

Medical Science

To Cite:

Iqbal MZ, Fatima N, Ahmad S, Farooq T, Shahid MG, Zaka R, Noor N, Asif R, Saleem R, Ramzan N, Zulfiqar A. Investigating the influence of patient demographics on the utilization of Complementary and Alternative Medications (CAM) for treating various lifestyle diseases in community and hospital pharmacies: A comprehensive literature review. *Medical Science* 2024; 28: e12ms3298
doi:

Authors' Affiliation:

¹Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Lahore University of Biological & Applied Sciences, Lahore, Pakistan
²Research Student, Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Lahore University of Biological & Applied Sciences, Lahore, Pakistan

*Corresponding Author

Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Lahore University of Biological & Applied Sciences, Lahore, Pakistan
Email: drmmziqbal@gmail.com

Peer-Review History

Received: 14 December 2023
Reviewed & Revised: 18/December/2023 to 26/February/2024
Accepted: 29 February 2024
Published: 04 March 2024

Peer-review Method

External peer-review was done through double-blind method.

Medical Science
pISSN 2321-7359; eISSN 2321-7367



© The Author(s) 2024. Open Access. This article is licensed under a [Creative Commons Attribution License 4.0 \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.



Investigating the influence of patient demographics on the utilization of Complementary and Alternative Medications (CAM) for treating various lifestyle diseases in community and hospital pharmacies: A comprehensive literature review

Muhammad Zahid Iqbal^{1*}, Neha Fatima², Sadia Ahmad², Tooba Farooq², Muntaha Gull Shahid², Rabia Zaka², Nisha Noor², Rameen Asif², Rabia Saleem², Nageen Ramzan², Ayesha Zulfiqar²

ABSTRACT

Background: Alternative and complementary medicine (CAM) is extensively utilized worldwide due to its potential in relieving both psychological and physical conditions. As the prevalence of lifestyle diseases has been increasing with each passing day, CAM plays a vital role around the globe. **Objective:** The current review was designed to analyze the effect of CAM usage on patients having lifestyle management diseases in various hospitals and community pharmacies. **Methods:** The researchers performed a systematic examination utilizing diverse search engines to locate cross-sectional studies. A manual exploration was carried out using the following electronic databases: Web of Science, Google Scholar, Science Direct, Pro Quest, Pub Med, ResearchGate and Scopus. This systematic review was according to the standards of "Preferred Reporting Items for Systematic Reviews" (PRISMA) and Meta-analysis. **Results:** This review included the updated studies taken from 2002 to 2023. The higher trend of CAM usage was from Western Asia. However, it covered other continents as well. Out of 26,000 patients, 18,000 were observed to be using alternative and complementary medicines. The AXIS tool served an essential

function in cross-sectional studies by rigorously assessing the study's quality. It offers a systematic method to gauge the quality, pertinence, and reliability of clinical research within cross-sectional studies. *Conclusion:* The cross-sectional analysis comprised 31 research articles published from 2002 to 2023. These studies were conducted across multiple nations by researchers. CAM usage is higher in chronic diseases like Hypertension, Arthritis, Diabetes, and Asthma. The trend of CAM usage was high in West Asia.

Keywords: Demographic factors, Hypertension, Confounders, PRISMA, Hypertensive Patients, Control of Hypertension, Complementary and Alternative Medications (CAM)

1. INTRODUCTION

CAM, an umbrella term, encompasses unconventional medical practices, interventions, and products that complement or augment conventional medical treatments. It expands the theoretical scope of medicine and addresses unmet healthcare requirements (Bukhsh et al., 2018). Variations and complementary expressions are necessary to employ in specific contexts. Complementary medicine encourages utilizing biomedicines along with acupuncture, physical activity and dietary changes instead of replacing them. In contrast, alternative medicines or therapy involve utilizing a substitute rather than biomedicine or herbal products (Ernst and Fugh-Berman, 2002). According to the National Institutes of Health (NIH), Conventional or traditional medicine is considered such an approach in which healthcare providers, including those with doctorates, address ailments and symptoms using medications, radiation therapy, or surgery. It's crucial to highlight that the practice of medicine extends beyond physicians alone. Other healthcare professionals, including pharmacists, medical assistants, nurses, and clinicians, can also adopt this approach within their respective areas of expertise (Ng et al., 2023).

Complementary and Alternative Medicine (CAM) comprises a range of techniques utilized alongside traditional therapies (complementary) or as alternatives to them. Although they have proven effectiveness, many healthcare practices within CAM have not yet been fully integrated into mainstream healthcare systems. Examples of CAM therapies include acupuncture, homeopathy, herbal remedies, and spiritual healing techniques (Valtonen et al., 2023). CAM, an abbreviation for Complementary and Alternative Medicine, encompasses a diverse array of treatments, including bee pollen and ozone therapy, along with traditional Chinese medical practices. These modalities present unique diagnostic criteria and a wide spectrum of treatment options, as noted by (Ernst and Fugh-Berman, 2002). Seemingly, CAM therapies don't rely on complex or advanced technology, provide affordable treatment facilities, and utilize the body's inherent capacity to heal itself. In evaluating CAM treatment as an eligible expense, it's crucial to conduct a comprehensive and unbiased assessment of its economic and health implications (Herman et al., 2005).

Globally, there's a growing trend of individuals seeking complementary and alternative medicine (CAM) to enhance their physical and mental health (Wu et al., 2023). As the prevalence of chronic illness has been increasing with each passing day, complementary and alternative medicines are growing in popularity around the globe. Diabetes mellitus presents a considerable public health challenge globally, contributing to substantial rates of morbidity and mortality (Al-Eidi et al., 2016). Numerous research endeavors have been undertaken within the realm of complementary and alternative medicine (CAM) to tackle chronic conditions like diabetes, hypertension, and cancer, alongside addressing broader health issues within specific geographic areas (Zyoud et al., 2016). Some natural products, including herbal remedies, vitamins, and some other probiotics, psychological treatments, acupuncture, acupressure and cupping therapy that is considered to be the most widely used CAM therapies (Dehghan et al., 2020). Multiple studies indicate that higher income, education level, and female gender are correlated with an elevated utilization of complementary and alternative medicine (CAM).

Results differ for racial or ethnic categories and age factors, with the common trend of non-Black status or self-identification of White people associated with a greater possibility of CAM use. CAM users are categorized as single, living with someone, or divorced. Mostly married individuals were found using the Chiropractic therapy of CAM (Conboy et al., 2005). In the United States, the average individual consults CAM practitioners approximately 19 times annually, with a one-year prevalence of CAM usage at 34%. The expenses associated with these practitioners can surpass \$500 per person (Hasan et al., 2009). Globally, researchers have examined numerous factors influencing CAM; however, many variables necessitate further investigation. CAM research findings and data are dispersed and not easily accessible. Definitive studies regarding CAM factors are spread across various platforms. Researchers require

concise and readily accessible information. Centralizing all CAM data on a unified platform can enhance awareness. The research investigated how patient demographics influence the utilization of complementary and alternative medicine for managing lifestyle diseases in both community and hospital pharmacies.

2. MATERIALS AND METHODS

The systematic review received primary guidance from a range of search engines. The study search was conducted using the following electronic databases: Science Direct, PubMed, Web of Science, Scopus, Directory of Open Access Journals, and ProQuest. Additionally, Google Scholar was utilized for manual searching. Furthermore, all study protocols adhere to the PRISMA flow statement guidelines. The keywords used for finding the research studies were: 'complementary medicine' 'alternative medicine', 'complementary and alternative medicine', 'complementary and alternative medicine use in Asian countries', 'use of complementary and alternative medicine for chronic diseases in different countries', and role of complementary and alternative medicine for chronic diseases. We restricted our search to English-language studies on chronic diseases published between January 2006 and December 2023. Out of the 2163 studies identified, only 31 were included in the systematic review based on their adherence to the inclusion criteria.

Inclusion Criteria

The inclusion criteria were as follows:

The study was on Chronic Diseases.

The studies were published in the language English.

The study population data were considered from CAM users only.

The studies were from different countries worldwide.

The study design of the included studies was observational cross sectional.

The studies were from general population and healthcare providers.

Exclusion Criteria

The exclusion criteria were as follows:

The studies of study design other than observational cross-sectional.

The studies were published in any other languages except for English.

Data Extraction

The information retrieved from the studies included the following details: Study design, author details, country of study, year of study, disease for assessment, sample size, demographics (age group, weight, BMI, gender, occupation, family, alcohol consumption, smoking, exercise habit, marital status, main source of health payment, education level, area of residence, disability, duration of disease, current medication, hospitalized within five years, any surgery in the past two years, current report of labs and comorbidity if any), and type of cam used. To assess and mitigate potential bias, we utilized the AXIS Tool.

3. RESULTS

This review was about using complementary and alternative medicines in patients to manage lifestyle diseases. Altogether, the review informs about the usage trend of CAM and its effect on handling lifestyle diseases. Most of the studies included in the review were from Asia to check the course of usage of CAM, and some studies included were from the US and Australia to keep the difference in notice about the usage trend of CAM. The direction of complementary and alternative medicine (CAM) usage necessitates consideration of various factors. The review included the updated studies taken from 2002 to 2023. CAM utilization in Asia surpasses that of other continents, influenced by factors such as religion, culture, economics, and historical connections. Western Asia exhibits a higher prevalence of complementary and alternative medicine (CAM) usage compared to the rest of Asia, with Southern Asia following closely.

Studies indicate elevated CAM usage rates in Western and Southern Asia, potentially influencing healthcare policies and practices in these regions. Discrepancies in CAM usage trends across continents have been observed in studies from the US and Australia.

Additionally, data from multiethnic communities were considered. Geographical location significantly influences CAM usage, with patients often aligning their choices with local customs, beliefs, and religious practices. The majority of studies focused on adult patients, although data from pediatric patients was also incorporated. Responses were collected from nearly 26,000 patients as part of the study assessing CAM usage. Among the total sample size, approximately 18,000 patients have chosen to use CAM and are reporting positive outcomes.

Some of the patients were regular CAM users while some patients were not, and some discussed their CAM usage with their physician, while most of the patients were taking CAM without any physician concern. Users of CAM who used it consistently reported varied outcomes in comparison to those who used it sporadically, particularly regarding their illness management. The identification of studies involved searching through diverse databases and registers, including Science Direct, PubMed, Web of Science, Scopus, ProQuest, and Google Scholar. Initially, 1454 records were screened, from which 267 studies were identified for retrieval, and subsequently, 141 studies were assessed for eligibility. Ultimately, 31 studies met the inclusion criteria for the review. As depicted in (Figure 1).

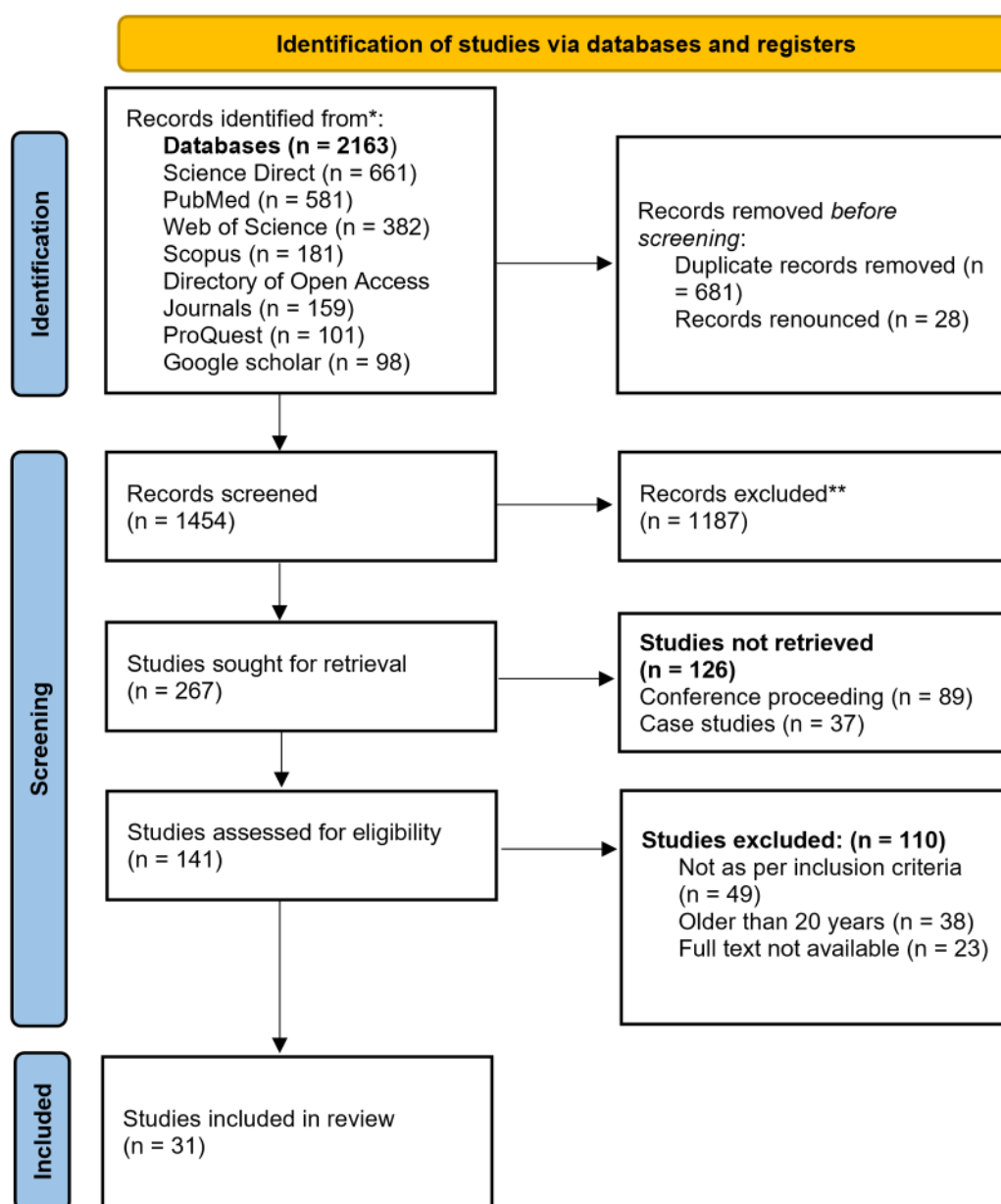


Figure 1 PRISMA flow diagram for systematic review

Table 1 Study characteristics of the included studies

Sr. No.	Study	Country	Disease name	Study design	Sample size (N)	Demographics	Type of CAM used	Outcome/conclusion
1.	(Chen et al., 2016)	Multiethnic community	Epilepsy	Cross-sectional prospective study, gathering of figures was done by using a Multidimensional questionnaire	N=178 Pediatric patients with epilepsy (PPE) Cam users=49	Age, Gender, Ethnicity	Traditional herbs, acupuncture, aromatherapy, hypnotherapy, multivitamins, minerals, massage, Tuina, and reflexology.	The majority ratio of CAM users were Chinese, and the average of PPE that used anti-epileptic drugs was 1.50, while the report indicated that 49 caregivers, accounting for 27.5% of the total, were administering CAM to their PPE. Caregivers who utilized CAMs for their patients with PPEs often lacked comprehensive information regarding the effects of CAMs. Some harbored misconceptions and neglected to discuss their usage with healthcare providers. However, healthcare professionals should routinely inquire about caregivers' use of CAM for PPEs, and this utilization should be documented. This approach ensures that the compatibility of CAMs with prescribed AEDs is monitored and assessed appropriately.
2.	(Ali-Shtayeh et al., 2013)	Palestine	Hypertension	This study employs a cross-sectional survey methodology, utilizing a semi-structured questionnaire.	N= 4575 Cam users= 3921	Gender, age group, marital status, education level, area of residence (city, village, refugee camp)	Biological-based therapies, herbs, honey, etc. Energy therapies (vitamins, minerals), Conventional oriental medicines (aromatherapy, homeopathy, folk remedy)	Herbal therapy for hypertension is highly prevalent in Palestine. 86% of hypertensive patients used one or more types of CAM for HTN management, out of which 62.1% were Herbs.
3.	(Medagama et al., 2014)	Sri-Lanka	Type 2 Diabetes	A cross-sectional survey was conducted among 252 randomly selected Type 2 diabetes patients. Prior to administering a questionnaire containing demographic data, diabetes-related information, and details regarding CAM use, verbal consent was obtained from the participants.	N=252 Cam users=128	Please furnish details encompassing age, occupation, gender, and diabetes-related information. This entails the duration of diabetes, present anti-diabetic medication, presence of complications, episodes of hypoglycemia, most recent Fasting Plasma Glucose reading,	Supplemental herbal remedies, naturopathy, Ayurvedic medicine, and acupuncture.	This study primarily examines the non-commercially available types of CAMs utilized by individuals with diabetes. Sri Lanka exhibits a widespread prevalence of individuals utilizing herbal dietary supplements. Crepe ginger has been identified as being associated with significant hypoglycemia. However, the overall incidence of hypoglycemia among CAM users was not found to be increasing.

						and HbA1C levels.		
4.	(Oktar et al., 2023)	Turkey	Chronic diseases	Following the completion of a cross-sectional observational study, logistic regression analysis was carried out.	N=692 individuals Cam users= 257	Referral location, age, gender, marital status, employment status, family structure, and alcohol consumption.	Phytotherapy, cupping therapy, acupuncture, leech therapy, hypnosis, music therapy, apitherapy, larval therapy, chiropractic, homeopathy, reflexology, prolotherapy.	The most commonly employed CAM practices included phytotherapy, cupping therapy, and acupuncture. A third of the patients had been diagnosed with a chronic disease, and among those admitted to healthcare institutions, a significant proportion had already undergone CAM practices. This suggests a relatively strong inclination towards CAM.
5.	(Shraim et al., 2017)	Palestine	N/A	Cross sectional design, a questionnaire was administered on licensed community pharmacists.	N=281, Three hundred thirteen community pharmacists were asked to participate, 284 pharmacists accepted, and 281 pharmacists provide their statistics in the analysis.	Gender, age, education level (bachelor, master), Experience, university of graduation, pharmacy location	Exercise, and Food supplements were the most frequently recommended modalities. Honey, herbs and massage came in second place. Other practices recommended by pharmacists were hijama remedies and Bloodletting – chiropractic etc.	This study investigated the knowledge, perception, practice, and belief of Community pharmacists on the Usage of CAM. The knowledge scores were fair to average. This study indicates a necessity for Palestinian pharmacists to undergo additional training and education regarding Complementary and Alternative Medicine (CAM). This would serve to augment their knowledge and expertise, enabling them to deliver enhanced pharmaceutical care to their patients. Through such measures, there is a potential to enhance the health outcomes of patients.
6	(Wazaify et al., 2011)	Jordan	Diabetes	Comparative random sampling through surveys & interviews	Total participants = 1000 CAM users = 166	Age, gender, Residence, Education	Herbal products	Out of 166 patients, about 69.3% (n=115) claimed that their symptoms were relieved the use of herbal products, about 9.6% (n=16) reported decreased disease progression, 18.1% (n=30) claimed the cure, and merely 3% (n=5) participants reported using herbs to lessen the side effects the concurrently administered drug.
7	(Chu et al., 2013)	China	Coronary Artery Disease	Parallel study by questionnaire	Total participants = 546 CAM users = 377	Gender, age, Education level, Residence, Income	Chinesemedicine (CM) [patent herbal medicine]	Based on patient demographics data, most CAM users were males (n= 211) with the age above 60 years. Among the 377 CAM users surveyed, 75.8% (n=286) asserted the effectiveness of CAM products, while 49.6% (n=187) reported experiencing reduced side effects with their usage. Furthermore, 21% (n=79) found CAM to be a cost-effective option.
8	(Sari et al., 2021)	Indonesia	Diabetes mellitus	Intersectional Non-random sampling by in-person interviews & questionnaire	Total participants = 628 CAM users = 341	Gender, Age, Marital status, Religion, Education level, Employment status, Income	Herbal products	Mostly Fe-males (73.9%) and participants with age of over 50 years (88.3%) have seemed to be regular users of CAM products, most popular CAM products among participants were herbal, followed by some spiritual therapy and nutritional products. However, there was not any associations found between the demographics and CAM usage

								still its safety and efficacy profile was considerable for the management of diabetes and good health.
9	(Amariles et al., 2006)	Colombia	Obesity	Intersectional Randomized study	Total participants=94 CAM users =49	Age, Gender, Marital status, Educational level, weight, BMI	Herbal products/home remedies	Demographic data states that 89.8% of females were using complementary medications for treating obesity. Participants cited dissatisfaction with conventional therapy outcomes as the reason for resorting to complementary medication for treating obesity.
10	(Devi et al., 2015)	India	Diabetes	Transverse randomized study by questionnaire	Total participants=252 CAM users=162	Age, Gender, Educational level, Family history	Herbal products/Dietary & nutritional supplements	Based on demographic data, a greater proportion of females (61.1%) were utilizing CAM products to manage type II diabetes mellitus in contrast to males (49.4%). Participants (54.9%) expressed satisfaction with CAM products either alone or in combination with conventional therapy, reporting significant improvement in managing their blood sugar levels.
11	(Farooqui et al., 2022)	Saudi Arab	Chronic diseases	Transverse survey	377	Age, marital status, employment status, education level.	Herbal products and spiritual therapies.	The study highlights the importance of health care providers being aware of CAM use among their patients and regularly assessing any potential negative consequences. Further research is needed to evaluate the safety and effectiveness of CAM in managing chronic diseases.
12	(Hussein et al., 2023)	Malaysia	Asthma	Intersectional studies	1280	Gender, ethnicity, level of education, occupation, household income, smoking, the primary source of health payment	Not specified.	The study examines the features associated with poor asthma control.
13	(Suresh Kumar et al., 2023)	United Arab Emirates	Cardiovascular	Comparative design	400	Age group, gender, marital status, BMI, employment status, field of work	Homeopathic, Ayurveda, acupuncture, wet and dry cupping therapy, traditional healing, massage, chiropractic therapy, and Chinese medicine, herbal medicine, vitamins honey products, relaxation	The sociodemographic factors were not significantly associated with the use of CAM. The study concluded that there is a need to promote awareness regarding alternative options for the management of CVDs alongside evidence-based medical techniques.
14	(Ruyvaran et al., 2021)	Iran	Gastrointestinal (GI) disorders	cross-sectional randomized sampling by questionnaire	244 adult patients CAM users = 89	Age, Gender, Marital Status, Education, Occupation, Residence,	Mineral & Animal byproducts, Wet Cupping Herbal,	Based on the patient's demographic data, 69.29% of CAM Users were female. The relationship between CAM use and period of ailment is direct. Significant relationship showed above age 60 years. Most of the

						Duration of disease, BMI		CAM users use Herbal medicine. 72% claimed the effectiveness of CAM.
15	(Opheim et al., 2012)	Norway	Inflammatory bowel disease	cross-sectional study by questionnaire	460 patients CAM users = 430	Age, Gender, Marital status, Education, Work Status, Place of residence, Smoking, Disease duration	Herbal remedies, Other dietary supplements, Homeopathic remedies	56% of UC (ulcerative colitis) patients utilize CAM, whereas only 44% of CD (Crohn's disease) patients do so. Moreover, 59% of women reported using CAM. Furthermore, only 13% of patients reported experiencing adverse effects or comorbid conditions from CAM usage.
16	(Hilsden et al., 2003)	Canada	inflammatory bowel disease	cross-sectional study randomized sampling by questionnaire	2847 patients CAM users=1332 patients	Age, Region, Type of IBD, Disease activity, Hospitalized in the past five years, Surgery in the past two year	Homeopathic, Herbal Therapy ("Aloe Vera, Garlic, flaxseed") Naturopathy	41% members use herbal therapies, and most of the patients claim the aids of using CAM 16% of participants of CAM users claim the adverse effect
17	(Alaaeddine et al., 2012)	Lebanon	Rheumatoid arthritis and osteoarthritis	Descriptive cross-sectional study by questionnaire-based interview	250 adult patient age b/w (20-90years)	Age, gender, occupation, educational level, Marital status	82.8% herbal therapy 22.4% exercise 12.1% massage 3.4% yoga and meditation	Herbal therapy: 63.7% beneficial 31% not beneficial 5.1% undetermined 24.1% show side effects like GIT problems and dermatology glitches
18	(Osamor and Owumi, 2010)	Nigeria	Hypertension	Quantitative study Qualitative study	440 Age b/w (25-90 years)	Age, sex, occupation, educational level, religion, marital status	63% herbs only 21% garlic 8% herbs and prayer	Significant association of CAM with gender, marital status, occupation Lack of association with age, educational level, religion
19	(Shahjalal et al., 2022)	Bangladesh	Chronic illness	Cross-sectional study	549	Gender, age, schooling, marital status, location of residence, monthly income knowledge on CAM	Homeopathy Ayurveda Unani	41.6% of CAM users stated that it is effective in the management of chronic illness 38.8% said it is less expensive
20	(Ünsal and Gözümlü, 2010)	Turkey	Arthritis	Descriptive cross-sectional by questionnaire	250	Age, Gender, marital status, education level, economic status	62.6% thermal therapy 41.5% herbal therapy 40.5% hot therapy 32.6% skin therapy 28.4% massage 12.6% cold therapy	Significance Association b/w economic state and CAM therapy Thermal spring therapy is the most preferred form Heat therapy, cold therapy, and massage therapy are efficacious. Externally applied treatment occasionally displays irritation and burning Externally applied therapy sometime show irritation and burning
21	(Bhalerao et al., 2013)	India	Epilepsy HIV RA DM	Treatment satisfaction questionnaire for medication	4664	Age, gender, duration of disease	Ayurveda most commonly use	CAM for epilepsy, HIV, and DM is hands-on, suitable, and safe In RA, CAM is the least effective, and convenient

				(TSQM) cross-sectional				
22	(Ali-Shtayeh et al., 2012)	Palestine	Diabetes mellitus	Cross-sectional random sampling by interview and questionnaire.	1883 participants 977 participants were using herbs	Gender, age, marital status, education level, residence	Herbal medicines, prayer, vitamins and minerals, exercise, honey, kefir grain and milk	35% of participants reported relieving disease-related symptoms, 22.9% claimed to resolve the disease, and 12.6% claimed to decrease the side effects of orthodox medications by means of CAM. While 45.7% rationalized the use of CAM for slowing down disease progression
23	(Mountifield et al., 2015)	Australia	Inflammatory bowel disease	Cross-sectional randomized sampling by questionnaire.	463 participants 206 participants were regular CAM users	Age, disability, employment, smoking, pension, marital status.	Herbal products, fish oil, massage, prayer, Chinese medications, probiotics, acupuncture, exercise, hypnotherapy	Some patients reported about dropping the dose of conventional medicines, 54.9% reported decreasing the side effects of chemical prescriptions, and the investigation score shows enlarged quality of life, lessened depression, and amplified anxiety with the use of CAM
24	(Ceylan et al., 2009)	Turkey	Diabetes mellitus	Study conducted by survey during a follow-up	301 participants 81 participants were using CAM	Gender, Marital status, Education level, Income, Profession	Herbal products, yogurt, parsley, lemon, hibiscus and fruits	The findings of the study suggest that patients did not discontinue the medications prescribed by their physicians. Instead, some patients ceased usage due to side effects or the absence of beneficial effects. This indicates that patients continue to place trust in their physicians over alternative medications.
25	(Rafi et al., 2020)	Bangladesh	Diabetes Mellitus	Cross-sectional study by face-to-face interview using a structured questionnaire	244 participants 86 participants were using CAM	Age, sex, Marital status, Education level, religion, income and residence	Herbal products, Homeopathic medicines, Traditional/Religious means, Multivitamin and Food supplements	Among all participants, 76% of CAM users reported experiencing poor glycemic control. Results from a simple logistic regression test indicated that non-CAM users had a 1.946 times higher likelihood of achieving reasonable glycemic control compared to CAM users. Additionally, 14% of CAM users reported experiencing side effects.
26	(Spinks et al., 2014)	Australia	Diabetes Mellitus and cardiovascular disease.	Cross-sectional study by postal surveys. Advertisements and rolling recruitment approaches were used to employee the individuals. Online recruitment was done by mail as well.	Total sample= 2669 Non-CAM users=1386 Left CAM use for more than 12 months= 142 Taken CAM from a practitioner in the last 12 months= 43 Taken CAM product in last 12 months=	Age, gender, marital status, residence, Income, education level, employment, BMI, smoking, exercise	Acupuncture, Chinese medicine, Nutrition, Neuropathy, Chiropractor, vitamins, minerals, herbs, Bach flower remedies and homeopathy.	Some negative and positive effects of CAM use been seen by the use of CAM on the quality of life. This study discovered a correlation between increased CAM usage and a lower quality of life. One potential explanation for this phenomenon could be the concurrent utilization of CAM alongside conventional medical treatments.

					514 In the last 12 months, both practitioner and product= 572			
27	(Tokem et al., 2012)	Turkey	Asthma	Descriptive type study conducted in the hospital.	200 patients	Age, education level, working status, social insurance	Herbs, exercise, mind-body techniques such as praying and imagining methods, nutritional and vitamin supplements	63% of patients use the CAM method, patients with enduring asthma and comorbidities use CAM and found the relation between them
28	(Ibrahim et al., 2018)	Iraq	Hypertension	Comparative study, obtain data from 2 hospitals by questionnaire.	436 patients	Gender, age, educational level, Income, marital status, duration of HTN, comorbidity	Biological-based therapies, Natural or herbal products, reflexology, Acupuncture.	As CAM treatment is not a risk-free approach and shows many adverse results, need more research.
29	(Golden et al., 2023)	United States	Different conditions, Rheumatic disease, orthopedic, and musculoskeletal pain.	Comparative study	150 participants	Gender, age, educational level, marital status, white non-Hispanic.	Herbal products/dietary supplements, bodywork, mind-body practices, Naturopathy, Acupuncture, Homeopathy.	Notice the care gap resulting from the lack of disclosure of CAM usage to the primary care provider (PCP).
30	(Villa-caballero et al., 2010)	United States	Diabetes	Questionnaire	21 participants	Gender, Age, Income, Education, Ethnicity	Pharmacological CAM, Non Pharmacological CAM	More research is required to clarify the safety and efficacy of CAM among different demographics with varied civilizations.
31	(Palileo-Villanueva et al., 2022)	Philippines and Malaysia	Hypertension	Comparative data from Economically marginalized rural and urban communities	946 participants	Gender, Age, Employment, Income	Natural and biologically based goods, body-based modalities, and energy-based therapies.	CAM provide optimal benefits, to improve primary care services.

It's essential to incorporate diverse demographic factors to ensure an accurate assessment of the correlation with CAM. Such as age is the factor involved in checking the use of CAM is higher in which age group, and on this source, other demographics added as well, for example, Gender, Education level, Occupation, Mental status, Income, Job type, Family status, Residency, relationship status, and weight, etc. A wide range of demographic characteristics were encompassed in the study to check the effect of demographics on the use of CAM to indicate or conclude how demographics showed impact on CAM use. The studies conducted in the US involved white non-Hispanic participants, selected based on their population demographics. Pediatric patients from a multi-ethnic community, including those with epilepsy, were also included in the study.

The diseases included in the review were lifestyle management diseases such as Diabetes Mellitus, Hypertension, asthma, and epilepsy. The utilization of complementary and alternative medicine (CAM) typically exerts a more significant influence on the management of chronic diseases compared to acute ones. This preference stems from the potential long-term benefits that herbs and other CAM therapies offer in chronic conditions, which are crucial to effectively manage. Moreover, diverse CAM therapies

demonstrate varying effects on the progression of different diseases. It is noteworthy that the majority of Asian studies examined in the review concentrated on lifestyle diseases such as diabetes mellitus, hypertension, arthritis, cardiovascular diseases, and asthma. Interestingly, the review also revealed that a notable portion of patients in the US using CAM were afflicted with diabetes mellitus and hypertension. As described in (Table 2).

AXIS tool

AXIS tool is the critical appraisal of Cross-sectional studies for the systematic evaluation of clinical research to examine trustworthiness, significance, and relevancy. The AXIS tool is a robust assessment instrument designed for evaluating the quality of interventional observational studies, encompassing cohort and case-control studies. Additionally, it serves to address the quality of study design and the potential for bias in cross-sectional studies. This tool is valuable for assessing the credibility, pertinence, and reliability of clinical research. As described in (Table 2).

Table 2 Appraisal tool for Cross-Sectional Studies (AXIS tool)

Study 1	Study 2	Study 3	Study 4	Study 5	Study 6	Study 7	Study 8	Study 9	Study 10	Study 11	Study 12	Study 13	Study 14	Study 15	Study 16	Study 17	Study 18	Study 19	Study 20	Study 21	Study 22	Study 23	Study 24	Study 25	Study 26	Study 27	Study 28
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	×	✓	×	✓	✓	×	×	×	×	✓	×	×	✓	×	×	N/A	×	✓	×	×	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

[illegible]

4. DISCUSSION

Indeed, the aim of this review was to assess the impact of CAM utilization on the demographic of patients with lifestyle-related diseases across different hospital and community pharmacy settings. The use of CAM is increasing among people, not merely to

improve a particular well-being but also to overcome many complications related to disease and other chronic conditions (Giangioppo et al., 2016). This thorough review indicates the prevalence of CAM use in various communities. The analysis is drawn from 31 studies conducted across diverse countries, highlighting notable disparities in the prevalence of CAM utilization. This review consists of the studies conducted between 2002 and 2023. It's worth noting that although the studies spanned 21 years, the majority of publications emerged after 2012. This could signify a shift in research focus or alterations in dissemination practices.

The review underscores that Complementary and Alternative Medicine (CAM) sees greater adoption in Asia compared to other continents, a phenomenon attributed to religious, cultural, economic, and historical factors. Despite the availability of conventional medicines, CAM remains prevalent in Asia. This observation aligns with findings from a cross-sectional study among pharmacy and non-pharmacy students in Pakistan conducted between 2016 and 2017, which indicated widespread CAM usage in Asia. The popularity of CAM products can be attributed to mass media and cultural beliefs, with patients often perceiving them as safe and effective. However, it's important to emphasize the necessity of consulting qualified healthcare professionals and integrating CAM with conventional treatments (Ashraf et al., 2019).

Moreover, some other findings carried out in the United States, Australia, and England through telephonic investigations and questionnaires stated that the main factor driving CAM usage among the majority of the population was the dissatisfaction with the conventional therapy, fear of side effects related to conventional medicines, and the spiritual, religious, and philosophical beliefs of patients, which is kind of similar to our findings regarding the use of CAM (Astin, 1998; Vincent and Furnham, 1996). Research carried out in England examined the utilization of complementary and alternative medicine (CAM), revealing a lower prevalence compared to a parallel study conducted in Japan, where a higher rate of CAM usage was reported in Asia. The reason for this high usage ratio of CAM in Japan is the cultural aspects and their beliefs that complementary therapies are more beneficial as they provide better health outcomes and have the potential to avoid disease (Hunt et al., 2010; Yamashita et al., 2002).

Furthermore, this review states that, in comparison to all of Asia, Western Asia has shown an increased prevalence in the use of CAM, followed by Southern Asia. This higher CAM usage in western Asia correlates with a cross-sectional study conducted in Saudi Arabia from 2017 to 2018, which showed that CAM use is highly prevalent among arthritis patients. One of the primary reasons behind the extensive adoption of CAM therapy among the Saudi population is their profound religious and spiritual convictions (Almuhareb et al., 2019). It's intriguing to observe the diversity in trends regarding CAM utilization across different continents. Recently, analyses from the United States and Australia were considered to explore this matter further. According to recent studies incorporated in this review, it seems that CAM usage in Australia has declined compared to a population-based survey conducted in 2005. This decline could be attributed to enhancements in the healthcare system over time, leading to improved health outcomes through conventional therapies.

Nevertheless, it remains noteworthy that despite these advancements, a considerable number of individuals continue to choose CAM therapies to attain supplementary benefits (Xue et al., 2007). A multiethnic community contributed some statistics as well to this review. A similar cross-sectional study was conducted from 2002 to 2003 among patients belonging to urban multiethnic groups, according to which the use of herbal remedies was prevalent but varied substantially among ethnic groups. Research indicates that Asians exhibit the highest frequency of herbal medication usage compared to other ethnicities, with African Americans reporting the lowest usage rates. This implies that cultural and religious beliefs, alongside awareness and affordability of herbal products, likely influence their utilization. These conclusions are substantiated by empirical data and hold relevance in discussions concerning herbal medication usage (Kuo et al., 2004).

This study examined both adult and pediatric patients, encompassing nearly 26,000 individuals. Among them, some consistently used complementary and alternative medicine (CAM), while others did not exhibit regularity in CAM usage. In a European study conducted in 2014, data were gathered from a larger participant pool, yielding somewhat comparable findings which was around 40 thousand, from 21 countries and it showed a high prevalence of use of CAM regarding demographic data, predominantly age, gender, and educational level. This revealed that elders, females, and people with higher educational levels tend to depend on CAM therapy for treatment of chronic conditions because of their cultural beliefs and better knowledge related to CAM products (Fjaer et al., 2020). The majority of patients were discovered to be using CAM without divulging this information to their physician although some patients consulted the CAM usage with their physician.

The results of this review are consistent with a cross-sectional survey conducted in Singapore in 2003, suggesting the reliability of the data. Incorporating multiple sources of information is crucial for broadening comprehension and bolstering the study's validity

(Lee et al., 2004). A study was conducted in Saudi Arabia in 2015 (AlGhamdi et al., 2015). In this cross-sectional and descriptive survey, it was observed that a noteworthy portion of patients refrained from informing their physician about their utilization of complementary and alternative medicine (CAM). The reason was discovered is poor physician-patient relationship, a lack of trust towards the physician, or a lack of response from the physician side, which leads to increased self-usage of CAM products among patients. The rationale for gathering this information is that it offers a rapid and cost-efficient method for obtaining consistent data from a sizable population. It's easy to analyze the results, and participants can answer questions anonymously.

On the contrary, a different study gathered data through computer-assisted personal interviews (CAPI) (Barnes et al., 2004). Studies revealed that the use of CAM was high in those patients that were in misery from chronic diseases like hypertension, diabetes, asthma, chronic kidney diseases, and arthritis (Farooqui et al., 2022). This arises from their capacity to offer an alternative or supplementary approach to managing chronic illnesses, particularly in cases where conventional treatments are scarce or insufficient. In a separate study, patients with other chronic gastrointestinal disorders exhibited notably lower usage of herbs and botanicals, with individuals suffering from IBD showing greater adherence to conventional drug therapies (Fábián et al., 2018). In a separate study carried out in Scotland, the varieties of CAM employed included herbal products as well as non-herbal therapies like osteopathy, hypnotherapy, and reiki, among others (Shakeel et al., 2008).

The extensive embrace of CAM in Asia stems from its alignment with cultural traditions, being perceived as natural and less intrusive. Because of their religious associations and customs, patients in the United Arab Emirates were more captivated in cupping therapy, herbal medicines, and honey products. Probiotics, hypnosis, acupuncture, and massage therapy were more widespread among Australian patients. In contrast to Asian patients, American patients received diverse types of cures, including massage therapy, naturopathy, mind-body practice, body-based systems, energy therapies, and pharmaceutical and non-pharmacological complementary and alternative medicine. The upshot is that patients were employing a variety of complementary and alternative medicine (CAM) depending on their beliefs, needs, religions, and traditional values. The Malaysian people most commonly reported using biological and natural products as complementary and alternative medicine (CAM) to address chronic conditions.

The first choice for alternative treatment in Malaysia is now honey, garlic, ginseng kucing, ginkgo biloba, and other natural items that are widely available in this nation and are being used more frequently (Rifaat et al., 2018). It is believed that natural products and herbs have therapeutic potential against numerous chronic illnesses, such as cancer and inflammation (Golden et al., 2023). According to reports, Malaysians reportedly spend RM1.2 billion yearly on imported herbal products. Research has demonstrated the efficacy of massage treatment in managing persistent pain and illnesses, such as cancer patients' discomfort and exhaustion, hypertension, autoimmune disorders like multiple sclerosis and asthma, and autoimmune conditions, including HIV and breast cancer (Zakaria et al., 2021).

Additional research has incorporated CAM therapy as part of prenatal care, only 36.2% of respondents to our most recent poll believed CAMs were unsafe to use while pregnant. Even though only a minute number of CAMs showed to be teratogenic, most have not undergone enough testing to rule out harmful effects on the fetus, and as a result, CAM use should be avoided during pregnancy (MacLennan et al., 2006). Some studies in India showed that participants were satisfied with the usage of CAM along with conventional therapy. A study conducted on Diabetic patients in Bangladesh showed significant results with 76% of patients. In comparison, a review which conducted in Saudi Arabia, Lebanon, Turkey, and Egypt revealed that the 39.3% ratio of participants in these countries is found using CAM therapies since diagnosis with Type 2 Diabetes mellitus, however, when comparing this study with research conducted in the UK, Canada, and Germany, it was found that CAM usage was less prevalent (Radwan et al., 2020).

5. CONCLUSION

This review has been undertaken to determine the effect of patient's demographical data on utilizing Complementary and Alternative medicine for managing different lifestyle diseases in various communities. It includes 31 studies, conducted between 2002 and 2023 from different countries. CAM is frequently used in Asia due to religious, economic, cultural, and historical aspects. There is a high rate of CAM use among arthritis patients in West Asia, which correlates with a study in Saudi Arabia.

The use of CAM varies in England, Norway, and Australia. The use of herbal medication varied among ethnic groups. Herbal medication usage is higher in Asians as compared to Africans and Americans. The pediatrics data showed that CAM usage is not limited to adults only. Most of the patients don't discuss their CAM usage with their physicians. The utilization of CAM is prevalent

among individuals with chronic diseases such as hypertension, diabetes, asthma, and arthritis. In the United Arab Emirates, patients' engagement with CAM, including practices like cupping therapy and herbal remedies, is influenced by their beliefs, religion, and traditional values. Similarly, Malaysians employ CAM as a natural and biological approach to managing chronic conditions.

Limitations of the study

This study was the systematic review on the topic, but it is meta-analysis.

Authors' Contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Funding

This study has not received any external funding.

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.

REFERENCES

- Alaaeddine N, Okais J, Ballane L, Baddoura RM. Use of complementary and alternative therapy among patients with rheumatoid arthritis and osteoarthritis. *J Clin Nurs* 2012; 21 (21-22):3198-204. doi: 10.1111/j.1365-2702.2012.04169.x
- Al-Eidi S, Tayel S, Al-Slail F, Qureshi NA, Sohaibani I, Khalil M, Al-Bedah AM. Knowledge, attitude and practice of patients with type 2 diabetes mellitus towards complementary and alternative medicine. *J Integr Med* 2016; 14(3):187-96. doi: 10.1016/S2095-4964(16)60244-3
- AlGhamdi KM, Khurram H, Al-Natour SH, Alghamdi W, Mubki T, Alzolibani A, Hafez DM, AlDraibi M. Use of complementary and alternative medicine among dermatology outpatients: results from a national survey. *J Cutan Med Surg* 2015; 19(6):570-9. doi: 10.1177/1203475415584867
- Ali-Shtayeh MS, Jamous RM, Jamous RM, Salameh NM. Complementary and alternative medicine (CAM) use among hypertensive patients in Palestine. *Complement Ther Clin Pract* 2013; 19(4):256-63. doi: 10.1016/j.ctcp.2013.09.001
- Ali-Shtayeh MS, Jamous RM, Jamous RM. Complementary and alternative medicine use amongst Palestinian diabetic patients. *Complement Ther Clin Pract* 2012; 18(1):16-21. doi: 10.1016/j.ctcp.2011.09.001
- Almuhareb AM, Alhawassi TM, Alghamdi AA, Omair MA, Alarfaj H, Alarfaj A, Alomari BA, Alblowi MS, Almalag HM. Prevalence of complementary and alternative medicine use among rheumatoid arthritis patients in Saudi Arabia. *Saudi Pharm J* 2019; 27(7):939-44. doi: 10.1016/j.jsps.2019.07.002
- Amariles P, González LI, Giraldo NA. Prevalence of self-treatment with complementary products and therapies for weight loss: A randomized, cross-sectional study in overweight and obese patients in Colombia. *Curr Ther Res Clin Exp* 2006; 67(1):66-78. doi: 10.1016/j.curtheres.2006.02.001
- Ashraf M, Saeed H, Saleem Z, Rathore HA, Rasool F, Tahir E, Bhatti T, Khalid J, Bhatti I, Tariq A. A cross-sectional assessment of knowledge, attitudes and self-perceived effectiveness of complementary and alternative medicine among pharmacy and non-pharmacy university students. *BMC Complement Altern Med* 2019; 19(1):95. doi: 10.1186/s12906-019-2503-y
- Astin JA. Why patients use alternative medicine: results of a national study. *JAMA* 1998; 279(19):1548-53. doi: 10.1001/jama.279.19.1548
- Barnes PM, Powell-Griner E, McFann K, Nahin RL. Complementary and alternative medicine use among adults: United States, 2002. *Seminars Integr Med* 2004; 2(2):54-71. doi: 10.1016/j.sigm.2004.07.003
- Bhalerao MS, Bolshete PM, Swar BD, Bangera TA, Kolhe VR, Tambe MJ, Wade MP, Bhowate SD, Sonje UB, Gogtay NJ, Thatte UM. Use of and satisfaction with complementary and alternative medicine in four chronic diseases: a cross-sectional study from India. *Natl Med J India* 2013; 26(2):75-8.

12. Bukhsh A, Gan SH, Goh BH, Khan TM. Complementary and alternative medicine practices among type 2 diabetes patients in Pakistan: a qualitative insight. *Eur J Integr Med* 2018; 23:43-49. doi: 10.1016/j.eujim.2018.09.003
13. Ceylan S, Azal Ö, Taşlipinar A, Türker T, Açıkel CH, Gulec M. Complementary and alternative medicine use among Turkish diabetes patients. *Complement Ther Med* 2009; 17(2):78-83. doi: 10.1016/j.ctim.2008.07.003
14. Chen C, Chong YJ, Hie SL, Sultana R, Lee SH, Chan WS, Chan SY, Cheong HH. Complementary and alternative medicines use among pediatric patients with epilepsy in a multiethnic community. *Epilepsy Behav* 2016; 60:68-74. doi: 10.1016/j.yebeh.2016.04.008
15. Chu FY, Yan X, Zhang Z, Xiong XJ, Wang J, Liu HX. Features of complementary and alternative medicine use by patients with coronary artery disease in Beijing: a cross-sectional study. *BMC Complement Altern Med* 2013; 13:28. doi: 10.1186/1472-6882-13-287
16. Conboy L, Patel S, Kaptchuk TJ, Gottlieb B, Eisenberg D, Acevedo-Garcia D. Sociodemographic determinants of the utilization of specific types of complementary and alternative medicine: an analysis based on a nationally representative survey sample. *J Altern Complement Med* 2005; 11(6):977-94. doi: 10.1089/acm.2005.11.977
17. Dehghan M, Namjoo Z, Bahrami A, Tajadini H, Shamsaddini-Lori Z, Zarei A, Dehghani M, Ranjbar MS, Nasab FR. The use of complementary and alternative medicines, and quality of life in patients under hemodialysis: A survey in southeast Iran. *Complement Ther Med* 2020; 51:102431. doi: 10.1016/j.ctim.2020.102431
18. Devi K, Santhini E, Manikandan R, Prabhu NM. The prevalence, awareness and potential of complementary alternative medicine in type 2 diabetics living in Madurai, India. *Eur J Integr Med* 2015; 7(5):469-73. doi: 10.1016/j.eujim.2015.04.003
19. Ernst E, Fugh-Berman A. Complementary and alternative medicine: what is it all about? *Occup Environ Med* 2002; 59(2):140-4. doi: 10.1136/oem.59.2.140
20. Fábíán A, Rutka M, Ferenci T, Bor R, Balint A, Farkas K, Milassin A, Lénárt Z, Nagy F, Szepes Z, Molnár T. The use of complementary and alternative medicine is less frequent in patients with inflammatory bowel disease than in patients with other chronic gastrointestinal disorders. *Gastroenterol Res Pract* 2018; 2018:9137805. doi: 10.1155/2018/9137805
21. Farooqui M, Alreshidi H, Alkheraiji J, Abdulsalim S, Alshammari MS, Kassem L, Hussein S, Ismail WI. A cross-sectional assessment of complementary and alternative medicine (CAM) use among patients with chronic diseases (CDs) in Qassim, Saudi Arabia. *Healthcare (Basel)* 2022; 10(9):1728. doi: 10.3390/healthcare10091728
22. Fjaer EL, Landet ER, McNamara CL, Eikemo TA. The use of complementary and alternative medicine (CAM) in Europe. *BMC Complement Med Ther* 2020; 20(1):108. doi: 10.1186/s12906-020-02903-w
23. Giangioppo S, Kalaci O, Radhakrishnan A, Fleischer E, Itterman J, Lyttle B, Price A, Radhakrishnan D. Complementary and alternative medicine use in children with cystic fibrosis. *Complement Ther Clin Pract* 2016; 25:68-74. doi: 10.1016/j.ctcp.2016.08.006
24. Golden J, Kenyon-Pesce L, Robison J, Grady J, Guerrero MP. Disclosure of Complementary and Alternative Medicine Use Among Older Adults: A Cross-Sectional Study. *Gerontol Geriatr Med* 2023; 9:23337214231179839. doi: 10.1177/23337214231179839
25. Hasan SS, Ahmed SI, Bukhari NI, Loon WC. Use of complementary and alternative medicine among patients with chronic diseases at outpatient clinics. *Complement Ther Clin Pract* 2009; 15(3):152-7. doi: 10.1016/j.ctcp.2009.02.003
26. Herman PM, Craig BM, Caspi O. Is complementary and alternative medicine (CAM) cost-effective? A systematic review. *BMC Complement Altern Med* 2005; 5(1):11. doi: 10.1186/1472-6882-5-11
27. Hilsden RJ, Verhoef MJ, Best A, Pocobelli G. Complementary and alternative medicine use by Canadian patients with inflammatory bowel disease: results from a national survey. *Am J Gastroenterol* 2003; 98(7):1563-8. doi: 10.1016/s0002-9270(03)00301-0
28. Hunt KJ, Coelho HF, Wider B, Perry R, Hung SK, Terry R, Ernst E. Complementary and alternative medicine use in England: results from a national survey. *Int J Clin Pract* 2010; 64(11):1496-1502. doi: 10.1111/j.1742-1241.2010.02484.x
29. Hussein N, Liew SM, Hanafi NS, Lee PY, Cheong AT, Ghazali SS, Chinna K, Pang YK, Kassim A, Parker RA, Schwarze J. Asthma control and care among six public health clinic attenders in Malaysia: A cross-sectional study. *Health Sci Rep* 2023; 6(5):e1021. doi: 10.1002/hsr2.1021
30. Ibrahim IR, Hassali MA, Saleem F, Al Tukmagi HF, Dawood OT. Use of complementary and alternative medicines: a cross-sectional study among hypertensive patients in Iraq. *J Pharm Health Serv Res* 2018; 9(1):59-65. doi: 10.1111/jphs.12209
31. Kumar AS, Jalal K, Shaikh AN, Kannan S, Muttappallymyalil J. Utilization of Complementary and Alternative Medicine for the Management of Cardiovascular Diseases Among Adults

- in Ajman, United Arab Emirates. *Cureus* 2023; 15(4):e37394. doi: 10.7759/cureus.37394
32. Kuo GM, Hawley ST, Weiss LT, Balkrishnan R, Volk RJ. Factors associated with herbal use among urban multiethnic primary care patients: a cross-sectional survey. *BMC Complement Altern Med* 2004; 4:18. doi: 10.1186/1472-6882-4-18
33. Lee GB, Charn TC, Chew ZH, Ng TP. Complementary and alternative medicine use in patients with chronic diseases in primary care is associated with perceived quality of care and cultural beliefs. *Fam Pract* 2004; 21(6):654-660. doi: 10.1093/fampra/cmh613
34. MacLennan AH, Myers SP, Taylor AW. The continuing use of complementary and alternative medicine in South Australia: costs and beliefs in 2004. *Med J Aust* 2006; 184(1):27-31. doi: 10.5694/j.1326-5377.2006.tb00092.x
35. Medagama AB, Bandara R, Abeysekera RA, Imbulpitiya B, Pushpakumari T. Use of complementary and alternative medicines (CAMs) among type 2 diabetes patients in Sri Lanka: a cross sectional survey. *BMC Complement Altern Med* 2014; 14:374. doi: 10.1186/1472-6882-14-374
36. Mountifield R, Andrews JM, Mikocka-Walus A, Bampton P. Doctor communication quality and Friends' attitudes influence complementary medicine use in inflammatory bowel disease. *World J Gastroenterol* 2015; 21(12):3663-70. doi: 10.3748/wjg.v21.i12.3663
37. Ng JY, Dhawan T, Fajardo RG, Masood HA, Sunderji S, Wieland LS, Moher D. The Brief History of Complementary, Alternative, and Integrative Medicine Terminology and the Development and Creation of an Operational Definition. *Integr Med Res* 2023; 12(4):100978. doi: 10.1016/j.imr.2023.100978
38. Oktar D, Metintas S, Önsüz MF, Öcal EE, Pala SÇ. Complementary and Alternative Medicine Uses of Individuals Diagnosed With Chronic Diseases. *Clin Exp Health Sci* 2023; 13(1):184-191. doi: 10.33808/clinexphealthsci.1185236
39. Opheim R, Bernklev T, Fagermoen MS, Cvancarova M, Moum B. Use of complementary and alternative medicine in patients with inflammatory bowel disease: results of a cross-sectional study in Norway. *Scand J Gastroenterol* 2012; 47(12):1436-47. doi: 10.3109/00365521.2012.725092
40. Osamor PE, Owumi BE. Complementary and alternative medicine in the management of hypertension in an urban Nigerian community. *BMC Complement Altern Med* 2010; 10:36. doi: 10.1186/1472-6882-10-36
41. Palileo-Villanueva LM, Palafox B, Amit AM, Pepito VC, Ab-Majid F, Ariffin F, Balabanova D, Isa MR, Mat-Nasir N, My M, Renedo A. Prevalence, determinants and outcomes of traditional, complementary and alternative medicine use for hypertension among low-income households in Malaysia and the Philippines. *BMC Complement Altern Med* 2022; 22(1):252. doi: 10.1186/s12906-022-03730-x
42. Radwan H, Hasan H, Hamadeh R, Hashim M, AbdulWahid Z, Hassanzadeh-Gerashi M, Al-Hilali M, Naja F. Complementary and alternative medicine use among patients with type 2 diabetes living in the United Arab Emirates. *BMC Complement Med Ther* 2020; 20(1):216. doi: 10.1186/s12906-020-03011-5
43. Rafi MA, Azad DT, Bhattacharjee M, Rahman N, Mubin KA, Rahman MA, Hossain MG. A hospital-based study on complementary and alternative medicine use among diabetes patients in Rajshahi, Bangladesh. *BMC Complement Med Ther* 2020; 20(1):219.
44. Ruyvaran M, Salehi A, Fallahzadeh E, Vojoud M, Sharifi MH, Mohamadian A. Traditional and complementary medicines usage and associated factors in gastrointestinal outpatients in Shiraz, Iran: a cross-sectional survey. *Adv Integr Med* 2021; 8(4):285-291. doi: 10.1016/j.aimed.2020.09.004
45. Sari Y, Anam A, Sumeru A, Sutrisna E. The knowledge, attitude, practice and predictors of complementary and alternative medicine use among type 2 diabetes mellitus patients in Indonesia. *J Integr Med* 2021; 19(4):347-353. doi: 10.1016/j.joim.2021.04.001
46. Shahjalal M, Chakma SK, Ahmed T, Yasmin I, Mahumud RA, Hossain A. Prevalence and determinants of using complementary and alternative medicine for the treatment of chronic illnesses: a multicenter study in Bangladesh. *PLoS One* 2022; 17(1):e0262221. doi: 10.1371/journal.pone.0262221
47. Shakeel M, Bruce J, Jehan S, McAdam TK, Bruce DM. Use of complementary and alternative medicine by patients admitted to a surgical unit in Scotland. *Ann R Coll Surg Engl* 2008; 90(7):571-6. doi: 10.1308/003588408X301046
48. Shraim NY, Shawahna R, Sorady MA, Aiesh BM, Alashqar GS, Jitan RI, Abu Hanieh WM, Hotari YB, Sweileh WM, Zyoud SE. Community pharmacists' knowledge, practices and beliefs about complementary and alternative medicine in Palestine: a cross-sectional study. *BMC Complement Altern Med* 2017; 17(1):429. doi: 10.1186/s12906-017-1940-8
49. Spinks J, Johnston D, Hollingsworth B. Complementary and alternative medicine (CAM) use and quality of life in people with type 2 diabetes and/or cardiovascular disease.

- Complement Ther Med 2014; 22(1):107-15. doi: 10.1016/j.ctim.2013.11.007
50. Tokem Y, Aytemur ZA, Yildirim Y, Fadiloglu C. Investigation into the use of complementary and alternative medicine and affecting factors in Turkish asthmatic patients. J Clin Nurs 2012; 21(5-6):698-707. doi: 10.1111/j.1365-2702.2011.03823.x
51. Ünsal A, Gözüml S. Use of complementary and alternative medicine by patients with arthritis. J Clin Nurs 2010; 19(7-8):129-38. doi: 10.1111/j.1365-2702.2009.03111.x
52. Valtonen J, Ilmarinen VJ, Lönnqvist JE. Political orientation predicts the use of conventional and complementary/alternative medicine: A survey study of 19 European countries. Soc Sci Med 2023; 331:116089. doi: 10.1016/j.socscimed.2023.116089
53. Vincent C, Furnham A. Why do patients turn to complementary medicine? An empirical study. Br J Clin Psychol 1996; 35(1):37-48. doi: 10.1111/j.2044-8260.1996.tb01160.x
54. Wazaify M, Afifi FU, El-Khateeb M, Ajlouni K. Complementary and alternative medicine use among Jordanian patients with diabetes. Complement Ther Clin Pract 2011; 17(2):71-5. doi: 10.1016/j.ctcp.2011.02.002
55. Wu H, Aziz AR, Dehghan M, Lari LA, Al-Amer R, Zakeri MA. Use of complementary and alternative medicine for reducing fear of cancer recurrence among cancer survivors: Does it work? Asia Pac J Oncol Nurs 2023; 10(10):100278. doi: 10.1016/j.apjon.2023.100278
56. Xue CC, Zhang AL, Lin V, Da-Costa C, Story DF. Complementary and alternative medicine use in Australia: a national population-based survey. J Altern Complement Med 2007; 13(6):643-50. doi: 10.1089/acm.2006.6355
57. Yamashita H, Tsukayama H, Sugishita C. Popularity of complementary and alternative medicine in Japan: a telephone survey. Complement Ther Med 2002; 10(2):84-93. doi: 10.1054/ctim.2002.0519
58. Zakaria AF, Ahmad-Sharoni SK, Fauzi R, Said N, Rahman PA, Mohd Abd Majid HA, Konneh AS. Prevalence, Types and Belief of Complementary and Alternative Medicine (CAM) Use Among Patients With Chronic Diseases: a Systematic Review. Malays J Med Health Sci 2021; 17(Supp3):288-298.
59. Zyoud SE, Al-Jabi SW, Sweileh WM, Tabeeb GH, Ayaseh NA, Sawafta MN, Khdeir RL, Mezyed DO, Daraghme DN, Awang R. Use of complementary and alternative medicines in haemodialysis patients: a cross-sectional study from Palestine. BMC Complement Altern Med 2016; 16:204. doi: 10.1186/s12906-016-1196-8