MEDICAL SCIENCE

Public knowledge, attitude and practice of complementary and alternative medicine in Makkah city, Saudi Arabia

Raghad Majed Hariri[1*], **Khulood Waleed Melebari**[1], **Aljoharah Abdullah Alqahtani**[1], **Bushra Ahmed Shaikh**[1], **Rasha Ibrahim Kutbi**[1], **Mayyas Abdulaziz Alnajmi**[1], **Yazan Hussain Shahat**[2], **Osama Abdullah Abdulrahman**[1], **Mokhtar Mahfouz Shatla**[3]

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Authors' Affiliation:
[1]Faculty of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia
[2]College of Public Health and Health Informatics, Umm Al-Qura University, Makkah, Saudi Arabia
[3]Department of Community Medicine and pilgrimage health, Faculty of Medicine, Umm Al-Qura university, Makkah, Saudi Arabia

[*]**Corresponding author**
Faculty of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia
Email: raghadmhariri@gmail.com
ORCID: 0009-0007-6504-0897

ORCID List

Raghad Majed Hariri	0009-0007-6504-0897
Khulood Waleed Melebari	0009-0000-0916-0068
Aljoharah Abdullah Alqahtani	0009-0001-5086-9471
Bushra Ahmed Shaikh	0009-0006-2015-8106
Rasha Ibrahim Kutbi	0009-0009-6969-8359

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ABSTRACT

Background and aim: Complementary and Alternative Medicine (CAM) is commonly practiced, and Makkah city being a religious site has more diversity and access to it, which should be addressed and measured. The objective of this study is to assess knowledge, attitude, and practice of various CAM practices in the population of Makkah city, Saudi Arabia. *Methods:* A web-based cross sectional descriptive study was conducted using a previously validated questionnaire which was translated in Arabic and thereafter distributed via electronic links to the target population. *Results:* A total of 437 responses were collected fulfilling the inclusion criteria. The participants were ranged from 18 to more than 50 years old, 89.2% of them were females and 95.4% were Saudi. A total of 347 participants had knowledge about CAM and it was observed to be higher among females 80.5% compared to the males 70.2%. 67.5% of the participants reported using CAM and the most reported source of knowledge was family/friends (62.5%), followed by social media (52.2%). 42.9% agreed that CAM is better than conventional medicine for treatment, and 42.8% concurred that it's safe to use without consulting a medical practitioner. 82.4% think CAM is effective for treatment, and 67.5% regard CAM as safe for use. *Conclusion:* CAM is widely favored by the citizens of Makkah, Saudi Arabia. Its high prevalence and increased use indicate the need for credible sources to ensure accurate and safe utilization among the citizens.

Keywords: Alternative Medicine, Complimentary Medicine, Attitude, Herbs, Saudi Arabia

1. INTRODUCTION

Complementary and Alternative Medicine (CAM) can be briefly defined

according to the Saudi Ministry of Health as "A set of therapeutic, preventive, or diagnostic practices that are not followed in the modern medical method which may be used in addition to the modern medicine". People all around the world have long used herbal and complementary medicine to treat and prevent a wide range of health issues. However, despite society's progressive acceptance of modern and conventional medicine, herbal and complementary medicine is still commonly practiced in both developed and developing countries (Al-Akeel et al., 2018; Nyeko et al., 2016).

According to the World Health Organization, traditional medicine is used by nearly 80% of African and Asian communities for basic healthcare (Al-Akeel et al., 2018; Nyeko et al., 2016). Furthermore, research shows that 70%-80% of the population in developed countries uses CAM at some point (Al-Akeel et al., 2018; Thomford et al., 2015). Local acceptability, a history of recognized efficacy, dissatisfaction with conventional medicine, affordability compared to conventional medicine, and local abundance are major factors encouraging growing use of CAM. Traditional remedies are also seen by the public as being safe to practice and without negative effects (Al-Akeel et al., 2018; Al-Ghamdi et al., 2017).

A study that was conducted in 2018, aimed at the Saudi population revealed that 88.4% of the participants have used CAM as a remedy before, thus indicating the ongoing relevance and the popularity of CAM practice among Saudis (Al-Akeel et al., 2018). In another study that looked at the attitudes and practice of complementary and alternative medicine (CAM) among adolescents in Saudi Arabia, revealed that CAM use by adolescents ranged from 1.6% to 58.6% during their lifetime (Musaiger and Abahussain, 2014).

Females were more likely than males to consume herbal medicine to treat coughs, colds, and flu, as well as abdominal pains. Friends, family, and relatives were the primary sources of CAM rather than media. The study showed that in general, adolescents' attitudes toward CAM were positive in the range of 21% to 43%, with some notable differences between females and males (Musaiger and Abahussain, 2014). Complementary and alternative medicine is increasingly popular for a variety of complicated reasons that vary from person to person and from culture to culture. These factors also fluctuate over time and may change depending on the type of therapy used (Ernst, 2000).

Since Makkah is considered the holy city in Islam, it has many cultural backgrounds on many different socioeconomic levels and especially given how easily accessible some forms of CAM are like Zamzam water and religious healers between the populations of the city. Therefore, the question that arises in light of the apparent acceptance of alternative medical practices and the willingness of consumers to pay out-of-pocket for these services is: What is the prevalence, socio-cultural and personal factors (knowledge, beliefs, attitudes and motivations) underlying a person's decision to use CAM? Hence, the present work is aimed at studying the knowledge, attitude and practice of the people living in Makkah city, Saudi Arabia, on complementary and alternative medicine (Elolemy and Albedah, 2012).

2. METHODS

A web-based cross sectional descriptive study was conducted and directed at the citizens of the city of Makkah, Saudi Arabia. The target population in the study was approximately 6 million residents of the Holy city of Makkah who were asked to participate in a survey that was shared via online chats from January 1st to April 1st, 2023. The inclusion criteria for this study included all adult citizens who were of the ages 18 and above in the holy city of Makkah of both genders, female and male. Raosoft was used to calculate the sample size that was required as a minimal amount for this study. The population of the Holy city of Makkah is approximately 6 million and the confidence interval was kept at 95%. According to that the sample size was calculated to be approximately 385. In the case of any data being lost the total size required was calculated to be 400 participants.

An online questionnaire was used akin to the one used in two corresponding researches about the use of CAM; one of them was executed in Riyadh region (Elolemy and Albedah, 2012), and the other among adolescents in Saudi Arabia (Musaiger and Abahussain, 2014). The questionnaire was simple and easy to understand and fill using google forms to obtain data it was spread and forwarded to the target population via electronic links which explained the objectives of the survey, the target population, and a request to participate voluntarily. The link was shared electronically via social media apps to the citizens of Makkah city.

The questionnaire was in the Arabic language and contained a consent form, socio-demographic data such as age and sex, and questions to assess the knowledge and sources of CAM, along with the prevalence of its practice, the attitude and behavior of the citizens towards it and the needs related to its use. We ensured the confidentiality of the participants and secured their information in a combined system of codes, numbers, and pseudonyms. Only the researchers had access to the data. The study conducted was submitted to the institutional research board of Umm Al-Qura University (UQU) to obtain approval and therefore no actions were taken to start until it has been obtained. No private or identifying information were collected from any of the participants of this study and it was collected in an anonymous manner, it was and will continue to be maintained strictly confidential.

The credit of the study conducted was given to the main investigator and co-investigators as well as those who contributed to a less substantial amount of data collected, the latter is mentioned as an acknowledgement in the manuscript.

Data analysis

The data were collected, reviewed and then fed to Statistical Package for Social Sciences version 21 (SPSS: An IBM Company). All statistical methods used were two tailed with alpha level of 0.05 considering significance if P value less than or equal to 0.05. Descriptive analysis was done by prescribing frequency distribution and percentage for study variables including participants' personal data, work, knowledge and use of CAM. Cross tabulation for showing distribution of CAM knowledge, CAM use, and source of information and Discussion of CAM practices with physicians by participants' socio-demographic data using Pearson chi-square test and exact probability test. Used CAM, symptoms for which CAM used was graphed.

3. RESULTS

A total of 437 participants fulfilling the inclusion criteria completed the study questionnaire. Participants' ages ranged from 18 to more than 50 years with mean age of 36.2 ± 13.9 years old. Exact of 390 (89.2%) were females and 417 (95.4%) were Saudi. Exact of 368 (84.2%) were university graduates. As for work, 128 (29.3%) participants were not working, 111 (25.4%0 were students and 198 (45.3%) were working (Table 1).

Table 1 Distribution of studied population according to socio-demographic characteristics, Makkah, Saudi Arabia (n=437)

Socio-demographics	No	%
Age in years		
18-35	211	48.3%
36-50	113	25.9%
> 50	113	25.9%
Gender		
Male	47	10.8%
Female	390	89.2%
Nationality		
Saudi	417	95.4%
Non-Saudi	20	4.6%
Educational level		
Secondary/below	69	15.8%
University/above	368	84.2%
Work		
Not working	128	29.3%
Student	111	25.4%
Working	198	45.3%

A total of 347 (79.4%) of the study participants had knowledge about CAM. Exact of 88.5% of participants aged 36-50 years were knowledgeable compared to 75.2% of others aged more than 50 years with recorded statistical significance (P=.020). Also, knowledge was detected among 80.5% of females compared to 70.2% of male participants (P=.049). All participants who had information from books/study had knowledge for CAM versus 50% of others with no specific source of knowledge (P=.025). Other demographic data showed insignificant association with participants' knowledge of CAM (Table 2).

As for CAM use, 295 (67.5%) reported using CAM. CAM use was significantly higher among middle aged participants (74.3%) than among young aged group (61.1%); P=.022. Also, 71.7% of working participants used CAM versus 58.6% of students (P=.048). No significant difference in CAM use rate by participants gender, nationality, and education (Figure 1).

Table 2 Distribution of studied population according to socio-demographic data and knowledge related to CAM

Socio-demographic data	Do you have knowledge about complementary and alternative medicine?				p-value
	Yes		No		
	No (347)	% (79.4%)	No (90)	% (20.6%)	
Age in years					
18-35	162	76.8%	49	23.2%	.020*
36-50	100	88.5%	13	11.5%	
> 50	85	75.2%	28	24.8%	
Gender					
Male	33	70.2%	14	29.8%	.049*
Female	314	80.5%	76	19.5%	
Nationality					
Saudi	333	79.9%	84	20.1%	.287$
Non-Saudi	14	70.0%	6	30.0%	
Educational level					
Secondary/below	54	78.3%	15	21.7%	.798
University/above	293	79.6%	75	20.4%	
Work					
Not working	101	78.9%	27	21.1%	.434
Student	84	75.7%	27	24.3%	
Working	162	81.8%	36	18.2%	
Sources of knowledge about complementary and alternative medicine					
Social media	183	95.3%	9	4.7%	.025*$
Internet websites	134	97.1%	4	2.9%	
Family/friends	215	93.5%	15	6.5%	
Mass media	129	95.6%	6	4.4%	
Books/study	11	100.0%	0	0.0%	
No specific source	1	50.0%	1	50.0%	

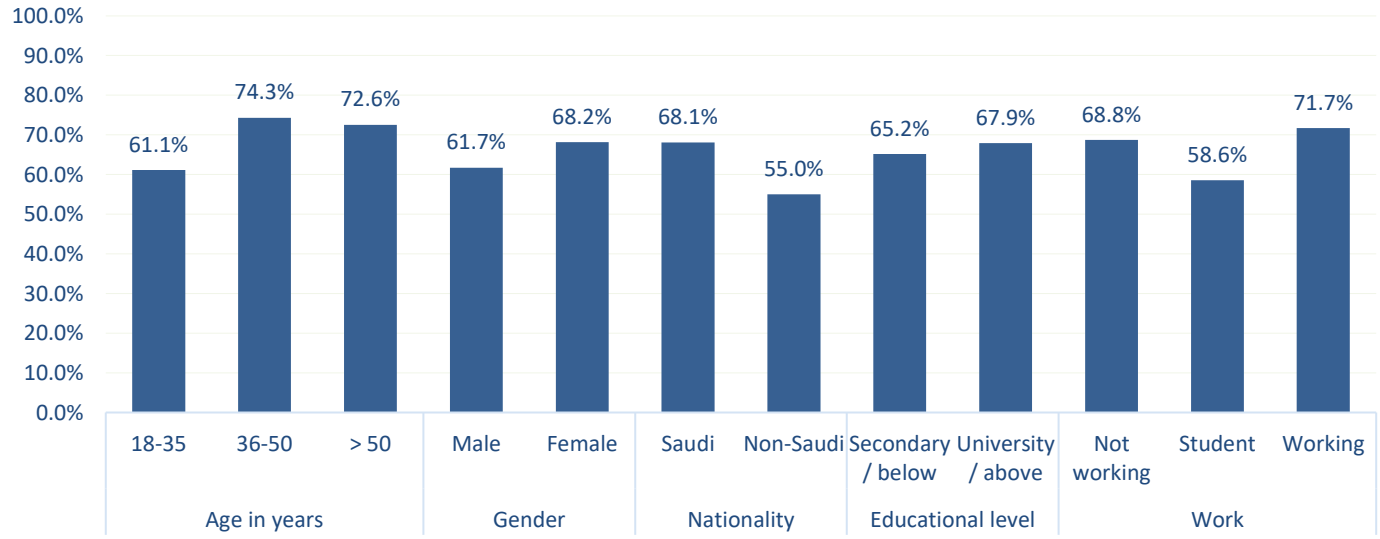

Figure 1 Socio-demographic data and CAM use among studied population, Makkah, Saudi Arabia

Participants Sources of knowledge about CAM and Socio-demographic data. The most reported source of knowledge included family/friends (62.5%), followed by social media (52.2%), internet websites (37.5%), and mass media (36.7%). The most reported

source among young aged participants was family and friends (70.8%) compared to 59.1% of old aged participants (P=.001). Likewise, family and friends were the most reported source of knowledge among Saudi participants (62.5%) followed by social media (52.8%) versus 62.5% and 37.5% for old aged group, respectively; P=.047 (Table 3).

Table 3 Participants Sources of knowledge about CAM and Socio-demographic data

Socio-demographics	Sources of knowledge about complementary and alternative medicine												p-value
	Social media		Internet websites		Family/friends		Mass media		Books/study		No specific source		
	No (192)	% (52.2%)	No (138)	% (37.5%)	No (230)	% (62.5%)	No (135)	% (36.7%)	No (11)	% (3%)	No (2)	% (0.5%)	
Age in years													
18-35	93	52.2%	58	32.6%	126	70.8%	49	27.5%	6	3.4%	2	1.1%	.001*
36-50	54	52.9%	47	46.1%	52	51.0%	43	42.2%	4	3.9%	0	0.0%	
> 50	45	51.1%	33	37.5%	52	59.1%	43	48.9%	1	1.1%	0	0.0%	
Gender													
Male	21	60.0%	12	34.3%	23	65.7%	11	31.4%	2	5.7%	0	0.0%	.815
Female	171	51.4%	126	37.8%	207	62.2%	124	37.2%	9	2.7%	2	.6%	
Nationality													
Saudi	186	52.8%	133	37.8%	220	62.5%	130	36.9%	11	3.1%	1	.3%	.047*
Non-Saudi	6	37.5%	5	31.3%	10	62.5%	5	31.3%	0	0.0%	1	6.3%	
Educational level													
Secondary/below	23	39.0%	25	42.4%	39	66.1%	17	28.8%	1	1.7%	1	1.7%	.124
University/above	169	54.7%	113	36.6%	191	61.8%	118	38.2%	10	3.2%	1	.3%	
Work													
Not working	52	47.3%	40	36.4%	70	63.6%	45	40.9%	2	1.8%	1	.9%	.321
Student	48	52.7%	32	35.2%	65	71.4%	26	28.6%	3	3.3%	1	1.1%	
Working	92	55.1%	66	39.5%	95	56.9%	64	38.3%	6	3.6%	0	0.0%	

P: Exact probability test ** P < 0.05 (significant)*

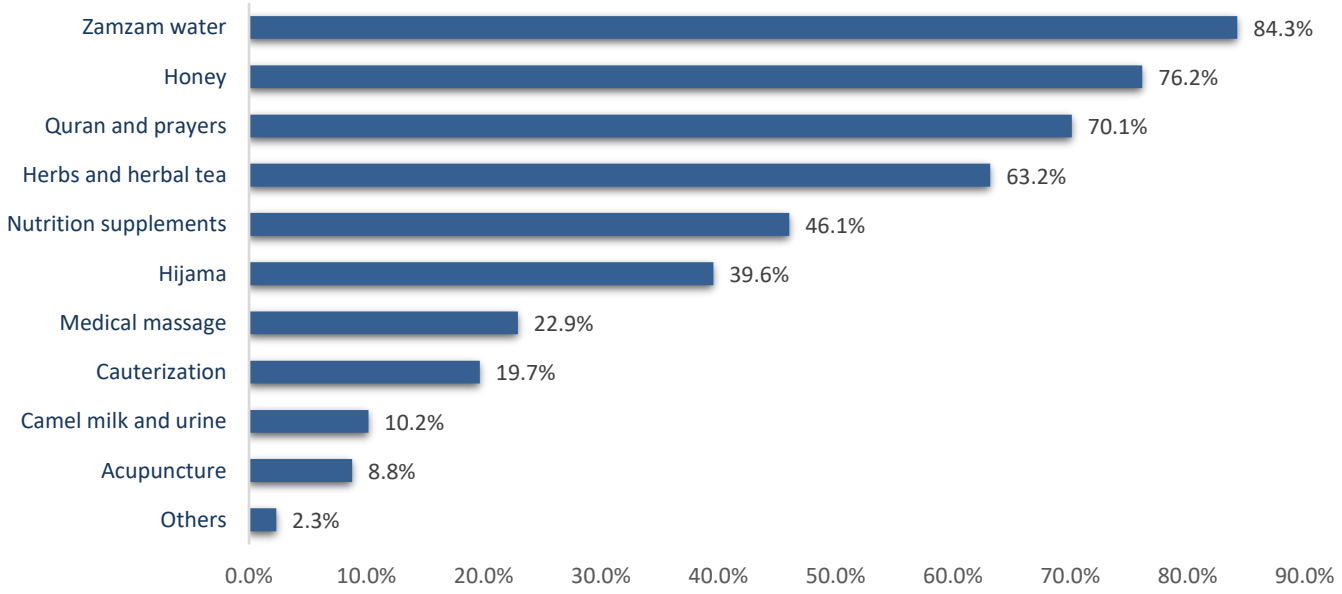

Figure 2 Types of CAM practices used by studied population, Makkah, Saudi Arabia

Types of CAM practices used by studied population, Makkah, Saudi Arabia. The most used CAM were Zamzam water (84.3%), honey (76.2%), Quran and prayers (70.1%), Herbs and herbal tea (63.2%), Nutrition supplements (46.1%), Hijama (39.6%), Medical massage (22.9%), and Cauterization (19.7%) (Figure 2). Symptoms for using CAM among studied population, Makkah, Saudi

Arabia. The most reported symptoms for which CAM are used included Cold and flu (70.2%), Abdominal Pains (67%), Cough (61.5%), Diarrhea (46.1%), to maintain and improve health (39.9%), fever (38.1%), and Headache (35.5%) (Figure 3).

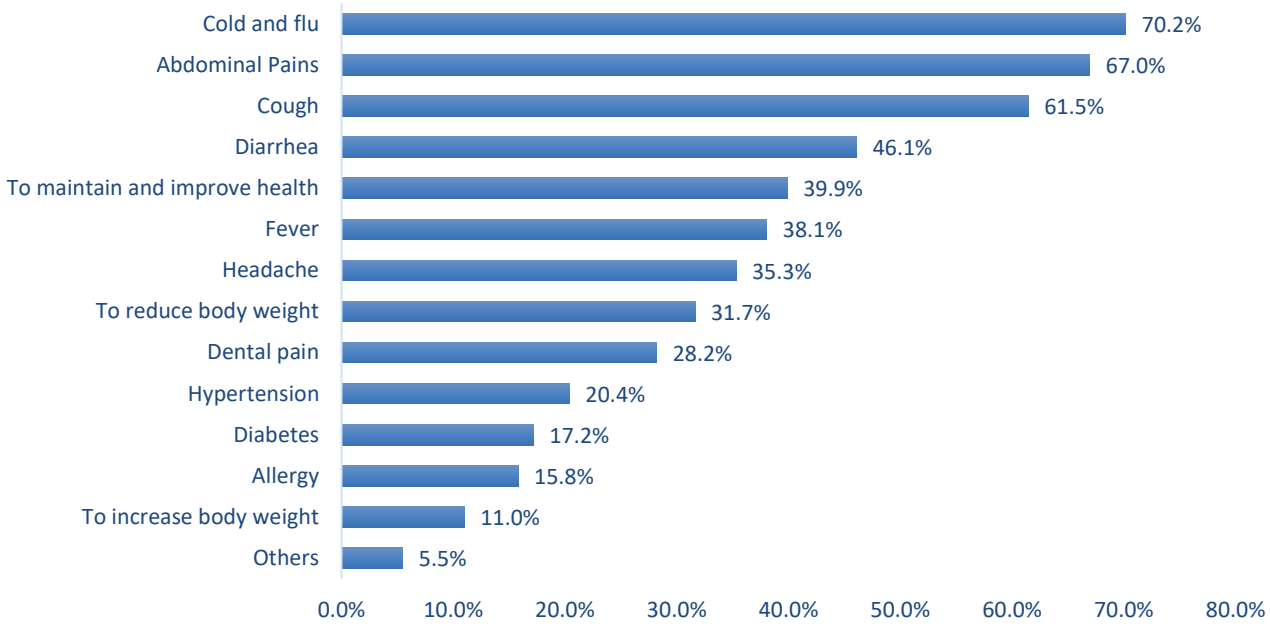

Figure 3 Symptoms for using CAM among studied population, Makkah, Saudi Arabia

Participants' attitude towards CAM, Makkah, Saudi Arabia. Exact of 42.9% agreed that complementary and alternative medicine is better than conventional medicine for the treatment of diseases, 42.8% agreed that they can practice complementary and alternative medicine without consulting a medical professional, 36.8% agreed that it is safe to use medicinal herbs, 35% reported that Vitamins and minerals can be used without prescription, while only 7.8% agreed that there are no side effects of overdose of vitamins and minerals supplements (Table 4).

Table 4 Participants' attitude towards CAM, Makkah, Saudi Arabia

Attitude items	Agree		Disagree		Don't Know	
	No	%	No	%	No	%
Complementary and alternative medicine is better for the treatment of diseases than conventional medicine	109	24.9%	177	40.5%	151	34.6%
Complementary and alternative medicine can be used without consulting a medical practitioner	187	42.8%	184	42.1%	66	15.1%
Medicinal herbs are safe to use	161	36.8%	149	34.1%	127	29.1%
Medicinal herbs can be used safely without prescribed medications	100	22.9%	258	59.0%	79	18.1%
Vitamins and minerals can be used without prescription	153	35.0%	242	55.4%	42	9.6%
Overdose of vitamins and minerals supplements do not cause any side effects	34	7.8%	349	79.9%	54	12.4%

Safety, effectiveness, cost and Needs related to CAM among study participants. As for Safety, effectiveness, and costs, 82.4% of the participants think complementary and alternative medicine is effective for treatment, 81.2% think complementary and alternative medicine is cheaper than conventional medicine, 67.5% think complementary and alternative medicine is safe for use, and 45.1% think they need more complementary and alternative medicine practice than conventional medicine. Considering needs, 76% think health education is needed, 72.3% reported for need for Specialized CAM centers/clinics and 51.5% told about need for Regulation for CAM practice (Table 5).

Table 5 Safety, effectiveness, cost and Needs related to CAM among study participants

Safety and needs	No	%
Safety, effectiveness, and costs		
Do you think complementary and alternative medicine is safe for use?	295	67.5%
Do you think complementary and alternative medicine is effective for treatment?	360	82.4%
Do you think complementary and alternative medicine is cheaper than conventional medicine?	355	81.2%
Do you think we need more complementary and alternative medicine practice than conventional medicine?	197	45.1%
What are the most important things you think are missing in regards to CAM practice?		
Regulation for CAM practice	225	51.5%
Health education	332	76.0%
Specialized CAM centers/clinics	316	72.3%

Discussion of CAM practices with physicians and Socio-demographic data. Exact of 33.6% of young aged participants never discussed this issue with physician versus 21.2% of old aged group (P=.023). Also, 42.3% of students never did compared to 21.9% of those who do not work (P=.001) (Table 6).

Table 6 Discussion of CAM practices with physicians and Socio-demographic data

Socio-demographics	Do you discuss with your physicians about using CAM as an alternative to conventional medicine?						p-value
	Usually		Sometimes		Never		
	No (88)	% (20.1%)	No (230)	% (52.6%)	No (119)	% (27.2%)	
Age in years							
18-35	44	20.9%	96	45.5%	71	33.6%	.023*
36-50	19	16.8%	70	61.9%	24	21.2%	
> 50	25	22.1%	64	56.6%	24	21.2%	
Gender							
Male	4	8.5%	28	59.6%	15	31.9%	.109
Female	84	21.5%	202	51.8%	104	26.7%	
Nationality							
Saudi	85	20.4%	220	52.8%	112	26.9%	.682$
Non-Saudi	3	15.0%	10	50.0%	7	35.0%	
Educational level							
Secondary/below	16	23.2%	32	46.4%	21	30.4%	.523
University/above	72	19.6%	198	53.8%	98	26.6%	
Work							
Not working	24	18.8%	76	59.4%	28	21.9%	.001*
Student	17	15.3%	47	42.3%	47	42.3%	
Working	47	23.7%	107	54.0%	44	22.2%	

P: Pearson X^2 test $: Exact probability test * P < 0.05 (significant)

4. DISCUSSION

The current study response consisted of 89.2% females exceeding males' response which was 10.8% in contrast to a previous study done in Riyadh in the year 2011 where female and male response rate was approximately equal (Elolemy and Albedah, 2012), which perhaps could be explained by the distribution of the online survey among female dominated online group chats. In this study 67.5% of participants reported the use of CAM previously, compared with the 84.6% in Riyadh (Elolemy and Albedah, 2012), which

could be explained by the difference in population between the two cities, comparing this percentage to the findings of earlier research conducted globally, it was high.

Research conducted in the USA in 2002 reported that the use of CAM was 47% (Rossi et al., 2006); whereas in Australia the use of CAM was 48.5% (Mac-Lennan et al., 1996), whilst in France it was 49% (Fisher and Ward, 1994). The higher prevalence of the use of CAM in Makkah could be due to the religious significance of the holy city which allowed the incorporation of Zamzam water, Quran and prayers among the list of CAM methods, since it is believed to have healing and protective benefits, these beliefs contributed in the increase of CAM use.

The present study shows a total of 80.5% female reported knowledge of CAM compared to 70.2% male participants. Similarly, to a previous study done in Riyadh (Elolemy and Albedah, 2012), where females used CAM showed relatively the same result as the current study. The difference in the percentage between the two genders could be due to the nature of the housewife community and how much time they spend at home with widely available methods of CAM present. As for the age demographics CAM is used more in the middle age category of participants in 74.3% which is more than the young age group that is 61.1% which correlate to the increased use of CAM with the increase in age similar results have been reported (Mc-Farland et al., 2002; Adams et al., 2003; Al-Faris et al., 2008).

In the current study, the percentage of CAM knowledge among people with higher education of university and above and working participants is higher than those with lower education and unemployed background. Zamzam water, honey, Quran and prayer are the most commonly practiced methods of CAM used in Makkah city while in Riyadh (Elolemy and Albedah, 2012) medical herbs prayers and Hijama were most frequent CAM practices used. This difference could also be attributed the geographical location of the holy city and abundance of Zamzam water available compared to other cities in the region. While the use of honey, Quran and prayers are similar between the two populations as they both share the same habits and religious beliefs.

Based on participants answers the most treated symptoms by CAM are cold and flu, abdominal pain and cough which is similar to the study that was done in 2014, the increase of consumption of CAM for these symptoms could be due to higher recurrence rate of them among the community which is widely believed to be non-urgent symptoms that would require a physician visit (Musaiger and Abahussain, 2014), and the availability and low cost of known CAM methods can be highly appealing to the public. As for abdominal pain, it is widely occurring symptom amongst females of menstruating age and majority prefers to treat it with available, natural non-pharmacological ways.

In this study and the one conducted by Musaiger and Abahussain, (2014), both agree that the most common source of information is family and friends which raise concerns for the accuracy of the information shared between family members and peers. But both studies differ in the second most used source. This study showed that social media is the second most common source of information while in the other study mentioned (Musaiger and Abahussain, 2014), television placed second. The difference could be due to the rising popularity of social media in recent years and the feasible accessibility to information on social media.

Also, social media provides a large variety of information tailored to ones need. The reliability of this study is impacted by the lack of generalize ability of the result to represent the larger geographical area of Saudi Arabia as the study was conducted exclusively in Makkah city, Saudi Arabia. So, future studies should take into consideration the inclusion of a wider population. Also, the study was achieved via online questionnaire that perhaps was difficult to reach some demographics with limited access to the social network. Future studies should aim to include equal representation of genders and age demographics participants. Also, different study design could be used in future studies to ensure accuracy and provide more detailed information on complementary and alternative medicine.

5. CONCLUSION

Complementary and Alternative Medicine is widely used among the population of Makkah City. The most reported source of knowledge among the participants is friends and relatives followed by social media. The majority of therapies used are related to Islamic Culture which includes Zamzam Water, Honey, Quran and Herbal Teas. Further studies should be conducted for a more comprehensive analysis regarding the safety of usage of the types of therapies of CAM and their protocols.

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Authors' contributions

Raghad Hariri and Osama Abdulrahman designed the study. Bushra Shaikh, Rasha Kutbi and Mayyas Alnajmi conducted the literature search. Khulood Melebari and Aljoharah Alqahani acquired and analyzed data. Yazan Shahat proofread and revised the manuscript. Mokhtar Shatla supervised the research overall and revised the manuscript. All authors read and approved the final manuscript.

Ethical approval and consent

All the participants have been informed that no identifying information is needed, and the consent was taken from them. Umm Al-Qura University Institutional Review Board issued the approval No. (HAPO-02-K-012-2023-03-1496)

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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