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Knowledge and Attitude toward the use of Alternative Medicine among Primary Care Physicians Working in Urban and Rural Areas of Riyadh Region

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ABSTRACT

Background: *Complementary and Alternative Medicine (CAM) therapies include natural products and body and mind practices. According to WHO, up to 80% of developing country populations rely on CAM for their primary health care, due to cultural tradition and lack of alternatives. In KSA, 68% of the population used at least one time in the past twelve months. The Holy Quran is the most used CAM therapy (50.3%).* ***Aim:*** *The study aims to assess the knowledge, utilization, and attitude toward the use of CAM and to compare PHC physicians working in urban and rural areas of the Riyadh region.* ***Method:*** *Facility-based cross-sectional survey was conducted among physicians working in the PHC of urban and rural areas of the Riyadh region utilizing multistage stratified random sampling.* ***Result:*** *230 physicians participated in the study, among them 55.7% and 44.3% of the physicians work in urban and rural areas of the Riyadh region, respectively. The majority of the physicians are male 61.7%, the age category of 25-35 (43.5%), Non-Saudi Arabian nationals 64.8%, GPs 64.3%, 1-5 years of work experience 47.4% and other than family medicine specialists 70%. 14.3% of the study participants mentioned that they participated in the lectures or workshops, or received training in the use of CAM. Honey and bee products 114 (49.6%) are the only CAM therapy; the majority of the physicians mentioned "understand and feel comfortable about counseling patients". Regarding CAM products, the majority of physicians feel comfortable about counseling patients. There were a significantly higher understanding and feeling comfortable about counseling patients about CAM products among physician working inside Riyadh (p-value ≤ 0.001). 32.2% of the physicians mentioned that they never used CAM for themselves or the family. 93.9% of the physicians did not refer any patient to the CAM practitioner, and the majority are physicians working in urban Riyadh. The knowledge score is about 22.74 (SD=8.03), and the mean attitude score is about 6.13 (SD=2.67), and there is no significant difference between the physicians working inside and outside Riyadh.* ***Conclusion:*** *Overall, the physicians had adequate knowledge about the CAM products and low-level knowledge about the CAM therapies, and attitude was higher among physicians. The least number of physicians refers the patients to the CAM practitioner or initiate a discussion with the patients.*

Keywords: Complementary and alternative medicine, Complementary medicine, Alternative medicine, Riyadh, Kingdom of Saudi Arabia, Primary health care, PHC, Physician

Abbreviations: WHO: World Health Organization, CAM: Complementary and Alternative Medicine, NHIS: National Health Interview Survey, USA: United States of America, KSA: Kingdom of Saudi Arabia, IBD: Inflammatory Bowel Disease, PHC: Primary Health Care, FDA: Food and Drug Administration, KSU: King Saud University, MU: Majmaah University, SD: Standard Deviation, ANOVA: Analysis of Variance, IRB: Institutional Review Board

INTRODUCTION

Complementary and Alternative Medicine

According to World Health Organization (WHO), the terms "complementary medicine" or "alternative medicine"

refer to a broad range of healthcare practices that are not part of that country's tradition or conventional medicine and not fully integrated into the dominant health-care system. It is used interchangeably with traditional medicine in some countries [1]. According to National Centre for Complementary and integrative health, "If a non-mainstream practice is used together with conventional medicine, it's considered complementary, and If a non-mainstream method in place of conventional medicine, it's deemed to be alternative" [2].

Complementary and Alternative Medicine (CAM) therapies include natural products and body and mind practices as a treatment modality [2]. Natural products like herbs, vitamins and minerals, and probiotics [2]. The body and mind practices are massage, yoga, chiropractic, osteopathic manipulation, acupuncture, relaxation techniques, and so on [2]. According to the National Health Interview Survey (NHIS) conducted in the United States of America (USA) in 2012, natural products, deep breathing, and yoga or Tai Chi are the three most commonly used complementary health approaches among adults [3]. CAM therapies and products are typically used to maintain general health and treatment for specific conditions, especially chronic conditions like pain, depression, anxiety, headaches, and cancer [4].

Prevalence of Use of CAM

According to WHO, up to 80% of developing country populations rely on CAM for their primary health care, due to cultural tradition and lack of alternatives [5]. In the USA, around 38% of adults and 12% of children are using at least any one of the CAM therapies or products [6]. CAM use is higher among women, and people more elevated levels of education and higher incomes [6].

In 2003, Norah Al-Rowais, et al. conducted a household survey among 1408 participants, to assess the prevalence of CAM in the Riyadh region, Kingdom of Saudi Arabia (KSA) [7]. 68% of the study participants used at least one time in the past twelve months [7]. The Holy Quran was the most used CAM therapy (50.3%), followed by honey (40.1%), myrrh (35.4%), and black seed (39.2%) [7]. In the survey the author concluded that the prevalence of CAM is high among Saudi Arabian citizens of the Riyadh region and the main reason for the use is perceived failure of the medical treatment [7].

In 2017, the same author conducted a systematic review of the prevalence extent of CAM use among Saudis [8]. According to the review, the most commonly used CAM practice is prayer and reciting the holy Quran [8]. The other widely used CAM therapies or products are herbs, honey, and dietary products [8]. The most commonly practiced among professionals is acupuncture. Overall, the prevalence of CAM in KSA is increasing day by day [8].

Risk of CAM Use

Natural products are often taken on a self-medication basis, without the advice of pharmacists or physicians. This lack of professional supervision may expose the consumer to various risks, including those derived by interactions with conventional drugs. On the other hand, CAM is also made it possible for fraudulent practices, misleading information, wrong diagnosis, improper treatments, and thus severe patient's injuries [9].

A study was conducted to show the association of self-prescribed CAM use and patients with gastrointestinal diseases [10]. There was a significant difference between the patients with Inflammatory Bowel Disease (IBD) 49.5%, or irritable bowel syndrome, 50.9% were more likely to use CAM than controls 27% ($p<0.001$) [10]. According to WHO, adverse drug reactions to CAM have more than doubled in three years [5].

CAM in Primary Health Care

To minimize the above mention risk on CAM use has to address and awareness of CAM proper use among patients to prevent adverse CAM and conventional drug interactions.

Hence, it needs attention from the Primary Health Care (PHC) physicians on their patients' use of CAM [11]. In the past couple of decades, CAM approaches are integrated within several health care services worldwide, including primary, secondary, and tertiary settings of health care [11].

According to the USA, Food and Drug Administration (FDA) Dietary Supplements Health and Education Act, 1994, herbal medicine are not classified as drugs [12]. WHO developed guidelines to promote the proper use of alternative medicines in collaboration with the State University of Milan [5].

The Rational of the Study

Though there is an increasing need to address how CAM therapies can be integrated into conventional medical systems. Understanding the extent and patterns of CAM usage in an economically developing country like KSA is essential for several reasons, including the development of strategies to improve health outcomes and health service planning. To address these issues, several studies have been conducted in KSA to understand the knowledge, utilization, and attitude about CAM among PHC physicians. But there is a gap in the literature to understand the difference between the physicians working inside and outside the Riyadh region.

Aims and Objectives

The study aims to assess the knowledge, utilization, and attitude toward the use of CAM, and to compare PHC physicians working in urban and rural areas of the Riyadh region.

The objective of the study is:

- To assess and compare the knowledge of CAM among PHC physicians working in urban and rural areas of the Riyadh region
- To assess and compare the utilization of CAM among PHC physicians working in urban and rural areas of the Riyadh region
- To assess and compare the attitude of CAM among PHC physicians working in urban and rural areas of the Riyadh region
- To find the association of knowledge and attitude with socio-demographic characteristics of the physicians

REVIEW OF LITERATURE

Studies Done Outside KSA

The survey was conducted among 1150 patients, 333 PHC physicians, and 241 CAM practitioners, to understand attitudes toward the integration of CAM in primary care [13]. The authors mentioned that majority of patients compared with physicians expected their family medicine physicians to refer the patients to CAM, to have knowledge about CAM, and to offer CAM treatment in the clinic with appropriate training [13]. And more patients are expected to obtain CAM treatment in a primary care setting compared to PHC physicians [13]. According to patients and physicians, family medicine physicians play a vital role in CAM treatment [13].

A study was conducted in Germany to compare the knowledge, attitude, and interest of CAM among medical students and doctors [14]. 73.8% of doctors and 40% of students already knew CAM [14]. However, neither doctors nor students considered themselves to be well informed on CAM [14]. The study participants also believed that the medical education curriculum should include CAM and also like to receive training in CAM therapies [14].

The study was conducted by Ahmed T. Elolemy, et al. in Egypt to assess the pattern of CAM use among 873 health workers [15]. 75.26% of the study participants knew CAM, among them, only 4.12% of them use it usually and 38.14% use CAM sometimes [15]. 54.79% of the study participants use media as a knowledge source [15]. The majority of the physicians are hesitant in talking with CAM with their patients or referring patients to CAM practitioners [16]. The crucial determining factor for seeking CAM are safety, religious beliefs, effectiveness, and low cost [15].

Wahner-Roedler, et al. conducted a study "to evaluate the attitudes of physicians at an academic medical centre against Complementary and Alternative Medicine (CAM) therapies and the physicians' knowledge base regarding common CAM therapies". [17]. 76% of the physicians never referred a patient to a CAM practitioner [17]. On the other hand, 44% mentioned that they would refer a patient if a CAM practitioner were available at their institution [17]. 57% thought that incorporating CAM therapies have a positive effect on patient satisfaction, and 48% believed that offering CAM would attract more patients [17]. The author conducted a follow-up study after eight years, and they found a more positive attitude of the physicians towards CAM and more willingness for CAM therapy training [17].

Studies Done Inside KSA

A cross-sectional household survey was conducted to assess the public knowledge, attitude, and practice of CAM

in the Riyadh region, Saudi Arabia [18]. 89% of the study participants knew CAM [18]. The primary source of information is media and family or friends [18]. Almost 85% of the study participants or their relatives used CAM and the females, homemakers, illiterate, and aged 60 years and above are the most common people who use CAM [18]. Medicinal herbs (58.89%), honey and bee products (54%), prayer (54%), hijama (35.71%), and cauterization or medical massage therapy (22%) were the commonly used CAM practices [18]. 8.3% of the study participants' conversed CAM therapies with their physicians [18]. The vast majority of the study participants believe that they need CAM practices, clinics, and health education [18].

The study was conducted among medical students in King Saud (KSU) and Majmaah (MU) medical colleges in KSA, to assess their attitude towards CAM [19]. 24% of the study participants were satisfied with their CAM knowledge, and 68% were interested to learn more about CAM [19]. Moreover, around 59% of the medical students support the inclusion of CAM in the medical curriculum, and 60% of them prefer to have CAM as a separate course [19]. The overall assessment of the attitude toward CAM was neutral, with a mean score of 3.1 [19].

The study aimed to assess the knowledge, attitudes, and utilization of CAM of PHC physicians in Riyadh conducted by Abdullah Al-Rowais, et al. among 1,113 physicians [20]. 51.7% of the physicians used CAM for themselves or family [20]. Approximately 86% of the physicians, never referred patients to CAM practitioners [20]. 60% of the physicians mentioned that patients initiate the discussion about CAM.20 82.5% agreed that health authorities should have a role in regulating CAM, and 75.7% agreed that the physicians' knowledge about CAM practices leads to better patient outcomes [20]. Overall the physicians had a positive attitude towards CAM and incorporated CAM into the healthcare system [20]. However, the majority of the physicians were reluctant to refer patients to CAM or to initiate discussion [20].

A facility-based cross-sectional survey was conducted to assess the knowledge, utilization, and attitude toward the use of CAM and to compare PHC physicians working in urban and rural areas of the Riyadh region.

Study Setting and Population

Physicians are working in the PHC urban and rural areas of the Riyadh region, regardless of gender, age and specialty.

Sample Size

According to the study conducted in 2012, by Abdullah Al-Rowais, et al., the number of PHC in Riyadh is 377, and there are 1024 physicians [20]. The estimated proportion of 0.3 desired precision of 0.05 with 95% of Confidence Interval, with the help of pool calculator the overall estimated sample size to be 246. Based on the probability proportional to the size of the physicians in each sector among urban and rural Riyadh, the estimated sample size in urban areas of Riyadh was 144, and in rural areas of Riyadh was 102.

Sampling Technique

Multistage stratified random sampling was utilized for this study. We obtained a list of all PHCs in the Riyadh region. Since there is no official record for which to classify urban or rural regions in Riyadh, we categorized urban and rural regions the same as the study conducted by Ghadah Alfaqeeh, et al. [21]. According to the study that the highest quartile governorates were classified as urban and the lower quartile as rural based on the population density which was calculated by dividing the total population by the area of the corresponding governorate [21].

As a result, we have 5 rural areas from each we randomly selected 5 PHCs and for urban we have 5 sectors inside Riyadh from each we selected randomly 5 PHCs. Convenient sampling was utilized to select physicians from each PHC.

Data Collection Tool

The questionnaire was adopted from the study conducted by Abdullah Al-Rowais, et al. in Riyadh [20]. Sight modification was made on the questionnaire based on the experts' opinions. The questionnaire consists of four domains, the socio-demographic characteristics of the study participants, physicians' knowledge about CAM therapies and their products, utilization of CAM among physicians, and attitude towards CAM.

Data Management and Analysis

The data entry was performed with the help of Google form, the final database was received in the form of an excel spreadsheet. Statistical software SPSS used for data cleaning and analysis. For descriptive statistics, mean and Standard Deviation (SD) are presented for continuous variables, and numbers and percentages are presented for the categorical variable. The Chi-Square analysis was used to find the difference between physicians working inside and outside Riyadh and with other variables. The attitude score of the physician was computed by including the twelve-item attitude question.

The attitude score was calculated by giving one point for the response option agree, and zero points for the response option disagree and uncertain. The score ranges from 0 to 12. The knowledge score was computed by giving 0 points for unfamiliarity, one point for limited familiarity, two points for understanding and feeling uncomfortable about counselling patients, and three points for understanding and feeling comfortable about counselling patients for ten items of CAM therapies and five items of CAM products. The knowledge score ranges from 0 to 45. The knowledge score and attitude score was compared to all the variables in the questionnaire with t-test and Analysis Of Variance (ANOVA), and the variable with statistically significant differences was listed. A p-value of <0.05 will be considered statistically significant.

Ethical Consideration

Ethical approval for this study was obtained from the Ministry of Health, Institutional Review Board (IRB), in KSA. Consent was obtained from the administration of each PHC and the participants before participating in the study. Participants were informed of their right to refuse participation or withdrawal from the study at any time without any penalties or consequences. The participants were made aware of the anonymity of their participation and informed that under no circumstances will any of their personal identifying information be collected or revealed or published. No incentive was given to the participants for participation. All the data collection forms were kept under strict confidentiality, accessible only to the researcher. The study did not anticipate any harm to the participants as a result of participating in the study.

RESULTS

Socio-demographic Characteristics of the Physicians

Overall, 230 PHC physicians participated in the study. The age distribution of the study participants are 25-35 (43.5%), 36-45 (40.9%), 46-55 (13.9%) and >55 (1.7%) years old. The majority of the physicians are male 142 (61.7%), and the female participants are about 88 (38.3%). 81 (35.2%) are Saudi Arabian nationals, and 149 (64.8%) belong to other nationalities. 128 (55.7%) and 102 (44.3%) of the physicians work in urban and rural areas of Riyadh, respectively. The majority of the physicians are GPs 148 (64.3%), and the rest are specialists 71 (30.9%) and consultants 11 (4.8%). The distribution of the work experience of the physicians are as 1-5 years 109 (47.4%), 6-10 years 78 (33.9%), 11-20 years 35 (15.2%), 21-30 years 8 (3.5%) and >30 years (0%). 30% of the physicians belong to Family medicine specialists, and 70% are other specialists (Table 1).

Table 1 Socio-demographic characteristics of the physicians

		Total		Inside Riyadh		Outside Riyadh		p-value
				128 (55.7%)		102 (44.3%)		
Variables	**Categories**	**N**	**%**	**N**	**%**	**N**	**%**	
Age	25-35	100	43.5%	64	64.0%	36	36.0%	0.001
	36-45	94	40.9%	55	58.5%	39	41.5%	
	46-55	32	13.9%	8	25.0%	24	75.0%	
	>55	4	1.7%	1	25.0%	3	75.0%	
Gender	Male	142	61.7%	70	49.3%	72	50.7%	0.010
	Female	88	38.3%	58	65.9%	30	34.1%	

Nationality	Non-Saudi	149	64.8%	56	37.6%	93	62.4%	<0.001
	Saudi	81	35.2%	72	88.9%	9	11.1%	
Job Title	GP	148	64.3%	67	45.3%	81	54.7%	<0.001
	Specialist	71	30.9%	52	73.2%	19	26.8%	
	Consultant	11	4.8%	9	81.8%	2	18.2%	
Years of Experience as PHC Physicians	1-5 years	109	47.4%	77	70.6%	32	29.4%	<0.001
	6-10 years	78	33.9%	39	50.0%	39	50.0%	
	11-20 years	35	15.2%	10	28.6%	25	71.4%	
	21-30 years	8	3.5%	2	25.0%	6	75.0%	
	>30 years	0	0%	0	0%	0	0%	
Qualifications	Family medicine	69	30.0%	61	88.4%	8	11.6%	<0.001
	Others	161	70.0%	67	41.6%	94	58.4%	

Knowledge about CAM

33 (14.3%) of the study participants mentioned that they participated in the lectures or workshops or received training in the use of CAM and there is no significant difference between physicians working inside and outside Riyadh (urban and rural). Formal training about CAM 10 (4.3%), General reading 100 (43.5%), Internet (non-medical cites) 56 (24.3%), Medical Journals 47 (20.4%) and others 17 (7.4%) are considered as the main sources of the information about CAM therapies. Significantly more physicians working in urban areas (85.1%) used medical journals as their source compared with physicians working outside Riyadh (rural) (14.9%) (p-value ≤ 0.001).

The CAM therapies like Herbal medicine, Acupuncture, Massage, and Cupping, the majority of the physicians had limited familiarity with the respective proportion of 76 (33.0%), 86 (37.4%), 87 (37.8%), and 85 (37.0%). The majority of the study participants are not familiar with the Cauterization 104 (45.2), Bees stinging 88 (38.3), and Ozone 146 (63.5).

Ruqyah 83 (36.1%) and Relaxation 79 (34.3%) are the CAM therapies where the majority of the physicians mentioned: "Understand it but feel Uncomfortable about counselling patients". Honey and bee products 114 (49.6%) are the only CAM majority of the physicians mentioned: "understand and feel comfortable about counselling patients".

Regarding familiarity with the herbs, the majority of the physicians mentioned that they understand it and feel comfortable about counselling patients and the herbs are Ginger 115 (50.0%), Garlic 103 (44.8%), Ginseng 71 (30.9%), Cinnamon 92 (40.0%) and Myrrh 76 (33.0%). And there was a significantly higher understanding and feel comfortable in counseling patients about CAM products among physicians working in urban areas of Riyadh (p-value ≤ 0.001) (Table 2).

Table 2 Knowledge of CAM therapies and products

CAM Therapies and products		Unfamiliar	Limited Familiarity	Understand it but feel uncomfortable about counseling patients	Understand it and feel comfortable about counseling patients	p-value
Herbal medicine	Inside Riyadh	18 (14.1)	37 (28.9)	56 (43.8)	17 (13.3)	<0.001
	Outside Riyadh	27 (26.5)	39 (38.2)	19 (18.6)	17 (16.7)	
	Overall	45 (19.6)	76 (33.0)	75 (32.6)	34 (14.8)	
Ruqyah	Inside Riyadh	9 (7.0)	31 (24.2)	61 (47.7)	27 (21.1)	<0.001
	Outside Riyadh	21 (20.6)	29 (28.4)	22 (21.6)	30 (29.4)	
	Overall	30 (13.0)	60 (26.1)	83 (36.1)	57 (24.8)	

Acupuncture	Inside Riyadh	27 (21.1)	47 (36.7)	45 (35.2)	9 (7.0)	0.934
	Outside Riyadh	24 (23.5)	39 (38.2)	32 (31.4)	7 (6.9)	
	Overall	51 (22.2)	86 (37.4)	77 (33.5)	16 (7.0)	
Massage	Inside Riyadh	16 (12.5)	55 (43.0)	40 (31.3)	17 (13.3)	0.318
	Outside Riyadh	17 (16.7)	32 (31.4)	39 (38.2)	14 (13.7)	
	Overall	33 (14.3)	87 (37.8)	79 (34.3)	31 (13.5)	
Cupping	Inside Riyadh	33 (25.8)	53 (41.4)	32 (25.0)	10 (7.8)	0.01
	Outside Riyadh	18 (17.6)	32 (31.4)	30 (29.4)	22 (21.6)	
	Overall	51 (22.2)	85 (37.0)	62 (27.0)	32 (13.9)	
Cauterization	Inside Riyadh	64 (50.0)	48 (37.5)	15 (11.7)	1 (0.8)	0.075
	Outside Riyadh	40 (39.2)	37 (36.3)	21 (20.6)	4 (3.9)	
	Overall	104 (45.2)	85 (37.0)	36 (15.7)	5 (2.2)	
Relaxation	Inside Riyadh	21 (16.4)	29 (22.7)	51 (39.8)	27 (21.1)	0.054
	Outside Riyadh	21 (20.6)	37 (36.3)	28 (27.5)	16 (15.7)	
	Overall	42 (18.3)	66 (28.7)	79 (34.3)	43 (18.7)	
Honey and bee products	Inside Riyadh	5 (3.9)	14 (10.9)	40 (31.3)	69 (53.9)	0.018
	Outside Riyadh	13 (12.7)	19 (18.6)	25 (24.5)	45 (44.1)	
	Overall	18 (7.8)	33 (14.3)	65 (28.3)	114 (49.6)	
Bees stinging	Inside Riyadh	53 (41.4)	49 (38.3)	23 (18.0)	3 (2.3)	0.184
	Outside Riyadh	35 (34.3)	34 (33.3)	27 (26.5)	6 (5.9)	
	Overall	88 (38.3)	83 (36.1)	50 (21.7)	9 (3.9)	
Ozone	Inside Riyadh	78 (60.9)	45 (35.2)	5 (3.9)	0 (0.0)	0.238
	Outside Riyadh	68 (66.7)	26 (25.5)	7 (6.9)	1 (1.0)	
	Overall	146 (63.5)	71 (30.9)	12 (5.2)	1 (0.4)	
Ginger	Inside Riyadh	9 (7.0)	24 (18.8)	33 (25.8)	62 (48.4)	0.746
	Outside Riyadh	8 (7.8)	21 (20.6)	20 (19.6)	53 (52.0)	
	Overall	17 (7.4)	45 (19.6)	53 (23.0)	115 (50.0)	
Garlic	Inside Riyadh	10 (7.8)	19 (14.8)	44 (34.4)	55 (43.0)	0.322
	Outside Riyadh	10 (9.8)	20 (19.6)	24 (23.5)	48 (47.1)	
	Overall	20 (8.7)	39 (17.0)	68 (29.6)	103 (44.8)	
Ginseng	Inside Riyadh	19 (14.8)	27 (21.1)	38 (29.7)	44 (34.4)	0.569
	Outside Riyadh	20 (19.6)	23 (22.5)	32 (31.4)	27 (26.5)	
	Overall	39 (17.0)	50 (21.7)	70 (30.4)	71 (30.9)	
Cinnamon	Inside Riyadh	13 (10.2)	20 (15.6)	34 (26.6)	61 (47.7)	0.037
	Outside Riyadh	11 (10.8)	28 (27.5)	32 (31.4)	31 (30.4)	
	Overall	24 (10.4)	48 (20.9)	66 (28.7)	92 (40.0)	
Myrrh	Inside Riyadh	13 (10.2)	28 (21.9)	29 (22.7)	58 (45.3)	<0.001
	Outside Riyadh	29 (28.4)	26 (25.5)	29 (28.4)	18 (17.6)	
	Overall	42 (18.3)	54 (23.5)	58 (25.2)	76 (33.0)	

Utilization of the CAM

74 (32.2%) of the physicians mentioned that they never used CAM for themselves or the family. Among 156 (67.8%) physicians who used CAM for themselves or their families; the most commonly used product is honey 42 (18.3%)

and no difference between physicians working inside and outside Riyadh (urban and rural). The response for the patient referral to the CAM is extremely likely 27 (11.7%), extremely unlikely 31 (13.5%), neither likely nor unlikely 38 (16.5%), somewhat likely 109 (47.4%), and somewhat unlikely 25 (10.9%). There was a significant difference in the likeliness to refer patients to the CAM therapies between physicians working inside and outside Riyadh (p-value ≤ 0.000).

216 (93.9%) of the physicians did not refer any patient to the CAM practitioner, and the majority are physicians working inside Riyadh (p-value=0.001). The majority of the physicians talk about the possible benefits of using CAM 112 (48.7%) only 1 to 25% of their patients.

The majority 132 (57.4%) of the physicians mentioned that patients are the one who initiates the discussion of the benefits and risks of a CAM therapy and only 64 (27.8%) of the physicians initiated the discussion.

Attitude towards CAM

The majority of the physicians believe that the Physician's knowledge about CAM practices leads to better patient outcome 163 (70.9%), physicians spiritual beliefs and practices play an important role in healing 134 (58.3%), physicians should know about commonly used CAM therapies in the region 160 (69.6%), CAM therapies have a true effect on symptoms, conditions and/or diseases 124 (53.9%), counselling on nutrition toward treatment and prevention of disease should be a major role of physician 155 (67.4%). Evidence-based CAM therapies should be offered in my health center 134 (58.3%), health authorities should have a role in regulating CAM 158 (68.7%), and academic institutions should provide knowledge, training 126 (54.8%). On the other hand, the majority of the physicians are uncertain that incorporating CAM increases patient satisfaction 117 (50.9%) and attract more patient 113 (49.1%), CAM practices are safe 118 (51.3%), and CAM practices are effective 115 (50.0%). There is no significant difference between the physicians working inside and outside Riyadh (Table 3).

Table 3 Attitude towards CAM

Statement		Response			p-value
		Agree	Disagree	Uncertain	
Physician's knowledge about CAM practices lead to better patient outcome	Inside Riyadh	86 (67.2)	12 (9.4)	30 (23.4)	0.32
	Outside Riyadh	77 (75.5)	9 (8.8)	16 (15.7)	
	Overall	163 (70.9)	21 (9.1)	46 (20.0)	
Physicians spiritual beliefs and practices play an important role in healing	Inside Riyadh	68 (53.1)	19 (14.8)	41 (32.0)	0.208
	Outside Riyadh	66 (64.7)	11 (10.8)	25 (24.5)	
	Overall	134 (58.3)	30 (13.0)	66 (28.7)	
Physicians should know about commonly used CAM therapies in the region	Inside Riyadh	86 (67.2)	7 (5.5)	35 (27.3)	0.675
	Outside Riyadh	74 (72.5)	5 (4.9)	23 (22.5)	
	Overall	160 (69.6)	12 (5.2)	58 (25.2)	
CAM therapies have true effect on symptoms, condition, and/or diseases	Inside Riyadh	69 (53.9)	9 (7.0)	50 (39.1)	0.869
	Outside Riyadh	55 (53.9)	9 (8.8)	38 (37.3)	
	Overall	124 (53.9)	18 (7.8)	88 (38.3)	
Counseling on nutrition toward treatment and prevention of disease should be a major role of physician	Inside Riyadh	94 (73.4)	8 (6.3)	26 (20.3)	0.067
	Outside Riyadh	61 (59.8)	13 (12.7)	28 (27.5)	
	Overall	155 (67.4)	21 (9.1)	54 (23.5)	
Evidence-based CAM therapies should be offered in my health center	Inside Riyadh	82 (64.1)	13 (10.2)	33 (25.8)	0.131
	Outside Riyadh	52 (51.0)	13 (12.7)	37 (36.3)	
	Overall	134 (58.3)	26 (11.3)	70 (30.4)	
Health authorities should have a role in regulating CAM	Inside Riyadh	91 (71.1)	7 (5.5)	30 (23.4)	0.318
	Outside Riyadh	67 (65.7)	11 (10.8)	24 (23.5)	
	Overall	158 (68.7)	18 (7 8)	54 (23.5)	

Academic institutions should provide knowledge, training	Inside Riyadh	71 (55.5)	9 (7.0)	48 (37.5)	0.146
	Outside Riyadh	55 (53.9)	15 (14.7)	32 (31.4)	
	Overall	126 (54.8)	24 (10.4)	80 (34.8)	
Incorporating CAM in my clinic would increase patient satisfaction	Inside Riyadh	43 (33.6)	19 (14.8)	66 (51.6)	0.809
	Outside Riyadh	38 (37.3)	13 (12.7)	51 (50.0)	
	Overall	81 (35.2)	32 (13.9)	117 (50.9)	
Incorporating CAM in my clinic would attract more patient	Inside Riyadh	40 (31.3)	23 (18.0)	65 (50.8)	0.825
	Outside Riyadh	33 (32.4)	21 (20.6)	48 (47.1)	
	Overall	73 (31.7)	44 (19.1)	113 (49.1)	
CAM practices are safe	Inside Riyadh	21 (16.4)	41 (32.0)	66 (51.6)	0.674
	Outside Riyadh	21 (20.6)	29 (28.4)	52 (51.0)	
	Overall	42 (18.3)	70 (30.4)	118 (51.3)	
CAM practices are effective	Inside Riyadh	28 (21.9)	34 (26.6)	66 (51.6)	0.229
	Outside Riyadh	32 (31.4)	21 (20.6)	49 (48.0)	
	Overall	60 (26.1)	55 (23.9)	115 (50.0)	

Knowledge and Attitude Score

The mean knowledge score is 22.74 (SD=8.03) with a range of 0 to 41. Specialist 25.43 (SD=7.45) and consultant 24.73 (SD=9.97) had higher knowledge score that GPs 21.30 (SD=7.84) (p-value ≤ 0.001). Family medicine physicians had a higher mean knowledge score of 25.42 (SD=7.31). Physicians who had training had significantly more knowledge score 26.60 (SD=7.09) (p-value ≤ 0.001). People who use medical journals 26.46 (SD=5.02) and had formal training 28.80 (SD=6.03) had significantly higher knowledge than physicians who read from general readings 20.57 (SD=8.34) (p-value ≤ 0.001). The physicians who referred patients to the CAM practitioner had a higher knowledge score of 27.21 (SD=6.37) (p-value=0.031) (Table 4).

Table 4 Knowledge score comparison with other variables

Variables		Mean	SD	95% CI for Mean		p-value
				Lower	Upper	
Job title	GP	21.30	7.84	20.03	22.58	0.001
	Specialists	25.43	7.45	23.67	27.20	
	Consultant	24.73	9.97	18.03	31.43	
Qualifications	Family medicine	25.42	7.31	23.66	27.18	0.001
	Others	21.60	8.07	20.34	22.85	
Previous training	Yes	26.60	7.09	24.09	29.12	0.003
	No	22.10	8.01	20.97	23.22	
Knowledge source	General reading	20.57	8.34	18.91	22.22	<0.001
	Internet	21.92	8.08	19.76	24.09	
	Medical Journals	26.46	5.02	24.99	27.94	
	Formal training	28.80	6.03	24.48	33.11	
	Others	24.35	8.73	19.85	28.84	
Referred to CAM practitioner	Yes	27.21	6.37	23.53	30.89	0.031
	No	22.415	8.05	21.37	23.53	

The mean attitude score is about 6.13 (SD=2.67) with the range from 0 to 12. The physicians who participated in the lectures or workshops or received training in the use of CAM had a higher mean attitude score of 7.15 (SD=2.89) than those who did not participate 5.95 (SD=2.60) (p-value=0.017). In using the knowledge source, the physicians who use formal training 8.60 (SD=2.22) had more attitude than a physician who uses general reading 5.54 (SD=2.72) (p-value=0.003) (Table 5).

Table 5 Attitude score comparison with other variables

Variables		Mean	SD	95% CI for Mean		p-value
				Lower	Upper	
Previous training	Yes	7.15	2.89	6.12	8.17	0.017
	No	5.95	2.60	5.59	6.32	
Knowledge source	General reading	5.54	2.72	4.99	6.08	0.003
	Internet	6.66	2.21	6.06	7.25	
	Medical Journals	6.31	2.71	5.52	7.11	
	Formal training	8.60	2.22	7.01	10.18	
	Others	5.88	2.89	4.39	7.36	
Referred to CAM practitioner	Yes	8.71	2.70	7.15	10.27	<0.001
	No	5.96	2.59	5.61	6.31	

t-test and ANOVA analysis performed for all variables with the attitude score, only the variables which statistically significant results were shown in the table

DISCUSSION

The study assessed the knowledge, utilization, and attitude toward the use of CAM and compare PHC physicians working in urban and rural areas of the Riyadh region. Two hundred thirty physicians participated in the study, among them 55.7% and 44.3% of the physicians work urban and rural areas of Riyadh, respectively.

The majority of the physicians are male 61.7%, the age category of 25-35 (43.5%), Non-Saudi Arabian nationals 64.8%, GPs 64.3%, 1-5 years of work experience 47.4% and other than family medicine specialists 70%. In comparison with physicians working in urban and rural areas of Riyadh, significantly more aged physicians are working in rural areas (p-value=0.001). And, the majority of the Saudi Arabian physicians, specialists, and consultants, physicians with 1 to 5 years' experience, and family medicine qualification are working inside the Riyadh (urban) (p-value ≤ 0.001). In comparison with the previous study conducted in the Riyadh region, the socio-demographic characteristics of the physicians are almost similar except for the majority of the physician in the age category of 30 to 39 [20].

14.3% of the study participants mentioned that they participated in the lectures or workshops, or received training in the use of CAM, whereas in the previous study, only 8% of the physician received training in the use of CAM. General reading 43.5% considered as the main sources of the information about CAM therapies and media 55% are the source for the study conducted in Egypt [15]. Honey and bee products 114 (49.6%) are the only CAM therapy; the majority of the physicians mentioned "understand and feel comfortable about counselling patients. In the study conducted in Egypt, the most commonly used CAM practices by health workers were spiritual healing as prayer and Ruqyah 73.2% [15]. The study conducted in Riyadh region, Ruqyah 40% followed by Honey and bee products 38% are the CAM therapy, the majority of the physicians mentioned "understand and feel comfortable about counselling patients [20].

Regarding CAM products, the majority of physicians feel comfortable about counselling patients. In the study conducted in the USA, the majority of the physicians had limited familiarity, whereas in the study conducted in the Riyadh region the majority of the physician feels comfortable about counselling the garlic and ginger products [17]. There were significantly higher understanding and feel comfortable about counselling patients about CAM products among physicians working in urban areas of Riyadh (p-value ≤ 0.001) [20].

32.2% of the physicians mentioned that they never used CAM for themselves or the family. In a study conducted in Riyadh 52% and a study conducted in Egypt, 57% of the physicians never used CAM for themselves or the family. 93.9% of the physicians did not refer any patient to the CAM practitioner, and the majority are physicians working inside Riyadh (p-value=0.001). 75% of physicians did not refer any patient to the CAM practitioner for both the studies conducted in the USA and Egypt and 85% for the previous study conducted in the Riyadh region [15,17].

The majority of the physicians had a positive attitude towards the CAM practice, and there is no significant difference between the physicians working in urban and rural areas of Riyadh. The result is consistent with the other studies conducted in the USA, Egypt, and Riyadh. The knowledge score is about 22.74 (SD=8.03), and the mean attitude score is about 6.13 (SD=2.67).

There is no significant difference between the physicians working inside and outside Riyadh (urban and rural areas) in the knowledge and attitude score. The physician had previous training and referred patients to the CAM practitioner had significantly higher knowledge and attitude score.

Our study is the first study to compare the knowledge between the physicians working inside and outside the Riyadh region. Hence it lags the comparability with other studies.

CONCLUSION

Overall, the physicians had adequate knowledge about the CAM products and low-level knowledge about the CAM therapies. There was little difference in knowledge between physicians working in urban and rural areas of the Riyadh region, but there is no significant difference in the knowledge score. The attitude was higher among both groups of physicians. The least number of physicians refer the patients to the CAM practitioner or initiate a discussion with the patients.

Recommendations

- More comprehensive studies are needed in other regions of the KSA, to have more knowledge about the kingdom
- More studies in setting other than PHC will also give more insight into CAM practice
- Our finding highlights the need for training programs or lectures about CAM therapies and their products for the physicians

DECLARATIONS

Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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