



## Medical Students' Knowledge, Attitude and Practice towards Traditional and Complementary Medicine, Tanta City, Gharbiyah Governorate, Egypt

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### Authors' contributions

This work was carried out in collaboration between all authors. Authors ATEO, NMR, WMD, HAZ, EAA and HE designed the study, performed the statistical analysis and wrote the protocol. Authors ATEO, NAQ, DSAD and SOS wrote the first draft of the manuscript. Authors ATEO and NAQ managed the analyses of the study. All authors contributed to the literature searches. All authors read and approved the final manuscript.

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### ABSTRACT

**Background:** The use of traditional and complementary medicine (T&CM) is rising among public and patients around the world, and this epidemiological trend is attributed to multiple explanations including diverse cultural belief systems.

**Objective:** The aim of this study was to explore knowledge, attitude and practice (KAP) of medical students towards T&CM.

**Methods:** A cross-sectional study enrolled a random sample of 1160 medical students from Tanta city, Gharbiyah governorate, Egypt between February and March, 2016. Their responses were recorded on a self-designed and self-administered structured questionnaire.

**Results:** About 86.21% of students had some knowledge about T&CM. Media was the main source of knowledge (TV 31.2%, and internet 13.6%) but males (media, 63.2%) and females (multiple sources, 32.9%) differed significantly concerning source of knowledge ( $P<0.05$ ). Of studied subjects, 66.6% used once some form of T&CM in lifetime but 62.2% of them used more than one modality. The most common modalities used in decreasing frequency were herbal medicine, Prophetic medicine, cupping (hijama), nutritional supplements, and honey and bee products. The reported reasons for using T&CM included being safe with less side effects (29.0%), religious and social beliefs (25.5%), failure of conventional medicine (15.9%) and less cost (13.1%). Most of the participants (80.3%) agreed that T&CM services should be available to patients. 90.0% of students expressed that T&CM needs to be regulated by concerned authorities. Furthermore, 86.6% of the participants suggested that the community including patients need health education about T&CM.

**Conclusion:** Overall, majority of participants showed good knowledge and favourable attitudes towards T&CM along with its good practice. Furthermore, T&CM needs regulatory measures along with its integration into conventional medicine. T&CM should be accessible to all patients, and all concerned people including medical students require mandatory health education and training to further improve their KAP.

*Keywords: Traditional and complementary medicine; conventional medicine; medical students; Egypt.*

## 1. INTRODUCTION

Traditional and Complementary Medicine (T&CM) is practiced since antiquity. It is defined as a group of diverse unorthodox medical and health care system, practices, and products that are not presently considered as part of conventional medicine [1]. The World Health Organization (WHO) defined traditional medicine as ‘the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health, as well as in the prevention, diagnosis, improvement or treatment of physical and mental illnesses’ [2]. Non-conventional medicine, known by other different names including alternative medicine, complementary and alternative medicine, traditional medicine [TM], and folk medicine, holistically focuses on balancing mind-body-spirit of an individual with or without disease [3]. During the last decade or so, the use of T&CM has been rapidly increasing in high income countries of the world [4]. In 2007, approximately 38 percent of U.S. adults aged 18 years or more and about 12 percent of children used some form of traditional medicine [4]. In the same year, U.S. adults spent \$33.9 billion out-of-pocket on visits to T&CM practitioners and purchases of T&CM products, classes, and materials [5].

Since globalization, the pattern of medical diseases in low- and middle-income countries is

changing with 50 percent of the health burden is now attributed to non-communicable diseases (NCD) [6]. Notably, T&CM approaches tend to deal with the contributing factors in particular high fat diet and junk food, obesity, sedentary lifestyle, lack of exercise and constant stress. These risk factors often lead to the development of chronic NCD. Furthermore, T & CM would be increasingly important for the development of future healthcare strategies for low- and middle-income countries [6]. Notably, high-income countries also share great healthcare burden due to NCD but the western world is far ahead of Eastern World in managing chronic NCD with the help of evidence-based preventive and therapeutic strategies [7]. Currently, a large number of patients are comparatively knowledgeable of complementary and alternative medicine (CAM) and use its products which are freely available in the market without prescription. Conventional healthcare providers are mostly unaware of patient’s usage of traditional therapies [7]. It is wise that either the patient should disclose use of TM or healthcare provider make sure to enquire about its concurrent use with modern medicine in order to avoid their interaction adverse effects, sometimes dangerous impacting the patient safety. Therefore, it is important to create the suitable conditions for the appropriate use of T & CM methods which can contribute to the improvement of patients’ health, well-being and safety.

This pilot study is significant in Egyptian context because it explores the KAP of medical student in academic setting, and there is considerable dearth of literature on this topic. Furthermore, the findings of this study will guide university academicians to make some important decisions especially concerning integration of T&CM curriculum into medical education. This study may also stimulate like-minded researchers to further advance research on traditional medicine in other universities and ministry of health settings in Egypt.

### **1.1 Aims of the Study**

This study explored the knowledge, attitude and practice (KAP) of medical students towards traditional and complementary medicine.

## **2. METHODS**

### **2.1 Study Design**

This was a cross-sectional university-based survey of randomly selected sample of medical students enrolled in three medical schools of Tanta University, Egypt.

### **2.2 Setting**

This study was conducted at Tanta University, Tanta city, Gharbiyah governorate, Egypt during the year 2016. This university was selected because the researchers had easy access to students and, hence, ease of data collection from all the included participants. This university has no special clinics for T& CM and CAM curriculum, which are yet to be integrated into the main medical curriculum of the university.

### **2.3 Sample**

A stratified random sample of 1160 medical students was selected between February and March, 2016. The participants were chosen from the three medical schools: School of Medicine (550/7142), School of Pharmacy (310/5866) and School of Dentistry (300/5601). This sample represented 15% of students in different grades of these schools. Students were first classified into different strata according to grade. Then each stratum was classified into male and female. Finally, one out of seven numbers was chosen randomly, and then each seventh student was selected by systematic random sampling technique.

### **2.4 Questionnaire**

The National Center for Complementary and Alternative Medicine (NCCAM) situated in Riyadh designed a self-administrated structured questionnaire in Arabic language that aimed to explore KAP of diverse participants including public, professionals and medical students. A slightly modified version of this questionnaire was used in the present study. The questionnaire was piloted on 30 medical students who suggested minor linguistic changes. These changes were made and all five experts agreed on the final questionnaire. This questionnaire explored the following elements: i) Students' knowledge about T&CM and its sources. For example, one of the main question related to knowledge was "what are the sources of your knowledge concerning T& CM? ii) Utilization of several listed T&CM modalities by students and their family members. One illustrative question about using T&CM was "which of the following traditional medicine have you used in your lifetime, and how many times? iii) Participants attitudes towards T & CM. One of the main questions concerning attitude was "do you think T&CM needs regulation and practitioners require regular training? and iv) causes of T&CM use. The questionnaire is available upon request from two co-authors (NAQ & ATE).

### **2.5 Inclusion and Exclusion Criteria**

The inclusion criteria were age 17 years and above and they were able to give oral informed consent to participate in the study, and Egyptian nationals who understand Arabic language. The exclusion criteria were expatriates, age below 17 and those with any disabling medical disease.

### **2.6 Procedure**

The medical students were approached to completely fill out the questionnaire when they were not attending their classes. The questionnaire was distributed by the first author and two other co-authors to selected students (n=1160) in the classroom who consented to participate in the study. Data collectors explained the items of the questionnaire to the students in about 10 minutes. They were also informed to feel free to further clarify any item on the questionnaire. The researcher collected the duly filled questionnaires from all students immediately after they completed it. There were multiple sessions for collecting the data from the

participants. The time taken to fill out the questionnaire was about 15 minutes. Attitudes of participants were explored using 4-point Likert scale (strongly agree, agree and strongly disagree and disagree).

### 2.7 Data Management and Analysis

Statistical Package for Social Sciences (SPSS) Software Windows Version.19 (SPSS Inc., Chicago, IL, USA) was used for data entry, coding and cleaning together with data management and analysis. The results were described as frequencies and percentages for all research variables. For continuous variables, mean and standard deviation were also calculated. The associations between both participants' KAP and sociodemographic variables and their responses about T &CM were determined using Pearson's Chi-square test. A p-value of  $\leq 0.05$  was considered significant.

### 2.8 Ethical Considerations

The first author informed the concerned authorities of Tanta University about this study. The permission was granted to him for conducting the present study. Informed consent was taken from all participants prior to the distribution of questionnaire to them. Furthermore, complete answering of the questionnaire is considered as an informed consent to participate in the study. The participants were clearly informed in nontechnical language about the nature and objectives of the study. In addition, they were also informed that their anonymized data will be used only for research purpose and its confidentiality will be maintained. The participants can withdraw from this study any time and they can contact the

study team for any query or to know the study results in the future. No incentives or rewards were given to the participants. Furthermore, this study did not involve any risk to the participants. The ethical committee accreditation number is TUMEC 12/17/2015/00548211/1/2/3 PH&CMD.

## 3. RESULTS

There were 1160 participants in this survey; four hundred and eighty four (41.7%) were males and 676 (58.3%) were females, and 796 (68.6%) were living in urban areas. Their age ranged from 17 to 25 years (mean =  $20.23 \pm 2.13$ ) and most of the participants (n=768, 66.2%) were in age band of 20-25. Their knowledge, attitude and practice about traditional and complementary medicine were assessed using a self-designed, structured questionnaire. All percentages in this study were calculated from 1160.

### 3.1 Subjects' Knowledge

Of the studied subjects, 86.2% (n=1000) had some knowledge about T&CM while 13.8% (n=160) of participants never heard about T&CM before. Only 19.7% (n=228) had informal discussions with doctors or family members or friends related to T&CM practices. Different sources of participants' knowledge of T&CM categorized by gender, residence and age groups are shown in Table 1. Media especially TV (31.2%) and Internet (13.6%) were the main source of knowledge among studied subjects, whereas 28.8% of participants reported more than one source. Males (57.9%) depended mainly on social media as a source of knowledge compared to females (36.8%). While females (32.9%) reported more than one source of knowledge compared to males (22.1%).

**Table 1. Participants' demographic variables and the source of knowledge of T&CM**

Sources of knowledge	Gender		Residence		Age		Total
	Male	Female	Urban	Rural	17-<20	20-25	
TV	160 (42.1)	152 (24.5)	220 (31.6)	92 (30.3)	136 (35.8)	176 (28.4)	312 (31.2)
Internet	60 (15.8)	76 (12.3)	88 (12.6)	48 (15.8)	60 (15.8)	76 (12.3)	136 (13.6)
Books	20 (5.3)	52 (8.4)	40 (5.7)	32 (10.5)	12 (3.2)	60 (9.7)	72 (7.2)
Friends	16 (4.2)	24 (3.9)	24 (3.4)	16 (5.3)	16 (4.2)	24 (3.9)	40 (4.0)
Relatives	32 (8.4)	52 (8.4)	52 (7.5)	32 (10.5)	24 (6.3)	60 (9.7)	84 (8.4)
Doctors	8 (2.1)	60 (9.7)	60 (8.6)	8 (2.6)	20 (5.3)	48 (7.7)	68 (6.8)
Multiple*	84 (22.1)	204 (32.9)	212 (30.5)	76 (25.0)	112 (29.5)	176 (28.4)	288 (28.8)
Total	380 (100)	620 (100)	696 (100)	304 (100)	380 (100)	620 (100)	1000 (100)

### 3.2 Participants' Attitude

The majority of participants (80.3%) had positive attitudes towards the need for establishing centres for T&CM. Similarly, most of the students (90%) suggested that the practice of T&CM should be regulated. Furthermore, 86.6% of participants opined for community health education concerning T&CM. According to 66.5% of the participants, there should be integration of T&CM into primary healthcare (PHC) services and 58.2% suggested its inclusion in medical curriculum (Table 2). The participants knowledge of T&CM was significantly associated with positive attitudes towards T&CM ( $p < 0.05$ ).

### 3.3 Practice

Of studied subjects, 66.6% ( $n=772$ ) used once some form of T&CM in lifetime. However, 62.2% ( $n=480$ ) of the participants used more than one modality. Herbals, cupping (Hijama), prophetic medicine, dietary supplements, honey and bee

products and acupuncture in decreasing frequency were the common practices (Table 3).

### 3.4 Sociodemographic Variables and T&CM

Gender, residence and exposure to informal discussions were not significantly associated with the use of T&CM ( $p > 0.05$ ). However, those subjects with age (17 to  $< 22$  years) (75.9%) had significant association with T&CM use. In addition, those participants (72%) having good knowledge of T&CM were significantly associated with high use of T&CM ( $p < 0.05$ ) (Table 4).

### 3.5 Reasons for Using T&CM

The medical students reported that the less adverse effects, religious and social beliefs, failure of conventional medicine and being less expensive are the main reasons for seeking T&CM (Table 5).

**Table 2. Attitude of participants towards T&CM**

Statements	Strongly disagree	Disagree	Total disagree	Agree	Strongly agree	Total agree
Special centres for T&CM	52 (4.5)	176 (15.2)	228 (19.7)	740 (63.8)	192 (16.6)	932 (80.3)
Regulation of TCM	16 (1.4)	100 (8.6)	116 (10.0)	696 (60.0)	348 (30.0)	1044 (90.0)
Community health education for T&CM	20 (1.7)	136 (11.7)	156 (13.4)	784 (67.6)	220 (19.0)	1004 (86.6)
Integration of T&CM into PHC	52 (4.5)	336 (29.0)	388 (33.5)	628 (54.1)	144 (12.4)	732 (66.5)
Integration of T&CM into medical curriculum	76 (6.6)	408 (35.2)	484 (41.8)	540 (46.6)	136 (11.7)	676 (58.2)

**Table 3. Distribution of T&CM use among studied subjects (n=1160)**

Type of T&CM	No	%
More than one type	480	62.2
Herbals	72	9.3
Cupping	56	7.3
Prophetic medicine	40	5.2
Dietary supplements	36	4.7
Honey and bee products	28	3.6
Acupuncture	20	2.6
Roqia (recitation from Holy Quran)	20	2.6
Massage therapy	12	1.6
Camel milk and urine	4	0.5
Hypnosis	4	0.5
Total users	772	66.6
Non-users	388	33.4

**Table 4. Participants' sociodemographic data and use of T&CM**

Variable		Use of T&CM				P
		Yes		No		
		No	%	No	%	
Gender	Male	304	63.6	176	36.4	0.37
	Female	464	68.6	212	31.4	
Residence	Urban	528	66.3	268	33.7	0.9
	Rural	244	67	120	33	
Age	17-<20	328	75.9	104	24.1	0.009*
	20-25	444	61.0	284	39	
Knowledge of T&CM	Yes	720	72	280	28	0.000*
	No	52	32.5	108	67.5	
Exposure to informal discussion about T&CM	Yes	76	68.4	72	31.6	0.74
	No	616	66.1	316	33.9	

\*Significant

**Table 5. The reasons for seeking T&CM**

Reasons for seeking T&CM	Frequency	%
Less side effects	336	29.0
Because of religious and social beliefs	296	25.5
Failure of conventional medicine	184	15.9
Being less expensive	152	13.1
More than one reason	192	16.6
Total	1160	100.0

#### 4. DISCUSSION

This study explored the knowledge, attitude and practice of medical students towards traditional and complementary medicine in Tanta University, Egypt. Furthermore, this research found association between participants' sociodemographic variables and KAP towards T & CM together with reasons for using non-conventional medicine. There are few studies in Egypt that addressed students' knowledge, practice and attitudes towards T&CM [8]. The present study has a mixed sample of students from pharmacy, dental and medicine; therefore, the results are expected to differ across three groups. However, the findings will also be discussed with those studies having homogeneous sample. This study compared the knowledge, experience and perceptions of fourth year medical students from Alexandria Medical college (Students=489), Egypt and Taibah medical college (Students=85), Saudi Arabia [8]. According to the participants from both institutions, some traditional modalities were useful in a variety of chronic diseases. The students lacked knowledge about safety and efficacy of TM; however they believed TM needs to be used as complementary to modern medicine as found in our study. Furthermore, participants suggested training of medical students in T&CM and its integration into medical curriculum. Taibah students were significantly

differed concerning TM experience compared to Alexandria students who reported to have less exposure to and experience in CAM [8]. In our five recent studies from Saudi Arabia [9-13], the findings emphasized on training of public and various professionals and integration of traditional therapies into medical curriculum. According to the present study, most participants agreed that the regular training of practitioners in TM is needed along with integration of conventional into modern medicine. Also supported by this study was the traditional curriculum integration into medical education. Recently, Alzahrani and colleagues (2016) explored knowledge and attitudes of senior medical students (n=273) towards CAM and their opinion concerning integration of CAM into medical curriculum in Jeddah city, Saudi Arabia. Consistent with our study, the study reported positive attitude of medical students' learning of CAM despite limited knowledge of certain CAM therapies like acupuncture and herbs such as St. John's Wort. In addition, the subjects emphasized that the evidence-based CAM in conjunction with modern medicine may help patients with atypical cases, and surprisingly, medical students did not like the idea to refer patients to CAM practitioners [14].

In a descriptive study concerning 3<sup>rd</sup> year medical students in Majmaah University, the majority of participants suggested the integration

of conventional and CAM therapies like our study for a better healthcare outcome, and about half of the students expressed positive attitude towards knowledge of CAM as many patients with chronic disease seek traditional therapies. According to Majmaah study, more knowledge through training in CAM is required to make an informed decision for its effectiveness in medical conditions [15]. According to this study, however, majority of participants were found to having some knowledge in and positive attitude towards T&CM. In other Gulf countries, there is limited literature on students' KAP towards traditional medicine, though the use of T&CM is rapidly increasing in this part of the world [11-13,16]. In a cross-sectional study conducted in Kuwait among medical and pharmacy students (n=250), Awad and associates found that about 55% of students, majority of females, used CAM especially herbal products, participants had limited knowledge of 11 CAM modalities, and pharmacy students had better information in herbal preparations than medical students. Among all CAM therapies, cautery was considered less beneficial, while massage, phytomedicine (herbal medicines) and recitation from Quran were most effective therapies. Most of participants expressed positive attitude towards CAM, and also recommended that the students need formal training to be good practitioners [16], the findings consistent with our present study. Overall, KAP of medical students, senior or second year, and a variety of professionals towards traditional medicine vary in accordance to research methodology and sample designing.

Conversely, there is a huge literature on traditional medicine in western world attributable to continuing research and public ever-increasing interest in using non-conventional therapies [17-20] and many more studies conducted on CAM supported this view [12,13]. Most of these studies reported significantly high knowledge, positive attitude and greater use of T&CM among medical students, and KAP varied with gender, grade or type of school [17-20], and these results are mostly consistent with our study. Chez and colleagues reported that majority of third year medical students were exposed to CAM therapies in the past and American public use traditional therapies to a greater extent [17]. The former finding is inconsistent with our study as the participants were not exposed to any training in traditional medicine. Furthermore, like the present study, medical students were aware of the fact that some CAM interventions are useful and do not pose any danger (i.e., safe) to the

public. Medical students knowledge was poor concerning safety of 10 most commonly used CAM therapies [17]. Kilic et al. (2009) found that internet was the main source of CAM information for medical school students of both gender. Knowledge of meditation, Tai Chi, Ayurveda, massage, reiki, spirituality and herbal therapy differed significantly between male and female Turkish medical students. About 65% of Turkish medical students believed in the benefit of CAM modalities [18]. According to the present study, however, medical students considered T.V. as the main source of knowledge about T&CM. In addition, internet, relatives, books and doctors were other important sources of knowledge of T&CM. Notably T&CM use is directly proportional to and significantly associated with higher knowledge. Notably, Turkish medical students obtained information mainly through internet, books, newspapers/journals followed by T.V [18]. In a study involving Czech students, internet, journals and books were found to be the main sources of information [19]. In our present study, internet was the second most common source of knowledge of T&CM .inconsistent with other studies [18,19]. Karsten and colleagues (2011) reported in decreasing frequency the main sources of knowledge about T&CM among medical students were practical experience, media, publications, medical education, congresses and talk with colleagues. The students considered themselves lacking sufficient knowledge of T&CM and ruled out some T&CM methods including geopathy, spiritual healing and iridology completely [20]. Like the results of the present study, medical students and other professionals (general physicians and gynaecologists) suggested that CAM needs to be integrated into medical education. Furthermore, students need to be taught CAM critically in medical schools [20].

There is a significant growing interest in the integration of T&CM modalities into medical curriculum parallel to the global increase in T&CM use [12,13]. In Egypt, with the absence of a nationally agreed policy, inclusion of T&CM in the medical curriculum varies widely. There are no specific courses related to T&CM in medical schools' curriculum in Egypt. Many medical schools in western countries have evidence based T&CM modalities including acupuncture, chiropractic and osteopathy integrated into medical curriculum [21,22]. According to this study, medical students showed significantly positive attitude towards T&CM consistent with others studies [18,23] but inconsistent with other researches [21,24]. In addition, like the present

study, most studies suggested that T&CM need to be integrated into medical curriculum and clinical practice [23-25]. Further research is needed to support the efficacy and safety for better informing medical students and traditional practitioners about T&CM [24]. Overall, medical students tend to have favourable attitude towards CAM along with multiple sources of knowledge, suggest continuous training and its integration into medical education.

Herbal supplements are used increasingly for preventive and promotional purposes of health around the world [26]. Zimmerman and Kandiah [26] reported that most of participants (from a total of 286) recruited from Western university were familiar with CAM including six herbs (gingko, ginseng, St. John's Wort, garlic, echinacea, and cinnamon) in varying frequency. However, many of college students were uncertain about the effectiveness of herbs in the prevention of disease or promotion of good health. Conversely in the present study, about 9% of participants were found to use herbs. There were three barriers to their CAM awareness including insufficient education, a lack of scientific evidence and a lack of trained professionals. Majority of students desired educational courses on CAM therapies and suggested integration of CAM into healthcare practices, and these findings match with our study. Medical students had good knowledge of herbs but required training in CAM to enhance their knowledge and practical experience. In a study conducted among German students, Jocham et al. [27] found that those who attended elective courses on acupuncture and homeopathy had more positive attitude towards CAM than unselected students consistent with other studies. Thus, this present study and other studies supported the view that the training of undergraduate students in traditional medicine is needed as it linked with the enhancement of knowledge and practice together with favorable attitudes towards traditional therapies [11,12].

According to this study, the knowledge of herbal medicine, cupping, prophetic medicine, dietary supplements, and honey and bee products were most familiar to medical students related to their religious, sociocultural habits and belief system. On the other hand, acupuncture was the most known T&CM modality among medical students in Singapore [28]. Among American medical students, massage, herbal medicine and meditation were the most knowledgeable T&CM practices [17]. In a study on Turkish medical students, authors reported that herbal medicine,

acupuncture, hypnosis, massage and meditation in decreasing order were the most knowledgeable practices. In addition, students believed that knowledge of T&CM would be useful and current T&CM practitioners need training to be medically qualified [29]. Notably, acupuncture and homeopathy were the best known methods among German medical students [24]. Overall, information among medical students concerning T&CM varies in accordance to research method and material, exposure to traditional medicines and clinical experience.

This study has some limitations. The findings are not generalizable to the medical students of other universities in Egypt. It is because of the sample is drawn only from one university. According to some reviewers, the heterogeneity of sample is a weakness as this study falls short of giving discrete and dynamic info about a particular group like medical or pharmacy or dental regarding T&CM. Accordingly, a homogeneous sample selected using sophisticated sampling technique as done in the present study would have been more appropriate in descriptive studies. This is the preliminary study meticulously conducted among medical students in Egyptian culture. The response rate revealed in this study (95.5%) is higher than other researches (17.5-88.6%) [14,16]. This high response rate reflects strength of this study in terms of its thoroughness. Finally, this research recommended regulatory measures, health education to public and professionals, integration into medical education and easy accessibility of T&CM to health seekers for improving its global utilization.

## 5. CONCLUSION

The tentative findings of this study suggested that majority of the medical students were familiar with the T&CM modalities widely used in Egyptian culture together with their good practice and positive attitude towards this traditional medical system, and these results are compatible with international data on complementary and alternative medicine.

## CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

## ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee



has been collected and preserved by the authors.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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