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DENGUE FEVER-RELATED KNOWLEDGE, ATTITUDES AND PRACTICES OF UNIVERSITY PHARMACY STUDENTS

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ABSTRACT

Background: *Dengue fever, a global disease that was first discovered in the 1950s, occurs in urban poor areas, suburbs and countryside's, especially in tropical countries, such as Vietnam. Given this prevalence, a necessary requirement is to analyse the knowledge, attitudes and practices related to dengue control in the country.*

Methods: *This cross-sectional study administered a survey to 242 students from the Faculty of Pharmacy at Lac Hong University from June to October 2017. Data were analysed using the Statistical Package for the Social Sciences (version 20.0) and Microsoft Excel (version 2010).*

Results: *Amongst the participating students, 149 were female (61.6%), and 93 were male (38.4%). The average scores of the students in the knowledge, attitude and practice sections of the questionnaire were 13.79, 10.36 and 6.49, respectively. The proportions of students who exhibited correct dengue fever-related knowledge, attitudes and practices were 27.7%, 53.3% and 60.7%, respectively.*

Conclusion: *A correlation amongst knowledge, attitudes and practices regarding dengue fever prevention was found in the pharmacy students. This result highlights the need to improve the understanding and perceptions of such learners with respect to the propagation of information on the disease and its prevention. Such programs would benefit the practices implemented at the academic community level.*

Keywords: *Attitude, Dengue, Knowledge, Practice, Pharmacy, Student, Vietnam.*

INTRODUCTION

Dengue fever (DF) is an infectious disease caused by a virus transmitted through mosquito bite and can worsen into an epidemic. A 2016 report released by the US Centres for Disease Control and Prevention (CDC) showed that every year, people suffering from DF amount to more than 400 million,[1] amongst whom 5% are life-threatening cases.[2] Dengue occurs mainly in poor residential areas, suburbs and rural regions[3] - at-risk localities where 40% of the world's population lives.[4,5] In Vietnam over the period 2007 to 2016, dengue occurrence was concentrated in the southern provinces, with these areas having about 90,844 cases of dengue per year.[6] Incidence increases from June to September, during which the long rainy season, combined with high temperatures, creates favourable conditions for mosquitoes to grow.[6] These problems have cost Vietnam up to US$94.87 million in annual health care expenses for dengue.[6]

The prevention of dengue viral infections hinges critically on the knowledge, attitudes and practices (KAPs) of the general population.[7,8] A study in Malaysia found that the dearth of understanding as regards dengue transmission and its prevention can increase the chances of DF proliferation.[9] Other studies indicated that preventive knowledge regarding DF should be expanded to control dengue outbreaks[10] and that the health service-seeking behaviours of patients should be investigated.[11] The effective treatment of the illness depends largely on appropriate and early diagnosis and medical care by experienced clinicians as these prevent complications and reduce fatality rates[3] from 20% to 1% or less. In light of these benefits, raising awareness regarding dengue prevention amongst people, especially the youth, is essential to minimising disease incidence and medical burdens borne by society. Notwithstanding the important role of awareness in preventing dengue, however, studies have shown that people have somewhat insufficiently developed KAPs. For example, Harapan et al.'s cross-sectional study on 609 individuals in Indonesia showed that 45% of the participants had good knowledge of dengue, but only 32% exhibited positive attitudes and practices for its prevention.[12] In research conducted on 191 junior high school students from Tien Giang, a province of southern Vietnam, Nhi found a statistically significant difference in dengue prevention-related KAPs before and after the implementation of communication initiatives featuring the disease.[13]

When it comes to awareness amongst the youth, a thorough inquiry into the knowledge of pharmacy students is imperative because they will assume important health care roles in the future. Given that health workers are the professionals who are most frequently in direct contact with dengue patients, their expertise and practice considerably affect all treatment, prevention and information dissemination programmes revolving around the disease. In consideration of these issues, we probed into the dengue related KAPs of pharmaceutical students of Lac Hong University in Dong Nai, Vietnam. The university is a medical human resource training school that produces trained pharmacists for local and national health work. The assessment of students' attitudes and practices is important in supplementing knowledge on the reasonable and timely prevention of dengue.

MATERIALS AND METHODS

Study population

As previously stated, this cross-sectional study was conducted from June to October 2017 to explore the dengue-associated KAPs of full-time and fifth-year students enrolled in the pharmacy programme of Lac Hong University. Trained data collectors were given a pre-designed questionnaire that was intended to help them ensure that the participants were students of the university.

The sample to be taken from the total population (about 600 university students) was determined using a single population ratio formula based on the following assumptions: The percentage of students with knowledge about dengue is 50%, the confidence interval is 95% and the error rate is 5%. The sample size calculated as suitable for this work was 234.[14]

Sampling and recruitment

Prospective participants were chosen via random sampling, and the eligibility criteria for inclusion in the research were as follows: a willingness to participate, survey completion, fluency in Vietnamese and the

ability to complete the questionnaire in 10 to 15 minutes. The survey was administered to 308 students, and after the elimination of invalid questionnaires, we ended up with a final sample of 242.

Instrument

The questionnaire consists of four sections. Section 1 revolves around demographic characteristics, including gender, year level, residence, monthly income and basic knowledge about dengue. Section 2 centres on knowledge about dengue, including familiarity with disease prevention, transmission and symptoms. Section 3 concerns attitude-related items, which are rated on a Likert scale ranging from 1 ('completely disagree') to 5 ('completely agree'), and Section 4 focuses on practical measures for preventing DF.

Data analysis and scoring

The instrument was developed on the basis of the questionnaire put forward by Dhimal et al.,[8] and its reliability was assessed using Cronbach's alpha. Data were statistically and descriptively (frequency, percentage, average, median, p-value, Mann–Whitney and Kruskal–Wallis testing) analysed using the Statistical Package for the Social Sciences 20.0 and Microsoft Excel 2010. The evaluation and calculation of scores were carried out thus:

- Section 2. The knowledge-related score represents the sum of the scores obtained for all the questions in this section. A correct answer is assigned 1 point, whereas an incorrect or 'unknown' response receives 0. The maximum score attainable in this section is 19 points.
- Section 3. The attitude-related score is calculated in accordance with the Likert scale responses. Selecting scales 1 to 3 earns a respondent 0 points, whereas choosing scales 4 and 5 earns 1 point.
- Section 4. The practice-related score is obtained by assigning 1 point to each correct answer.

To determine whether the KAP scores of the participants are good or poor, this study considered 80% of the maximum score for each section as basis for evaluation. Specifically, scores of 16 to 19 points in the knowledge section, 11 to 13 points in the attitude section and 7 to 8 points in the practice section were classified as reflective of favourable performance. Spearman's rank correlation coefficient was used to assess the degree of relevance between good and poor score groups.

RESULTS

The demographic profile of the respondents is shown in **Table 1**, which indicates that the female students accounted for a higher percentage than did the male students. The students aged 18 to 25 years old accounted for a high proportion given that the survey involved more than 80% of regular enrolees. Amongst the respondents, 51.2% lived with their parents, and 90.1% resided in urban areas. Those who have contracted DF amounted to 31.8%. The income of the students ranged from 3 to 5 million VND/month.

Table 1: Demographic characteristics of participants

Code	Characteristics	Female		Male		Total	
		n=149	%	n=93	%	N=242	%
T	**Age groups**						
T1	18 - <25	117	78.5	76	81.7	193	79.8
T2	25 - 35	28	18.8	13	14.0	41	16.9
T3	>35	4	2.7	4	4.3	8	3.3
HH	**Learning system**						
HH1	Formal university	118	79.2	79	84.9	197	81.4
HH2	University connected	31	20.8	14	15.1	45	18.6
NH	**School years**						
NH1	Sophomore	31	20.8	14	15.1	45	18.6
NH2	Junior	8	5.4	16	17.2	24	9.9

NH3	Senior	7	4.7	19	20.4	26	10.7
NH4	Fifth year	103	69.1	44	47.3	147	60.7
KV	**Area**						
KV1	Urban	134	89.9	84	90.3	218	90.1
KV2	Rural	15	10.1	9	9.7	24	9.9
TG	**Religion**						
TG1	No	95	63.8	53	57.0	148	61.2
TG2	Buddhist	26	17.4	17	18.3	43	17.8
TG3	Catholicism	26	17.4	23	24.7	49	20.2
TG4	Protestantism	2	1.3	-	-	2	0.8
DT	**Ethnics**						
DT1	Kinh	139	93.3	87	93.5	226	93.4
DT2	Khmer	3	2.0	1	1.1	4	1.7
DT3	Hoa	5	3.4	5	5.4	10	4.1
DT4	Chăm	2	1.3	-	-	2	0.8
LT	**Part-time job**						
LT1	Yes	62	41.6	37	39.8	99	40.9
LT2	No	86	57.7	56	60.2	142	58.7
BT	**History of DF**						
BT1	Yes	43	28.9	34	36.6	77	31.8
BT2	No	106	71.1	59	63.4	165	68.2
NK	**Know someone else who has history of DF**						
NK1	Yes	89	59.7	66	71.0	155	64.0
NK2	No	60	40.3	27	29.0	87	36.0
SV	**Who are you living with?**						
SV1	Parents	77	51.7	47	50.5	124	51.2
SV2	Relatives	12	8.1	8	8.6	20	8.3
SV3	Friend(s)	31	20.8	19	20.4	50	20.7
SV4	Alone	27	18.1	17	18.3	44	18.2
SV5	Other	2	1.3	2	2.2	4	1.7
TN	**Income (million VND per month)**						
TN1	<3	48	32.2	14	15.1	62	25.6
TN2	3 - <5	49	32.9	46	49.5	95	39.3
TN3	5 - <7	26	17.4	19	20.4	45	18.6
TN4	>7	1	0.7	4	4.3	5	2.1
TN5	NA	25	16.8	10	10.8	35	14.5

Table 2 presents the students' average knowledge scores, which reflected a statistically significant difference in dengue-related understanding between the male students residing in urban areas and those living in rural localities (p = 0.038), with the knowledge of the former (15.1 ± 1.8) being higher than that of the latter (13.6 ± 2.4); between the female students who diligently accomplished their jobs and those who were not as hard-working (p = 0.021); and between the female students staying with their parents, relatives or friends and those living alone (p = 0.044).

Table 2: DF knowledge of female and male students according to demographic characteristics groups

Code	Mean (SD)	Median (IQR)	P-value*	Mean (SD)	Median (IQR)	P-value*
	Male			**Female**		
T1	13.7 (2.4)	14.0 (12.0 - 16.0)	0.863	13.7 (2.4)	14.0 (12.0 - 15.0)	0.211
T2	13.8 (2.7)	15.0 (14.0 - 16.0)		14.6 (2.9)	15.0 (12.8 - 17.0)	
T3	14.5 (1.3)	14.5 (13.8 - 15.3)		13.0 (1.8)	13.0 (11.8 - 14.3)	
HH1	13.6 (2.4)	14.0 (12.0 - 16.0)	0.334	14.1 (2.4)	14.0 (13.0 - 16.0)	0.334
HH2	14.3 (2.3)	15.0 (14.0 - 15.8)		14.2 (2.4)	14.0 (12.5 - 16.0)	
NH1	14.3 (2.3)	15.0 (14.0 - 15.8)	0.683	14.2 (2.4)	14.0 (12.5 - 16.0)	0.683
NH2	13.9 (2.4)	14.0 (12.8 - 16.0)		12.6 (2.4)	11.0 (11.0 - 14.5)	
NH3	13.2 (2.7)	14.0 (11.0 - 15.0)		14.4 (1.3)	15.0 (14.0 - 15.0)	
NH4	13.7 (2.3)	14.0 (12.8 - 16.0)		14.2 (2.4)	14.5 (13.0 - 16.0)	
KV1	13.6 (2.4)	14.0 (12.0 - 15.3)	**0.038**	13.8 (2.5)	14.0 (12.0 - 16.0)	0.924
KV2	15.1 (1.8)	16.0 (15.0 - 16.0)		13.9 (2.4)	14.0 (12.5 - 15.5)	
LT1	14.2 (2.0)	14.0 (14.0 - 16.0)	0.158	13.3 (2.4)	14.0 (12.0 - 15.0)	0.021
LT2	13.4 (2.6)	14.0 (11.0 - 15.0)		14.2 (2.5)	14.5 (13.0 - 16.0)	
BT1	13.8 (2.5)	14.0 (12.0 - 16.0)	0.596	13.8 (2.4)	14.0 (12.0 - 16.0)	0.626
BT2	13.8 (2.3)	14.0 (13.0 - 16.0)		12.6 (4.6)	14.0 (11.0 - 15.0)	
NK1	13.6 (2.4)	14.0 (11.3 - 15.8)	0.397	13.8 (2.4)	14.0 (12.0 - 16.0)	0.977
NK2	14.3 (2.0)	14.0 (14.0 - 16.0)		11.1 (6.2)	13.0 (10.0 - 15.0)	
SV1	13.4 (2.7)	14.0 (11.0 - 16.0)	0.385	14.4 (2.5)	15.0 (13.0 - 16.0)	**0.044**
SV2	14.6 (2.3)	15.0 (13.8 - 16.3)		13.2 (2.5)	13.0 (12.0 - 14.0)	
SV3	13.4 (2.0)	14.0 (11.5 - 14.5)		14.0 (2.1)	15.0 (12.0 - 15.5)	
SV4	14.4 (1.7)	15.0 (14.0 - 16.0)		13.5 (1.9)	14.0 (13.0 - 15.0)	
SV5	15.5 (2.1)	15.5 (14.8 - 16.3)		18.0 (1.4)	18.0 (17.5 - 18.5)	
TN1	13.4 (3.0)	14.0 (11.5 - 16.0)	0.124	14.4 (2.3)	15.0 (13.0 - 16.0)	0.478
TN2	13.5 (2.4)	14.0 (11.3 - 15.0)		13.7 (2.2)	14.0 (12.0 - 15.5)	
TN3	14.5 (1.6)	14.0 (14.0 - 16.0)		13.8 (1.9)	14.0 (12.0 - 15.0)	
TN4	11.5 (3.1)	10.5 (9.8 - 12.3)		-	12.0 (12.0 - 12.0)	
TN5	15.0 (1.9)	15.5 (14.3 - 16.0)		14.8 (3.1)	15.5 (13.3 - 17.0)	

Note: *(*) Differences between groups identified by the Mann-Whitney Test and Kruskal-Wallis. The difference was statistically significant with P <0.05*

Table 3 illustrates that no difference in dengue-associated attitudes was found between the male and female students. However, the male students who have suffered from the disease (10.6 ± 1) exhibited more favourable attitudes than did the male respondents who have not contracted the illness (9.5 ± 3.1). The male and female participants of different year levels showed differences (p = 0.001) in dengue prevention practices (**Table 4**). The same was true between the students staying with their parents, relatives or friends and those living alone (p = 0.032). As can be seen from **Figure 1**, most of the students received information on dengue mainly through television (87.2%). Information sources such as books, newspapers, magazines and schools also accounted for high proportions (76.9% and 69.4%, respectively). By contrast, health workers served as minimal sources of dengue-related information (39.3%).

Table 3: The attitude of DF of female and male students according to demographic groups

Code	Mean (SD)	Median (IQR)	p-value*	Mean (SD)	Median (IQR)	p-value*
	Male			Female		
T1	10.3 (1.2)	10.0 (9.0 - 11.0)	0.261	10.5 (1.1)	11.0 (10.0 - 11.0)	0.875
T2	9.6 (1.3)	10.0 (8.0 - 11.0)		10.4 (1.1)	11.0 (9.0 - 11.0)	
T3	10.5 (1.0)	10.0 (10.0 - 10.5)		11.0 (0.8)	11.0 (10.8 - 11.3)	
HH1	10.2 (1.2)	10.0 (9.0 - 11.0)	0.899	10.6 (1.1)	11.0 (10.0 - 11.0)	0.899
HH2	10.1 (1.1)	10.0 (10.0 - 11.0)		10.4 (1.2)	11.0 (9.0 - 11.0)	
NH1	10.1 (1.1)	10.0 (10.0 - 11.0)	0.892	10.4 (1.2)	11.0 (9.0 - 11.0)	0.892
NH2	10.1 (1.3)	10.0 (9.0 - 11.0)		10.3 (1.3)	10.0 (10.0 - 11.0)	
NH3	10.1 (1.3)	10.0 (9.0 - 11.0)		10.9 (0.7)	11.0 (10.5 - 11.0)	
NH4	10.3 (1.2)	10.5 (9.8 - 11)		10.5 (1.1)	11.0 (10.0 - 11.0)	
KV1	10.1 (1.2)	10.0 (9.0 - 11.0)	0.187	10.5 (1.1)	11.0 (10.0 - 11.0)	0.705
KV2	10.7 (0.9)	11.0 (10.0 - 11.0)		10.5 (1.2)	11.0 (9.5 - 11.0)	
LT1	10.1 (1.3)	10.0 (9.0 - 11.0)	0.900	10.4 (1.2)	11.0 (9.3 - 11.0)	0.388
LT2	10.2 (1.2)	10.0 (9.0 - 11.0)		10.5 (1.1)	11.0 (10 - 11.0)	
BT1	10.6 (1.3)	11.0 (10.0 - 11.0)	0.444	10.6 (1)	11.0 (10.0 - 11.0)	0.030
BT2	10.1 (1.1)	10.0 (9.0 - 11.0)		9.5 (3.1)	10.5 (9.0 - 11.0)	
NK1	10.2 (1.2)	10.0 (9.0 - 11.0)	0.969	10.6 (1.1)	11.0 (10.0 - 11.0)	0.306
NK2	10.2 (1.0)	10.0 (10.0 - 11.0)		8.1 (4.3)	10.0 (8.0 - 11.0)	
SV1	10.1 (1.2)	10.0 (9.0 - 11.0)	0.750	10.8 (1)	11.0 (10.0 - 11.0)	0.103
SV2	9.9 (1.6)	9.5 (8.8 - 11.3)		9.8 (1.3)	10.0 (9.0 - 11.0)	
SV3	10.3 (1.3)	11.0 (9.5 - 11.0)		10.4 (1.1)	11.0 (10.0 - 11.0)	
SV4	10.5 (0.9)	10.0 (10.0 - 11.0)		10.3 (1.3)	11.0 (9.0 - 11.0)	
SV5	10.5 (0.7)	10.5 (10.3 - 10.8)		11 (-)	11.0 (11.0 - 11.0)	
TN1	10.2 (1.1)	10.0 (10.0 - 11.0)	0.651	10.7 (1.1)	11.0 (10.0 - 11.0)	0.575
TN2	10.2 (1.3)	10.0 (9.0 - 11.0)		10.4 (1.0)	11.0 (10.0 - 11.0)	
TN3	10.1 (1.2)	10.0 (9.0 - 11.0)		10.4 (1.2)	11.0 (9.0 - 11.0)	

TN4	9.5 (1.3)	9.5 (8.8 - 10.3)		-	9.0 (9.0 - 9.0)	
TN5	10.6 (0.8)	11.0 (10.0 - 11.0)		10.7 (1.2)	11.0 (10.3 - 11.0)	
Note: *(*) Differences between groups identified by the Mann-Whitney Test and Kruskal-Wallis. The difference was statistically significant with P <0.05*						

Table 4: Practice in prevention DF by male and female students according to demographic groups

Code	**Mean (SD)**	**Median (IQR)**	**P-value***	**Mean (SD)**	**Median (IQR)**	**P-value***
	Male			**Female**		
T1	6.5 (1.7)	7.0 (5.0 - 8.0)	0.733	6.4 (1.9)	7.0 (5.0 - 8.0)	0.836
T2	6.5 (1.9)	7.0 (6.0 - 8.0)		6.7 (1.8)	8.0 (5.8 - 8.0)	
T3	6.3 (1.5)	7.0 (6.3 - 7.0)		6.0 (2.3)	6.0 (4.0 - 8.0)	
HH1	6.5 (1.7)	7.0 (5.0 - 8.0)	0.879	6.6 (1.8)	8.0 (6.0 - 8.0)	0.879
HH2	6.5 (1.8)	7.0 (6.0 - 8.0)		6.5 (2.0)	8.0 (5.0 - 8.0)	
NH1	6.5 (1.8)	7.0 (6.0 - 8.0)	**0.011**	6.5 (2.0)	8.0 (5.0 - 8.0)	**0.011**
NH2	7.4 (1.4)	8.0 (7.8 - 8.0)		6.3 (2.2)	8.0 (4.5 - 8.0)	
NH3	5.8 (1.3)	6.0 (5.0 - 6.5)		7.0 (1.5)	8.0 (6.5 - 8.0)	
NH4	6.5 (1.8)	7.5 (5.0 - 8.0)		6.6 (1.8)	8.0 (6.0 - 8.0)	
KV1	6.5 (1.7)	7.0 (5.0 - 8.0)	0.599	6.5 (1.9)	8.0 (5.0 - 8.0)	0.207
KV2	6.8 (1.6)	8.0 (6.0 - 8.0)		5.8 (2.3)	6.0 (3.5 - 8.0)	
LT1	6.4 (1.8)	7.0 (5.0 - 8.0)	0.901	6.4 (1.9)	7.0 (5.0 - 8.0)	0.440
LT2	6.6 (1.6)	7.0 (5.8 - 8.0)		6.5 (1.9)	8.0 (5.0 - 8.0)	
BT1	6.6 (1.7)	8.0 (6.0 - 8.0)	0.583	6.6 (1.8)	8.0 (6.0 - 8.0)	0.121
BT2	6.6 (1.7)	7.0 (5.5 - 8.0)		5.8 (2.6)	7.0 (4.0 - 8.0)	
NK1	6.5 (1.7)	7.0 (5.0 - 8.0)	0.769	6.6 (1.8)	8.0 (5.0 - 8.0)	0.393
NK2	6.7 (1.6)	7.0 (6.0 - 8.0)		4.8 (3.1)	5.0 (3.0 - 8.0)	
SV1	6.2 (1.8)	7.0 (4.5 - 8.0)	0.052	7.0 (1.3)	8.0 (7.0 - 8.0)	**0.032**
SV2	7.1 (1.5)	8.0 (6.8 - 8.0)		5.4 (2.0)	5.0 (3.5 - 7.0)	
SV3	6.1 (1.6)	6.0 (5.0 - 7.5)		6.5 (2.1)	8.0 (5.0 - 8.0)	
SV4	7.4 (1.2)	8.0 (7.0 - 8.0)		5.9 (2.3)	7.0 (3.5 - 8.0)	
SV5	7.5 (0.7)	7.5 (7.3 - 7.8)		8.0 (-)	8.0 (8.0 - 8.0)	
TN1	5.9 (2.0)	6.0 (4.0 - 8.0)	0.289	6.8 (1.7)	8.0 (6.0 - 8.0)	0.291
TN2	6.5 (1.7)	7.0 (5.0 - 8.0)		6.5 (1.8)	7.0 (5.0 - 8.0)	
TN3	6.8 (1.2)	7.0 (6.0 - 8.0)		6.0 (2.1)	7.0 (4.0 - 8.0)	
TN4	5.3 (2.2)	5.0 (3.8 - 6.5)		-	3.0 (3.0 - 3.0)	
TN5	7.2 (1.3)	8.0 (7.0 - 8.0)		7.4 (1.1)	8.0 (7.3 - 8.0)	
Note: *(*) Differences between groups identified by the Mann-Whitney Test and Kruskal-Wallis. The difference was statistically significant with P <0.05*						

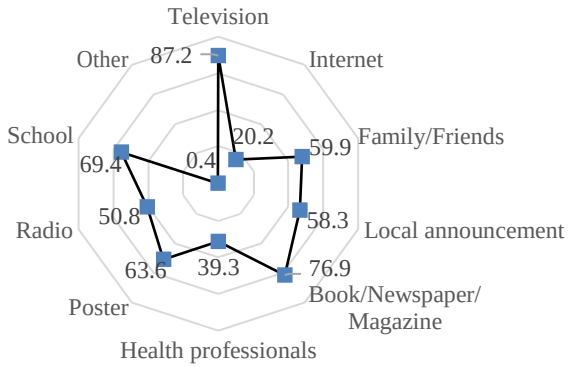

Fig 1: Source of information about DF

As reported in **Table 5**, a significant correlation was found between the anti-dengue KAPs of the male and female students ($p < 0.001$). For both the male and female respondents, the correlation between knowledge and practice ($r = 0.564$ for men, $r = 0.653$ for women) was higher than that between knowledge and attitude ($r = 0.425$ for men, $r = 0.343$ for women). In addition, knowledge and practice were more highly correlated amongst the female students ($r = 0.653$) than amongst their male counterparts ($r = 0.564$). Finally, the percentages of students who displayed correct KAPs with respect to dengue prevention were 27.7%, 53.3% and 60.7%, respectively, and their average scores in the knowledge, attitude and practice sections of the questionnaire were 13.79, 10.36 and 6.59, respectively (**Table 6**).

Table 5: Correlation between Knowledge, attitude and practice of DF of 2 groups of male and female students

	Male			**Female**		
	K	A	P	K	A	P
K	-	0.425*	0.564*	-	0.343*	0.653*
A	0.425*	-	0.404*			
P	0.564*	0.404*	-	0.343*	-	0.451*

Table 6: Knowledge, attitudes and practices of male and female students on DF

Proportion	**K**		**A**		**P**	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
Rate of students achieving KAP (%)	27.96	27.5	44.09	59.1	59.14	61.7
Mean score	13.74	13.82	10.17	10.48	6.52	6.47
Good K/A/P (%)	27.7		53.3		60.7	
Mean score	13.79		10.36		6.59	
Max score	19		13		8	

DISCUSSION

Knowledge of pharmacy students about dengue fever

As mentioned earlier, the majority of the respondents derived information about DF through television (87.2%), which is the primary media channel in Vietnam today. This finding is similar to the results obtained by Nhi for Tien Giang students[13] and Huong for Dong Thap province's residents.[2] The high proportion of books, newspapers, magazines and school sources consulted by the participants for dengue information is consistent with the training provided to pharmaceutical students. A most worrying issue, however, is the minimal contribution of medical staff to information dissemination (39.3%). This deficiency can be ascribed to the low percentage of students who have had DF (31.8%), which means they have not had an opportunity to interact with health care providers.

The percentage of students with good knowledge of DF was low at only 27.2%, a figure falling below the result obtained by Harapan et al. in Indonesia (45.9%).[12] This difference points to the need for schools to focus on teaching pharmacy students' content that features infectious diseases, especially DF. The current research uncovered that most of the students knew only about the common symptoms of DF, such as fever and headaches; only 4.5% of them were aware that the disease is also accompanied by bone pain. These findings are similar to those of Dhimal in the Nepalese context.[15] In spite of this insufficient understanding of symptoms, however, the students exhibited good knowledge of the path of disease transmission and dengue prevention—positive outcomes that originated from local authorities' propagation of information on dengue prevention measures.

The correlation analysis showed that the final-year students exhibited better knowledge than did those in lower years, as evidenced by the average scores of the fifth-year female students (18±1.4) compared with those of the females in other year levels ($p = 0.044$). The male students living in rural areas also had DF knowledge superior to that of the males residing in urban areas ($p = 0.038$).

Attitudes of pharmacy students about dengue fever

The students generally displayed favourable attitudes about DF (53.3%), with the proportion found in this work higher than that derived by Bhatt et al. in Indonesia (32%)[5] but lower than that obtained in Nepal (83%).[8] Nevertheless, the low DF knowledge of the students did not prevent them from forming good habits and attitudes regarding dengue control given the information dissemination activities implemented by local health facilities and schools. The female students who have contracted the disease had a higher average score (10.6 / 13) than did those who have never been afflicted with dengue (9.5/13). This result is attributed to the increased awareness of the respondents regarding dengue prevention given the dangers of the disease.

Practices of pharmacy students with respect to dengue fever prevention

The students demonstrated excellent DF prevention practices (60.7%), which can be a positive focal point for emphasis in maintaining the information campaigns executed in schools. The percentage of students with useful habits was higher than those observed in community studies carried out by Bhatt et al. in Indonesia (32%)[5] and Dhimal in Nepal (37%).[15]

The relationship between the knowledge, attitudes and practices of male and female students

A positive correlation was found amongst the students' KAPs, congruent with results for Indonesia[5] and Nepal (37%).[8] Correct and relevant knowledge was statistically significantly associated with good attitudes and practices amongst both the female and male students in the present work ($p < 0.001$). Solid knowledge correlated more strongly with good practices ($r = 0.653$) than with positive attitudes ($r = 0.343$), indicating the necessity of reinforcing student knowledge in dengue information and prevention programmes. Moreover, the correlation between knowledge and practices was higher amongst the female students ($r = 0.653$) than amongst their male peers ($r = 0.564$).

CONCLUSION

According to the statistical data obtained in this study, the proportion of students with good knowledge of DF was low (27.7%), whereas those with commendable attitudes and practices were relatively high (53.3% and 60.7%, respectively). The main sources of information for students are television (87.2%) and books, newspapers and magazines (76.9%). The results also reflected a correlation amongst dengue prevention KAPs. The students with an accurate understanding of the disease also held positive attitudes concerning preventive practices. The findings highlighted the need to improve the knowledge imparted through training content and programmes.

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CONFLICTS OF INTERESTS

The authors have no conflicts of interests to declare.

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