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Trends in Complementary Health Approach Use Among U.S. College Students: A Systematic Review and Meta-Analytic Comparison, 2012–2023

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ABSTRACT

Background: People seek complementary health approaches (CHAs) for a variety of health reasons, and high rates of CHA use among U.S. college students have been reported.

Purpose: Based on a 2012 study, researchers assessed trends in college CHA use by conducting an updated systematic review of studies published between June 2011–December 2022.

Methods: For eight studies that met inclusion/exclusion criteria, weighted means were used to report CHA use, and changes in CHA use between two time points (2012 and 2023) were determined using Chi-square and Pearson's *r*.

Results: Overall CHA use in the past 12 months was 69.7%, and the most commonly used CHAs were NVNM/herbal medicine (55.8%), relaxation techniques (53%), supplements (42.3%), and yoga (37%). Statistically significant ($p < .01$) increases were shown for NVNM/herbal medicine (+25.2%, $r = 0.23$), yoga (+19.3%, $r = 0.19$), and meditation (+10.8%, $r = 0.10$). Use of megavitamins significantly ($p < .01$) decreased by 19% ($r = 0.20$), compared to 2012 data.

Discussion: Future research on college student CHA use needs to be comprehensive and consistent.

Translation to Health Education Practice: Certified Health Education Specialists should study and understand trends in CHA use to educate students on the efficacy of CHAs for whole person health.

ARTICLE HISTORY

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Background

Complementary health approaches (CHAs), such as herbs, acupuncture, yoga, and meditation, have become more prevalent in scientific research and literature to describe the combined use of health care systems, products, therapies, or services that are not typically part of conventional medical care (e.g., use of physicians, nurses, pharmacists, therapists).^{1,2} Previously reported as complementary and alternative medicine (CAM), CHAs have also been called natural remedies; holistic healthcare; and traditional, non-mainstream, unconventional, complementary, alternative, integrative, unorthodox, or unproven medicine.^{3–6} In contrast to conventional medical care, CHAs are typically not taught in medical schools, not covered by insurance, have less regulation, may or may not require a healthcare provider, and may be less studied for efficacy.^{7,8} However, people perceive CHAs as natural, low-risk, and more easily accessible and affordable than conventional care.^{8,9} People seek CHAs for a variety of nutritional, psychological, and/or physical health reasons.^{1,8,10}

Over the past several decades, CHA use has increased worldwide, with 88% of World Health Organization countries assessing CHA use among their residents.^{9,11} CHA use

varies greatly by country, with 10% to 76% of samples reporting use of one or more types of CHAs.¹¹ Across published studies, reported CHA use was higher in East Asian countries (56–76%) than countries in other parts of the world; and prayer for health reasons was the most reported CHA used in United States and East Asian samples.¹¹ However, direct comparison of CHA use between countries is limited due to variations in how CHA use was defined and measured.¹¹ Across all studies in a 2020 systematic review of international CHA use, perceived benefits of CHA use, dissatisfaction with conventional medical care, and perceived safety of CHAs were the most commonly reported reasons that people use CHAs, regardless of geographical location.⁹ In African populations, affordability, accessibility, and tradition were top factors in CHA use, while social networks and locus of control were top factors in CHA use in Asian and Western populations, respectively.⁹

In the United States, 50% of adults report use of at least one CHA in their lifetimes.¹² Yoga has been the most reported CHA used among U.S. adults (9.5% in 2012 and 14.3% in 2017), and the number of adults reporting use of meditation tripled from 4.1% in 2012 to 14.2% in 2017.¹³

The number of U.S. physicians likely to recommend CHAs to their patients has also increased compared to previous years, with 53% of U.S. physicians reporting recommendation of at least one CHA in the past 12 months.¹⁴

The use of CHAs among U.S. college samples has been shown to be equal to or higher than in the general U.S. adult population. In 2012, a systematic review of CHA/CAM use studies found 10 articles that reported the prevalence of CHA/CAM use among U.S. college students.¹⁵ Between 1999 to mid-2011, six studies reported overall CHA/CAM use within the last 12 months at rates of 44% to 77.8% among college student samples.¹⁵ Some of the most commonly used therapies were herbal/nonvitamin nonmineral (NVNM) products (41.1%), aromatherapy (16.4%), yoga (17.7%), deep breathing (42.0%), megavitamins (32.1%), chiropractic (17.5%), and massage therapy (32.0%).¹⁵

Purpose

Despite the high demand for additional knowledge about CHAs within universities,¹⁶ published studies about CHA use among college students are limited, and little is known about CHA use over time among college samples. The purposes of this study were to: (1) repeat the 2012 systematic literature review¹⁵ for college CHA use studies published between June 2011 and December 2022; (2) conduct a meta-analysis on the rates of CHA use found in CHA use studies; and (3) identify trends in CHA use between the college samples in the 2012 review to college samples identified in the 2023 review.

Methods

For the purpose of this study, the term “2012 review” refers to the 2012 systematic review,¹⁵ which analyzed college CHA use studies up to May 2011. The term “2023 review” refers to the current systematic review that analyzed college studies from June 2011 through December 2022. Based on the original 2012 review published in the *American Journal of Health Education*,¹⁵ researchers followed the same systematic plan with updates to reflect changes in terminology used by CHA researchers and healthcare professionals and changes in databases (Figure 1). For inclusion criteria, researchers searched six databases (Academic One File, Academic Search Premier [EBSCO], PubMed, Health Source: Nursing/Academic Edition, PsycINFO, and Google Scholar) for articles published between June 2011 and December 2022. The database search used combinations of keywords identified in the 2012 review (“alternative medicine,” “complementary medicine,” “college students,” and “university students”)

plus one new keyword (“integrative medicine”). Exclusion criteria were applied to eliminate research that was conducted outside of the United States or that focused on the efficacy of a treatment or illness. After inclusion and exclusion criteria were applied, the reference lists for all remaining articles were reviewed for any relevant articles that did not surface in the original database search, and duplicate articles were eliminated.

Key elements (i.e., journal, location, sample size, sampling method, CHA use definition, number of individual CHA therapies assessed, and instrument format) from each study were summarized for comparison. For meta-analysis, studies that defined the CHA use variable as “use of CHA in the past 12 months” were analyzed. Weighted means were calculated for overall CHA use and individual CHA therapies. For each variable, Chi-square was calculated to determine the statistical significance of CHA use between college samples reported in the 2012 review and the college samples reported in this review. For each statistically significant result, effect size (Pearson’s r) was used to determine the magnitude of change between the 2012 samples and samples in the current study.

Results

After inclusion and exclusion criteria were applied, eight articles published between June 2011 – December 2022 met the requirements for the purpose of this review (Table 1).^{16–23} Two articles were published in the *Journal of American College Health*, and the remaining articles were found in the *Journal of Alternative and Complementary Medicine*, *Complementary Therapies in Clinical Practice*, *Hindawi Publishing Corporation*, *ProQuest*, *International Journal of Clinical and Experimental Hypnosis*, and *Alternative Medicine and College Students*. Data were collected in the Midwest ($n = 3$), West ($n = 2$), South ($n = 2$), and Northeast ($n = 1$) regions of the United States (Figure 2). Sample sizes ranged from 100 to 6484 participants. All studies used self-reported surveys, but multiple formats were used; five online, one paper, one combination of paper and online, and two unspecified.

The number of CHAs assessed in the 2023 review of literature ranged from 11 to 32 (average of 18 therapies) per seven of the eight studies, with one study reporting overall CHA use only. Comparatively, in the 2012 review, the number of therapies assessed ranged from 1 to 33 (average of 12 therapies). The combined number of unique CHAs assessed across the eight studies in the 2023 review was 48, which is nearly double what studies in the 2012 review assessed ($n = 26$). Most commonly assessed in the 18 studies across the two time points (10

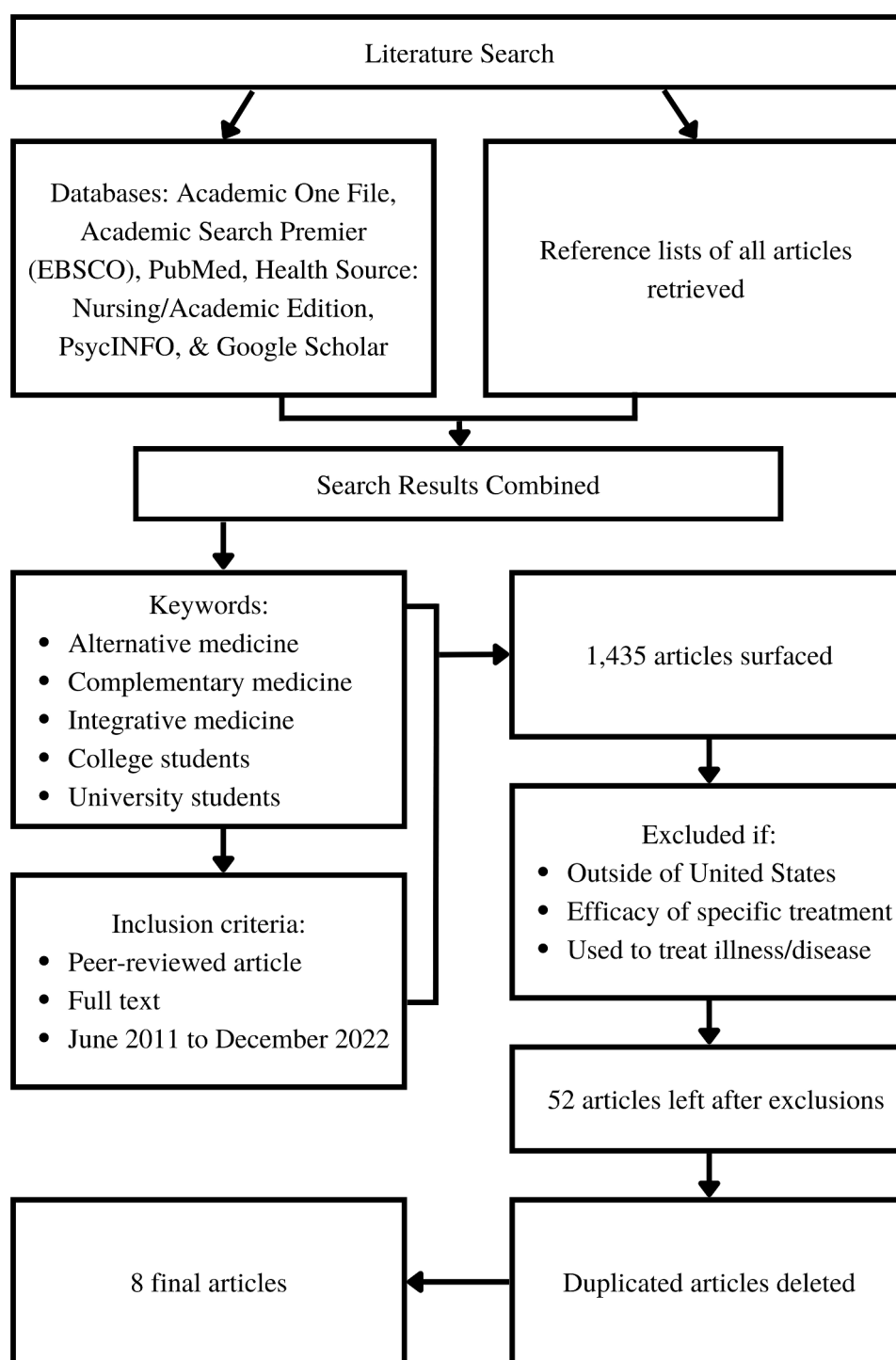


Figure 1. Flowchart for systematic literature review.

studies in 2012; 8 studies in 2023) were NVNM/herbal (12 studies), chiropractic (11 studies), massage therapy (10 studies), acupuncture (9 studies), meditation (7 studies), and yoga (7 studies).

Two studies^{16,19} reported on college students using at least one CHA during their lifetimes, which had a weighted mean of 46.7% ($n = 2939$) (Table 2). Compared to the only sample²⁴ reporting lifetime use

in the 2012 review (95.4%), this suggests a statistically significant ($p < .01$) reduction and moderate effect size (48.7%, $r = 0.30$) in college students reporting use of at least one CHA during their lifetimes. Across five studies,^{16–18,22,23} overall CHA use in the past 12 months ranged from 35.1% to 82%, with a weighted mean of 69.7%, which is a statistically significant increase ($p < .1$) over the 57.8% of college students in the 2012 review

Table 1. Overview of reviewed CHA studies.

Year	Authors	Journal/Source	Title of Study	U.S. Locale	N	Sampling	Instrument	Overall CHA Use Measure	Individual CHA Variables Reported
2013	Sansgiry, Mhatre, Artani	Alternative Medicine and College Students	Use of and attitude toward complementary and alternative medicine: understanding the role of generational influence	South (TX)	400	Randomized Convenience	Survey- in person recruitment but survey format unspecified	Last 12 months	0
2014	Liu, Huynh, Broukhim, Cheung, Schuster, Najm	The Journal of Alternative and Complementary Medicine	Determining the attitudes and use of complementary, alternative, and integrative medicine among undergraduates	West (CA)	2839	Entire Student Population	Online Survey	Lifetime & Last 12 months	17
2015	Versnik Nowak, DeGise, Daugherty, O'Keefe, Seward Jr., Setty, Tang	Journal of American College Health	Prevalence and predictors of complementary and alternative medicine (CAM) use among ivy league college students: implications for student health services	Northeast (NY)	6484	Stratified Random	Online Survey	Last 12 months	32
2016	Nguyen, Liu, Patel, Tahara, Nguyen	Complementary Therapies in Clinical Practice	Use and interest in complementary and alternative medicine among college students seeking healthcare at a university campus student health center	West (CA)	403	Convenience	Paper Survey	Last 12 months	14
2016	Subramanian, Midha	Hindawi Publishing Corporation	Prevalence and perspectives of complementary and alternative medicine among university students in Atlanta, Newcastle upon Tyne, and New Delhi	South (GA)	100	Convenience	Online Survey	Lifetime*	18 [^]
2017	Putz	ProQuest	Complementary and alternative medicine: current mind-body practices and perceptions of undergraduate students	Midwest (MN)	293	Convenience	Paper Survey	Last 12 months**	26
2020	Green, Green, Carroll	International Journal of Clinical and Experimental Hypnosis	The perceived credibility of complementary and alternative medicine: a survey of undergraduate and graduate students	Midwest (OH)	146	Convenience	Paper and Online Survey	Last 5 years*	11
2022	Salihu, Wallace	Journal of American College Health	Use and attitudes toward complementary and alternative medicine among university students: the role of gender and race	Midwest (IL)	506	unclear	Online Survey	Last 12 months	11 [^]

*Excluded from meta-analysis due to CHA measure other than use in the past 12 months.

**Included in meta-analysis for individual CHAs but did not report overall CHA use.

[^]Included a variable category labeled *other*.

($r = 0.11$). For use of individual CHAs in the past year, college students in six of the 2023 studies^{16-18,20,22,23} reported the highest use of NVNM & herbal medicine (55.8%), relaxation techniques (53%), supplements (42.3%), yoga (37%), deep breathing exercises (30.1%), massage therapy (29.7%), physical activity/body movement (29.5%), meditation (21.9%), and music therapy (20%).

Three CHAs showed statistically significant ($p < .01$) increases and some were significant between the 2012 and 2023 college samples: NVNM & herbal medicine ($r = 0.23$; 2012 = 30.5% vs. 2023 = 55.8%), yoga ($r = 0.19$; 2012 = 17.7% vs. 2023 = 37%), and meditation mS012

Table 2. Trends in college student CHA use in the past 12 months between 2012 review and 2023 review.

	# of studies (2023)	2023: %	# of studies (2012)	2012: %	Difference	r
Overall Use						
Lifetime (ever used in past)	2	46.7	1	95.4	-48.7**	0.30^^
Past year	5	69.7	5	57.8	11.9**	0.11^
Significant Increases						
NVNM & Herbal Medicine	4	55.8	8	30.5	25.2**	0.23^
Yoga	3	37.0	4	17.7	19.3**	0.19^
Meditation	4	21.9	3	11.1	10.8**	0.10^
Acupuncture	5	8.5	4	3.7	4.8**	0.07
Diet-based Therapies	2	14.0	1	9.4	4.6**	0.03
Homeopathy	4	8.0	2	4.2	3.8**	0.04
Bodywork	1	6.5	2	3.9	2.6**	0.04
Healing Therapy/Reiki	2	3.1	2	1.2	1.8**	0.03
Ayurveda	3	3.2	2	1.8	1.4*	0.02
Significant Decreases						
Megavitamins	1	13.0	2	32.1	-19.1**	0.20^
Progressive Relaxation	1	5.6	1	18.0	-12.4**	0.13
Deep Breathing Exercises	2	30.1	1	42.0	-11.9**	0.06
Aromatherapy	2	11.6	3	16.4	-4.8**	0.06
Chiropractic	5	10.7	6	14.3	-3.7**	0.07
Hypnosis	4	1.5	1	3.7	-2.2**	0.04
Massage Therapy	5	29.7	5	32.0	-2.2*	0.02
Crystal Therapy	1	0.9	2	1.6	-0.7*	0.02
Nonsignificant Changes						
Folk Medicine	1	5.0	1	7.0	-2.0	0.02
Energy Healing	3	3.2	2	3.8	-0.7	0.01
Qi Gong	2	1.8	2	1.6	0.3	0.01
Iridology	1	0.2	2	0.5	-0.3	0.02
Naturopathy	2	2.9	1	3.2	-0.3	0.00
Biofeedback	4	1.7	1	1.9	-0.2	0.00
Reported in 2023 studies but not in 2012 studies						
Relaxation Techniques	1	53.0	...	...	...	...
Supplements	3	42.3	...	...	...	...
Physical Activity/Body Movement	2	29.5	...	...	...	...
Music Therapy	2	20.0	...	...	...	...
Traditional Chinese Medicine	1	19.0	...	...	...	...
Pilates	1	17.0	...	...	...	...
Visualization	1	16.0	...	...	...	...
Prayer	2	15.5	...	...	...	...
Dietary Supplement	1	15.0	...	...	...	...
Movement Therapy	1	11.0	...	...	...	...
Dance Movement Therapy	1	9.6	...	...	...	...
Art Therapy	2	9.5	...	...	...	...
Cognitive Behavioral Therapy	1	8.9	...	...	...	...
Guided Imagery	2	7.6	...	...	...	...
Spiritual Healing	1	7.5	...	...	...	...
Traditional Healers	1	4.7	...	...	...	...
Therapeutic Touch	1	4.1	...	...	...	...
Color Therapy	1	3.8	...	...	...	...
Tai Chi	3	2.7	...	...	...	...
Acupressure	1	2.4	...	...	...	...
Osteopathic Manipulation	2	2.1	...	...	...	...
Alexander Technique	1	1.3	...	...	...	...
Feldenkrais	1	0.8	...	...	...	...
Chelation	1	0.2	...	...	...	...
Trager Psychophysical Integration	1	0.2	...	...	...	...
Reported in 2012 studies but not in 2023 studies						
Light Therapy	...	...	2	3.9	...	...
Magnet Therapy	...	...	2	3.5	...	...
Reflexology	...	...	3	3.1	...	...

* $p < .05$, ** $p < .01$.

^small magnitude, ^^medium magnitude.

CHAs assessed in those studies. For example, one study in 2008 assessed 33 different CHAs,²⁴ which increases the likelihood that participants would report using at least one of them during their lifetimes. This is nearly double the number of CHAs assessed in the two more

recent studies, in which only 17 and 18 CHAs were assessed.^{16,19} This demonstrates the need for consistent and comprehensive assessment of CHAs.

Across five studies, nearly 7 out of 10 college students (69.7%) reported using at least one CHA in the past 12

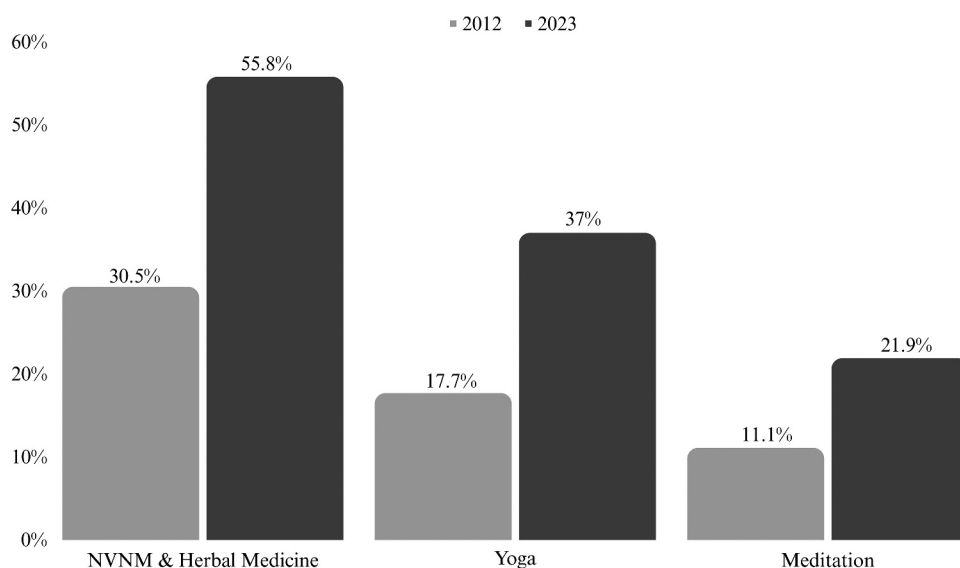


Figure 3. Top 3 CHA increases among college samples, 2012–2023.

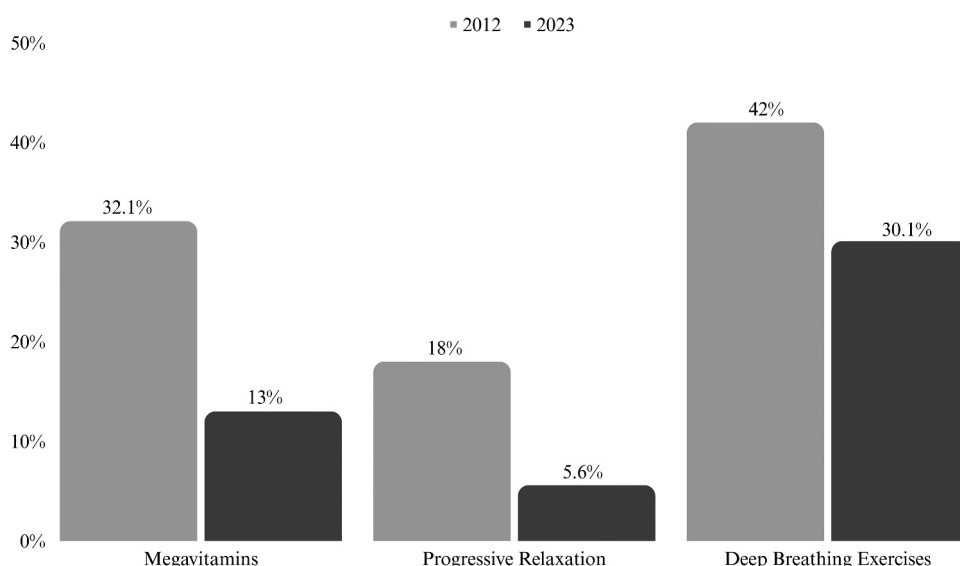


Figure 4. Top 3 CHA decreases among college samples, 2012–2023.

months, which is a statistically significant increase ($p < .1$) over the nearly 6 in 10 college students (57.8%) reported in the 2012 review. Use of NVNM & herbal medicine (55.8%), relaxation techniques (53%), supplements (42.3%), yoga (37%), deep breathing exercises (30.1%), massage therapy (29.7%), physical activity/body movement (29.5%), meditation (21.9%), and music therapy (20%) were high in college CHA studies between June 2011–December 2022. Compared to college studies conducted prior to June 2011, the greatest increases were seen for NVNM/herbal medicine (+25.2%), yoga (+19.3%), and meditation (+10.8%), while the greatest

decreases were seen for megavitamins (−19.1%), progressive relaxation (−12.4%), and deep breathing exercises (−11.9%).

Compared to CHA rates among U.S. adults,¹³ U.S. college students are using yoga at nearly three times the rate (37% vs. 14.3%) and meditation at 1.5 times the rate (21.9% vs. 14.2%) of the general adult population. During similar time frames (U.S. adults 2012–2017 vs. U.S. college studies 2011–2022), both U.S. adults and college samples showed increases in yoga and meditation. While increases in meditation (+10.1% for U.S. adults vs. +10.8 for U.S. college

students) were similar in both populations, use of yoga increased at 4 times the rate (+19.3%) for college students compared to U.S. adults (+4.8%).¹³

Yoga and meditation are both “mind and body practices,” which are holistic CHAs often used to address issues that are common among college populations: stress (43.7%), anxiety (37.3%), depression (27.5%), and sleep (25.9%).^{25,26} Yoga practice in the U.S. typically involves participants working through a series of physical postures while focusing on breath and mindfulness.²⁷ Meditation attempts to help participants calm the mind through mindfulness or focus on a particular sound, sensation, or mantra.²⁸ Research about the efficacy of mind and body practices, such as yoga and meditation, for health has been steadily growing, but mixed results suggest more research is needed.^{26–33}

Quality of studies

In the original 2012 review, recommendations were made to improve the assessment and reporting of CHA use among college students.¹⁵ Studies collected in the 2023 systematic review were subject to similar issues, which affect data analysis and comparison. These issues are reported not only in research on CHA use on college campuses but also in CHA studies worldwide.⁸ Two key issues that should be addressed in future studies include consistency in the operationalization of overall CHA use and assessment of individual CHAs.

Researchers need to consistently operationalize, assess, and report overall CHA use.^{15,22} In the 2023 review, only one study¹⁶ reported overall CHA use as both lifetime use and use in the past 12 months. Five studies in the 2023 review reported CHA use in the past 12 months^{16–18,22,23} (of which one reported individual CHAs but not overall CHA use,²⁰ while two articles reported only lifetime use^{16,19} and another reported use within the past 5 years.²¹ This inconsistency in reporting continually affects the ability to compare CHA data and accurately report trends in use both nationally and internationally.⁸ Ideally, future researchers will assess the overall use and use of individual CHAs both “in the past 12 months” and “ever in the lifetime.” At minimum, it is recommended that researchers assess CHA use “in the past 12 months,” as it seems to be more commonly reported.

While more therapies were assessed in the 2023 studies (average of 18 CHAs per study) than in the 2012 studies (average of 12 CHAs per study), a vast range (11 to 32 CHAs per study) still exists. By collecting data on more CHAs, there can be a better understanding of which CHAs are currently being used by college students and to identify trends over time. The 2022 NHIS

survey collected data on the use of 10 CHAs (chiropractic, acupuncture, massage therapy, naturopathy, art therapy, music therapy, meditation, guided imagery or progressive relaxation, and yoga).³⁴ In college CHA studies, chiropractic, acupuncture, meditation, and yoga are commonly reported yet missing from many studies. However, naturopathy, art therapy, music therapy, guided imagery, and progressive relaxation are less reported in college studies.

The number of CHAs assessed across all studies from the 2023 and 2012 reviews total 53 unique CHAs. Both [Table 2](#) and the NHIS survey³⁴ are not extensive lists that include all CHAs. This review, specifically [Table 2](#), can be used as a starting point to identify a comprehensive list of CHAs to assess; however, it is recommended that professional health organizations, such as the Integrative, Complementary, and Traditional Health Practices member section of the American Public Health Association (APHA)³⁵ collaborate with the National Health Interview Survey³⁴ and/or the National College Health Assessment²⁵ to create and promote a comprehensive standardized assessment of CHAs so that research can be consistent.

In some cases, it was not possible to determine if reviewed studies were assessing the same CHA but using differing terminology. Studies in this systematic review reported on similar CHAs, such as progressive relaxation and relaxation techniques, guided imagery and visualization, dietary supplements and supplements, etc. The NCCIH has an extensive list of CHAs with definitions and other important information such as effectiveness and common usage that would be a beneficial resource for researchers to utilize.³⁶ Modifications to the formatting of questions such as a combination of qualitative and quantitative (open/closed) questions affect participants’ responses.⁸

Limitations

There are limitations that could have affected the results of this systematic review and meta-analysis. In the data collection process, published articles could have been missed if they did not surface in the database search. Selection bias could cause errors in the inclusion and exclusion criteria that prompted articles to be not included in this analysis. Due to variations in studies, the meta-analysis may not accurately reflect trends in CHA use. These include inconsistent operationalization of overall CHA use (i.e., lifetime, past 12 months, past 5 years), variations in the number of individual CHAs assessed, and CHA names/groupings. Data collected in both the 2012 ($n = 10$) and 2023 ($n = 8$) reviews may not necessarily be representative of the entire U.S. college population, as surveys were administered in 12 different

states, leaving a big gap as to which college students were surveyed (Figure 2). The low number of studies in the 2012 and 2023 reviews might also have affected the outcomes of the statistical analyses. To address this, the weighted mean was used to combine the samples of studies, and both Chi-square and Fisher's Exact Test were considered for statistical analysis. Fewer than 20% of cells had frequencies < 5,³⁷ so Fisher's Exact Test was eliminated and Chi-square was used.

Translation to Health Education Practice

The National Commission for Health Education Credentialing Inc. (NCHEC) has established eight areas of responsibilities that outline the skills and duties of a Certified Health Education Specialist: (1) assessment of needs and capacity, (2) planning, (3) implementation, (4) evaluation and research, (5) advocacy, (6) communication, (7) leadership and management, and (8) ethics and professionalism.³⁸ To align with the NCHEC competencies, CHA researchers and Certified Health Education Specialists on college campuses should assess their students' needs as well as explore using or adding CHA programs and resources to address common issues such as anxiety, depression, stress, sleep, and tobacco cessation (Sub-competency 1.3.4: Assess existing and available resources, policies, programs, practices, and interventions; Sub-competency 1.4.2 Prioritize health education and promotion needs).³⁸ A collaborative team of physicians, health promotion professionals, and Certified Health Education Specialists at Columbia University put this into practice by engaging stakeholders in the assessment of CHA needs and behaviors of students, which led to acupuncture being added to their student health services (Sub-competency 2.1.2: Facilitate collaborative efforts among priority populations, partners, and stakeholders; Sub-competency 2.3.4: Adopt, adapt, and/or develop tailored intervention(s) for priority population(s) to achieve desired outcomes).^{38,39}

Nationally and globally, Certified Health Education Specialists can support research on CHA behaviors. The NCCIH's strategic plan includes five objectives that guide research priorities and public education activities.⁴⁰ Certified Health Education Specialists can contribute to these objectives by educating students on how to evaluate the efficacy of varying CHAs (Sub-competency 4.1.1: Align the evaluation plan with the intervention goals and objectives), promoting CHA research and its effects on whole-person care (Sub-competency 8.4.1: Explain the major responsibilities, contributions, and value of the health education specialist), and engaging in education about CHA use (Sub-

competency 8.3.2: Participate in continuing education opportunities to maintain or enhance continuing competence).³⁸ Additionally, Certified Health Education Specialists should be aware of the increasing prevalence of CHA use among the college student population and use such trends to develop educational materials for classrooms, social media, textbooks, student health centers, internships, and places of employment (Sub-competency 6.4.3: Develop communication aids, materials, or tools using appropriate multimedia [e.g., infographics, presentation software, brochures, and posters]).³⁸ Figure 5 provides a list of helpful web-based CHA resources that can guide CHA research and development of educational interventions on CHAs for college students or other learners.^{36,41–50}

Future CHA researchers should develop a consistent, comprehensive data collection tool across all CHA studies in order to depict an accurate representation of CHA use among college students or any population (Sub-competency 1.2.7: Determine primary data collection needs, instruments, methods, and procedures; Sub-competency 4.1.7: Select quantitative and qualitative tools consistent with assumptions and data requirements).³⁸ Consistency can be achieved by researchers using the same operationalization of overall CHA use and assessing the same individual CHAs studied previously. To be comprehensive, CHA researchers should use Table 2 and the NCCIH website³⁶ to create an extensive list of CHAs with definitions, examples, and other important information for study participants to understand what is being assessed (Sub-competency 1.2.7: Determine primary data collection needs, instruments, methods, and procedures).³⁸ Instead of depending on national data or meta-analyses, assessing CHA use on individual campuses would allow Certified Health Education Specialists and healthcare professionals to understand the unique needs of their students and tailor care for student health services (Sub-competency 1.1.2: Identify priority population[s]; Sub-competency 1.3.2: Determine the knowledge, attitudes, beliefs, skills, and behaviors that impact the health and health literacy of the priority population[s]; Sub-competency 1.3.5: Determine the capacity [available resources, policies, programs, practices, and interventions] to improve and/or maintain health; Sub-competency 1.3.6: List the needs of the priority population[s]).³⁸ To university stakeholders, this would demonstrate an investment in creating a culture of health and well-being (Sub-competency 1.4.2: Prioritize health education and promotion needs),³⁸ a goal of the American College Health Association's Healthy Campus Framework.⁵¹ Predictors of CHA use, such as social, cultural, economic, political, and

CHA Research / Professional Resources

- "Know the Science"
<https://www.nccih.nih.gov/health/know-science>
- How To Find Information About Complementary and Integrative Health Practices on PubMed® <https://www.nccih.nih.gov/health/how-to-find-information-about-complementary-health-approaches-on-pubmed>
- Online Continuing Education Series
<https://www.nccih.nih.gov/training/videolectures>
- Resources for Health Care Providers
<https://www.nccih.nih.gov/health/providers>

CHA Educational Resources for College Learners

- Health Topics A-Z
<https://www.nccih.nih.gov/health/atoz>
- 6 Things To Know When Selecting a Complementary Health Practitioner
<https://www.nccih.nih.gov/health/tips/things-to-know-when-selecting-a-complementary-health-practitioner>
- Wellness & Wellbeing
<https://www.nccih.nih.gov/health/wellness-and-well-being>
- Stress
<https://www.nccih.nih.gov/health/stress>
- Sleep Disorders
<https://www.nccih.nih.gov/health/sleep-disorders-in-depth>
- Using Dietary Supplements Wisely
<https://www.nccih.nih.gov/health/using-dietary-supplements-wisely>
- Quitting Smoking
<https://www.nccih.nih.gov/health/quitting-smoking>

Figure 5. CHA resources for college health professionals and learners.

environmental factors, can be explored to increase understanding of how and why college students use CHAs (Sub-competency 1.3.3: Identify the social, cultural, economic, political, and environmental factors that impact the health and/or learning processes of the priority population[s]).³⁸ Certified Health Education Specialists should study and understand trends in CHA use to educate students on the efficacy of CHAs for whole person health, which emphasizes health, resilience, and disease prevention for healthier, longer lives (Sub-competency 8.3.2: Participate in continuing education opportunities to maintain or enhance continuing competence).^{38,52}

In the design and administration of this study, researchers applied the sub-competencies of a Certified Health Education Specialist to conduct a systematic literature review, complete a meta-analysis, and identify trends related to CHA use. For the systematic literature review, researchers defined the purpose and scope of the assessment (Sub-competency 1.1.1), identified the priority population (Sub-competency 1.1.2), conducted

a literature review (Sub-competency 1.2.3), identified data gaps (Sub-competency 1.2.6), adhered to established procedures to collect data (Sub-competency 1.2.8), developed a data analysis plan (Sub-competency 1.2.9), compared findings to norms, existing data, and other information (Sub-competency 1.4.1), and developed recommendations based on findings (Sub-competency 1.4.4).³⁸ For both the systematic review and the meta-analysis, researchers established clear procedures for qualitative and quantitative data to be extracted from reviewed studies (Sub-competency 4.3.1: Train data collectors; Sub-competency 4.3.3: Use appropriate modalities to collect and manage data; Sub-competency 4.3.4: Monitor data collection procedures).³⁸ Once data were extracted, data were prepared for analysis (Sub-competency 4.3.5) and analyzed (Sub-competency 4.3.6).³⁸ Researchers then compared findings to other studies (Sub-competency 4.4.2), identified limitations of the research (Sub-competency 4.4.3), drew conclusions based on findings (Sub-competency 4.4.4), and developed recommendations based on findings (Sub-

competency 4.4.7).³⁸ To disseminate the findings (Sub-competency 4.5.2), researchers collaborated on preparing and revising a manuscript (Sub-competency 4.5.1) that can contribute to the profession (Sub-competency 8.4.6).³⁸ As this project involved undergraduate and graduate students as members of the research team, the faculty member served as a mentor (Sub-competency 8.3.5) while assessing and implementing training needs of the student researchers (Sub-competency 7.2.3; Sub-competency 7.2.5) throughout the project.³⁸

Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

- National Center for Complementary and Integrative Health. Complementary, alternative, or integrative health: what's in a name. <https://www.nccih.nih.gov/health/complementary-alternative-or-integrative-health-whats-in-a-name>. Published 2021. Accessed March 22, 2023.
- National Cancer Institute. NCI dictionary of cancer terms. <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/conventional-medicine>. Accessed June 27, 2023.
- Ng JY, Boon HS, Thompson AK, Whitehead CR. Making sense of “alternative”, “complementary”, “unconventional” and “integrative” medicine: exploring the terms and meanings through a textual analysis. *BMC Complement Altern Med*. 2016;16(1):134. doi:10.1186/s12906-016-1111-3.
- Steele L. Health and wellness: holistic and complementary methods. In: Leal Filho W, Wall T, Azul A Brandli L, Özuyar PG, eds. *Good Health and Well-Being. Encyclopedia of the UN Sustainable Development Goals*. eBook in a Series. SpringerLink; 2020:293–304. doi:10.1007/978-3-319-95681-7_18.
- Ng JY, Dhawan T, Dogadova E, et al. Operational definition of complementary, alternative, and integrative medicine derived from a systematic search. *BioMed Central*. 2022;22(104). doi:10.1186/s12906-022-03556-7.
- Yuan H, Ma Q, Ye L, Piao G. The traditional medicine and modern medicine from natural products. *Molecules*. 2016;21(5):559. doi:10.3390/molecules21050559.
- National Center for Complementary and Integrative Health. Paying for complementary and integrative health approaches. <https://www.nccih.nih.gov/health/paying-for-complementary-and-integrative-health-approaches>. Published 2016. Accessed June 27, 2023.
- Lee EL, Richards N, Harrison J, Barnes J. Prevalence of use of traditional, complementary and alternative medicine by the general population: a systematic review of national studies published from 2010 to 2019. *Drug Saf*. 2022;45(7):713–735. doi:10.1007/s40264-022-01189-w.
- Tangkiatkumjai M, Boardman H, Walker DM. Potential factors that influence usage of complementary and alternative medicine worldwide: a systematic review. *BMC Complement Med Ther*. 2020;20(1). doi:10.1186/s12906-020-03157-2.
- Paudyal V, Cadogan C, Fialová D, et al. Provision of clinical pharmacy services during the COVID-19 pandemic: experiences of pharmacists from 16 European countries. *RSAP*. 2021;17(8):1507–1517. doi:10.1016/j.sapharm.2020.11.017.
- Harris PE, Cooper KL, Relton C, Thomas KJ. Prevalence of complementary and alternative medicine (CAM) use by the general population: a systematic review and update. *Int J Clin Pract*. 2012;66:915–916. doi:10.1111/j.1742-1241.2012.02945.x.
- Funk C. Americans' health care behaviors and use of conventional and alternative medicine. Pew Research Center Science. <https://www.pewresearch.org/science/2017/02/02/americans-health-care-behaviors-and-use-of-conventional-and-alternative-medicine/>. 2017. Accessed June 27, 2023.
- Clarke TC, Barnes PM, Black LI, Stussman BJ, Nahin RL. Use of yoga, meditation, and chiropractors among U.S. adults aged 18 and over. *NCHS Data Brief*. 2018;325:1–8.
- Stussman BJ, Nahin RR, Barnes PM, Ward BW. U.S. physician recommendations to their patients about the use of complementary health approaches. *J Integr Complement Med*. 2020;26(1):25–33. doi:10.1089/acm.2019.0303.
- Nowak ALV, Hale HM. Prevalence of complementary and alternative medicine use among U.S. college students. *Am J Health Educ*. 2012;43(2):116–126. doi:10.1080/19325037.2012.10599227.
- Liu MA, Huynh NT, Broukhim M, Cheung DH, Schuster TL, Najm W. Determining the attitudes and use of complementary, alternative, and integrative medicine among undergraduates. *J Complement Altern Med*. 2014;20(9):718–726. doi:10.1089/acm.2014.0041.
- Sansgiry SS, Mhatre SK, Artani SM. Use of and attitude toward complementary and alternative medicine: understanding the role of generational influence. *Altern Ther Health Med*. 2013;19:10–15.
- Nguyen J, Liu MA, Patel RJ, Tahara K, Nguyen AL. Use and interest in complementary and alternative medicine among college students seeking healthcare at a university campus student health center. *Comp Ther Clin Pract*. 2016;24:103–108. doi:10.1016/j.ctcp.2016.06.001.
- Subramanian K, Midha I. Prevalence and perspectives of complementary and alternative medicine among university students in Atlanta, Newcastle upon Tyne, and New Delhi. *Int Sch Res Notices*. 2016;2016:1–9. doi:10.1155/2016/9309534.
- Putz JAM. *Complementary and Alternative Medicine: Current Mind-Body Practices and Perceptions of*

- Undergraduate Students* [dissertation]. Minnesota State University Mankato. <https://www.semanticscholar.org/paper/Complementary-and-Alternative-Medicine%3A-Current-and-Putz/adc9491e15714458b01a86204602ab7954be5c0d>. Published 2017. Accessed August 23, 2023.
21. Green OJ, Green JP, Carroll PJ. The perceived credibility of complementary and alternative medicine: a survey of undergraduate and graduate students. *Int J Clin Exp Hypn*. 2020;68(3):327–347. doi:10.1080/00207144.2020.1756695.
 22. Salihu EY, Ebert WL. Use and attitudes toward complementary and alternative medicine among university students: the role of gender and race. *J Am Coll Health*. 2022;1–10. doi:10.1080/07448481.2022.2115296.
 23. Nowak ALV, DeGise J, Daugherty A, et al. Prevalence and predictors of complementary and alternative medicine (CAM) use among ivy league college students: implications for student health services. *J Am Coll Health*. 2015;63(6):362–372. doi:10.1080/07448481.2015.1042878.
 24. Nowak ALV, Dorman SM. Social-cognitive predictors of college students use of complementary and alternative medicine. *Am J Health Educ*. 2008;39(2):80–90. doi:10.1080/19325037.2008.10599019.
 25. American College Health Association. American college health association national college health assessment III: undergraduate student reference group executive summary spring 2022. https://www.acha.org/documents/ncha/NCHA-III_SPRING_2022_UNDERGRAD_REFERENCE_GROUP_EXECUTIVE_SUMMARY.pdf. Published 2022. Accessed August 23, 2023.
 26. National Center for Complementary and Integrative Health. Mind and body practices. <https://www.nccih.nih.gov/health/mind-and-body-practices>. Published September 2017. Accessed June 22, 2023.
 27. National Center for Complementary and Integrative Health. Yoga: what you need to know. <https://www.nccih.nih.gov/health/yoga-what-you-need-to-know>. Published April 2021. Accessed June 22, 2023.
 28. National Center for Complementary and Integrative Health. Meditation and mindfulness: what you need to know. <https://www.nccih.nih.gov/health/meditation-and-mindfulness-what-you-need-to-know>. Published April 2020. Accessed June 22, 2023.
 29. National Center for Complementary and Integrative Health. Mind and body approaches for stress and anxiety: what the science says. <https://www.nccih.nih.gov/health/providers/digest/mind-and-body-approaches-for-stress-science>. Published April 2020. Accessed June 27, 2023.
 30. National Center for Complementary and Integrative Health. Yoga for health: what the science says. <https://www.nccih.nih.gov/health/providers/digest/yoga-for-health-science>. Published February 2020. Accessed June 22, 2023.
 31. Tripathi MN, Kumari S, Ganpat TS. Psychophysiological effects of yoga on stress in college students. *J Educ Health Promot*. 2018;7:43. doi:10.4103/jehp.jehp_74_17.
 32. Lemay V, Hoolahan J, Buchanan A. Impact of a yoga and meditation intervention on students' stress and anxiety levels. *Am J Pharm Educ*. 2019;83(5):7001. doi:10.5688/ajpe7001.
 33. Panjwani U, Dudani S, Wadhwa M. Sleep, cognition, and yoga. *Int J Yoga Published*. 2021;14(2):100–108. doi:10.4103/ijoy.IJOY_110_20.
 34. National Center for Health Statistics. National Health Interview Survey (NHIS) questionnaire. https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2022/EnglishQuest-508.pdf. 2022. Accessed August 23, 2023.
 35. American Public Health Association. Integrative, complementary and traditional health practices. <https://www.apha.org/apha-communities/member-sections/integrative-complementary-and-traditional-health-practices>. Published 2022. Accessed June 10, 2023.
 36. National Center for Complementary and Integrative Health. Health topics A-Z. <https://www.nccih.nih.gov/health/atoz>. Accessed June 27, 2023.
 37. Kim HY. Statistical notes for clinical researchers: chi-squared test and fisher's exact test. *Restor Dent Endod*. May 2017;42(2):152–155. doi:10.5395/rde.2017.42.2.152.
 38. NCHEC. Responsibilities & competencies for health education specialists. <https://www.nchec.org/responsibilities-and-competencies>. Published 2020. Accessed June 27, 2023.
 39. O'Keefe R, Wilson K, Anderson BJ, Seward S. Integrating an acupuncture service at an Ivy league university student health service. *Medical Acupuncture*. 2015;27(6):487–492. doi:10.1089/acu.2015.1135.
 40. National Center for Complementary and Integrative Health. NCCIH strategic plan FY 2021–2025: mapping the pathway to research on whole person health. <https://nccih.nih.gov/about/nccih-strategic-plan-2021-2025>. Accessed June 27, 2023.
 41. National Center for Complementary and Integrative Health. Know the science. <https://www.nccih.nih.gov/health/know-science>. Accessed June 27, 2023.
 42. National Center for Complementary and Integrative Health. How to find information about complementary health on pubmed. <https://www.nccih.nih.gov/health/how-to-find-information-about-complementary-health-approaches-on-pubmed>. Published 2021. Accessed June 27, 2023.
 43. National Center for Complementary and Integrative Health. NCCIH online continuing education series. <https://www.nccih.nih.gov/training/videlectures>. Accessed June 27, 2023.
 44. National Center for Complementary and Integrative Health. Resources for health care providers. <https://www.nccih.nih.gov/health/providers>. Accessed June 27, 2023.
 45. National Center for Complementary and Integrative Health. 6 things to know when selecting a complementary health practitioner. <https://www.nccih.nih.gov/health/tips/things-to-know-when-selecting-a-complementary-health-practitioner>. Accessed June 27, 2023.
 46. National Center for Complementary and Integrative Health. Wellness and well-being. <https://www.nccih.nih.gov>.

- [nih.gov/health/wellness-and-well-being](https://www.nih.gov/health/wellness-and-well-being). Published 2018. Accessed June 27, 2023.
47. National Center for Complementary and Integrative Health. Stress. <https://www.nccih.nih.gov/health/stress>. Published 2022. Accessed June 27, 2023.
 48. National Center for Complementary and Integrative Health. Sleep disorders: in depth. <https://www.nccih.nih.gov/health/sleep-disorders-in-depth>. Published 2015. Accessed June 27, 2023.
 49. National Center for Complementary and Integrative Health. Using dietary supplements wisely. <https://www.nccih.nih.gov/health/using-dietary-supplements-wisely>. Published 2019. Accessed June 27, 2023.
 50. National Center for Complementary and Integrative Health. Quitting smoking with complementary health approaches. <https://www.nccih.nih.gov/health/quit-ting-smoking>. Published 2021. Accessed June 27, 2023.
 51. American College Health Association. The healthy campus framework. <https://www.acha.org/HealthyCampus/Framework/HealthyCampus/Framework.aspx>. Accessed July 6, 2023.
 52. National Center for Complementary and Integrative Health. Whole person health: what you need to know. <https://www.nccih.nih.gov/health/whole-person-health-what-you-need-to-know>. Published May, 2021. Accessed June 27, 2023.