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## Abstract

**Background:** Complementary and alternate medicine (CAM) has been defined as a group of diverse medical and healthcare systems, practices, and products not presently considered part of conventional medicine (CM). Studies in different countries have revealed a geographical difference in the knowledge about CAM therapies, especially among medical school staff and students. This study aimed to assess the extent of CAM use among staff working in paramedical colleges in the Riyadh region of Saudi Arabia and to examine their perception and attitudes towards such medicines. **Materials and methods:** Eighty paramedical staff members of different age groups and specializations were invited to participate in the study. A self-administered questionnaire adapted from similar studies was used in this study.

**Results:** The response rate was 99%. The majority of respondents (56%) reported believing that CAM therapies play an important complementary role to the action of CM.

**Conclusion:** To the best of the authors' knowledge, this is the first study of its kind to assess peoples' attitudes towards CAM use in the region. As the use of healing practices outside of CM rise among patients, ignorance of CAM by future medical practitioners can cause a communication gap between people and the profession that serves them. It is encouraging that the majority of medical staff in this study recognizes and is enthusiastic to rectify this lack of knowledge.

**Key words:** Complementary and alternate medicine, paramedical staffs, attitude, perception, beliefs

**List of Non-Standard Abbreviations:** CAM: Complementary and alternate medicine; CM: Conventional medicine

## Introduction

Complementary and alternate medicines (CAM) have been defined as a group of various medical and healthcare systems, practices, and products that are not considered to be part of modern conventional medicine (CM) (National Institutes of Health 2009). This term has gained popularity worldwide. In the US, its use has been reported to have increased from 34% in 1990 to 42% in 1997 (Eisenberg, et al., 1993; Eisenberg, et al., 1998). As per reports, these therapies are used by 20% to 50% of the population in European countries and 52% in Australia, and adults use CAM more than children do (Fisher, et al., 1994; Vickers, 1994; MacLennan, et al., 2002). National estimates of CAM use were highest for East Asian countries like Japan, South Korea, and Malaysia (Nahin, et al., 2009). According to the World Health Organization, approximately 80% of the population in developing countries relies on traditional medicines mainly of herbal origin for primary healthcare (Chan, 2003).

Various studies have revealed geographical differences in knowledge about CAM therapies, especially among medical school staff and students in different countries. Self-perceived knowledge of acupuncture, massage, and meditation was highest among the studied countries in Australia (Hopper, 1998). In Britain, knowledge about acupuncture, yoga, and homeopathy was highest among medical school staff (Rampes, et al., 1997) while, in America, students reported knowing most about massage, herbal medicine, and meditation (Chez, et al., 2001). This study was done to assess the use of CAM among staff working in a paramedical college in the Riyadh region of Saudi Arabia and to know their perception of and attitudes towards CAM. To the best of our knowledge, no such study has been conducted in the region before. Staff members in a medical college are in a responsible position as they train the future generation of professionals. They can indirectly influence the advice received by the general population about medicines other than those belonging to CM. We aim to understand the interest in and importance of CAM among paramedical college staff. This shall provide a better picture of the prospect of using CAM. Additionally, results of this study will also provide useful information for review of medical syllabi in the country.

## Material and Methods

### Participants

Eighty paramedical staff members of different age groups and specializations were invited to participate in the study. Participants were assured that their participation was confidential. Before conducting the study, necessary approvals were obtained from the institutional review board. This study was conducted over a period of two months starting in April of 2015.

**Study Tool**

A self-administered questionnaire adapted from similar studies (Perkin, et al., 1994; Rampes, et al., 1997; Hopper and Cohen, 1998; Chez, et al., 2001; Patterson, et al., 2008) was used in this study. It was designed to find the attitudes and perception of participants regarding CAM use. It was modified according to local culture and demands. It consisted of closed-ended, multiple-choice questions and required participants to indicate their level of agreement on a 5-point scale. It consisted of two parts. The first part included questions about demography, general attitudes, and perception and knowledge related to CAM. The second part concerned positive beliefs, environmental influence, and psychological comfort factors regarding CAM. CAM was defined as those systems of medicines not included in CM.

**Statistical Analysis**

Responses on both parts of the questionnaire were analyzed separately using a question program online survey software application. Data were compared for any significant differences in responses in terms of demographic variables that could affect CAM use. Attitudes and perceptions related to CAM were compared using a Chi-square test. Results were considered significant for  $p < 0.05$ . Chi-square analysis was used to determine differences in probability of CAM use based on respondent characteristics.

**Results**

**Demographic Information**

The response rate was 99%. All respondents were female, aged between 20 and 40 years old. At least 31% of the respondents were found to be post-graduate when characterized according to their educational backgrounds (Table 1).

**Table 1:** Demographic characteristics of respondents (n = 9)

	<b>Characteristic</b>	<b>Number (%)</b>
<b>1</b>	<b>Age distribution (years):</b> 17–21/22–30/31–39/> 40	33 (44.0%)/20 (26.7)/18 (24.0%)/4 (5.3%)
<b>2</b>	<b>Education:</b> (Unlettered/Graduate/High education)	0 (0.0%)/52 (69.3%)/23 (30.7%)

**General Attitudes, Perception, and Knowledge**

The majority of respondents (56%) reported believing that CAM therapies play an important complementary role to the action of CM (Table 2). At least 15% of respondents reported that CAM therapies are effective, and 72% reported that it has a positive impact on patient health. Another 56% reported that, in their opinion, CAM is more effective than CM for treatment of certain specific diseases like infertility and skin diseases. Almost half of the respondents (48%) reported that they have heard about CAM therapies like acupuncture, herbal medicines, and aromatherapy. Although herbal medicine was reported to be the most popular therapy, the majority did not know much about its uses and side effects. The absence of side effects (69%) was the most reported reason behind the popularity of CAM with 56% of respondents preferring these over CM (Table 3).

**Table 2:** Relationship between age and role of CAM towards respondents (n = 79)

<b>Age</b>	<b>What role can be played by CAM beside the existence of CMs at the present time?</b>				
	<b>Primary role</b>	<b>Secondary role</b>	<b>Complementary role</b>	<b>No role</b>	<b>Raw total n (%)</b>
17-21	5 (15.6%)	14 (43.8%)	11 (34.4%)	2 (6.3%)	<b>32 (43.8%)</b>
22-30	1 (5.0%)	6 (30.0%)	12 (60.0%)	1 (5.0%)	<b>20 (27.4%)</b>
31-39	0 (0.0%)	2 (11.1%)	16 (88.9%)	0 (0.0%)	<b>18 (24.7%)</b>
> 40	0 (0.0%)	0 (0.0%)	2 (66.7%)	1 (33.3%)	<b>3 (4.1%)</b>
Column total n (%)	6 (8.2%)	22 (30.1%)	41 (56.2%)	4 (5.5%)	73 (100%)

Chi-square, significant correlation between the variables 95%,  $p$ -value at 0.014;  $M \pm SD$  (2.59  $\pm$  0.723); ERROR: 0.085, CAM: Complementary and alternate medicine

Although 55% of respondents reported that they were unsure if CAM can affect babies, the majority of respondents still reported using them during pregnancy (29%) and lactation (42%). Among others, most of the respondents reported preferring herbal medicines in these conditions (Table 4).

**Table 3:** General attitude, perception, and knowledge regarding CAM (n = 79)

1	Sources of information	Number (%)			
		Primary role	Secondary role	Complementary role	No role
	What role can be played by CAM beyond those of CM at present?	6 (8.2%)	22 (30.1%)	41 (56.2%)	4 (5.5%)
2	Does CAM have a positive impact on patients' health?	Yes	No	Sometimes	
		18 (24.0%)	3 (4.0%)	54 (72.0%)	
3	Are CAM therapists able to diagnose and prescribe treatment as CM practitioners do?	Yes	No	Sometimes	
		14 (18.9%)	9 (12.2%)	51 (68.9%)	
4	What are the diseases that are better treated with CAM than with CM?	Infertility	Fractures	Skin diseases	Vertebral
		20 (28.2%)	18 (25.4%)	25 (35.2%)	8 (11.3%)
5	Have you or any of your family members ever used CAM?	Yes		No	
		36 (48.0%)		39 (52.0%)	
6	What is the interest of the respondents toward herbal medicine?	Great interest	Average interest	Little interest	No interest
		20 (31.3%)	35 (54.7%)	8 (12.5%)	1 (1.6%)
7	Do you prefer to use CAM or CM?	CAM		CM	
		42 (56.0%)		33 (44.0%)	
8	What is the main reason/s driving you to use CAM?	More beneficial	Cheap and available	No side effects	Better than drugs
		10 (14.9%)	2 (3.0%)	46 (68.7%)	9 (13.4%)

\*CAM: Complementary and alternate medicine CM: Conventional medicine

For the second part of the questionnaire, means and standard deviations describing the results as data revealed a normal distribution. Eleven statements were included to which respondents could either agree or disagree. Five of these statements assessed positive belief about CAM, three were constructed to elicit environment influence towards CAM, and the last three described psychological comfort about CAM (Table 5).

**Table 4:** Beliefs regarding CAM use during pregnancy and lactation (n = 79)

1	Uses	Alternatives						
		Yes	No	Sometimes	I don't know			
	Can CAM therapies be used during pregnancy?	22 (29.3%)	12 (16.0%)	20 (26.7%)	21 (28.0%)			
2	Do CAM therapies affect the health of the fetus if used during pregnancy?	Yes	No	Sometimes	I don't know			
		7 (9.3%)	8 (10.7%)	19 (25.3%)	41 (54.7%)			
3	Which HM is used in pregnancy?	Cumin	Fenugreek	Ginger	Anise	Mint	Others	I don't know
		4 (5.4%)	3 (4.0%)	3 (4.0%)	7 (9.3%)	3 (4.0%)	9 (12.0%)	46 (61.3%)
4	Can CAM therapies be used during lactation?	Yes	No	Sometimes	I don't know			
		31 (41.9%)	2 (2.7%)	14 (18.9%)	27 (36.5%)			
5	Do CAM therapies affect the health of the baby if taken during lactation?	Yes	No	Sometimes	I don't know			
		21 (28.0%)	3 (4.0%)	12 (16.0%)	39 (52.0%)			
6	Which HM was used in lactation?	Fenugreek	Cinnamon	Sage	Anise	Others	I don't know	
		18 (24%)	4 (5.3%)	3 (4.0%)	5 (6.7%)	11 (14.7%)	34 (45.3%)	

\*CAM: Complementary and alternate medicine, HM herbal medicine

Discussion

Thoughts of adults are necessary to understand how various internal and external factors play a role in their health choices. Although knowledge about what influences their choice to use CAM is essential for understanding how factors can play a role in healthcare decisions, to the best of our knowledge, there is limited information currently available about their decision making regarding CAM use. This study was conducted to assess the use of CAM among staff working in a paramedical college in the Riyadh region of Saudi Arabia and to examine their perceptions of and attitudes towards such medicines. The majority of respondents (56%) reported believing that CAM therapies play an important complementary role besides the action of CM.

**Table 5:** Beliefs about CAM among respondents (n = 79)

No.	Item	Strongly disagree	disagree	To some extent	Agree	Strongly agree	M ± SD	Factor loading
1	CAM providers give valuable information on maintaining a healthy lifestyle.	1 (1.3%)	5 (6.3%)	40 (50.0%)	24 (30.0%)	10 (12.5%)	3.46 (0.84)	0.094
2	There are fewer side effects when using natural remedies.	0 (0.0%)	9 (11.3%)	26 (32.5%)	38 (47.5%)	7 (8.8%)	3.54 (0.81)	0.91
3	CAM involves natural plants, which are healthier than taking drugs provided by CM.	0 (0.0%)	9 (11.3%)	32 (40.0%)	25 (31.3%)	14 (17.5%)	3.55 (0.91)	0.10
4	You would be more likely to use CAM if there were more CAM clinics.	0 (0.0%)	17 (21.3%)	27 (33.8%)	22 (27.5%)	14 (17.5%)	3.41 (1.02)	0.11
5	Do you believe that CAM increases the body's own defenses and enhances self-healing.	2 (2.5%)	8 (10.0%)	32 (40.0%)	28 (35.0%)	10 (12.5%)	3.45 (0.93)	0.10
6	Increased knowledge of CAM tends to increase use of it.	0 (0.0%)	5 (6.3%)	25 (31.7%)	33 (41.8%)	16 (20.3%)	3.76 (0.85)	0.96
7	Parents and family can influence on their children about CAM use.	1 (1.3%)	12 (15.0%)	27 (33.8%)	26 (32.5%)	14 (17.5%)	3.5 (0.99)	0.11
8	Young people are more likely to use CAM if their teachers or friends are using it.	2 (2.5%)	24 (30.4%)	24 (30.4%)	22 (27.9%)	7 (8.9%)	3.10 (1.02)	0.12
9	People who believe in the physical, mental, and spiritual aspects of health are more likely to use CAM.	0 (0.0%)	7 (8.9%)	28 (35.4%)	26 (32.9%)	18 (22.8%)	3.70 (0.93)	0.10
10	People who are afraid of treatment with medicines by doctors are more likely to use CAM.	1 (1.3%)	5 (6.3%)	22 (27.5%)	28 (35.0%)	24 (30.0%)	3.86 (0.96)	0.11
11	People believe that using CAM is not harmful.	3 (3.8%)	14 (17.5%)	40 (50.0%)	16 (20.0%)	7 (8.8%)	3.13 (0.93)	0.10

\*CAM: Complementary and alternate medicine

Such understanding of the choice for health options shall enable practitioners to guide others in making suitable healthcare choices and provide a basis for health planning that includes a range of services (Braun, et al., 2000). It is important to increase awareness among nurses, pharmacists, physicians, and allied health care professionals about CAM therapies, which, clinically, would minimize the risk of potentially harmful pharmaceutical-natural substance interactions (Reznik, et al., 2002; Wilson, 2002; Hagen, et al., 2003).

**Table 6:** Relationship between the level of education and improvement through use of CAM (n = 75)

Statement	Level of education	Number / %				Row total
		Infertility	Fractures	Skin diseases	Vertebro-chondral	
What are the diseases that are better suited to CAM than to CM	Bachelor (graduate)	16 (32.7%)	10 (20.4%)	18 (36.7%)	5 (10.2%)	49 (69.0%)
	Higher education	4 (18.2%)	8 (36.4%)	7 (31.8%)	3 (13.7%)	22 (31.0%)
Column total		20 (28.2%)	18 (25.4%)	25 (35.2%)	8 (11.3%)	71 (100%)

\*CAM: Complementary and alternate medicine CM: Conventional medicine

The presence of some disease has been described as a reason to use CAM in various studies (Grootenhuis, et al., 1998; Pommier, et al., 2002; Reznik, et al., 2002; Hagen, et al., 2003). Respondents were more likely to use CAM if they had frequent symptoms or longer illness duration. However, there is no evidence regarding use of CAM therapy for preventive healthcare in our study.

**Table 7:** Relationship between level of respondent’s education and CAM/CM use (n-75)

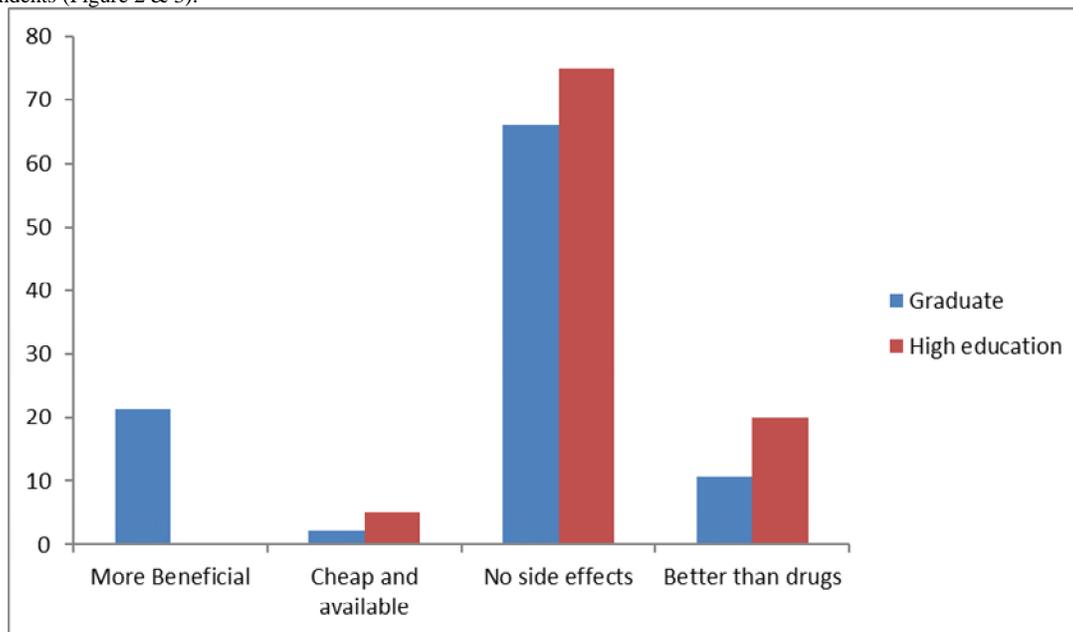
Level of education	Do you prefer to use CAM or CM?		
	CAM	CM	Raw total n (%)
Bachelor (graduate)	29 (55.8%)	23 (24.2%)	52 (69.3%)
Higher education	13 (56.5%)	10 (43.5%)	23 (30.7%)
Column total N (%)	42 (56.0%)	33 (44.0%)	75 (100.0%)

Chi-square, significant correlation between the variables 95%, p-value at 0.99; M ± SD (2.31 ± 0.46); ERROR: 0.054 CAM: Complementary and alternate medicine CM: Conventional medicine

This study provides preparatory evidence for a measurement tool that can be used in future studies related to CAM. Results show that respondents have limited knowledge about CAM use and its efficacy and safety, which they claim to know about. Most respondents were unaware that these therapies, like osteopathy, naturopathy, and homeopathy, are commonly practiced in Western countries. Herbal medicine is reported to be the most popular among other CAM therapies. This could be due to cultural reflection, as 90% of the respondents were of Arab origin where use of such medicine is traditional.

Knowledge about sources of authentic information about CAM therapy was observed to be low. Lack of knowledge about side effects or interaction with other drugs would affect the advice given to students upon graduation, which would shape their perception of the importance of CAM as future practicing health professionals. Various studies have highlighted the importance of physicians having at least basic knowledge about CAM, especially herbal medicines (Nortier, et al., 2000; Ruschitzka, et al., 2000).

Around half of the respondents reported using CAM therapy at some time in their lives, and almost same percentage reported improvements in their condition (Table 6). As reported in other similar studies, they decided to use CAM because of realized efficacy; its natural contents, easy availability, or advice of loved ones (Breuner, et al., 1998; Pommier, et al., 2002; Wilson, 2002) (Table 7 & Figure 1). Social impact factors, such as friends (Wilson, 2002) or family members (Reznik, et al., 2002), have been reported in previous studies and were harmonious with the results of the factor analysis in the CAM questionnaire. Similarly, from a qualitative study (Patterson, et al., 2008), it was found that family, teachers, and friends have an influence on others to use CAM. However, there was no statistically significant difference between use of CAM therapy and level of education among respondents (Figure 2 & 3).



**Figure 1:** Educational level of respondents and the main reason/s for using CAM (n = 67)

The majority of the respondents used CAM therapy with the belief that it would result in better outcomes compared to CM. The self-prescription and use of CAM may result in delay in diagnosis and start of CM treatment (Furlow, et al., 2008). Some of the common ailments which respondents believed to have improved after the use of CAM therapy include infertility, fractures,

and skin diseases. As reported in a study on CAM use in the US (Eisenberg, et al., 1993), most patients use CAM therapies for non-emergency conditions.

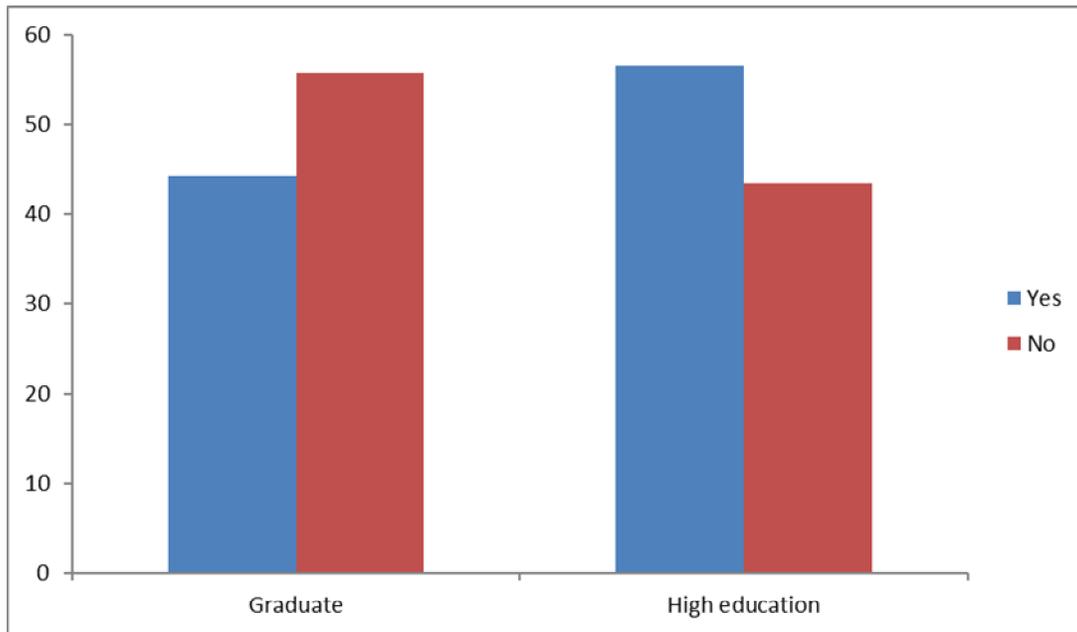


Figure 2: Level of education (percentage) and use of CAM therapies (n = 75)

There was a statistically significant relation between CAM use and the level of education (Figure 4 & 5). Middle-aged women who are more highly educated show more interest in CAM therapy and use it more frequently. This is concurrent with the findings of other studies, which report that doctors have a more positive attitude towards CAM in comparison to patients (Picking, et al., 2011) (Furrow, et al., 2008). People with lower education were less likely to use CAM (Lewith, et al., 2001; Gupta, et al., 2002; Singh, et al., 2004; Kumar, et al., 2006). This change in attitude and perception may be associated with age and life experiences.

This study showed psychometric properties with those respondents who used CAM in the past for prevention or treatment of different diseases having the most positive attitudes towards CAM and the greatest likelihood of using them again. Aside from this, respondents also expressed that their spiritual and religious belief may influence their attitudes towards CAM use. This could pose a problem when managing people with different religions (Patterson, et al., 2009).

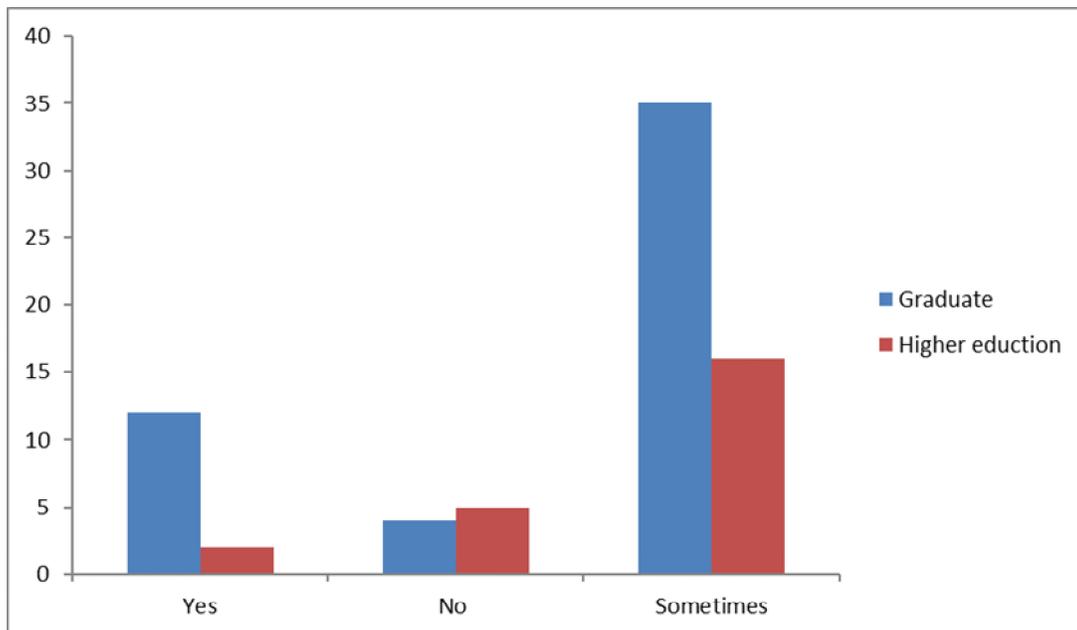


Figure 3: Relationship between level of education of respondents and their opinion regarding CAM therapies (n = 75)

Awareness among new medical graduates about CAM would allow them to know that there are other therapeutic options available for patients outside their own science. This would make them to understand the mechanisms behind alternative medical therapies, including their advantages and disadvantages. Revision in medical curriculum is needed to consolidate sensitization towards CAM and to better qualify students to understand the implications of the use of such medicines by their patients. Clinicians in various studies have expressed the desire to include evidence-based CAM in medical curriculum (Owen, et al., 2001; Ghassemi, 2005). CAM courses as a part of curriculum have been introduced in various medical schools in the US and Europe (Dutta, et al., 2003; Varga, et al., 2006). Wetzel, et al., suggested that it is a good starting point to include CAM in medical curriculum to equip students with knowledge of the therapies commonly used by the local population (Wetzel, et al., 2003). This would also help in optimization of holistic healthcare in this region.

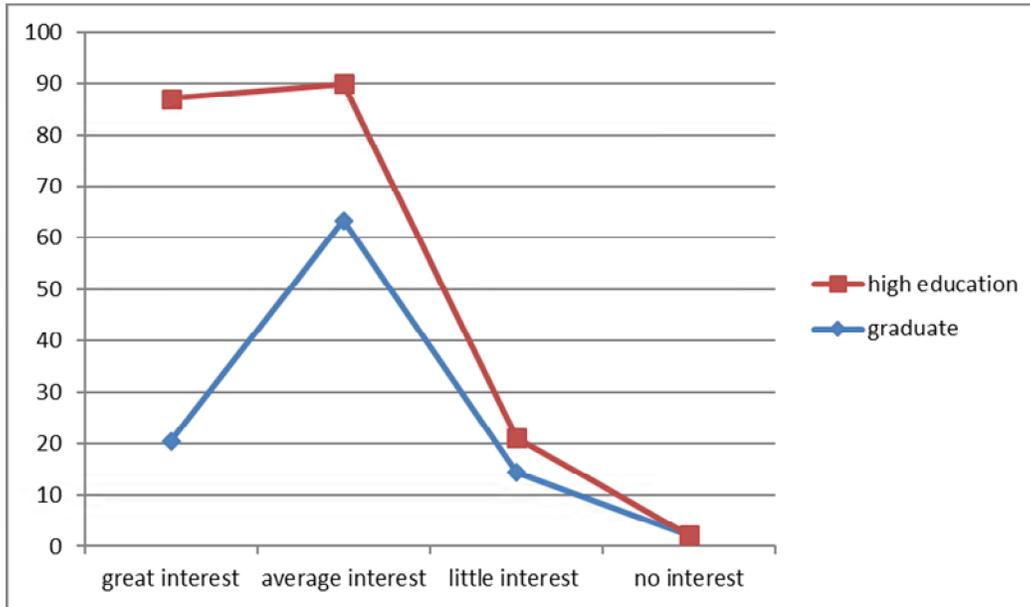


Figure 4: The percentage of respondents' interest in CAM therapies and educational level (n = 79)

Limitations of this study include the fact that all of the survey respondents were female and were already CAM users. Future studies should focus on testing the applicability of this on a larger sample with equal representation from both genders.

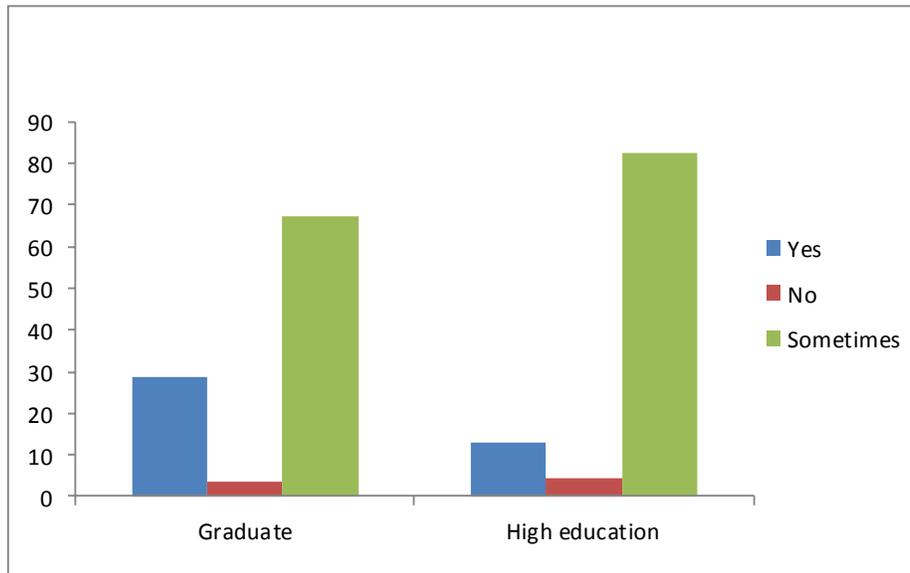


Figure 5: Level of education of respondents (percentage) and their opinion towards positive impact of CAM on patients' health (n = 75)

**Conclusion**

This is the first study of its kind to assess people's attitude towards CAM use in the region. As the use of various therapies outside of CM rise among patients, unawareness of CAM by medical practitioners may lead to a communication gap between them and patients. It is encouraging that the majority of medical staff in this study recognized CAM use. The results of this study are

timely in view of the changing legal status of herbal medicine practitioners in Saudi Arabia. It will facilitate further studies on this subject in the future, keeping the national and cultural outlines of the region in mind.

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