Original article

Effects of different forms of communication on knowledge, attitudes and practices related to antibiotics smart use by undergraduate students in different faculties

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Objectives To investigate correlations among different forms of communications and the knowledge, attitudes and practices of undergraduate students related to antibiotics smart use.

Methods Correlations of knowledges, attitudes, and practices regarding antibiotics and different forms of communications among third year students of three faculties, Associated Medical Sciences (AMS), Engineering (ENG) and Economics (ECON), were computed using a questionnaire and Spearman's rank correlation coefficient analysis.

Results The highest correct knowledge and practices scores were exhibited by AMS students: 3.17 ± 1.12 ($p < 0.001$) and 4.08 ± 0.67 ($p = 0.001$), respectively. Gender, the only personal factor, was significantly correlated with negative attitudes and practices among Engineering and Economics students. Correct knowledge scores were significantly correlated with the method of communication. Only weak relationships were found with communication from medical practitioners among AMS and Engineering students, r = 0.278 ($p = 0.004$); and r = 0.295 ($p < 0.001$). Correlations were also weak for radio, television, and print media among the Engineering students, r = 0.287, (p = 0.003). A moderate relationship was found with communication from the internet in Engineering students, r=0.311 ($p < 0.001$), health posters or brochures, and family or close friends of the AMS students, r =0.329, ($p = 0.001$), and r = 0.305, ($p = 0.001$), respectively. Other correlations were not statistically significant.

Conclusion Antibiotics Smart Use (ASU) is an innovative model to promote the rational use of medicines, fight against the irrational use of antibiotics, and counteract antimicrobial resistance. The present study revealed that the information regarding antibiotics smart use provided via various forms of communications should be provided to improve the knowledge, attitude, and practice regarding antibiotics smart use among undergraduate students. **Chiang Mai Medical Journal 2021;60(2):135-48. doi 10.12982/CMUMEDJ.2021.12**

Keywords: antibiotics smart use, knowledge, attitudes, practices, communication

Introduction

Antibiotics are drugs that possess antibacterial activities which are used for treating bacterial infections. Irrational use of antibiotics, including inappropriate use, overuse, underuse and misuse, can result in ineffective therapy, increases in bacterial resistance problems, more adverse drug reactions, higher costs of therapy and an increased economic burden on the national health system. There is a positive correlation between antibiotic resistance and the consumption of antibiotics (1). Worldwide, an estimated two-thirds of antibiotic sales occur without a prescription (2). Unneces-

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sary use of antibiotics has been observed among both health professionals and the general public (3). In Thailand, many people at the community level have incorrect knowledge, wrong attitudes, and inappropriate practices regarding antibiotics smart use (4). Socio-demographic characteristics related to antibiotic use include level of knowledge, attitudes, and practices (5). The Antibiotic Smart Use (ASU) program was introduced in Thailand as a model to promote the rational use of medicines and to reduce the risk of antibiotic resistance (6). The most common causes of antibiotic resistance include buying drugs from a drug store without first consulting a doctor, inappropriate prescribing of antibiotic, overuse of antibiotics, overly easy accesses to purchase, and the use of an incorrect antibiotic to treat a disease (7). These problems of antibiotic use are the result of incorrect knowledge regarding consumption of antibiotics (8). Inappropriate use is correlated with various factors including gender, education level, occupation, age, and knowledge regarding antibiotic use. A significant positive correlation between antibiotic use and income has been reported. Additionally, a negative correlation has been demonstrated between the knowledges and practices of antibiotic use (9). However, there have been few studies of the relationship between level of knowledges, attitudes, and practices (KAP) related to antibiotics smart use in young adults, especially undergraduate students, an important group on which to focus efforts to fix the current problem of inappropriate antibiotic use. These individuals need to know about antibiotic smart use including the correct and incorrect aspects of knowledge, attitudes and practices in order to communicate with others as social leaders to help reduce the problem.

Objectives

The present study aimed to survey communication-related factors related to knowledges, attitudes and practices related to antibiotics smart use among undergraduate students in three different academic areas: health sciences, sciences and technology, and social sciences and humanities. The study also aimed to assess the correlation between academic area and appropriate or 'smart' use of antibiotics.

Methods

Study population

The study surveyed antibiotics smart use of undergradate students from three different faculties, AMS, Engineering, and Economics, which are representative of students in the health sciences, sciences and technology, and social sciences and humanities, respectively. Purposive sampling was used to recruit a total of 6,237 students from the three different faculties. The sample size of 361 subjects at 95% confidence level, 5% margin of error and population ratio = 0.5 was calculated using the Krejcie & Morgan equation. One hundred and forty-two AMS, 403 Engineering, and 171 Economics students were recruited using random sampling and probability proportional to group size methods.

Ethical accreditation

The study was approved by the Human Ethics Committee, Faculty of Medicine, Chiang Mai University under the health status and health services of Chiang Mai University students research program, study code: COM-2560-04956. The study was approved by the dean of each faculty. Informed consent was obtained from all participants. The information obtained from this research will be kept confidential. Data were collected during September-November 2017.

Research tools

A self-administered questionnaire for collecting data from each student was distributed via Google Forms. The questionnaire items were internally reviewed for content validity by three experts in the fields of pharmacy, epidemiology and public health. Modifications of questionnaire items was accomplished based on the suggestions of experts who have had experience with public health questionnaires. The questionnaire was pre-tested with 30 eligible medical students at the same undergraduate level. Results of the pre-test

were used to improve the questionnaire until the final version achieved a satisfactory Cronbach's alpha reliability score. The overall Cronbach's alpha for the 20 items was 0.913 with 0.947, 0.880, 0.888 for knowledge, attitude and practices, respectively. The questionnaire consisted of four parts as shown in Table 1. The questionnaire consists of four parts (Table 1). The first part covers personal data, including faculty, gender, living accommodations and allowance as well as history of illness and antibiotic use in the previous 6 months. The second part includes 15 items. The first nine items are statements intended to evaluate the respondent's knowledge regarding antibiotics smart use. The response choices for the nine items are: largely sure, uncertain, largely not sure and not sure. Some of the statements are correct and some are erroneous. For the correct statements, the responses were rated on a 5-point scale: sure = 5, largely sure = 4, uncertain = 3, largely not sure = 2 and not sure = 1. For the incorrect statements, responses were reverse rated, i.e., sure = 1, etc. The final five items evaluate the respondent's sources of information about antibiotics, i.e., the internet, radio, television and print media, as well as personal communication channels, i.e., medical practitioners, family, close friends, and classmates. The third part consists of 15 statements regarding attitudes toward antibiotic use. Some of the statements are correct and some incorrect. For correct statements, the responses were rated on a 5-point scale: agree = 5, largely agree = 4, uncertain = 3, largely disagree = 4, and disagree = 5. As with the first section, each correct item was rated 5, 4, 3, 2, and 1 and each incorrect item was reverse rated, i.e., agree = 1, etc.

The average scores of the groups were then analyzed in three categories: knowledge, attitudes and practices. The categories of antibiotics smart use were adapted from a previous antibiotics study (10). The average scores in each category were classified as poor, moderate, and good antibiotics smart use with a range of < 2.50, 2.51-3.50, and > 3.50, respectively.

Hypotheses

The study had three hypotheses. Firstly, it was anticipated that AMS students (health sciences) would have a higher average knowledge, attitude and practice score for antibiotics smart use than the other two student groups. Secondly, it was expected that personal factors of the students would be related to their knowledges, attitudes and practices related to antibiotic smart use. Thirdly, some forms of communication were anticipated to be significantly correlated with knowledges, attitudes and practices related to antibiotic smart use.

Statistical analysis

The Independent Samples t-Test was used to compare differences in terms of knowledges, attitudes, and practices among the student groups. ANOVA and Tukey multiple comparison analysis were performed to compare knowledges, attitudes and practices among the three groups of students at $p = 0.001$. Spearman's Rank Correlation Coefficient was performed to determine the effect of different communications which affected to knowledges, attitudes and practices.

Results

Students' socio-demographic characteristics and antibiotics use within the last 6 months are presented in Table 2. A total of 716 currently enrolled undergraduate students participated in the study: 142 from AMS, 171 from Economics, and 403 from Engineering. The male:female ratios were 1:2.46, 1:1.89, and 1:0.30 for AMS, Economics, and Engineering, respectively. The majority of the students (74.58%) reported no history of illness or use of antibiotics within the previous 6 months. For the students who had a history of illness, antibiotics use was usually related to flu, pharyngitis, acnes, dental infection, or cystitis.

The average score of correct knowledge in AMS students was significantly higher than the other two groups (3.17 ± 1.12, $p < 0.001$) as was the average correct practice score of the AMS students (4.08 ± 0.67, $p = 0.001$) (data not shown).

Table 1. Questionnaire regarding knowledges, attitudes, and practices regarding antibiotic smart use of students from three faculties of Chiang Mai University

Part I. General sociodemographic data

Please check ✓ the appropriate box or fill the answer in the blank

1. Faculty
   - ☐ Engineering
   - ☐ Associated Medical Sciences
   - ☐ Economics
2. Gender
   - ☐ Male
   - ☐ Female
3. Monthly allowance
   - ☐ 3,000 baht
   - ☐ 3,001-5,000 baht
   - ☐ 5,001-7,000 baht
   - ☐ 7,001-9,000 baht
   - ☐ > 9,000 baht
4. Accommodations
   - ☐ Private dormitory
   - ☐ University dormitory
   - ☐ Apartment/Condominium
   - ☐ Home
5. History of using antibiotics in the past 6 months
   - ☐ Yes
   - ☐ No
6. Reason for antibiotic use (symptom or disease)
   - ☐ ……..

Part II. Knowledge regarding antibiotic smart use

Please check ✓ the appropriate circle

Antibiotic use	Sure	Largely sure	Uncer-tain	Largely not sure	Not sure
1. Some infectious diseases such as tonsillitis, abscess, diarrhea, gingivitis or toothache are curable with antibiotics.	☐	☐	☐	☐	☐
2. Antibiotics can reduce fever.	☐	☐	☐	☐	☐
3. Antibiotics can reduce pains or aches.	☐	☐	☐	☐	☐
4. Antibiotics can be used to treat the flu or sore throat caused by a virus.	☐	☐	☐	☐	☐
5. If antibiotics are used inappropriately or discontinued before completing the dose, it can lead to drug resistance.	☐	☐	☐	☐	☐
6. Inappropriate use of antibiotics can lead to complications.	☐	☐	☐	☐	☐
7. The symbol “EXP. 01/01/2012” on a label means the drug was produced on 1 January 2012.	☐	☐	☐	☐	☐
8. If a rash, facial or mouth swelling or angina pectoris appear after taking antibiotics, you should stop taking the antibiotic and consult your doctor.	☐	☐	☐	☐	☐
9. Taking penicillin can cause beta lactam resistance.	☐	☐	☐	☐	☐
10. You obtained your knowledge about antibiotic use from the internet.	☐	☐	☐	☐	☐

Antibiotic use	Sure	Largely sure	Uncer-tain	Largely not sure	Not sure
11. You obtained your knowledge about antibiotic use from communication with a medical practitioner.	☐	☐	☐	☐	☐
12. You obtained your knowledge about antibiotic use from radio, television, or print media.	☐	☐	☐	☐	☐
13. You obtained your knowledge about antibiotic use in the classroom.	☐	☐	☐	☐	☐
14. You obtained your knowledge about antibiotic use from health posters or brochures.	☐	☐	☐	☐	☐
15. You obtained your knowledge about antibiotic use from family and close friends	☐	☐	☐	☐	☐

Part III. Attitudes regarding antibiotic smart use
Please ✓ the appropriate circle

Antibiotic use	Agree	Largely agree	Uncer-tain	Largely disagree	Disagree
1. Expensive antibiotics are more effective than cheap antibiotics.	☐	☐	☐	☐	☐
2. Antibiotics are anti-inflammatory drugs.	☐	☐	☐	☐	☐
3. Antibiotics are safe. No one has died from taking antibiotics.	☐	☐	☐	☐	☐
4. If you suffer with fever, you should take antibiotics.	☐	☐	☐	☐	☐
5. When you feel sick, antibiotics should be taken.	☐	☐	☐	☐	☐
6. Antibiotics kill all microorganisms including viruses and bacteria.	☐	☐	☐	☐	☐
7. You believe that diseases can be cured spontaneously, even without antibiotics.	☐	☐	☐	☐	☐
8. Remaining antibiotics can be used or shared with other people to treat similar symptoms.	☐	☐	☐	☐	☐
9. You should have a doctor's prescription before buying antibiotics from a drug store.	☐	☐	☐	☐	☐
10. You can buy antibiotics online without a doctor's prescription.	☐	☐	☐	☐	☐
11. You can obtain antibiotics from close friends without consulting a doctor.	☐	☐	☐	☐	☐
12. If you suffer from a sore throat or excess sputum, you should take antibiotics to kill bacteria.	☐	☐	☐	☐	☐
13. The common cold is naturally curable without taking antibiotics.	☐	☐	☐	☐	☐
14. If you suffer from food poisoning, you should take antibiotics.	☐	☐	☐	☐	☐
15. Cheap antibiotics can easily result in antibiotic resistance which can lead to the more difficult treatment.	☐	☐	☐	☐	☐

Part IV. Practices regarding antibiotic smart use
Please ✓ the appropriate circle

Antibiotic use	Always	Usually	Some-times	Occa-sionally	Rarely
1. You regularly take the complete dose of antibiotics as prescribed by the doctor.	☐	☐	☐	☐	☐
2. You obtain leftover antibiotics from close friends who have had similar symptoms.	☐	☐	☐	☐	☐
3. You stop taking antibiotics if your symptoms improve after 1-2 days.	☐	☐	☐	☐	☐
4. You start taking antibiotics immediately if you suffer from a common cold, fever, cough or runny nose.	☐	☐	☐	☐	☐
5. You take antibiotics when you suffer from a sore throat.	☐	☐	☐	☐	☐
6. If you have diarrhea less than 3 times a day, you can take an oral rehydration solution (ORS) and have a light meal without taking antibiotics.	☐	☐	☐	☐	☐
7. You take antibiotics when you have nausea, vomiting or a stomachache due to food poisoning.	☐	☐	☐	☐	☐
8. When you suffer from a wound, you always take antibiotics to prevent infection.	☐	☐	☐	☐	☐
9. You always check the expiration date before taking antibiotics.	☐	☐	☐	☐	☐
10. You keep any remaining antibiotics for use next time you have the same symptoms.	☐	☐	☐	☐	☐
11. If the symptoms don't improve after your doctor has prescribed antibiotics, you will go to another doctor to get different antibiotics.	☐	☐	☐	☐	☐
12. You request the doctor to prescribe antibiotics even if the doctor has informed you that it is not needed for your condition.	☐	☐	☐	☐	☐
13. You keep antibiotics away from sunlight, heat, and humidity.	☐	☐	☐	☐	☐
14. If you have an itchy rash or urticaria after taking antibiotics, you will stop taking the drug and see your doctor again.	☐	☐	☐	☐	☐
15. Before taking antibiotics, you read the label carefully to confirm that it can treat your disease or symptoms and to be sure how to take it.	☐	☐	☐	☐	☐
16. You crush an antibiotic pill or tablet or sprinkle the powder from a capsule onto a wound to cure it faster.	☐	☐	☐	☐	☐
17. You increase the dose of antibiotics on your own if you feel the illness has become worse.	☐	☐	☐	☐	☐
18. You buy a new type of antibiotic if your condition doesn't get better after taking the drug prescribed by a doctor.	☐	☐	☐	☐	☐
19. If you forget to take your antibiotics when scheduled, you take the drug as soon as you remember it and take another pill at the next meal.	☐	☐	☐	☐	☐
20. If you were prescribed to take antibiotics "before meals", you take the drug 30 minutes to 1 hour before a meal.	☐	☐	☐	☐	☐

Table 2. Socio-economic characteristics of participating undergraduate students

Socio-economic data	AMS	Engineering	Economics
N (100%)	142 (100)	403 (100)	171 (100)
Gender			
Male	41 (28.87)	309 (76.67)	59 (34.50)
Female	101 (71.13)	94 (23.33)	112 (65.50)
Year of birth			
Before 1995	2 (1.41)	24 (5.96)	10 (5.85)
1995-1999	131 (92.25)	365 (90.57)	150 (87.72)
After 1999	9 (6.34)	14 (3.47)	11 (6.43)
Average allowance (baht/month)			
< 4,000	16 (11.27)	29 (7.20)	10 (5.85)
4,001-6,000	57 (40.14)	182 (45.16)	44 (25.73)
6,001-8,000	44 (30.99)	142 (35.24)	90 (52.63)
> 8,000	25 (17.61)	50 (12.41)	27 (15.79)
Accommodations			
CMU dormitory	70 (49.30)	44 (10.92)	29 (16.96)
Private dormitory	47 (33.10)	232 (57.57)	70 (40.94)
Apartment/condominium	10 (7.04)	49 (12.16)	28 (16.37)
Home	15 (10.56)	78 (19.35)	44 (25.73)
A history of illness including use of antibiotics in the past 6 months			
Yes	38 (26.76)	89 (22.08)	55 (32.16)
No	104 (73.24)	314 (77.92)	116 (67.84)

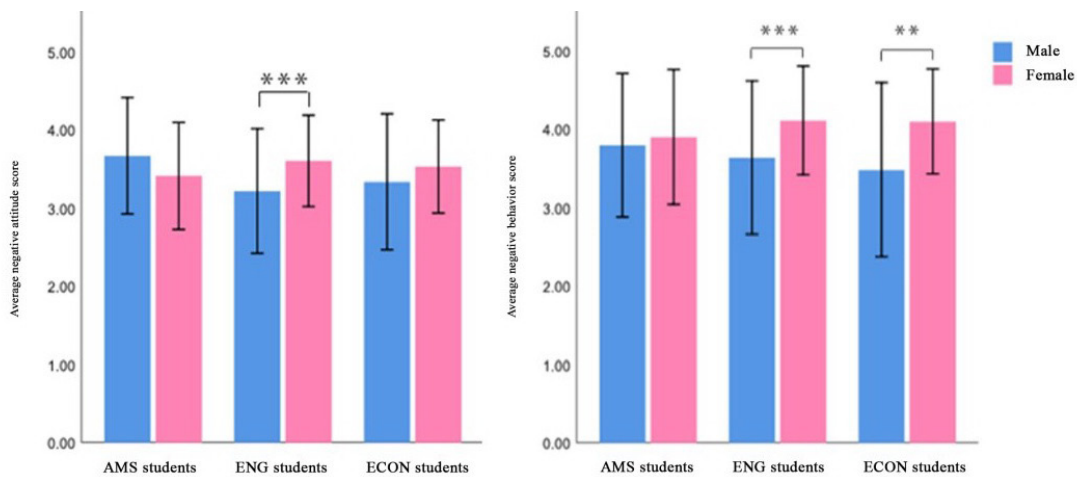

Figure 1. Average incorrect attitude and practices scores of male and female students by faculty (Error bars: ± 1 SE)
$^{**}p < 0.001$; $^{***}p < 0.01$

Gender was the only personal factor associated with incorrect attitudes and practices related to antibiotics smart use (Fig. 1). The average negative attitude score of female Engineering students (3.61 ± 0.59) was significantly higher than the male Engineering students (3.22 ± 0.80) ($p < 0.001$). Similarly, the average incorrect practice scores of female Engineering students were significantly higher than both male Engineering students (4.12 ± 0.70 and 3.64 ± 0.98, $p < 0.001$)

and male Economics students (4.11 ± 0.67 and 3.49 ± 1.11, p = 0.002). There were no significant differences in other personal factors related to knowledges, attitudes and practices of antibiotics smart use among the groups. However, the attitude and practice scores of female Engineering students were significantly different from those of both male Engineering and male Economics students although the ratio of male to female Engineering students was different from the ratios for Economics and AMS students.

The correlations between the different communication via internet, medical practitioners, radio and television, print media, classrooms, health posters or brochures, and family and close friends and antibiotics smart use were analyzed (Table 3). Knowledges acquisition via medical practitioners was significantly correlated with the average knowledges score in the AMS and Engineering student groups. As shown in Fig. 2a, the correlation coefficient for AMS students was r = 0.278 (p = 0.004) and for Engineering students was r = 0.295 (p <0.001). There was a statistically significant positive correlation between communication via radio and television, or print media with knowledges in the ENG students (Fig. 2b) with r = 0.287 (p = 0.003). The results evidenced only weak relationships of knowledges with these communication forms the three student groups.

A moderate relationship between communication via health posters or brochures (Fig. 2c) as well as via family or close friends (Fig. 2d) with correct knowledge was found in AMS students, r =0.329 (p = 0.001) and r = 0.305 (p = 0.001), respectively. Conversely, communication via radio and television, or print media as well as via family or close friends (Fig. 3), there were the statistically significant negative correlations with incorrect

Table 3. Correlation of different forms of communication and knowledges, attitudes, and practices related to antibiotic smart use

Source of information	Knowledges		Attitudes		Practices	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
AMS students						
- Internet	**0.247***	-0.024	0.122	0.047	-0.015	-0.135
- Medical practitioner	**0.278***	-0.100	0.033	0.008	0.033	-0.086
- Radio and television or print media	**0.312****	-0.269**	-0.036	-0.067	0.098	-0.147
- Classroom	**0.272***	0.074	-0.016	0.117	0.070	0.127
- Health poster or brochure	**0.329****	-0.181	-0.115	-0.067	0.002	-0.097
- Family or close friends	**0.305****	-0.109	-0.124	-0.031	-0.035	0.057
ENG students						
- Internet	**0.311****	-0.091	0.160	-0.030	**0.311****	-0.058
- Medical practitioner	**0.295****	-0.100	**0.222****	0.007	**0.344****	-0.018
- Radio and television or print media	**0.287****	-0.380**	0.106	-0.292**	0.174*	-0.287**
- Classroom	**0.214****	-0.237**	0.148	-0.135	**0.224****	-0.150
- Health poster or brochure	**0.202***	-0.259**	0.122	-0.230**	0.137	-0.246**
- Family or close friends	**0.242****	-0.274**	0.086	-0.124	0.194*	-0.053
ECO students						
- Internet	0.082	-0.024	0.060	0.053	**0.212**	0.136
- Medical practitioner	0.068	-0.070	0.116	0.115	0.143	0.089
- Radio and television or print media	**0.280***	-0.187	0.065	-0.125	0.181	-0.057
- Classroom	0.156	-0.045	0.193	0.117	0.096	-0.092
- Health poster or brochure	0.194	-0.284*	-0.090	-0.192	-0.125	-0.079
- Family or close friends	0.080	-0.287**	-0.019	-0.250*	-0.034	-0.096

$^{*}p \leq 0.01$; $^{**}p \leq 0.001$; bold numbers, r ≥ 0.200

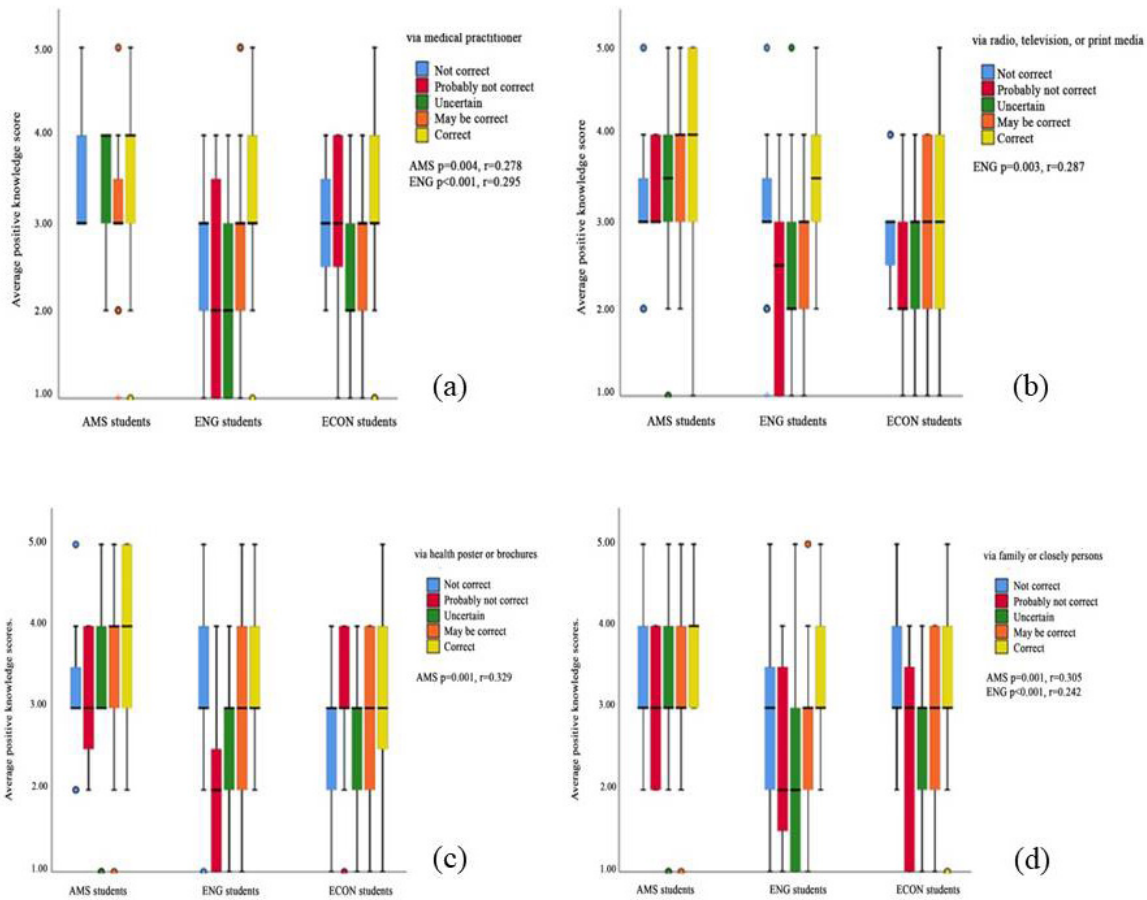

Figure 2. Distribution of source of information by area of study: (a) medical practitioner, (b) radio, television and print media, (c), health posters or brochures, (d) family or close friends and average knowledge scores.

knowledge among Engineering and Economics students: r = -0.269 ($p < 0.001$), and r = -0.287 ($p = 0.001$).

A significant negative correlation between receive of information via radio and television, or print media and correct information regarding antibiotics among Engineering students was demonstrated (r = - 0.292, $p < 0.001$) (Fig. 3c). As shown in Fig. 4, there were moderate correlations between knowledge acquisition via medical practitioners (a) and via the internet (b) with the average correct practice scores of Engineering students (r = 0.344 ($p < 0.001$) and r = 0.311 ($p < 0.001$), respectively).

Among the avenues of knowledge acquisition about antibiotics smart use, there were statistically significant correlations with information received via radio and television, or print media and incorrect practices among Engineering students (r = -0.287, $p < 0.001$) (Fig. 4c).

Discussion

The results of the present study indicate that the average correct knowledge and practice scores of AMS students, representing health sciences students, were significantly higher than the scores of the other two groups, i.e., students in sciences and technology those in the social sciences and humanities. A study in 2015 indicated that the incidence of correct antibiotic use practices of health sciences students at Khon Kaen University were significantly higher than that of non-health sciences students (11). This finding is similar to a study by Ying Huang et al. (12)

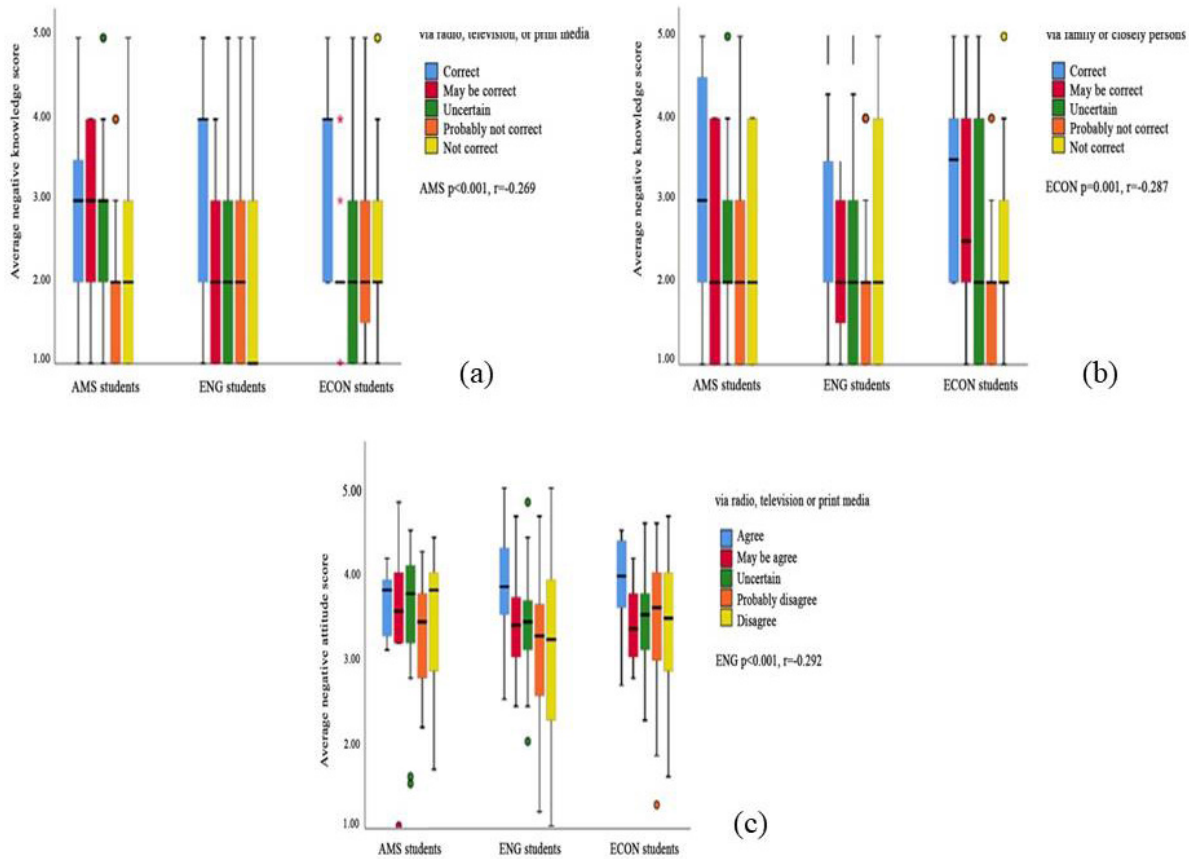

Figure 3. Distribution source of information by channel of communication (a) radio, television, or print media, (b) family or close friends, (c) radio, television or print media

regarding knowledges, attitudes and practices of antibiotic use of 2,500 undergraduate university students in China. In that study, medical students displayed more correct knowledges and attitudes regarding antibiotic use than non-medical students. This suggests that antibiotic smart use should be promoted among non-health sciences students, e.g. Engineering and Economic students, to improve their acquisition of correct knowledges and practices of antibiotics smart use. The present study of the correlation of personal factors on knowledges, attitudes and practices regarding antibiotics smart use revealed that only gender was associated with inaccurate attitudes and practices among Engineering and Economics students.

There were significant correlations between incorrect knowledges, attitudes, and practices of students related to antibiotics and gender, age, education, occupation and monthly income. There was also a positive correlation between knowledges and attitudes towards antibiotics smart use ($p < 0.001$). The student groups which had higher average knowledge scores were more likely to have appropriate attitudes regarding antibiotics use. Likewise, there was also a positive correlation between knowledges and practices regarding antibiotics smart use ($p < 0.001$). The student groups which had higher average knowledge scores were more likely to have better antibiotics smart use practices. There was also a moderate positive correlation between attitude and practice scores and antibiotics smart use ($p < 0.001$). The student groups which had higher attitude scores were more likely to have better practices.

A report of a study of pharmacies in Pathumthani Province (13) revealed that gender, marital status, religion, education, income, and the acqui-

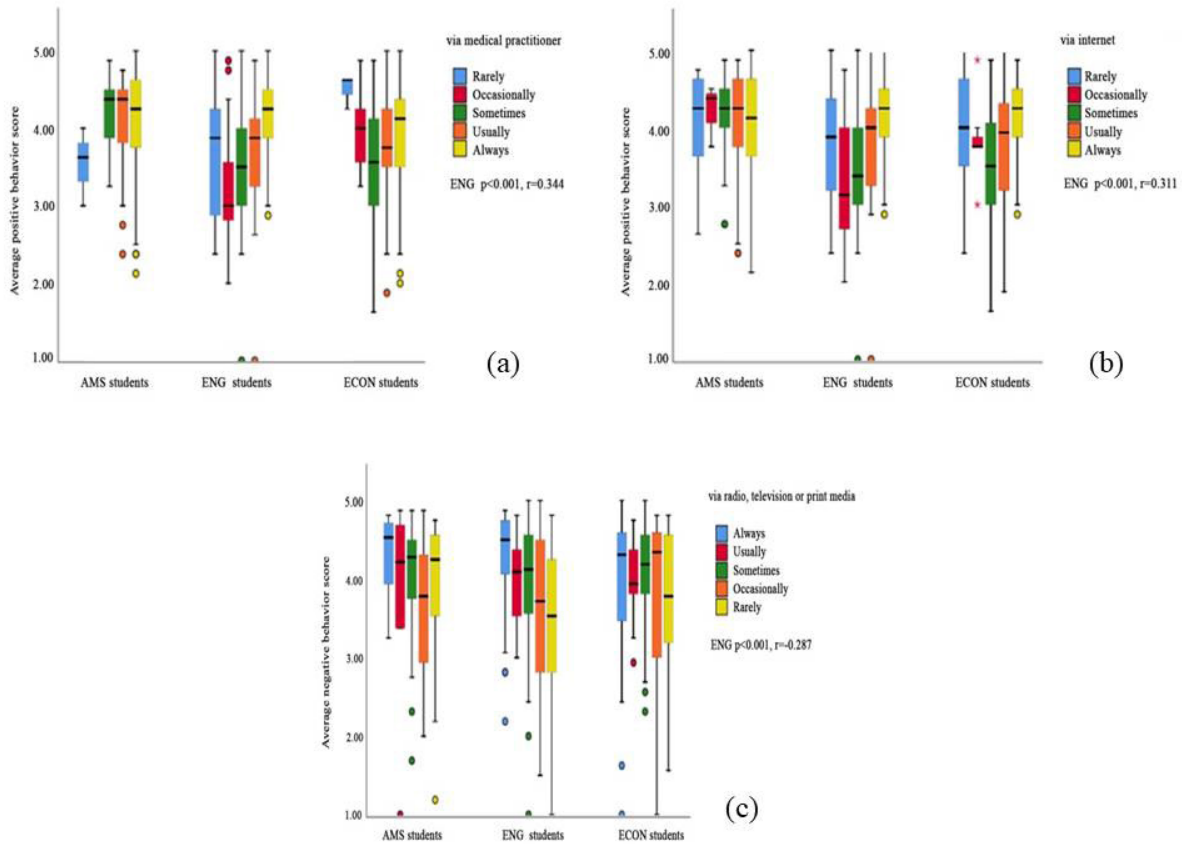

Figure 4. Distribution source of information by channel of communication (a) medical practitioner, (b) internet, (c) radio, television or print media showing average correct and incorrect practices scores.

sition of advice regarding drugs were factors affecting knowledges and practices related to antibiotic use. It can be assumed that these factors also apply to the undergraduate student population in our study as well. This study also demonstrated the correlation between the different communication forms towards knowledges, attitudes, and practices related to antibiotics smart use. Some information from various media about antibiotic use may be incorrect, misunderstood or unclear, resulting in incorrect knowledges, attitudes and practices. The promotion of accurate, clear and easily understandable information regarding antibiotics smart use could decrease the inaccurate knowledges, attitudes and practices of undergraduate students and thus result in an increase in antibiotics smart use. Similarly, the content of posters and brochures should be easily understandable, clear, accurate and interesting. Making the data on a poster or brochure attractive is also very important.

Information provided by various media including brochures may not be clear or may be difficult to understand. As is the case with acquisition of knowledge from family or close friends, lack of clarity of the presentation of the information, misunderstandings or mistakes may result in poor antibiotics smart use as evidenced by the inaccurate knowledge and attitudes of the Economics students. Poor antibiotics smart use may also be caused by the poor knowledges, attitudes or practices related to antibiotics smart use of family or close friends. Students should be provided with correct information to allow them to alter their misguided attitudes and incorrect practices, a difficult task. Orientation regarding antibiotics smart use should be provided to student groups to help them improve their knowledges, attitudes

and practices. When that has been accomplished, the students with improved understanding of antibiotics smart use would be able to pass on that information to their family and close friends to help them improve their own knowledge, attitudes and practices as well. Based on the results of the present study, it is suggested that a program of health promotion on antibiotics smart use be required for all undergraduate students, especially in the social sciences and humanities students, and the sciences and technology students. The academic events created by student affairs could include the invited speakers who can emphasize the correct application of different antibiotics as well as provide an explanation of the causes of antibiotics resistance. Such clear and easily understood information could be provided via appropriate forms of communications for accessing the correct antibiotic use. Because of the difference in the subject matter of their fields of study, undergraduate students in the health sciences have better knowledges, attitudes, and practices regarding antibiotic smart use than the other two groups. The level of knowledges, attitudes and practices related to antibiotics smart use should be determined, e.g., using questionnaires, to identify appropriate topics for specific groups. Examples of incorrect practices found in this study include not observing the drug expiration date, not leaving a sufficient time interval between eating and taking antibiotics, not consuming the complete antibiotic dose, and using antibiotics without appropriate indications as well as other inappropriate of antibiotics practices described in a study of Nakorn Pathom province (14). In the present study, the majority of the students (593 or 82.82%) had accurate knowledges regarding the use of antibiotics for treating bacterial infections. Conversely, 298 (51.92%) of the non-health sciences students incorrectly believed that antibiotics are an effective treatment for viral infections. They also evidenced misconceptions, inaccuracies and inadequate knowledges of antibiotics (data not shown). A study in Jordan by Shehadeh et al. (10) found that 67.1% of the respondents in their study believed incorrectly that antibiotics can treat a common cold, cough, and any inflammation. Several reports have found some survey respondents incorrectly believed that antibiotics can be used as an antiviral (15-18). According to a study by Morgan (7), one factor in the inappropriate use of antibiotics is that many antibiotics can be sold without prescription or professional consultation. The question that arose from our results was set regarding that which forms of communication for providing antibiotics smart use could improve the knowledges, attitudes, and practices of these undergraduate students.

Conclusions

Undergraduate AMS students, representing the health sciences, exhibited significantly more correct knowledges and practices related to antibiotics smart use than undergraduate students in other fields. To improve antibiotics smart use, information about antibiotics should be clear, accurate and easy to understand whether provided via radio and television, print media (including posters and brochures), family members or close friends.

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Conflict of interests

None

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รูปแบบการสื่อสารที่แตกต่างต่อความรู้ ทัศนคติ และพฤติกรรมที่เกี่ยวกับการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลของนักศึกษามหาวิทยาลัย

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วัตถุประสงค์ เพื่อวิเคราะห์หาความสัมพันธ์ของรูปแบบการสื่อสารที่แตกต่างต่อความรู้ ทัศนคติ และพฤติกรรมการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลของนักศึกษามหาวิทยาลัย

วิธีการ เป็นการศึกษาความสัมพันธ์ของความรู้ ทัศนคติ และพฤติกรรมกับรูปแบบการสื่อสารที่แตกต่างในนักศึกษาเทคนิคการแพทย์ วิศวกรรมศาสตร์ และเศรษฐศาสตร์ ภายใต้แบบสอบถาม และการวิเคราะห์สัมประสิทธิ์ความสัมพันธ์ของสเปียร์แมน

ผลการศึกษา ความรู้ และพฤติกรรมเชิงบวกในการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลสูงสุดในนักศึกษาเทคนิคการแพทย์ 3.17 ± 1.12 (p <0.001) และ 4.08 ± 0.67 (p = 0.001) ตามลำดับ โดยเรื่องเพศเป็นปัจจัยส่วนบุคคลเพียงปัจจัยเดียวที่สัมพันธ์อย่างมีนัยสำคัญต่อทัศนคติ และพฤติกรรมเชิงลบในนักศึกษาวิศวกรรมศาสตร์ และเศรษฐศาสตร์ คะแนนความรู้เชิงบวกพบว่ามีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับวิธีการสื่อสารแบบต่าง ๆ ของการใช้ยาปฏิชีวนะอย่างสมเหตุสมผล พบความสัมพันธ์ระดับอ่อนกับการสื่อสารที่ผ่านบุคลากรทางการแพทย์ (r = 0.278, p = 0.004; และ r = 0.295, p < 0.001) ในนักศึกษาคณะเทคนิคการแพทย์ และวิศวกรรมศาสตร์ และในรูปแบบผ่านวิทยุ โทรทัศน์และสื่อสิ่งพิมพ์ในนักศึกษาวิศวกรรมศาสตร์ (r = 0.287, p = 0.003) พบความสัมพันธ์ระดับกลางในรูปแบบการสื่อสารผ่านอินเตอร์เน็ต สัมพันธ์อย่างมีนัยสำคัญกับคะแนนพฤติกรรมเชิงบวกในนักศึกษาวิศวกรรมศาสตร์ (r = 0.311, p < 0.001) รูปแบบโปสเตอร์หรือแผ่นพับสุขภาพ และผ่านครอบครัวหรือเพื่อนสนิทอย่างมีนัยสำคัญพบในนักศึกษาเทคนิคการแพทย์ (r =0.329, p = 0.001 และ r = 0.305, p = 0.001) ส่วนความสัมพันธ์กับการสื่อสารรูปแบบอื่นๆ ไม่พบว่ามีนัยสำคัญทางสถิติ

สรุป ในการศึกษาครั้งนี้พบว่าข้อมูลเกี่ยวกับการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลผ่านการสื่อสารรูปแบบต่าง ๆ ควรจัดให้มีรูปแบบการสื่อสารเพื่อพัฒนาความรู้ ทัศนคติ และพฤติกรรมของการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลในนักศึกษามหาวิทยาลัยระดับปริญญาตรี **เชียงใหม่เวชสาร 2564;60(2):135-48. doi 10.12982/CMUMEDJ.2021.12**

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