

ORIGINAL ARTICLE

Awareness on Traditional and Complementary Medicine among Undergraduate Students in Universiti Putra Malaysia

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ABSTRACT

Introduction: In Malaysia, the use of Traditional and Complementary Medicine (T&CM) for health maintenance is growing yearly. However, the public might not be aware that the usage of T&CM could have an effect if misused. **Objective:** This study aims to determine the level of knowledge, attitude, practice, and awareness of T&CM among Health Sciences (HS) and Non-Health Sciences (NHS) students at Universiti Putra Malaysia (UPM). **Methods:** A self-administered online questionnaire was distributed to undergraduate students in UPM through student's group chat application. **Results:** There were no significant differences between HS and NHS students' knowledge, attitude and practice. However, the level of awareness between the two groups were significantly different (HS: 10.07 ± 1.37 , NHS: 9.63 ± 1.62) with $p < 0.01$. The main sources to obtain the information for T&CM were family or friends (77.4%), the internet (77.4%), and mass media (59.2%). Common T&CM used were aromatherapy (55.9%), prayer or spiritual healing (73.6%), and traditional herbal (64.1%). Patterns of usage for the above modalities were observed with aromatherapy (5.8%) and traditional herbal (4.8%) highest for weekly, whereas prayer or spiritual healing has the highest for daily usage (32.2%). **Conclusion:** Students exhibit adequate knowledge, demonstrate a positive attitude and good practice, and have a higher awareness of T&CM. It is recommended for repeated cross-sectional studies to be conducted on the same respondents to track changes in their knowledge, attitude, practice, and awareness of T&CM over time. Malaysian Journal of Medicine and Health Sciences (2023) 19(SUPP14): 80-90. doi:10.47836/mjmhs.19.s14.9

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INTRODUCTION

Traditional and Complementary Medicine (T&CM) is defined as a health-related practice in order to prevent, treat, manage ailment and illness, preserve mentally and physically well-being of a person (1). T&CM usage is common among Malaysian population for health care maintenance. A study by Basri and co-workers showed about 66.9% of the study population is currently using T&CM (2). Similarly, a high number of patients in Malaysia with chronic kidney disease were found to consume T&CM (3). A study by Soon highlighted in the National Health and Morbidity Survey 2015, 29.25% of the Malaysian population used T&CM, whereas in 2020 alone reported usage of 21.51% by Malaysian population (4). In addition, Jasamai and co-workers reported a high prevalence (71.2%) of Complementary and Alternative Medicine (CAM) usage among

respondents (5) and about 33.9% in a study by Aziz and Tey (6). The use of T&CM is also popular among university students in Malaysia. It was shown that nursing students were willing to practice CAM compared to medical students (7). The reasons for using T&CM were mainly due to the low cost, easy access to the treatment, family recommendations, belief in its effectiveness to treat a health problem, good for health, and being safe compared to conventional medicine (5,6,8).

T&CM practices recognised in Malaysia include Traditional Indian, Chinese, Malay Medicine, Islamic Medical Practices, Homeopathy, and Complementary therapies. The practices were used for maintaining health, and treating or preventing minor and chronic illnesses (6). A high prevalence of herb-based therapies was found within the Malaysian population for health purposes (9). However, the adverse health effects of the consumption and usage of T&CM can cause medical illnesses such as nephrotoxicity, hepatotoxicity, cardiotoxicity, neurotoxicity, and skin toxicity (10). Several studies have proven that some herbal plants

can cause kidney disease (11–13) and herbal-induced liver injury (14–16). A study by Jatau and co-workers also found that some patients seeking treatment at the emergency department had a history of using T&CM for their health care (17).

Although the public prefers to use T&CM, knowledge and understanding of T&CM itself and its side effects are lacking (8). Some people misjudged the benefits and risks of T&CM. Not many are well informed about the health effects due to T&CM practices. Study showed that students who took T&CM were unsure of its effectiveness and safety of the products (18). A study in Kuwaiti found that the medical and pharmacy students had poor knowledge on T&CM but displayed positive attitudes on T&CM with believe that the practice could benefit its user (19). A study among university students found the attitudes and perceptions of traditional medicine to be positive (20). Other studies showed that the nursing students were more positive and willing to practice T&CM than medical students (7).

The information on the T&CM practices can affect the overall knowledge, attitude, and practice toward T&CM. Evidence-based medicine, lack of a mechanism to regulate clinical competence in T&CM, one-way communication systems, and registration of traditional products are among the challenges the Ministry of Health (MOH) faced to ensure information on Traditional Malay Medicine is still relevant to be used (4). In Malaysia, no insurance coverage for national healthcare or private insurance to cover T&CM (21). Misuse of T&CM can happen as T&CM was portrayed as harmless due to the lack of information and scientific evidence (6). A study among healthcare providers shows a lack of evidence available to provide formation on the nature, efficacy, risk, and benefits of T&CM (22). Thus, this study aims to determine the knowledge, attitude, practice, and awareness of T&CM among Health Sciences (HS) and Non-Health Sciences (NHS) students at Universiti Putra Malaysia.

MATERIALS AND METHODS

Study Design

A descriptive and cross-sectional study was conducted using non-random sampling method on undergraduate students at Universiti Putra Malaysia (UPM). The survey was conducted from April 2021 until May 2021. Data was collected from both HS and NHS faculties from the first- year to the fourth-year student (or fifth-year students for the Veterinary Medicine Faculty).

Study population

A total of 292 students from UPM were enrolled in the study. The target population was undergraduate students enrolled in the university. Since this study aims to compare between HS and NHS students, the sample size calculation was based on the

expected outcome of the proportions of events in two groups (23). Taking the information from a study by Ashraf and co-workers, the average prevalence of pharmacy and non-pharmacy students pursuing further knowledge (P: 0.08 and NP: 0.0897) was used to determine the sample size for one group of students (20).

A sample size of 146, each for HS (Faculty of Medicine and Health Sciences except for Doctor of Medicine as the students learned about human health, disease, and treatment of disease.) and NHS (Faculty of Agriculture, Faculty of Forestry, Faculty of Veterinary Medicine, Faculty of Economics and Management, Faculty of Engineering, Faculty of Educational Studies, Faculty of Science, Faculty of Food Science and Technology, Faculty of Human Ecology, Faculty of Modern Languages and Technology, Faculty of Design and Architecture, Faculty of Computer Sciences and Information Technology, Faculty of Biotechnology and Biomolecular Sciences & Faculty of Environmental Studies) students were estimated by using the expected outcome of in proportions of events in two groups by keeping the response rate at 50% alpha error (α), confidence level at 95% and addition of 20% of expected dropout (23). A simple convenience sampling was used for the selection of study participants.

Inclusion and Exclusion Criteria

Inclusion Criteria

Participants must be full-time study undergraduate students in UPM, Serdang campus aged 18 and above. The students must have experience in using T&CM.

Exclusion Criteria

Students other than undergraduate, other university students, UPM students in Bintulu campus as well as lecturers, staff, and executive program students in UPM were exempted from the study. Students with no experience in using T&CM were also excluded from the study.

Data Collection

A self-administered questionnaire was constructed from several (5,8,20,24–26). A pre-test was done involving 16 HS and 15 NHS from UPM. The reliability test was evaluated using Cronbach's alpha accepted at 0.7, and IBM Statistical Package for Social Science (SPSS) version 25. Data obtained during pre-test study was not included in the final analysis. The questionnaire was distributed to respondents through social media, which is WhatsApp application. The questionnaire was sent to the student's group chat, which were available in both English and Malay. The questionnaire was estimated to take 10-15 minutes to complete. The questionnaire was divided into five parts:

Part A: Demographic Information

Basic demographics such as gender, age groups,

ethnicity, year of study, faculty of study, and source of information regarding T&CM.

Part B: Students' Knowledge on T&CM

Knowledge about sixteen (16) commonly known modalities (acupuncture, aromatherapy, art or music therapy, ayurveda, cupping, chiropractic, homeopathy, hypnosis, meditation, naturopathy, oriental medicine, osteopathy, prayer or spiritual healing, traditional herb, and traditional massage) was assessed using four options; never heard, yes but no knowledge, yes but basic knowledge and, yes and have further knowledge. Ten (10) knowledge-related statements about T&CM include acupuncture, aloe vera, aconitum plant, cupping, and ginseng. Six (6) awareness-related statements such as awareness on fake medicine, herb-drug interaction, and willingness to tell doctor on the T&CM usage.

Part C: Students' Attitude on T&CM

This part consisted of twenty (20) statements to assess respondents' attitudes on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) questions regarding T&CM.

Part D: Students' Practice on T&CM

This part consisted of fifteen (15) statements to assess the practices of respondents on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) questions regarding T&CM.

Part E: Type of T&CM Used

Assess the type of T&CM modalities used by the students, frequent T&CM usage and frequency of usage for the last sickness.

Data Analysis

The data was analysed by using IBM SPSS version 25. Descriptive analysis was performed to determine the percent-ages, means and standard distribution (SD). The association of dependent variables including the knowledge, attitude, practice, awareness, type of T&CM used, frequents T&CM usage and frequency of T&CM used for the last sickness with independent variables such as demographic information was estimated by using Pearson's Chi square test. Independent t- test was used to compare the difference between HS and NHS students' level of knowledge, attitude, practice and awareness. The normality of the data was determined by using Kurtosis, confirming that the data was normally distributed. An alpha value of less than 0.05 was considered statistically significant.

Ethical Approval

The Ethics Committee for Research Involving Human Subjects (JKEUPM), Universiti Putra Malaysia, approved the study, reference number JKEUPM-2021-021.

RESULTS

Demographical Information

The demographical information of respondents was summarised in Table I. The total respondents were 292 undergraduate students, 146 (50%) each belonging to HS and NHS faculty. A total of 56 (19.2%) male and 236 (80.8%) female students participated in this study. Most of the respondents belonged to the age group of 21- 23 years old (71.6%). The majority of the students were Malay students (82.8%). Generally, the third-year students (31.2%) recorded the highest participation in this study. Family or friends (77.4%), internet (77.3%), and mass media (59.3%) were the primary sources to obtain the information on T&CM (Table I).

Table I : Demographical information of respondents

Characteristic	Science Health <i>n</i> = 146	Non-Science Health <i>n</i> = 146
Gender		
Male	29 (19.9 %)	27 (18.5 %)
Female	117 (80.1 %)	119 (81.5 %)
Age Groups		
18 – 20 years old	35 (24.0 %)	24 (16.4 %)
21 – 23 years old	106 (72.6 %)	103 (70.5 %)
24 – 26 years old	5 (3.4 %)	18 (12.3 %)
27 – 29 years old		1 (0.7 %)
Ethnicity		
Malay	118 (80.8 %)	124 (84.8 %)
Chinese	19 (13.0 %)	4 (2.7 %)
Indian	6 (4.1 %)	4 (2.7 %)
Native		12 (8.2 %)
Others	3 (2.1 %)	2 (1.4 %)
Years of Study		
1 st year student	43 (29.5 %)	29 (19.9 %)
2 nd year student	28 (19.2 %)	27 (18.5 %)
3 rd year student	39 (26.7 %)	52 (35.6 %)
4 th year student	36 (24.7 %)	34 (23.3 %)
5 th year student		4 (2.7 %)
Source of Information		
Family or Friends	111 (76.0 %)	115 (78.8 %)
Books or Literature	37 (25.3 %)	34 (23.3 %)
Internet	117 (80.1 %)	109 (74.4 %)
Health Service Provider	33 (22.6 %)	32 (21.9 %)
Mass Media	84 (57.5 %)	89 (61.0 %)
Others	6 (4.1 %)	1 (0.7 %)

Table II : Knowledge related to T&CM

Items	Statement	Related Knowledge			X ²	p-value
		Correct	Incorrect	Don't Know		
1	Acupuncture can be used to decrease withdrawal symptoms and relieve pains (correct)					
	Health Sciences	107 (73.3%)	6 (4.1%)	33 (22.6%)	2.415	0.31
Non-Health Sciences	105 (71.9%)	2 (1.2%)	39 (26.7%)			
2	Aloe vera can heals burns (correct)					
	Health Sciences	128 (87.7%)	4 (2.7%)	14 (9.6%)	1.052	0.63
Non-Health Sciences	122 (83.6%)	5 (3.4%)	19 (13.0%)			
3	Aloe vera is not rich in anti-oxidant (incorrect)					
	Health Sciences	73 (50.0%)	9 (6.2%)	64 (43.8%)	1.665 ^a	0.44
Non-Health Sciences	63 (43.2%)	8 (5.5%)	75 (51.4%)			
4	Aconitum plant contain Aconitine which is harmful (correct)					
	Health Sciences	14 (9.6%)	9 (6.2%)	123 (84.2%)	4.030 ^a	0.13
Non-Health Sciences	8 (5.5%)	4 (2.7%)	134 (91.8%)			
5	Cupping is useful for muscle relaxation (correct)					
	Health Sciences	46 (31.5%)	31 (21.2%)	69 (47.3%)	0.679 ^a	0.71
Non-Health Sciences	50 (34.2%)	34 (23.3%)	62 (42.5%)			
6	Ginseng can be used safely in people with high blood pressure (incorrect)					
	Health Sciences	27 (18.5%)	44 (30.1%)	75 (51.4%)	5.460 ^a	0.07
Non-Health Sciences	15 (10.3%)	39 (26.7%)	92 (63.0%)			
7	Ginkgo biloba commonly used safely in people with Alzheimer's disease (correct)					
	Health Sciences	39 (26.7%)	6 (4.1%)	101 (69.2%)	3.970 ^a	0.14
Non-Health Sciences	25 (17.1%)	6 (4.1%)	115 (78.8%)			
8	Herbal medicine is safe to be use with hospital medicine (incorrect)					
	Health Sciences	64 (43.8%)	21 (14.1%)	61 (41.8%)	13.774 ^a	0.00*
Non-Health Sciences	41 (28.1%)	45 (30.8%)	60 (41.1%)			
9	Study shows garlic can increase high cholesterol level (incorrect)					
	Health Sciences	65 (44.5%)	6 (4.1%)	75 (51.4%)	0.098 ^a	0.95
Non-Health Sciences	65 (44.5%)	5 (3.4%)	76 (52.1%)			
10	Over consumption of salt can caused diabetes (incorrect)					
	Health Sciences	104 (71.2%)	18 (12.3%)	24 (16.4%)	0.192 ^a	0.91
Non-Health Sciences	104 (71.2%)	20 (13.7%)	22 (15.1%)			

^ap < 0.05, data is significantly difference

Level of Knowledge, Attitude and Practice on T&CM

There were no significant differences between the level of knowledge, attitude, and practice among HS and NHS students, p > 0.05. The HS mean knowledge score was 59.01 ± 8.55 while NHS was 57.82 ± 8.52. NHS mean scores were slightly higher for both attitude (69.97 ± 8.90) and practice (50.18 ± 5.18) than HS where attitude (68.92 ± 8.29) and practice (49.18 ± 5.08). Both groups possess adequate knowledge, displayed positive attitude and good practices on the T&CM.

Students' Knowledge on T&CM Modalities

The HS students appeared to have more knowledge on the T&CM modalities compared to the NHS students. There were significant differences in the knowledge of modalities for cupping (p = 0.005), naturopathy (p = 0.01) and prayer or spiritual healing (p = 0.03) (Supplementary Data 1).

More than 60% of NHS students never heard on ayurveda (HS: 54.1%, NHS: 63.7%) and osteopathy (HS: 55.5%, NHS: 28.8%). Moreover, more than 40%

Table III : Attitude related to T&CM

Items	Statements	Health Sciences <i>n</i> = 146	Non-Health Sciences <i>n</i> = 146	<i>p</i> -value
1	All practitioners of T&CM shall be medically qualified.	4.25	4.04	0.08
2	I believe T&CM can cure illnesses.	3.58	3.62	0.61
3	T&CM is a threat to public health.	2.55	2.73	0.46
4	T&CM is more effective than modern medicine.	2.69	2.69	1.00
5	Health practitioner should be able to advice on T&CM usage.	3.95	4.03	0.47
6	T&CM should only be used as a last resort when modern medicine did not work.	3.16	3.06	0.38
7	Herbal medicine is safe and effective.	3.29	3.38	0.30
8	T&CM is more cost-effective than modern medicine.	3.24	3.39	0.16
9	Patients that use T&CM can get better.	3.03	3.27	0.01*
10	T&CM should be integrated in student's education program.	3.55	3.68	0.17
11	Physician should supervise T&CM usage.	4.01	4.23	0.03*
12	Lack of scientific evidence is a barrier toward T&CM usage.	4.15	4.08	0.48
13	Side effect of T&CM is unknown.	3.55	3.49	0.58
14	Side effect of herbal medicine is known.	3.33	3.24	0.33
15	Modern medicine produces side effect.	3.77	3.62	0.12
16	T&CM proved to be effective.	3.30	3.25	0.57
17	I prefer natural therapy.	3.14	3.28	0.16
18	Herbal medicine can be used as a supplement.	3.49	3.59	0.31
19	Herbal medicine can boost immunity.	3.29	3.49	0.06
20	Wound can be treated by using herbal plant.	3.60	3.80	0.03*

**p* < 0.05, data is significantly difference

of HS students were lack in the knowledge on hypnosis (HS: 49.3%, NHS: 40.4%), naturopathy (HS: 40.4%, NHS: 28.8%) and oriental medicine (HS: 45.9%, NHS: 39.7%).

Other than that, more than 50% of HS students have basic knowledge on several modalities including aromatherapy (HS: 66.4%, NHS: 63.0%), acupuncture (HS: 63.0%, NHS: 61.0%), traditional herb (HS: 61.0%, NHS: 56.2%) and cupping (HS: 53.4%, NHS: 56.2%). In general, HS and NHS students pursue further knowledge on prayer or spiritual healing (HS: 28.8%, NHS: 39.0%) (Supplementary Data 1).

Knowledge related to the T&CM

Out of ten (10) knowledge statements, only two were correctly marked by the majority of the HS and NHS students. There was a significant difference for item 8; herbal medicine is safe to be used with hospital medicine (*p* < 0.01). More than 50% of the students did not know the danger of Aconitum plants (HS: 84.2%, NHS: 91.8%), usage of ginseng (HS: 51.4%, NHS: 63.0%), Ginkgo biloba (HS: 69.2%, NHS:

78.8%) and garlic (HS: 51.4%, NHS: 52.1%). Moreover, more than half of the students has a misunderstanding about the content of aloe vera (HS: 50.0%, NHS: 43.2%) and overconsumption of salt can cause diabetes (HS: 71.2%, NHS: 71.2%) (Table II).

Students' Attitude on T&CM

The mean score for Total Attitude of undergraduate students was 69.44 ± 8.60 . Student's attitude scored by using a 5-point Likert scale were summarized in Table III. Mean attitude scores less than 3 were treated as negative while scores more than 3 were treated positively. Individual items that exhibit significant differences between HS and NHS included statement on item 9; patients that used T&CM can get better, item 11; physician should supervise T&CM usage and item 20; wound can be treat by using herbal plant (*p* < 0.05) (Table III).

By using the 5-point Likert scale, HS students scored higher compared to NHS on item 1, all practitioners of T&CM shall be medically qualified (HS: 4.25 ± 0.97 , NHS: 4.04 ± 1.01) and item 12, lack of scientific

Table IV : Practice related to T&CM

Items	Statements	Health Sciences	Non-Health Sciences	p-value
		n = 146	n = 146	
1	I should use T&CM as recommended by family and friends.	2.92	3.23	0.00*
2	I did not use T&CM because I know its side effect.	3.10	2.99	0.28
3	Physician should supervise T&CM usage.	4.10	4.12	0.78
4	I still use herbal medicine event though I know it is not safe.	2.08	2.25	0.10
5	Pharmacist should advice on T&CM usage.	4.01	4.03	0.84
6	Physician should not supervise on T&CM usage.	2.07	2.16	0.43
7	T&CM should be practice by everyone.	2.88	3.12	0.01*
8	Lack of scientific evidence is a barrier toward T&CM usage.	4.16	4.11	0.62
9	Modern medicine is more safe.	3.41	3.47	0.58
10	It is important to consult a health professional before using T&CM.	4.32	4.23	0.35
11	Herbs can be consumed as a nutritional supplement.	3.55	3.73	0.06
12	Herbs cannot be consumed as a nutritional supplement.	2.64	2.63	0.89
13	I rarely used T&CM.	3.68	3.71	0.80
14	I should not use T&CM when I do not have knowledge on it.	3.96	3.88	0.54
15	I used TCM after getting advice from uncertified T&CM practitioner.	2.30	2.51	0.17

*p < 0.05, data is significantly difference

Table V : Awareness related to T&CM

Items	Statement	Student's Awareness		X ²	p-value
		Yes	No		
1	Aware of the fake herbal medicine.				
	Health Sciences	27 (18.5%)	119 (81.5%)	1.015 ^a	0.31
Non-Health Sciences	34 (23.3%)	112 (76.7%)			
2	Aware of the herb-drug interaction.				
	Health Sciences	29 (19.9%)	117 (80.1%)	6.997 ^a	0.01*
Non-Health Sciences	49 (33.6%)	97 (66.4%)			
3	Use drugs and herbal medicine in the same time.				
	Health Sciences	101 (69.2%)	45 (30.8%)	0.390 ^a	0.53
Non-Health Sciences	96 (65.8%)	50 (34.2%)			
4	Aware of the side effect of T&CM.				
	Health Sciences	22 (15.1%)	124 (84.9%)	15.361 ^a	0.00*
Non-Health Sciences	51 (34.9%)	95 (65.1%)			
5	Experience side effect after consumptions or usage of T&CM.				
	Health Sciences	92 (63.0%)	54 (37.0%)	0.059 ^a	0.81
Non-Health Sciences	94 (64.4%)	52 (35.6%)			
6	Willing to tell doctor about the use of T&CM.				
	Health Sciences	11 (7.5%)	135 (92.5%)	4.134 ^a	0.04*
Non-Health Sciences	22 (15.1%)	124 (84.9%)			

^ap < 0.05, data is significantly difference

evidence is a barrier toward T&CM usage (HS: 4.15 ± 0.93 , NHS: 4.08 ± 0.90). In contrast, NHS students scored higher than HS for item 2, I believe T&CM can cure illnesses (HS: 3.57 ± 0.75 , NHS: 3.62 ± 0.83) and item 5, health practitioners should be able to advise on T&CM usage (HS: 3.95 ± 0.82 , NHS: 4.03 ± 0.96).

Students' Practice on T&CM

The mean score for Total Practice of undergraduate students was 49.68 ± 5.14 . Student's practice scored by using a 5-point Likert scale were summarized in Table IV. Mean practice scores less than 3 treated as negative practices while scores more than 3 treated as positive practices. Individual items with significant differences between HS and NHS students were item 1; I should use T&CM as recommended by family and friends ($p = 0.00$) and item 7; T&CM should be practice by everyone ($p = 0.01$) (Table IV).

HS scored higher compared to NHS for item 2, I did not use T&CM because I know its side effect (HS: 3.10 ± 0.91 , NHS: 2.99 ± 0.80) and item 8, lack of scientific evidence is a barrier toward T&CM usages (HS: 4.16 ± 0.87 , NHS: 4.11 ± 0.75). Contrary, NHS scored higher than HS students on item 3, physician should supervise T&CM usage (HS: 4.10 ± 0.81 , NHS: 4.12 ± 0.83) and item 9, modern medicine is safer (HS: 3.41 ± 0.81 , NHS: 3.47 ± 0.90).

Level of Awareness on T&CM

There were significant differences between the level of awareness of T&CM between HS and NHS ($p < 0.05$). The mean awareness score between the two groups slightly differs with HS scored 10.07 ± 1.37 while NHS scored 9.63 ± 1.62 . Both groups have a high awareness of T&CM.

Students' Level of Awareness

The level of awareness of undergraduate students is shown in Table V. The mean awareness score is 9.85 ± 1.51 . Items demonstrating significant differences included item 2; aware of the herb-drug interaction, item 4; aware of the side effect of T&CM and item 6; willing to tell doctor about the usage of T&CM ($p < 0.05$). The HS and NHS students use drugs and herbal medicine at the same time (HS: 69.2%, NHS: 65.8%) and does experience side effect after the consumption or usage of T&CM (HS: 63.0%, NHS: 64.4%) (Table V).

Determination of Type of T&CM Used

Assessment of Type of T&CM Used

Undergraduate students from both HS and NHS faculty marked 13 T&CM as No. Students from both groups differed in the type of T&CM modalities used; art or music therapy ($p < 0.001$), cupping, hypnosis, prayer or spiritual healing, traditional herbal, and traditional massage ($p < 0.05$). The common types of T&CM used

by HS and NHS students were aromatherapy (HS: 51.4%, NHS: 60.3%), prayer or spiritual healing (HS: 67.1%, NHS: 80.1%), and traditional herb (HS: 56.2%, NHS: 71.9%) (Supplementary Data 2).

Assessment on T&CM Frequent Usage

Students from both groups did not differ in the frequent usage of T&CM except for prayer or spiritual healing ($p < 0.05$). Almost 50% of the students never used half of the T&CM modalities listed in Supplementary Data 3. More than 30% of NHS students occasionally used aromatherapy (HS: 30.1%, NHS: 30.1%), prayer or spiritual healing (HS: 16.4%, NHS: 31.5%) and traditional herb (HS: 35.6%, NHS: 43.2%). The highest annual and monthly usage of T&CM recorded was traditional herb (HS: 12.3%, NHS: 12.3%), (HS: 11.0%, NHS: 9.6%) respectively. The highest weekly usage includes aromatherapy (HS: 6.8%, NHS: 4.8%), art or music therapy (HS: 6.8%, NHS: 6.8%), meditation (HS: 6.8%, NHS: 3.4%), prayer or spiritual healing (HS: 6.2%, NHS: 7.5%) and traditional herb (HS: 3.4%, NHS: 6.2%). Apparently, prayer or spiritual healing was used daily compared to other modalities (HS: 32.9%, NHS: 31.5%) (Supplementary Data 3).

Assessment on Frequency of T&CM Usage for the Last Sickness

Students in both groups differed in the frequency of T&CM usage for the last sickness for cupping, prayer or spiritual healing, and traditional herbal ($p < 0.05$). The NHS students used prayer or spiritual healing more than four times (HS: 25.3%, NHS: 37.0%) and three times usage for aromatherapy (HS: 6.8%, NHS: 9.6%), traditional herb (HS: 4.8%, NHS: 15.1%) and traditional massage (HS: 3.4%, NHS: 9.6%) (Supplementary Data 4).

DISCUSSION

Out of 292 respondents, majority respondents were female and Malay students. This is mainly due to the higher number of female and Malay students currently studying in UPM who agreed to participate in this study. Most of the students enrolled in this study were those aged between 21 and 23 years old, and Malay students marked up to more than three-fourths of the respondents. The third-year students were the highest among other years of study. The family or friends, internet, and mass media greatly influenced the T&CM information. This is like several other studies that suggest family, friends, and mass media as the primary sources contributing to the knowledge on T&CM (20,24,25,27). A study among Malaysian population also showed that knowledge of T&CM were obtained from family, friends, and the internet (8). A study by Khan and co-workers showed that family or relatives, health professionals, books, media, and CAM practitioners are major sources of CAM information(28).

Data from this study suggested the students had no difference in their knowledge, attitude, or practice towards T&CM. The HS students had a slightly better understanding of T&CM than NHS students. Contrary, NHS students had slightly higher positive attitudes and good practices compared to HS students. A study among pharmacy students in a Malaysian public university found that they did not have adequate knowledge of T&CM although they had positive attitudes and perceptions (29). Nursing students were more knowledgeable and had a positive attitude and practice than medical students (7). In Australia, dental students were found to have little to no knowledge of CAM (30). Positive attitude on T&CM was displayed for study in Saudi Arabia (28), Bangladesh (27), Ghana (25), Canada (31), and the United Arab Emirates (32).

There were significant differences in the student's knowledge of the T&CM modalities. Both groups have heard and have only basic knowledge about cupping and prayer or spiritual healing but lack knowledge about naturopathy. The same result was found in a study by Ashraf and co-workers where both pharmacy and non-pharmacy students were found to have a basic understanding about cupping and spiritual healing (20). Disagreement was found for the statement herbal medicine is safe to be used with hospital medicine. About two-fifths of the student did not know whether using herbal medicine with prescribed hospital medicine was safe however, as much as two-fifths said it was safe to use both. A review of several herbal medicine usage with hospital medicine found the side effects such as headache, tremors, toxicity as well as interference in the blood clotting and central nervous system functions (33).

This study suggested both HS and NHS students exhibited positive attitude and good practices on T&CM. Both groups of students believe patients who use T&CM can get better, supervision of T&CM by the physician is needed and herbal plants can treat wounds. T&CM was practiced by the students as per recommendation by family and friends. Recommendations from families and friends may be influenced by the knowledge received from them (20,24). Similar to other study, this study found that lack of scientific evidence was the caused for not using T&CM (24,34,35).

The level of awareness between the two groups of students was found to be significant. The HS students appeared to be slightly aware on the T&CM compared to NHS students. However, based on the T&CM awareness questions, both groups appeared to not be aware of the herb-drug interaction, side effect of T&CM and did not tell their doctor on the usage of T&CM. Not having using T&CM in daily life or for treatment, fear of knowing that the practice use may lead to the disease formation or not important to tell

on are among the reason for not informing the doctors. Agreement on the statement; patients should inform or consult physician on T&CM usage was found between the medical and pharmacy students (19). Even among the patients that use T&CM did not disclosed the usage of T&CM to their doctors (36). A study by Jatau and coworkers suggested that Emergency Department doctors in hospitals always enquire about their patient's T&CM usage for their diseases may be related to T&CM-related toxicity and to avoid any unwanted complications due to treatment received (17).

In this study, ayurveda, cupping, chiropractic, hypnosis, oriental medicine, and osteopathy recorded the highest non-usage of more than 80%. Similar results were found in another study that pointed out some of the least used modalities. A study in Turkey shows that ayurveda and chiropractic are never being used by health sciences and medical students (34). Acupuncture, chiropractic, and hypnosis were the least used among medical and pharmacy students (19). In contrast, pharmacy students in Bangladesh mostly used homeopathy, ayurveda, meditation, and massage (27). Cupping was mainly used for University of Sharjah students (32). Notable differences were found for art or music therapy, cupping, hypnosis, prayer or spiritual healing, traditional herbs, and traditional massage.

The commonly used T&CM practices among students from both faculties were aromatherapy, prayer or spiritual healing and traditional herbs. Hasan and co-workers also found that prayer was the most used by pharmacy students (35). A study in Saudi Arabia found prayers or spirituality and herbal medicine having been used by health sciences students however, aromatherapy was least used (28). In the United Kingdom, massage and aromatherapy are the most used, and the reason for usage were musculoskeletal pain, relaxation, sleep, and stress (18). A study in Canada listed aromatherapy as one of the top three self-administered by health professions students (31).

Highlighted in this study, prayer or spiritual healing was used daily by both HS and NHS students. Religious practices or prayer were the most common CAM methods used by the students (34). The reason for the usage may be influenced by the religious background of the students (32). However, the same modality was not being used due to the lack of scientific evidence to prove the effectiveness of the treatment (27). Treatment of the last sickness note differences in the usage of cupping, prayer or spiritual healing and traditional herb. Usage of prayer or spiritual healing and traditional herb ranging from one usage to more than four times. However, cupping was rarely an option to treat disease.

Reducing the misuse or unacknowledged of T&CM requires a multifaceted approach that combines education, regulation, and responsible practices among public. It is important to increase the public awareness campaign on the safe use of T&CM, potential interactions with medications, and the importance of seeking guidance from healthcare professionals' prior usage of any T&CMs. Stricter regulations and monitoring systems especially on labelling, manufacturing, and sale of T&CM are needed to ensure the safety of the products.

CONCLUSION

Findings from this study show that both HS and NHS possess adequate knowledge, display positive attitudes and good practice on T&CM. There was a significant difference between the level of awareness of HS and NHS even though the awareness was high. The most common T&CM modalities used were aromatherapy, prayer or spiritual healing, and traditional herbal. It is recommended for a repetitive cross-sectional study to be conducted on the same respondents to analyse the change of knowledge, attitude, practice, and awareness on the T&CM over time.

Limitations to this study included the sample population of this study, which may not represent the actual population of undergraduates in UPM as a convenient sampling method was used. Furthermore, the students' knowledge, attitude and practice may differ and change over time. The students' response may also subject to recall bias as students may be confused on the used modalities with respect to the time of usage.

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