambodia (No. NECHR 326).

Informants

The participants of this qualitative study were undergraduate pharmacy students in year 3 to year 5 at the Faculty of Pharmacy of University of Puthisastra in Phnom Penh, Cambodia. In Cambodia, pharmacy education takes five years. The reason for choosing only year 3 to year 5 students was they start to take the courses on general bacteriology, applied bacteriology, and drug use on year 3. The researchers were not allowed to gain access to the database of students, e.g. the exact numbers of students enrolling in years 3 to 5, names or students' identification numbers. This was to maintain privacy of the students. Therefore, a voluntary method was used to recruit the participants. Permission to conduct the research was sought from the Dean. A student registration officer was asked to assist in disseminating a letter of invitation to pharmacy students. The invitation letter contained information on the objectives of the research project, the scope of an interview, and participant inclusion criteria.

Inclusion criteria were 1) being pharmacy students who practiced self-medication within the last three months prior to the study, and 2) had a smart phone with a Facebook messenger application. The Facebook name of the researcher was also given in the invitation letter. Students who agreed to participate made the first contact to the researcher. The researcher then made an appointment for an interview.

Data collection

An online interview via Facebook messenger was employed for data collection. Consent was obtained prior to each interview. Each of the interviews was conducted with audio call. The permission to record the interview was sought prior to the commencing of each interview. In case the permission to record was not granted, the interview was transcribed by hand.

The interview questions were divided into two parts. The first part of the interview asked about the symptoms that participants had self-medicated in the last three months. In the second part there were seven main open-ended questions which were structured based on the three constructs of the TPB. The first construct was attitudes. According to the TPB, attitudes were defined as a person's perception toward the belief about and the judgment of the outcomes of preforming the behavior (12). In the context of self-medication, the expected behavior was self-medication without antibiotics. In this study two questions were asked to explore pharmacy students' attitudes towards the use of antibiotics for self-medication, instead of their attitude towards self-medication without antibiotics. This was to avoid socially desirable responses.

The second construct was the subjective norms about self-medication. Three questions were used to explore perceived subjective norms. The first question aimed to identify the referent persons of pharmacy students regarding self-medication. Since it is not known what the subjective norms about self-medication are (using or not using antibiotics), the second question aimed to identify the norm of self-

medication of the referent group. The third question was used to identify students' motivation to comply with the referents' suggestions. The third construct was the perceived behavioral control of self-medication without antibiotics which was explored by two questions. The first question aimed to explore the presence or absence of facilitators and barriers to practice self-medication without antibiotics (controllability). The second question explored the amount of power students believed they had over performing of self-medication without antibiotics (self-efficacy).

The questions were assessed by three experts who were community pharmacists and met the following criteria 1) had been working in community pharmacies for at least three years 2) had experience in conducting research and developing questionnaires. The interview questions were translated into the Khmer language by the first author and were approved by the Khmer language lecturer in the ASEAN Languages and Cultures Program at Faculty of Humanities and Social Sciences, Mahasarakham University. The duration of each interview was approximately 25 to 30 minutes.

Data analysis

Content analysis was used to find emerging themes from the responses. In this qualitative study, several strategies were taken to maximize the trustworthiness of the study. To avoid misinterpretation and interpersonal variation, the interviews were conducted in the Khmer language only by the first author whose first language is Khmer. The verbatim translation from Khmer to English was also conducted by the first author to ensure the accuracy of the translation. To ensure the validity of the findings, both researchers independently coded and analyzed data.

Results
Characteristics of the participants

Twenty students were interviewed. There were 14 females and 6 males. Their age ranged between 19-23 years old. Ten were the participants from year 5, six were from year 4 and the remaining four students were from year 3. All participants were single. All of them had attended the course on the rational use of drugs or pharmacotherapy.

Self-medication practices

All participants had used self-medication with antibiotics, sixteen students reported that they used to self-medicate when they were unwell and also had used antibiotics without prescription in the last three months. The symptoms that they self-treated with antibiotics were sore throat (n=6), diarrhea (n=5), cough (n=3), flu (n=6), infected wound (n=2) and severe acne (n=2). The sources of antibiotics reported by the participants were pharmacies and left-over antibiotics at home.

Attitude toward using non-prescribed antibiotics

All participants reported that they used to self-medication with antibiotics. They were asked to identify their attitude toward their current practice of using non-prescribed antibiotics by answering the questions "*What do you believe are the advantages and disadvantages of self-medicating with antibiotics?*" and "*What do you think or feel about self-medication with antibiotics?*"

Their attitudes on the issue were found to be positive and negative. In their view, advantages of self-medication with antibiotics included 1) saving time, 2) saving money, and 3) speeding recovery. The disadvantages of the behaviors were 1) causing antibiotic resistance, 2) causing side effects, 3) wasting time and money from misdiagnosis, 4) causing drug allergy, and 5) being bad for future health. The following quotes illustrate participants' responses from the interview.

"Going to the hospital takes my whole morning." (Participant 2)

"Buy antibiotics from pharmacy takes less money than getting it from the hospital." (Participant 6)

"It (self-medication with antibiotics) is easy, and it helps me getting better quickly." (Participant 5)

"There is a possibility of misdiagnosis. Spend time using wrong medicine delays the treatment and may end up paying more." (Participant 8)

"I am the kind of person who get allergy easily, so I am careful with medicines, especially antibiotic." (Participant 3)

Subjective norms concerning self-medication

The question *"Are there any individuals or groups who you would consult when you are unwell with minor ailments?"* was used to identify the referent persons. The question *"How did your (referent persons) self-medicate when they were unwell?"* was used to identify norms of self-medication among referent group. The question *"How important is it for you to follow their advice?"* was used to identify participants' perceived pressure from those referents, to use or not to use antibiotics when self-medicating.

The referent persons discovered in this study were 1) family members, 2) close friends, and 3) neighbors. Although doctors/pharmacists were also mentioned, participants did not recognize them as a referent group for self-medication practice. Most participants reported that their family members, close friends and neighbors commonly self-medicated with antibiotics. Most participants also reported that they used to receive suggestions from either family members, close friends, or people around them to self-medicate with antibiotics. Their family had no objection if they wanted to self-medicate with antibiotics. On the other hand, they did not feel that they were pressured or expected to use antibiotics for self-medication. One participant reported that her doctor would be unhappy if the doctor knew that she self-medicated with antibiotics. The following quotes from the interview illustrate participants' responses.

"All of my friends suggest me the drugs (antibiotics) that I could find it by myself at pharmacy

whenever I complain about my symptoms."* (Participant 13)

"My family approves when I want to self-medicate because they usually do it too when they don't feel well." (Participant 15)

"I don't mind doing what my family recommends me because they have experiences of using it and it works for my symptoms too." (Participant 10)

"People around me think I should self-medicate with antibiotics when having minor symptoms." (Participant 5)

Perceived behavioral control of self-medication

Since the preferable behavior is self-medication without antibiotics, the question regarding to perceived behavioral control was aimed to elicit perceived self-controllability and self-efficacy of the participants over the practice of self-medication without antibiotics. Controllability was explored with a question *"Is the choice of whether to use antibiotics up to you?"* The self-efficacy was explored with a question *"How confident are you that you could self-medicate without antibiotics?"*

Most participants reported that in the past their decision to use antibiotics depended on their symptoms and their experience of the health outcomes from taking medicines. In terms of influence on decision-making, most participants reported that the decision to self-medication with antibiotics depended on themselves. They felt confident that they can control themselves not to self-medication with antibiotics. However, one participant's response suggested that the severity of the symptom would dictate the behavior.

"Getting antibiotics from the pharmacy is very easy but I am confident that I can control my temptation to self-medicate with antibiotic." (Participant 10)

"Whether I want to self-medicate with antibiotic or not is entirely up to me." (Participant 3)

"For me, not taking antibiotic when I have minor symptoms is not difficult." (Participant 9)

"It depends on the specific situation, if I can manage my symptoms by myself why bothering visiting a hospital." (Participant 15)

Discussion and Conclusion

The TPB proposes a model which predicts the occurrence of human behavior provided that the behavior is intentional (10). It has been adopted to study human health behavior, such as intention to engage in physical activities by children and adolescents (11). The TPB was also adopted to study self-medication practice (16). In this qualitative study, we also employed the TPB to explore Cambodian pharmacy students' self-medication practice in relation to using non-prescribed antibiotics. It was found that all Cambodian pharmacy students in this study had experience in using non-prescribed antibiotics to manage their minor recognized symptoms such as sore throat, diarrhea, cough, flu, wound infection and severe acne. The most common sources of their non-prescribed antibiotics were pharmacies and leftover antibiotics in their homes (16,17).

The findings from this study suggested that our studied Cambodian pharmacy students had a positive attitude toward self-medication with antibiotics. Saving time and saving money were the two advantages of self-medication with antibiotics reported by this group of students. This finding is similar to those found by previous studies (18,19). Some students raised antibiotics resistance and the potential risk of drug allergies as their concern. This reflected that some of Cambodian pharmacy students perceived disadvantage or harm in using non-prescribed antibiotics. This finding is also in line with other previous studies. It is not surprising that some of them were not worried about side effects nor antibiotics resistance.

Cambodian pharmacy students in this study reported that family and friends were their main referent groups. These groups of persons were reported to be the influencing group for health-related action in other

previous studies (19,20). However, in this study, it seemed that the referent group only shared their experience of using non-prescribed antibiotics for self-medication with students. The participants did not seem to be pressured or had motivation to comply with the suggestion of the referent group. Although one student mentioned that doctors would not approve of the practice of self-medication with antibiotics, doctors were not perceived by this group of students as referent persons.

Although, in Cambodia, accessing to non-prescribed antibiotics seems to be easy, the studied pharmacy students were confident that they can self-medication without antibiotics if they wanted to. Their response that there was not pressure from peers was relevant to their response about controllability in that it was entirely up to them whether to use non-prescribed antibiotics or not. They agreed that inappropriate use of antibiotics increased the chance of antibiotic resistance, and it was better to ask a physician or pharmacist for antibiotics when needed (21).

We acknowledge some limitations in this study. First, most qualitative studies recruit participants who were key informants or information rich cases. However, participants in this study were not selected by the researchers. They were self-selected and met the inclusion criteria of the study. However, it can be confident to say that the participants were information rich cases as during the interviews, they were able to provide fruitful and detailed information. Second, the findings from qualitative study like this one may not be generalized to Cambodian pharmacy students as a whole. Third, other factors in addition to attitude, subjective norm and perceived behavior control in relation to self-medication were not discovered in this study as the TPB was used as a conceptual framework for designing interview questions. The other limitation was that it is not possible to assess whether information bias due to social desirability existed. However, the findings on pharmacy students having both positive and

negative attitude toward self-medication with antibiotics and that some of them having no confidence in controlling themselves not to self-medication with antibiotics suggested that the responses or the findings of this study should be trustworthy.

Despite some limitations, the findings suggested an opportunity to employ the TPB for future quantitative study on the issue. The hypothesis generated from this study was that, in Cambodian pharmacy students, their positive attitude toward using non-prescribed antibiotics for self-medication will lower their intention to self-medication without antibiotics; their subjective norm may not significantly affect their intention, and their perceived behavioral control of not using non-prescribed antibiotics will raise their intention in doing so. It is not clear from the findings of this study whether attitude or perceived behavioral control would have a stronger effect on the intention. We suggest conducting a quantitative study to test this proposed hypothesis. It was suggested in the steps of scale development that indicative items for latent construct should be pooled from literatures and themes emerging from the qualitative interview (22). Hence, the findings of this qualitative study can provide information to draft indicative items to measure each component of the TPB regarding to self-medication without antibiotics for the next quantitative study.

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