Biomedical & Pharmacology Journal, June 2023. Vol. **16**(2), p. 687-696

How are CAM Practices known, Perceived, and Used by People: Narrative Review of the Literacy, Attitude and Use of Complementary and Alternative Medicine Among Adults

Afnan Nurul Aman Shaikh, Khadija Jalal, Athira Suresh Kumar, Swetha Kannan and Jayakumary Muttappallymyalil

Department of Community Medicine, College of Medicine, Gulf Medical University Ajman, UAE.
*Corresponding Author E-mail: dr.jayakumary@gmu.ac.ae

https://dx.doi.org/10.13005/bpj/2650

(Received: 27 January 2023; accepted: 16 March 2023)

Patients throughout the world frequently use complementary and alternative medicine (CAM), especially to treat chronic or untreatable diseases. Since the standards for many chronic illnesses have shifted dramatically, researches have shown that many healthcare providers include integrative and holistic approach in their treatment programs. Therefore, this study evaluates people's literacy, attitudes, and usage of CAM modalities in the current setting. The thorough narrative review presented is carried out utilizing six computerized databases: Taylor & Francis Online, Research Gate, Frontiers, ScienceDirect, BioMed Central, and PubMed. The key word used for the search was Complementary and alternate medicine (CAM). The results were collected and subjected to content analysis. The current data show that people who are employed, younger, and female likely to be more knowledgeable, have better attitudes, and use CAM frequently. Friends and family are the most frequent sources of knowledge about CAM. Further study is needed in this area due to the lack of studies that address CAM literacy and attitudes.

Keywords: Attitude; Chronic Conditions; Herbal Medicine; Integrative Medicine; Literacy.

Complementary and Alternative Medicine (CAM) is a non-mainstream approach consisting of certain medical products and practices that fall outside the conventional approach towards the treatment of a certain medical condition. When these approaches are adopted along with conventional therapies, their use is referred to as complementary medicine. The use of (CAM) can be classified into 4 different categories[1];

1. Biologically Based Practices like vitamins, dietary supplements etc. involves the utilization of certain substances which are found in nature and when appropriately used can help to support and promote health.
2. Manipulative and Body Based practices such as massage therapy, chiropractic therapy etc, which focus on the body's structure and systems and use various manipulation techniques and certain movements.
3. Biofield therapy like Reiki which is a form of energy medicine and involves the utilization and manipulation of energy fields such as electromagnetic fields which are present around the body.
4. Whole Medical Systems such as Ayurvedic Medicine, homeopathic medicine, traditional Chinese medicine etc, are systems of medicines which have evolved separate from the allopathic

medicine system and have comprehensive theoretical and practical systems.[2]

CAM methods use their rich local, culturally embedded practices, historical trajectory, and intricate indigenous belief systems to define their holistic philosophy.[3]

People frequently choose CAM therapies over more traditional forms of therapy for a variety of reasons. This involves a lack of faith in and discontent with traditional healthcare providers, a desire for personal control over health-related decisions, and a conviction in the significance and worth of one's inner life and experiences.[4]

It has become more popular throughout the world, particularly for the treatment of chronic illnesses. Numerous studies show that persons with a variety of chronic diseases are more likely to use complementary and alternative medicine than traditional types of care.[5] Data indicate that among Canadian individuals with chronic pain, the use of CAM may have increased by as much as two times due to dissatisfaction with traditional medical practices.[6]

The purpose of this review is to collate and evaluate the published evidence concerning the literacy, attitude, use and informational sources of CAM among different sociodemographic factors and identify the informational gaps that require further research.

METHODS

The thorough narrative review presented is based on data from a search carried out utilizing six computerized databases: Taylor & Francis Online, Research Gate, Frontiers, ScienceDirect, BioMed Central and PubMed. In order to get a better understanding of the general sociodemographic and sources of information on knowledge, attitude, and utilization of CAM, the chosen focus of this review is on the studies conducted in the general population that included both community and clinical samples. All studies using adult samples from the community and clinical settings that have statistical documentation of association between sociodemographic variables and literacy, attitude, and use of CAM have been identified. The articles that were chosen were published between 2010 and 2022 and were written in English. The most popular study type was cross-sectional, however other study designs were also selected. The keyword used in the search was complementary and alternative medicine. Articles that were pertinent to the topic were read. The following criteria were used to determine the final articles that were accepted for the review.:

1. Explanation of CAM used in broad accordance with the National Center for Complementary and Alternative Medicine (NCCAM) definition of CAM
2. Assessment Of Literacy, Attitude and Use of CAM
3. Assess at least one of demographic characteristics (age, gender, income, education level, field of work, marital status, nationality, BMI) and/or health-related characteristics (at least one of presence of specific condition or number of conditions).

No consideration was given to articles that didn't meet the aforementioned criteria. Figure 1 depicts a summary of the entire procedure. A total of 35 articles, selected on the basis of inclusive criteria were read, assessed and evaluated. The authors, country and year of publication and the database accessed from are summarized in Table 1

RESULTS

A cross-sectional study in Malaysia[9], found that individuals who were 25 or younger had better awareness about CAM. This result was significant. According to a study done in Saudi Arabia[10], participants between the ages of 18 and 22 had the greatest levels of literacy. According to the findings of a survey done in South Korea, CAM use is more common among those in their 30s then in people in their 20s. According to the reports, young folks utilized CAM more frequently. [30] In a study conducted among US individuals of various ethnic backgrounds, it was discovered that younger female residing in Western regions had higher understanding of CAM and its modalities.[31]

There was no discernible difference in the degree of CAM knowledge between patients of different genders, according to a study carried out among hospitalized patients in France.[7] Females were found to have more knowledge than males, according to the a study done in Malaysia[9] to examine the literacy of CAM among the general population. However, a study conducted in Ghana[12] revealed that male participants had higher

knowledge scores than female participants (17.9%), despite the fact that this result was not statistically significant. Results from a study conducted in Turkey[22] to assess cancer patients receiving chemotherapy's awareness of CAM revealed that female patients had greater understanding than male patients.

Men's and women's beliefs varied significantly, according to a study that was done among Malaysians living outside of cities. According to statistics, women were shown to have a stronger belief than men that CAM practitioners offered a healthier lifestyle plan. Additionally, they thought that those who had had negative experiences with traditional medical approaches to therapy are more inclined to choose CAM.[25] A cross-sectional study of the adult population in Malaysia revealed that women were more likely to have favorable attitudes and beliefs than males toward complementary and alternative therapies.[26] Women were found to use CAM more frequently than men among arthritis patients in the US[14-17]. Women and men used CAM at significantly different rates in a study of US individuals with numerous chronic conditions, the findings of which were clearly significant. Comparatively speaking, a much higher percentage of women than men reported using CAM. According to the logistic regression analysis of CAM use, women were more likely than males to have used CAM to treat their diseases.[17] In a survey that was carried out in South Korea, the findings revealed that women were more likely than men to use CAM.[30]

In a study in Abu Dhabi[11], it was discovered that local Emirati participants knew more than non-Emiratis, however this was not substantially related to knowledge. Malay participants in Malaysia[9] were found to be more knowledgeable than Chinese, Indian, and international participants. A cross-sectional study of the adult population in Malaysia revealed that the majority of participants had favorable attitudes regarding CAM therapies. The study revealed a significant connection between attitudes and beliefs.[26] In a study of adult US residents of various ethnic backgrounds, it was discovered that Asians were the ethnic group most likely to use CAM, followed by Blacks and others.[31]

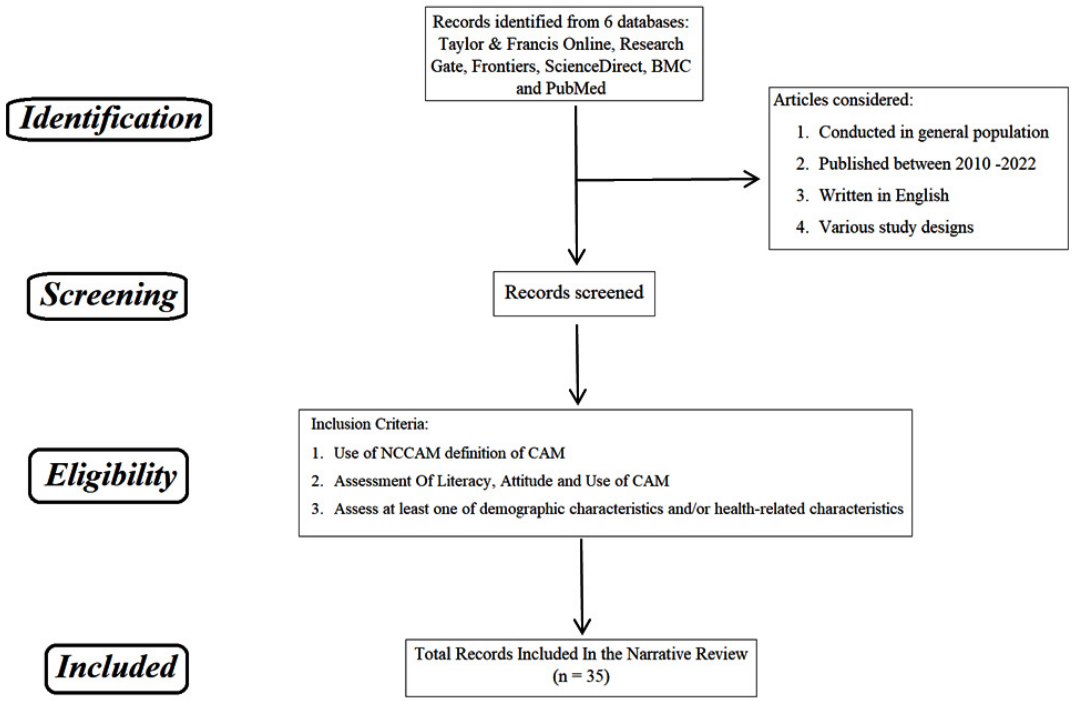

Fig. 1. Flowchart of Content Analysis

According to Turkish research[22], participants who did not have a college degree demonstrated superior understanding. Patients with various levels of education had similar levels of awareness of CAM in France[7], with no discernible differences. According to a study in Abu Dhabi[11], participants with a university degree or above had higher levels of literacy. In a survey of adult US

Table 1. *Summary of articles included in the narrative review*

No.	Authors	Country	Year Published	Database accessed from
1	Wieland L, Manheimer E, Berman B	UK	2011	PMC
2	Agarwal V.	US	2018	Frontiers
3	Kuruvilla D, Lindsey H, Grinberg A, et al.	US	2022	BMC
4	Falci L, Shi Z, Greenlee H.	US	2016	PMC
5	LaChance J, Booth R, Befus D.	Canada	2020	Taylor & Francis Online
6	Michel-Cherqui M, Had-Bujon R, Mongereau A et al.	France	2020	PMC
7	James P, Bah A.	Sierra Leone	2014	BMC
8	Syed G, Mohiuddin, Aziz S, et al.	Sungai Petani, Malaysia	2022	PMC
9	Alzahrani S, Bashawri J, Salawati E, et al.	Saudi Arabia	2016	Hindawi
10	Al Marshedi S, Al Samahi E, Al Mohammed M.	Abu Dhabi, UAE	2019	ResearchGate
12	Ameade EPK, Amalba A, Helegbe GK et al.	Ghana	2016	ScienceDirect
13	Ojukwu M, Mbizo J, Leyva B, et al.	US	2015	PubMed
14	Alwhaibi M, AlRuthia Y, Meraya A.	US	2019	PubMed
15	Mbizo J., Okafor A., Sutton M. A., et al.	US	2016	PubMed
16	Khan M. U., Jamshed S. Q., Ahmad A., et al.	Global	2016	PubMed
17	Alwhaibi M., Sambamoorthi U.	US	2016	Hindawi
18	Kretchy IA, Boadu JA, Kretchy JP, et al.	Ghana	2021	ScienceDirect
19	Alazmi AS, Alhamad J, et al.	Saudi Arabia	2020	PubMed
20	Radwan H, Hasan H, Hamadeh R, et al.	UAE	2020	PubMed
21	Rafi MA, Azad DT, Bhattacharjee M, et al.	Rajshahi, Bangladesh	2020	PubMed
22	Inci H.	Karabuk, Turkey	2020	PubMed
23	Alehegn HZ, Asiferaw ET, Welda ZG, et al.	Gondar, Northwest Ethiopia	2022	ScienceDirect
24	Radi R, Isleem U, Omari LA, et al.	Jordan	2018	ScienceDirect
25	Teow YEE, Mathialagan A, Ng SC, et al.	Malaysia	2021	ResearchGate
26	Islahudin F, Shahdan IA, Mohamad-Samuri S, et al.	Malaysia	2017	PMC
27	Shorofi SA, Arbon P, et al.	Adelaide, Australia	2010	PubMed
28	Al- Zahim AA, Al- Malki NY, Al- Abdulkarim FM, et al.	Riyadh, Saudi Arabia	2013	PMC
29	Khan A, Ahmed ME, Aldarmahi A, et al. Awareness	Jeddah, Saudi Arabia	2020	Hindawi
30	Kim S, Kim B, Kim J, et al.	South Korea	2019	PMC
31	Rhee TG, Evans RL, Mcalpine DD, et al.	US	2017	PMC
32	Zhang Y, Leach MJ, Sundberg T, et al.	US	2015	Hindawi
33	Falci L, Shi Z, Greenlee H, et al.	US	2016	PubMed
34	Shaboun S, Salama L, Abdrabba F, et al.	Benghazi, Libya	2022	ResearchGate
35	Doko T, Salaric I, Bazdaric K.	Croatia	2020	ResearchGate

citizens of various ethnic backgrounds, employed women with greater educational backgrounds were more likely to utilize CAM as a stress reliever.[31] According to the results of a cross-sectional study conducted in Jordan among university students over the age of 18 in the faculties of medicine, pharmacy, and engineering, male students and participants with less-educated parents are least receptive to CAM. The respondents who had more educated parents have a more favorable attitude regarding CAM.[24] With the exception of a little difference between high school level and lower high school level among females, it was discovered that higher educational status was associated with greater utilization of CAM modalities across both men and women.[32]

Participants in Turkey[22] who are unemployed displayed better CAM literacy. An evaluation of the knowledge of medical and health sciences students in Ethiopia revealed that those students who hailed from higher-income households had more knowledge than those whose parents had lower incomes.[23] Research conducted among Abu Dhabi's general public found that employed individuals had higher levels of CAM literacy. In a survey of adult US citizens of various ethnic backgrounds, employed women were more likely to utilize CAM to relieve stress.[31] Adults with several chronic diseases were shown to have a stronger propensity for CAM therapy, according to a US study. When compared to adults without chronic conditions, this population was older, earned minimum wage or was unemployed.[33]

According to research conducted in Malaysia[9], participants who worked in the private sector exhibited higher levels of CAM literacy. This outcome, though, lacked statistical significance.

A study assessing the knowledge of medical and health sciences students in Ethiopia revealed that pharmacy students knew substantially more about CAM than did medical students. Students studying nursing had less knowledge than those studying medicine.[23] There was no discernible variation in CAM knowledge amongst patients with different occupations in France.[6] A survey of nurses working in five hospitals in Australia found that the majority of the nurses had a favorable attitude toward CAM. The nurses' opinions about complementary and alternative therapies and their levels of literacy were found to be positively correlated. [27] A survey of patients at the King Khalid University Hospital (KKUH), in Riyadh, Saudi Arabia, indicated that the majority of them have a favorable attitude toward CAM.[28] There was no discernible difference in CAM use amongst students of different genders or colleges, according to the findings of a cross-sectional study that was carried out among health science students

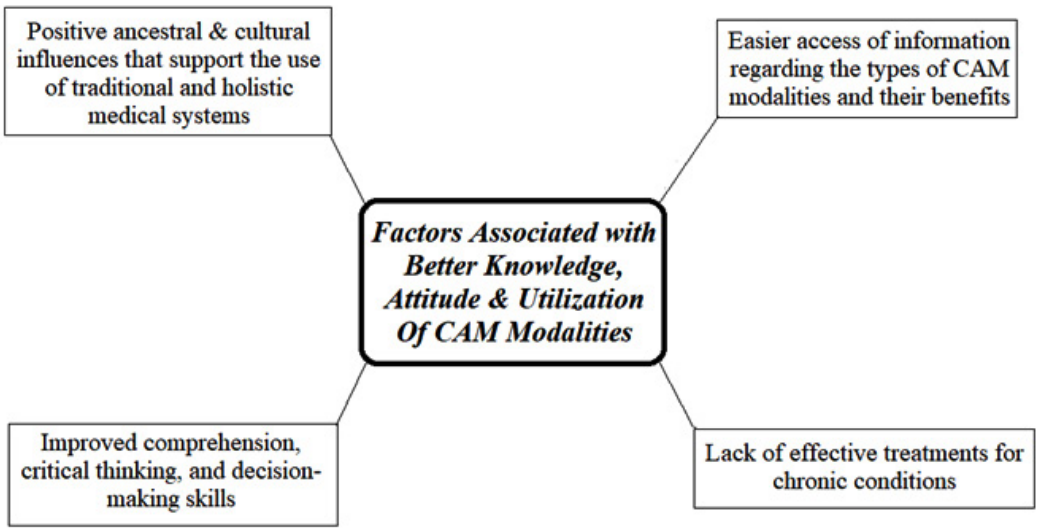

Fig. 2. Factors Influencing the Knowledge, Attitude & Use of CAM Modalities

at King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Jeddah, Saudi Arabia. Moreover, two thirds of the students support using CAM modalities for excellent mental health and think that CAM practice encourages a healthy lifestyle.[29]

In contrast to people who were married and living together, it was shown in a research of adult men and women in the US that both widowed men and women, as well as divorced women, had higher chances of using CAM modalities of therapy.[32]

From a study done among cancer survivors in the US, it was concluded that CAM use was greatest among adults who were overweight, followed by those who come under the obese class. It was observed that those who were overweight had increased use of CAM. People who were overweight were found to be using CAM as twice as those with normal/underweight BMI values.[13]

The way CAM is utilized by patients in Malaysia has been affected by a variety of information sources. The biggest influence (32.5%) came from friends.[16] The majority of Thai patients frequently used CAM at the recommendation of their friends and relatives. 78% of CAM users in India started their therapy on a friend or family member's advice.[16] Family, friends, and coworkers (44.3%) were the main sources of Ghanaians' knowledge about CAM for the prevention of COVID-19. [18] More than half of Saudi Arabia's patients who visited a primary care institution had heard of CAM from friends and relatives.[19] The majority of type 2 diabetes CAM utilizers in the UAE received encouragement from family (42.7%) and friends (25%) to use CAM.[20] 72% of diabetic CAM users in Rajshahi, Bangladesh, cited their friends, neighbors, and family as influences.[21] In a study on the sources of knowledge about complementary and alternative medicine (CAM) among students of pharmacy and medicine in Benghazi, Libya, 8.9% of participants and more than half (51.6%) of participants who were pharmacy students named friends and colleagues as a source.[34]

Participants' sources of CAM knowledge varied depending on the features of the Abu Dhabi community. The majority of persons with chronic diseases asked doctors for advice.[11] CAM therapies utilized by patients in Malaysia has been affected by a variety of information sources. Second among the participants in terms of percentage were medical experts (24.9%).[16] Health professionals (46.9%) were the main source of information for Ghanaians about CAM for the prevention of COVID-19.[18] In a research on type 2 diabetes CAM users in the UAE, only 13.5% of people stated that they used alternative medicine on a doctor's advice.[20] According to participants in a study on the sources of knowledge about complementary and alternative medicine (CAM) among people studying pharmacy and medicine in Benghazi, Libya (54.2%), medical professionals were the second most popular source of information.[34]

The media was the most popular source of knowledge regarding complementary and alternative medicine, according to a descriptive cross-sectional survey of people pursuing undergraduate pharmacy in Sierra Leone (58.9%).[8] Depending on the characteristics of the Abu Dhabi community, participants' sources of CAM information differed. Higher educated people used the internet as a resource for information.[11] The majority of type 2 diabetes CAM users in the UAE were persuaded to use CAM by social media (17.7%).[20] In a study on CAM use among persons doing Croatian Health Studies, the majority of respondents (72.9%) cited the Internet as their primary source of CAM knowledge.[35]

The world wide web appeared as the most popular information source (55.9%) for all participants in a study on the sources of knowledge on complementary and alternative medicine (CAM) among students studying pharmacy and medicine in Benghazi, Libya.[34]

The CAM modalities utilized by patients in Malaysia has been affected by a variety of information sources. The participants' least preferred citation for advertising was 15.8%.[16] A smaller percentage of participants (5.8%) answered to the question regarding their formal education in a survey about CAM use among adults pursuing Croatian health studies, according to the majority of respondents.[35]

DISCUSSION

According to the studies evaluated, those who were under 30 years old, female, of Asian ethnicity, worked in the medical field, had high

levels of education and were employed were shown to have a tendency to be more knowledgeable, have better attitude and utilize CAM more frequently. The awareness of CAM is better among those under the age of 25. This might be as a result of the ease with which people in this age range can access informational resources. Additionally, it was shown that women are more likely than men to seek complementary and alternative medicine (CAM) for their illnesses because they understand and value CAM more. It was found that the regions of South-East Asia, the Eastern Mediterranean, and the Western Pacific use complementary and alternative medicine (CAM) more skillfully and effectively. This might be as a result of the positive ancestral and cultural effects these countries have that encourage the use of tradition & holistic medicine systems. According to the findings, those with higher levels of education are likely to be more educated, have more positive attitudes, and be more likely to use complementary and alternative medicine. This might be the outcome of enhanced understanding, critical reasoning, and decision-making skills acquired through formal education. Figure 2 illustrates the factors that contribute to the better knowledge, attitude and utilization of CAM among adults. The primary information sources were friends and family, which indicates that doctors and nurses should receive training in CAM modalities to reduce misinformation and incorrect understanding of CAM treatments. Existing research frequently ignores the population's use of CAM for general well-being and other physiological changes, such as pregnancy, aging, and so forth, and instead focuses on the prevalence rates of CAM use in specific clinical populations, such as those with diabetes, arthritis, and malignancies. It's also crucial to concentrate on CAM knowledge, attitudes, and usage in countries other than the USA and to consider the most recent papers on novel CAM developments and evidence of their effectiveness.

CONCLUSION

People who are employed, younger, and female are likely to be more knowledgeable, have better attitudes, and use CAM frequently, according to the most recent data. The most common sources of information regarding CAM are friends and relatives.

Medical personnel should be aware of these wide-ranging modalities since chronic diseases are more prevalent and patients are increasingly avoiding traditional medical methods to manage them. Additionally, patients should be able to choose between an allopathic and a holistic approach to therapy from their physicians.

Given the dearth of studies that deal with CAM literacy and attitudes, further research is required in this area. In general, it would be helpful for doctors to find accurate information if they had a deeper understanding of the variables relating to CAM knowledge, attitude, and use as well as a more focused approach and attention to specific issues, such as factors that predict the use of specific CAM modalities or the association between CAM literacy, attitude, or use and specific individual sociodemographic or health factors.

ACKNOWLWDGEMENTS

The authors would like to express their sincere gratitude to their study supervisors, Dr. Jayakumary Muttappallymyalil, Assistant Research Professor, Gulf Medical University, Ajman, for giving them the chance to supervise our work and for their helpful advice.

Conflict of Interest

The author has no other conflict of interest to declare.

Funding Sources

There is no funding sources.

REFERENCES

1. Complementary and Alternative Medicine (CAM) [Internet]. National Cancer Institute. 2022 [cited 14 January 2022]. Available from: https://www.cancer.gov/about-cancer/treatment/cam
2. Wieland L, Manheimer E, Berman B. Development and Classification of an operational definition of complementary and alternative medicine for the Cochrane collaboration. *Altern Ther Health Med.* 2011;17(2): 50–59. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3196853/
3. Agarwal V. Complementary and Alternative Medicine Provider Knowledge Discourse on

Holistic Health. *Frontiers in Communication*. 2018;3:1-12. Available from: https://www.frontiersin.org/articles/10.3389/fcomm.2018.00015/full

4. Kuruvilla D, Lindsey H, Grinberg A, et al. Complementary and integrative medicine perspectives among veteran patients and VHA healthcare providers for the treatment of headache disorders: a qualitative study. BMC Complementary Medicine and Therapies. 2022;22(1):1-10. Available from: https://bmccomplementmedtherapies.biomedcentral.com/articles/10.1186/s12906-022-03511-6#citeas
5. Falci L, Shi Z, Greenlee H. Multiple Chronic Conditions and Use of Complementary and Alternative Medicine Among US Adults: Results From the 2012 National Health Interview Survey. *Prev Chronic Dis*. 2016;13:E61. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4858448/
6. LaChance J, Booth R, Befus D. Exploring unmet healthcare needs, healthcare access, and the use of practitioner based complementary and alternative medicine in adults with chronic pain. Contemporary Nurse [serial online] 2020;56(2);105-119. Available from: https://www.tandfonline.com/doi/full/10.1080/10376178.2020.1743192?scroll=top&needAccess=true
7. Michel-Cherqui M, Had-Bujon R, Mongereau A et al. Knowledge and use of complementary therapies in a tertiary care hospital in France: A preliminary study. *Medicine (Baltimore)*. 2020; 99(45):e23081. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7647629/
8. James P, Bah A. Awareness, use, attitude and perceived need for Complementary and Alternative Medicine (CAM) education among undergraduate pharmacy students in Sierra Leone: a descriptive cross-sectional survey. BMC Complementary and Alternative Medicine. 2014;14(1): 1-9. Available from: https://bmccomplementmedtherapies.biomedcentral.com/articles/10.1186/1472-6882-14-438
9. Syed G, Mohiuddin, Aziz S, et al. Knowledge, Attitude, and Practice of General Population toward Complementary and Alternative Medicines in Relation to Health and Quality of Life in Sungai Petani, Malaysia. 2022; 12(1): 57–63. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7397999/
10. Alzahrani S, Bashawri J, Salawati E, et al. Knowledge and Attitudes towards Complementary and Alternative Medicine among Senior Medical Students in King Abdulaziz University, Saudi Arabia. Evidence-Based Complementary and Alternative Medicine. 2016;2016:1-7. Available from: https://www.hindawi.com/journals/ecam/2016/9370721/
11. Al Marshedi S, Al Samahi E, Al Mohammed M. Knowledge, Attitudes and Practice of Complementary and Alternative Medicine in the Abu Dhabi Region. World Family Medicine Journal/Middle East Journal of Family Medicine. 2019;17(7):8-16. Available from: http://www.mejfm.com/July%202019/CAM%20Abu%20Dhabi.pdf
12. Ameade EPK, Amalba A, Helegbe GK et al. Medical students' knowledge and attitude towards complementary and alternative medicine – A survey in Ghana. *Journal of Traditional and Complementary Medicine*. 2016; 6(3): 230-236. Available from: https://www.sciencedirect.com/science/article/pii/S2225411015000437
13. Ojukwu M, Mbizo J, Leyva B, et al. Complementary and Alternative Medicine Use Among Overweight and Obese Cancer Survivors in the United States. *Integrative Cancer Therapies*. 2015; 14(6): 503-514. Available from: https://pubmed.ncbi.nlm.nih.gov/26044767/
14. Alwhaibi M, AlRuthia Y, Meraya A. Gender Differences in the Prevalence of Complementary and Alternative Medicine Utilization among Adults with Arthritis in the United States. Evidence-Based Complementary and Alternative Medicine. 2019; 2019: 1-11. Available from: https://pubmed.ncbi.nlm.nih.gov/31781281/
15. Mbizo J., Okafor A., Sutton M. A., et al. Complementary and alternative medicine use by normal weight, overweight, and obese patients with arthritis or other musculoskeletal diseases. *The Journal of Alternative and Complementary Medicine*. 2016; 22(3): 227–236. Available from: https://pubmed.ncbi.nlm.nih.gov/26938367/
16. Khan M. U., Jamshed S. Q., Ahmad A., et al. Use of complementary and alternative medicine among osteoarthritic patients: a review. *Journal of Clinical and Diagnostic Research: JCDR*. 2016;10(2): JE01–JE06 Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4800547/
17. Alwhaibi M., Sambamoorthi U. Sex differences in the use of complementary and alternative medicine among adults with multiple chronic conditions. *Evidence-Based Complementary and Alternative Medicine*. 2016; 2016:1-8 Available from: https://www.hindawi.com/journals/ecam/2016/2067095/
18. Kretchy IA, Boadu JA, Kretchy JP, et al. Utilization of complementary and alternative

medicine for the prevention of COVID-19 infection in Ghana: A national cross-sectional online survey. *Preventive Medicine Reports*. 2021; 24; 101633. https://www.sciencedirect.com/science/article/pii/S2211335521003247

19. Alazmi AS, Alhamad J, et al. Attitudes and practices of complementary and alternative medicine among patients attending primary care center in Saudi Arabia: A prospective cross-sectional study. *Journal of Family Medicine and Primary Care.* 2020; 9(10): 5177-5182. Available from: https://pubmed.ncbi.nlm.nih.gov/33409184/
20. Radwan H, Hasan H, Hamadeh R, et al. Complementary and alternative medicine use among patients with type 2 diabetes living in the United Arab Emirates. *BMC Complementary Medicine and Therapies*. 2020; 20(1): 216. Available from: https://pubmed.ncbi.nlm.nih.gov/32650773/
21. Rafi MA, Azad DT, Bhattacharjee M, et al. A hospital-based study on complementary and alternative medicine use among diabetes patients in Rajshahi, Bangladesh. *BMC Complementary Medicine and Therapies*. 2020; 20(1): 219. Available from: https://pubmed.ncbi.nlm.nih.gov/32660539/
22. Inci H. Complementary and Alternative Medicine Awareness in Cancer Patients Receiving Chemotherapy. World Cancer Research Journal. 2020; 7: e1752. Available from: https://www.wcrj.net/wp-content/uploads/sites/5/2020/11/e1752.pdf
23. Alehegn HZ, Asiferaw ET, Welda ZG, et al. Medical and health science Students' knowledge, attitude, and practice towards complementary and alternative medicine in University of Gondar. *Clinical Epidemiology and Global Health*. 2022; 17: 101148.

https://www.sciencedirect.com/science/article/pii/S2213398422001907

24. Radi R, Isleem U, Omari LA, et al. Attitudes and barriers towards using complementary and alternative medicine among university students in Jordan. Complementary Therapies in Medicine. 2018; 41: 175-179. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0965229918305053
25. Teow YEE, Mathialagan A, Ng SC, et al. Gender Differences in Beliefs and Attitudes Towards Complementary and Alternative Medicine Use Among a Non-urban, Malaysian Population. Journal of Community Health. 2021; 46(1): 645-652. Available from: https://www.researchgate.net/publication/343586209_Gender_Differences_in_Beliefs_and_Attitudes_Towards_Complementary_and_Alternative_Medicine_Use_Among_a_Non-urban_Malaysian_Population
26. Islahudin F, Shahdan IA, Mohamad- Samuri S, et al. Association between belief and attitude toward preference of complementary alternative medicine use. *Patient Preference and Adherence.* 2017; 11: 913-918. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5436780/
27. Shorofi SA, Arbon P, et al. Nurses' knowledge, attitudes, and professional use of complementary and alternative medicine (CAM): a survey at five metropolitan hospitals in Adelaide. *Complement Ther Clin Pract*. 2010; 16(4): 229-34. Available from: https://pubmed.ncbi.nlm.nih.gov/20920809/
28. Al- Zahim AA, Al- Malki NY, Al- Abdulkarim FM, et al. Use of Alternative Medicine by Saudi Liver Disease Patients Attending a Tertiary Care Center: Prevalence and Attitudes. *Saudi J Gastroenterol.* 2013; 19(2): 75-80. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3632014/
29. Khan A, Ahmed ME, Aldarmahi A, et al. Awareness, Self-Use, Perceptions, Beliefs, and Attitudes toward Complementary and Alternative Medicines (CAM) among Health Professional Students in King Saud bin Abdulaziz University for Health Sciences Jeddah, Saudi Arabia. *Evidence-Based Complementary and Alternative Medicine*. 2020; 2020: 11. Available from: https://www.hindawi.com/journals/ecam/2020/7872819/
30. Kim S, Kim B, Kim J, et al. The Use of Complementary and Alternative Medicine among Korean Young Adult Members of Fitness Centers. *Evid Based Complement Alternat Med.* 2019; 2019: 7648237. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6409052/
31. Rhee TG, Evans RL, Mcalpine DD, et al. Racial/Ethnic Differences in the Use of Complementary and Alternative Medicine in US Adults With Moderate Mental Distress. *J Prim Care Community Health.* 2017; 8(2): 43–54. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5932659/
32. Zhang Y, Leach MJ, Sundberg T, et al. Differences between Male and Female Consumers of Complementary and Alternative Medicine in a National US Population: A Secondary Analysis of 2012 NIHS Data. Evidence-Based Complementary and Alternative Medicine. 2015; 2015: 413173. Available from: https://www.hindawi.com/journals/ecam/2015/413173/
33. Falci L, Shi Z, Greenlee H, et al. Multiple Chronic

Conditions and Use of Complementary and Alternative Medicine Among US Adults: Results From the 2012 National Health Interview Survey. *Preventing Chronic Disease*. 2016; 13: 150501. https://www.cdc.gov/pcd/issues/2016/15_0501.htm

34. Shaboun S, Salama L, Abdrabba F, et al. Knowledge, Attitude, and Use of Complementary and Alternative Medicine among Final-Year Pharmacy and Medical Students in Benghazi, Libya. *Ibnosina Journal of Medicine and Biomedical Sciences*. 2022; 1-9. Available from: https://www.researchgate.net/publication/362109531_Knowledge_Attitude_and_Use_of_Complementary_and_Alternative_Medicine_among_Final-Year_Pharmacy_and_Medical_Students_in_Benghazi_Libya

35. Doko T, Salaric I, Bazdaric K. Complementary and Alternative Medicine Use Among Croatian Health Studies Students - A Single Center Cross-Sectional Study. Acta Medica Academica. 2020; 49(3): 240-248. Available from:: https://www.researchgate.net/publication/350525138_Complementary_and_Alternative_Medicine_Use_Among_Croatian_Health_Studies_Students_-_A_Single_Center_Cross-Sectional_Study