Original Research Article

Students' knowledge, perceptions and practice towards direct-to-consumer advertising of pharmaceuticals in Malaysia

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Abstract

Direct-to-consumer advertising (DTCA) of pharmaceuticals is increasingly popular and has both benefits and harm. We examined the knowledge, perception and practice (KAP) of Malaysian students. In this cross-sectional study, 200 questionnaires were returned. 31% of students had good; 59.5% had fair, and 9.5% had poor knowledge, on the types of drugs and information permitted for DTCA. Health-related programme students scored higher. Internet was the most influential media. Age, gender, the programme students were enrolled in, year of study, and having a family member who was a healthcare worker were significant predictors of KAP (p<0.05). A significant, positive association between knowledge on drugs that can be advertised and the practice of requesting for these drugs at the general practitioners' clinics were observed (p=0.045). Many preferred advertised drugs over non-advertised, and although the former costed more, they indicated that the quality of advertised drugs is no better than those prescribed by the doctors. Respondents believed that advertisements were educational although these advertisements provided insufficient information on adverse effects. Ease of use and medication costs were the main information looked for in advertisements. Two-thirds of the sampled students believed that these advertisements do not harm the doctor-patient relationship; 62% would have first consulted a doctor and if he or she refused to prescribe, they would not seek the prescription from another doctor. In conclusion, students represent a population of end-users of DTCA whose practices are heavily influenced by information available through DTCA. Accurate, responsible, and lawful advertising should be enforced by the authorities.

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1.0   Introduction

Although promotion on pharmaceuticals (defined as any kind of drug used for medicinal purposes) may be viewed simply as a means of transmitting information on the drugs, it has been identified as a promising factor for many multibillion-dollar businesses and generating profits for pharmaceutical companies (1). Direct-to-consumer advertising (DTCA) refers to the marketing and advertising of prescription-only medicines aimed at the public as-opposed to specifically targeting health professionals. Such advertising is currently prohibited in Malaysia. Pharmaceutical promotion is regulated by the Pharmaceutical Association of Malaysia (PhAMA) Code of Pharmaceutical Marketing Practices for Prescription (Ethical) Products (19th edition) 2015 (PhAMA Code). Under this guideline, only medical professionals should receive promotional materials on pharmaceuticals. Pharmaceutical companies are not permitted to legally advertise pharmaceutical products directly to the public. DTCA is documented as legal in two countries: in the USA and in New Zealand (2). The decision to legalize DTCA produced several controversial debates about "fair balance" between benefits and risks posed to the public. Positive exchanges and conversations with physicians were achieved significantly regarding disease-specific DTCA (3). Objectively, there were more true claims and fewer false claims for prescriptions (4). On the other hand, there were concerns relating to the ethicality of drug advertising to "at risk" groups (individuals with poorer health status, lower income groups who were less educated, older and ethnic minorities) and therefore, there is a need for stricter guidelines to ensure that advertising by pharmaceutical companies are done ethically (5).

The Canadians experienced a policy change in 2000 that permitted "reminders" to advocate good advertising. Many heavily-advertised drugs have since been subjected to safety advisories, which served as a stark warning to these companies (6). A few firms adopted DTCA strategies of advertising across several indications; this prompted an increase in self-diagnosis and request for specific drugs by the millions of consumers (7,8). This was compounded by the shift in the promotional platforms from traditional leaflet formats to internet-based DTCA (e-DTCA) (9,10), which served to increase the advertisers' outreach. Indeed, this had posed a novel regulatory challenge to the developing countries (9,11). Although the advertising of medicinal products, skills and service is prohibited under the legislature in most countries including Malaysia, pharmaceutical companies have taken an unequivocal approach of getting to consumers by campaigning about the disease instead (3). This is done with the use of visual aids (12) and advertisements on lifestyle changes to offset the need for drugs (13). These tactics had created an overwhelming call for regulatory bodies to proactively track and monitor DTCA (9,13).

To safeguard public health while allowing for drug marketing, policymakers will need to review the regulations surrounding DTCA (2,11) to make the methods of enforcements as current and as appropriate as possible for the digital age. In addition, individuals, depending on their knowledge and perceptions, possibly have different responses to pharmaceutical advertisements (14,15). To the best of our knowledge, studies surrounding this, particularly among students in tertiary institutions in Malaysia, are lacking. Hence, this study aimed to examine the knowledge, perception and practice of students from a Malaysian public university. The youth, in particular, as budding future professionals and end-users, will greatly impact the overall purchasing trends and power as consumers.

2.0   Materials and methods

2.1   *Study design*

A cross-sectional study was carried out among university students of Universiti

Teknologi MARA (UiTM) at the Puncak Alam Campus located in the state of Selangor, Malaysia. A convenient sampling method was adopted. The study protocol was approved by the Research Ethics Committee, UiTM, reference number: 600-IRMI (5/1/6/17).

2.2   Data Collection and Sampling

A single proportion formula was used to calculate the sample size whereby the required number of respondents calculated was 196. From March to July 2017, two hundred questionnaires were distributed to students enrolled to a variety of courses. Students were enrolled in the Pharmacy, Accountancy, Hotel and Tourism, Business and Management, Education, and Health Sciences programs. Undergraduates aged 18 years and above, Malaysian citizens and full-time students were included in this study. All the students were briefed about the nature and the objectives of the research. Participation in the study was entirely voluntary, and students were assured that their responses would be kept strictly confidential and only used for research purposes with no effect on their academic performance. Written consent was obtained from the participants prior to questionnaire distribution. All two hundred questionnaires distributed were completed and returned.

2.3   Survey instrument: questionnaire

The validated questionnaire originally published by Al-Haddad *et al* (14) in English, was adopted and used in this study (14). Face and content validation were done by a group of senior lecturers from the Department of Pharmacy Practice at the university. The questionnaire had six parts: Part A – demographic profile of students (8 questions), Part B: Domain knowledge: –students' understandings on DTCA of pharmaceuticals (6 questions), Part C: – Domain knowledge: sources of DTCA of pharmaceuticals (9 questions), Part D: Domain perception: students' perceptions on DTCA of pharmaceuticals (18 questions). Part E:

Domain practice: type of information that students are interested in which they use in their day-to-day life (7 questions), Part F: Domain practice – the implications of DTCA on students practice (8 questions). An appendix containing medical jargon or healthcare-related terminologies with definitions and explanations were distributed together with the questionnaires in order to assist respondents of non-health background. The responses were both Likert-scaled and with yes-no-not sure options. A pilot study was done on the questionnaire prior to conduct of the study and a test for reliability resulted in a Cronbach alpha value of 0.71 indicating good, internal consistency between the questionnaire items.

2.4   Data Analysis

All the data obtained from the questionnaire was entered into the SPSS version 23 software package for analysis. Descriptive results were presented as frequencies and percentages. Chi Square and Fischer Exact tests were used to determine the association between the students' demographic profiles and the scores of items under the domains of knowledge, perceptions and practices, and between knowledge on drugs that can be advertised and the practice of requesting for these drugs at the general practitioners' clinic. A p-value of ≤ 0.05 was considered statistically significant.

3.0   Results

A total of 200 questionnaires were completed and returned successfully by the respondents. Table 1 shows the demographic profile of students. A majority (57%) of them were females from the third year of their studies in the health-related programmes (59.5%) and were within the age group "20-25 years" (81%).

Table 2 summarises students' understandings on the DTCA of pharmaceuticals. Out of the 200 students, 62 (31%) had good knowledge (score 5 marks or

more), 119 (59.5%) had fair knowledge (score between 2- 4 marks) and 19 (9.5%) had poor knowledge (score 1 or less) about DTCA of pharmaceuticals. Higher percentage of students (19%) from health-related program scored higher as compared to 12% of students from the non-health-related program. On the other hand, 6% of students from non-health-related program had poor knowledge compared to only 3.5% from the health-related program.

A majority of respondents were aware that companies putting up medical advertisements should seek government approval (64.5%), and that only registered drugs (74.5%), and "over-the-counter products" (67%) are permitted to be advertised. In addition, 35.5% of respondents assumed that only drugs without any side effects are allowed to be advertised to the public whereas 37.5% respondents agreed that direct advertising of prescribed drugs to the public should be allowed. Age, gender, the program students were enrolled in and their year of study, as well as having a family member working within the healthcare system were significant predictors of knowledge, perception and practice (p<0.05).

Students' knowledge on the sources of DTCA of pharmaceuticals is shown in Table 3. Internet and television (collectively 82.5%) had the strongest influence on respondents, especially on those from the central region of the urban areas. Respondents who lived in the urban (44.5%) were more influenced by the internet than those who lived in the rural (38%) while the majority of students from the rural (42.5%) areas were more influenced by television as compared to students from the urban (40.5%) areas. Advertisements done via email and pamphlets showed the lowest influences on our respondents (19.5% and 39.5%, respectively) whereas advertisements in newspapers, post, radio and billboard showed an average influence. Students who were from health-related programs were greatly influenced by advertisements on the internet and information they hear from friends and family members. Television, newspapers and internet, in particular, showed significant influence on female respondents.

Table 4 entails students' perceptions on DTCA of pharmaceuticals. More than half of the respondents neither believed that advertised drugs are better than non-advertised drugs (51%) nor did they believe that the quality of the products depended on the frequency of the advertising activities (59.5%). In addition, more than half of the respondents (55%) believed that advertising increased drug costs and almost half of the respondents (49%) believed that the pharmaceutical advertisements made the drugs look better than what they actually were. Less than half (40%) of the respondents believed that the pharmaceutical advertisements provided reliable information about the advertised products and only 16% agreed that pharmaceutical promotions better informed patients of their medical problem. More than half (58%) of our respondents agreed that advertisements of pharmaceutical drugs do not give enough information about the possible risks and adverse effects of drugs. On a positive note, a majority of them (67.5%) felt that advertisements helped them to be aware of new drugs. Furthermore, 53% believed that pharmaceutical advertisements helped them to have better discussions with their doctor about their health and helped them to make better decisions about their health conditions (44.5%).

Table 5 summarises the type of information that the students were interested in when viewing DTCA of pharmaceuticals. Ease of use and the cost of the medication were the main criteria that the respondents were looking for (97.5% and 90.5% respectively). The respondents were least interested in drug-drug interactions (63.5%).

Table 1: Part A: Demographic profile of respondents

	Demographic Characteristic	Frequencies N	Percentage %
Gender	Male	86	43
	Female	114	57
Age	< 20 years old	29	14.5
	20-25 years old	162	81.0
	> 25 years old	9	4.5
Place of birth	East coast region	49	24.5
	Northern region	43	21.5
	Central Region	48	24.0
	Souther Region	35	17.5
	Sabah and Sarawak	25	12.5
Place of origin	Urban	102	51
	Rural	98	49
Program	Health-related	119	59.5
	Non-health related	81	40.5
Year of study	Year 1	51	22.5
	Year 2	45	22.5
	Year 3	82	41.0
	Year 4	22	11.0
Any family member working in health- related fields?	Yes	90	45
	No	110	55
Scoring	0	9	4.5
	1	10	5.0
	2	22	11.0
	3	45	22.5
	4	52	26.0
	5	47	23.5
	6	15	7.5
Health-related program 1 mark given for every question answered correctly	Poor knowledge	7	3.5
	Fair Knowledge	69	34.5
	Good Knowledge	38	19
Non-health related program 1 mark given for every question answered correctly	Poor knowledge	12	6
	Fair Knowledge	60	30
	Good Knowledge	24	12

Table 2: Part B: Domain knowledge: students' understandings of DTCA of pharmaceuticals.

Questions	Responses			Chi Square test exact p - values					
	n (%)			(p < 0.05)					
	Yes	No	Not sure	Age	Gender	Place of origin	Program	Year of study	Family member working in a healthcare field
Only drugs without any side effects are allowed to be advertised to the public	71 (35.5)	96 (48.0)	33 (16.5)	0.501*	0.001*	0.845*	0.000*	0.000*	0.339*
Medical advertisements should seek government approval only	129 (64.5)	44 (22.0)	27 (13.5)	0.014*	0.644*	0.681*	0.065*	0.289*	0.018*
Only registered drugs are allowed to be advertised	149 (74.5)	34 (17.0)	17 (8.5)	0.004*	0.206*	0.971*	0.018*	0.042*	0.301*
Direct advertising of prescribed drugs to the public is permitted	75 (37.5)	85 (42.5)	40 (20.0)	0.569*	0.504*	0.378*	0.001*	0.048*	0.362*
Direct advertising of over the counter products to the public is permitted	134 (67.0)	27 (13.5)	39 (19.5)	0.001*	0.277*	0.594*	0.001*	0.047*	0.806*
Only safe medicines are allowed to be advertised to the public	133 (66.5)	35 (17.5)	32 (16.0)	0.005*	0.932*	0.537*	0.177*	0.038*	0.234*

* Fischer Exact test

Table 3: Domain knowledge: sources of DTCA of pharmaceuticals (9 questions).

Questions	Responses					Chi-Square test exact *p*-values (p < 0.05)					
	E (n)%	G (n) %	A (n) %	P (n) %	VP (n) %	Age	Gender	Place of origin	Program	Year of study	Family member working in a healthcare field
Advertisement on television	62 (31.0)	103 (51.5)	27 (13.5)	6 (3.0)	2 (1.0)	0.000*	0.235*	0.049*	0.084*	0.002*	0.831*
Advertisement on radio	26 (13.0)	90 (45.0)	62 (32.0)	19 (9.5)	3 (1.5)	0.047*	0.283*	0.916*	0.015*	0.017	0.439*
Advertisement on newspaper	20 (10.0)	66 (33.0)	79 (39.5)	32 (16.0)	3 (1.5)	0.023*	0.001*	0.204*	0.001	0.000	0.496*
Advertisement on internet	77 (38.5)	88 (44.0)	26 (13.0)	8 (4.0)	1 (0.5)	0.003*	0.257*	0.323*	0.406*	0.061*	0.797*
Advertisement on magazine	47 (23.5)	60 (30.0)	58 (29.0)	34 (17.0)	1 (0.5)	0.232*	0.110*	0.759*	0.000	0.317	0.116*
Advertisement on billboard	29 (14.5)	54 (27.0)	62 (31.0)	50 (25.0)	5 (2.5)	0.248*	0.001*	0.396*	0.000	0.000	0.020*
Advertisement on mail	11 (5.5)	28 (14.0)	73 (36.5)	76 (38.0)	12 (6.0)	0.030*	0.132	0.870	0.000	0.006	0.346
Pamphlets/leaflets	20 (10.0)	59 (29.5)	60 (30.0)	56 (28.0)	5 (2.5)	0.683*	0.001*	0.225*	0.000	0.015	0.354*
Friends and family members	51 (25.5)	45 (22.5)	63 (31.5)	37 (18.5)	4 (2.0)	0.713*	0.000*	0.850*	0.0002*	0.000	0.522*

* Fischer Exact Test

Note: E: excellent, G: good, A: average, P: poor, VP; very poor

Table 6 shows the influence of DTCA of pharmaceuticals on the students practice. Around one-fifth of the respondents (21.5%) would recommend the advertised drugs to their friends and family members. In addition, 26.5% of respondents would request for their doctor to prescribe them an advertised drug. A majority (60%) of the respondents did not consult another doctor when the initial doctor consulted did not prescribe an advertised drug that they requested for. In addition, more than half (56%) were unwilling to change the current medication to a more frequently advertised one. A smaller proportion (17.5%) of respondents preferred to buy advertised drugs despite the high price and one-tenth will buy pharmaceutical products on sale regardless of their short expiry date. A higher proportion of respondents who were enrolled in a health-related program and originated from the urban areas and aged 20 to 25 years, with a family member working in a medical-related field disagreed with the statements regarding decisions on drug selections as in Table 6. A significant, positive association between knowledge on drugs that can be advertised and the practice of requesting for these drugs at the general practitioners' clinics were observed (p=0.045).

4.0 Discussion

To the best of our knowledge, this is the first study to sample the youth's knowledge, perception and practice towards drug to consumer advertising of pharmaceuticals in Malaysia.

From our study's findings on the domain of knowledge, it was observed that respondents were aware that drug advertisements should be approved by health authorities although they were not sure as to which types were or were not permitted. Their views were divided with regards to the direct promotion of over-the-counter products and products with side-effects. In a survey done by Yang *et al* (15) in Korea, authors found that only a minimal of 17% of respondents were

familiar with DTCA of prescription drugs. In a study by Naik *et al* (16) on the impact of different media, television and printed media showed the highest influence on students.

These findings are quite consistent with other findings where researchers found that drug promotions on television and internet had strong impact on the number of pharmacy visits for drugs and non-drug visits and on the number of prescription requests by patients (14). Television had strong influences on students from the rural compared to the urban areas. This is in line with findings by Liu and Gupta (17) which showed that DTCA in television has strong influence on underserved segments of the population and remained the most utilized platform for DTCA. Furthermore, a study by Khanfar *et al* (18) evaluated the impact of television advertisement of medication for seasonal allergy of asthma and found that about 90% of respondents had seen a particular advertisement while 12.4% of them communicated with their doctors, asking them about the advertised drug. Sullivan *et al* (12) concluded that DTCA in print and on television with the help of a visual aid helped people recall information effectively compared to when there was no visual aid. There is a significant difference in the mean scores of attitudes about social media among respondents with varying level of education or qualification. As the level of qualification increased, the attitude towards prescription drug advertisement on social media also improved (19).

Results on the domain of perception and practice showed that less than a quarter of the respondents preferred promoted over non-promoted drugs. More than half of the respondents pointed out that the quality of frequently advertised drugs was no better than those prescribed by healthcare providers. A majority of the participants had positive attitudes towards DTCA of pharmaceuticals concerning their role in education and spreading awareness.

Table 4: Part D: Domain perception : students' perceptions on DTCA of pharmaceuticals.

Questions	Responses					Chi-square test exact *p*-values ($p < 0.05$)					
	SD *n* (%)	DA n (%)	N n (%)	A n (%)	SA n (%)	Age	Gender	Place of origin	Program	Year of study	Family member working in a healthcare field
Promoted drugs are better than non-advertised drug	14 (7.0)	88 (44.0)	60 (30.0)	34 (17.0)	4 (2.0)	0.896*	0.003*	0.573*	0.002*	0.032	0.413*
Pharmaceutical advertising encourage patients to decide on their choice of drug without the help of a healthcare professional	16 (8.0)	83 (41.5)	41 (20.5)	54 (27.0)	6 (3.0)	0.229*	0.001*	0.008*	0.000*	0.001	0.694*
Pharmaceutical advertising provide reliable information regarding a particular medicine	11 (5.5)	56 (28.0)	53 (26.5)	76 (38.0)	4 (2.0)	0.109*	0.000*	0.947*	0.000*	0.000	0.164*
Pharmaceutical advertising inform patients of potential side effects	17 (8.5)	59 (29.5)	50 (25.0)	69 (34.5)	5 (2.5)	0.443*	0.000*	0.755*	0.006*	0.001	0.357*
Pharmaceutical promotions better inform patient of their medical problem	10 (5.0)	47 (23.5)	58 (28.0)	72 (36.0)	13 (6.5)	0.139*	0.003*	0.730	0.001	0.136	0.795
The quality of a particular product depends on the frequency of the advertising activities	24 (12.0)	95 (47.5)	49 (24.5)	30 (15.0)	2 (1.0)	0.216*	0.545*	0.554*	0.000*	0.196	0.703*
Pharmaceutical advertising increase drug cost	3 (1.5)	29 (14.5)	58 (29.0)	79 (39.5)	31 (15.5)	0.101*	0.078*	0.404*	0.036*	0.165	0.595*
Advertisements of pharmaceutical drugs help me have better discussions with my doctor about my health	5 (2.5)	30 (15.0)	59 (29.5)	92 (46.0)	14 (7.0)	0.019*	0.638*	0.746*	0.000*	0.026	0.688*
I like pharmaceutical advertisements	7 (3.5)	29 (14.5)	82 (41.0)	69 (34.5)	13 (6.5)	0.049*	0.741*	0.896*	0.069*	0.324	0.941*
Pharmaceutical advertisements help me make better decisions about my health	6 (3.0)	34 (17.0)	71 (35.5)	79 (39.5)	10 (5.0)	0.020*	0.670*	0.521*	0.202*	0.331	0.875*
Pharmaceutical advertisements help make me aware of new drugs	3 (1.5)	23 (11.5)	39 (19.5)	116 (58.0)	19 (9.5)	0.003*	0.290*	0.127*	0.001*	0.000	0.563*

*   Fischer Exact test
Note: SD: strongly disagree, DA: disagree, N: neutral, A: agree, SA: strongly agree

Table 4: Part D: Domain perception: Students' perceptions on DTCA of pharmaceuticals (continued)

Questions	*Responses*					Chi-square test exact p-values ($P < 0.05$)					
	SD n (%)	DA n (%)	N n (%)	A n (%)	SA n (%)	Age	Gender	Place of origin	Program	Year of study	Family member working in a healthcare field
I trust the quality of the frequently advertised drugs more than those prescribed by healthcare professionals	24 (12.0)	81 (40.5)	50 (25.0)	38 (19.0)	7 (3.5)	0.231*	0.000*	0.655*	0.000*	0.082	0.907*
Advertisements of pharmaceutical drugs do not give enough information about the possible risk and negative effects of using a drug	3 (1.5)	22 (11.0)	59 (29.5)	85 (42.5)	31 (15.5)	0.000*	0.629*	0.731*	0.000*	0.181	0.672*
Advertisements of pharmaceutical drugs do not give enough information about the benefit and positive effects of using the drug	7 (3.5)	43 (21.5)	70 (35.0)	65 (32.5)	15 (7.5)	0.009*	0.252*	0.413*	0.331*	0.034	0.352*
Pharmaceutical advertisements make the drugs look better than their reality	5 (2.5)	29 (14.5)	68 (34.0)	77 (38.5)	21 (10.5)	0.044*	0.386*	0.705*	0.000*	0.000	0.268*
I support direct to consumer advertising	4 (2.0)	40 (20.0)	92 (46.0)	57 (28.5)	7 (3.5)	0.717*	0.188*	0.658*	0.031*	0.057	0.813*
I prefer all drugs to be advertised to the public	12 (6.0)	64 (32.0)	68 (34.0)	44 (22.0)	12 (10.5)	0.608*	0.054*	0.221	0.277*	0.013	0.243
I prefer only over the counter drugs to be advertised to the public	2 (1.0)	50 (25.0)	73 (36.5)	58 (28.0)	19 (9.5)	0.077*	0.068*	0.849*	0.000*	0.045	0.605*

*   Fischer Exact Test

Note: SD: strongly disagree, DA: disagree, N: neutral, A: agree, SA: strongly agree

Table 5: Part E: Domain practice: type of information that students are interested in which they use in their day-to-day life

Questions	Responses (n) (%)		Chi Square Test Exact p- value ($p < 0.05$)					
	Yes	No	Age	Gender	Place of origin	Program	Year of study	Family member working in a healthcare field
Ease of use	195 (97.5)	5 (2.5)	1.000*	0.393*	0.205*	0.160*	0.439*	0.659*
Side effects	164 (82.0)	36 (18.0)	0.001	0.583*	0.713*	0.195*	0.000*	0.096*
Drug–drug interactions	127 (63.5)	73 (36.5)	0.873*	0.658*	0.660*	0.026*	0.420*	0.240*
Cost	181 (90.5)	19 (9.5)	0.524*	0.467*	0.812*	0.048*	0.234*	0.814*
Drug indication	167 (83.5)	33 (16.5)	0.051*	0.083*	0.450*	0.000*	0.011*	0.340*
Cases that the advertised medication is used to treat	158 (79.0)	42 (21.0)	0.203	0.114*	0.229*	0.163*	0.015*	0.384*
Innovation product	136 (68.0)	64 (32.0)	0.170*	1.000*	0.225*	0.644*	0.801*	0.287*

*   Fischer Exact Test

Table 6: Part F: Domain Practice: Influence of DTCA of pharmaceuticals on students' practice.

Questions	Responses					Chi-Square test exact p-values					
	SD (n)%	DA (n) %	N (n) %	A (n) %	SA (n) %	Age	Gender	Place of origin	Program	Year of study	Family member working in a healthcare field
I will ask my doctor to prescribe me an advertised medicine	9 (4.5)	82 (41.0)	56 (28.0)	42 (21.0)	11 (5.5)	0.345*	0.000*	0.379	<0.001	<0.001	0.089
I will consult another doctor if he/she does not prescribe me an advertised drug that I requested	18 (9.0)	102 (51.0)	45 (22.5)	27 (13.5)	8 (4.0)	0.532*	0.103*	0.386	0.087	0.076	0.403
I will change my doctor to another if he/she does not prescribe me an advertised drug that I requested	13 (6.5)	111 (55.5)	55 (27.5)	19 (9.5)	2 (1.0)	0.233*	0.740*	0.106	0.690	0.657	0.761
I prefer to buy advertised drugs despite their price	22 (11.0)	87 (43.5)	56 (28.0)	29 (14.5)	6 (3.0)	0.252*	0.629*	0.459	0.292	0.111	0.665
I will change my current medication to a more frequently advertised medicine	17 (8.5)	95 (47.5)	60 (30.0)	26 (13.0)	2 (1.0)	0.071*	0.206*	0.604	0.361	0.083	0.585
I will buy pharmaceutical products on sale regardless their expiration date	56 (28.0)	82 (41.0)	41 (20.5)	18 (9.0)	3 (1.5)	0.094*	0.112*	0.403	<0.001	0.162	0.978
I would buy an advertised drug without referring to my doctor	36 (11.0)	88 (44.0)	46 (23.0)	27 (13.5)	3 (1.5)	0.280*	0.344*	0.429	0.215	0.083	0.507
I would recommend advertised drugs to my friends and family members	19 (9.5)	68 (34.0)	70(35.0)	39 (19.5)	4 (2.0)	0.462*	0.440*	0.651	0.036	0.033	0.531

* Fischer Exact test

Note: SD: strongly disagree, DA: disagree, N: neutral, A: agree, SA: strongly agree

Suh *et al* (20) surveyed 350 patients in South Korea and found that the respondents had positive attitudes towards DTCA. Patients mentioned that drug advertisements are essential, and that they had the intention to use those information (20). Similar results were reported by Harrington *et al.* (2012) where assessment of the attitudes of 243 pharmacy students toward DTCA showed that the participants agreed with the statement that DTCA assisted patients to take more active roles in treatment options (21). Becker *et al* (8) found that drug advertisements increased the awareness about antipsychiatric drugs among patients with depression.

DTCA of pharmaceuticals can potentially harm the doctor-patient relationship in many aspects. Pharmaceutical advertisements do not always inform patients about the possible risks of the advertised products as objectively as they advertise about their benefits (22); this may mislead the patients. In our study, almost a quarter of the investigated sample in this study indicated that they would request from their doctor a drug that they had come across. A study showed that promotions about antidepressants resulted in requests for a new drug or a change in medication (23). Another study indicated that seniors requesting for a prescription as a result of drug promotions may complicate the relationship between the doctors and their patients (24). On the contrary, many physicians stated that patients requesting for drugs they had seen on advertisements had a positive influence on the doctor-patient relationship (23). Another study found that patients who requested specific drug brands were only 3.5% (14).

5.0 Conclusion

In conclusion, students' knowledge on pharmaceuticals advertised influenced their perceptions and practice of medication use. Students were generally aware of the types of drugs authorized to be advertised. Those who lived in the rural areas, believed that advertisements, particularly on television and on the internet helped them to be aware of new drugs and to have better discussions with their doctor and to make better decisions about their health conditions despite insufficient information provided relating to the risks and adverse effects of drugs. Ease of use and the cost of the medication were the main criteria that the respondents were looking for in an advertisement. Students represent a population of end-users of DTCA. As their knowledge and perception and practice are heavily influenced by information available through DTCA, accurate, responsible, and lawful advertising should be advocated by the relevant parties. The enforcement of the regulations is imperative in order to protect public interest.

Conflict of interest

The authors declared that there were no conflict of interest.

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