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Variability in Perceptions of Complementary Health Approaches Among Graduate Student Trainees

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VARIABILITY IN PERCEPTIONS OF COMPLEMENTARY HEALTH APPROACHES AMONG GRADUATE STUDENT TRAINEES

A thesis submitted in partial fulfillment of the requirements
for the degree of Master of Science at Virginia Commonwealth University

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Table of Contents

List of Figures and Tables

Page

Abstract

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Complementary Health Approaches (CHAs) encompass a diverse range of practices which are often used both independently and alongside conventional medical treatments. Understanding how graduate students training in different fields perceive CHAs is important because these professional trainees will go on to occupy roles as healthcare practitioners, researchers, policy makers, and consumers. This study used sequential rank agreement methods (Ekstrøm, Gerds, & Jensen, 2019) to investigate variations in perceptions of CHAs in a sample of graduate students ($N = 416$) from 140 possible training programs. Ratings of CHA familiarity, perceptions of CHA legitimacy, and willingness to recommend CHAs were compared among trainees from (a) clinical versus (b) academic training programs; and, within clinical fields, (c) mental health trainees versus (d) biomedical trainees. Overall, clinical trainees were more familiar with CHAs than academic trainees. In addition, and within the clinical cohort, mental health trainees were more familiar with CHAs and perceived them as more legitimate than biomedical trainees. Language used to characterize CHAs also was investigated, as were associations among key descriptive terminology, training background, and willingness to recommend CHAs.

Keywords: complementary and integrative healthcare, CAM, perceptions, training background, sequential rank agreement

Variability in Perceptions of Complementary Health Approaches Among Graduate Student Trainees

Complementary health approaches (CHAs) can be defined as a spectrum of non-traditional healthcare practices and perspectives that purport to mitigate or prevent negative health outcomes, and which may be demonstrated as effective when implemented either independently or in conjunction with more standard techniques from traditional western medicine (Barnes, Bloom, & Nahin, 2008; NCCIH 2021; Ng, 2021; Ventola, 2010). Examples of CHAs include massage, chiropractic/osteopathic manipulation, non-vitamin supplements, yoga, acupuncture, mind-body therapies, hypnosis, homeopathy, and naturopathy.

Understanding how individuals think about CHAs is important. Clinicians' perceptions of these approaches inform their treatment-related decisions which, in turn, can directly affect peoples' safety and well-being (Swan et al., 2015; Verona, 2010). Practices falling under the CHA umbrella also are related to cultural beliefs and spiritual traditions (Gyasi et al., 2018; Odegard et al., 2022). Therefore, individuals' identities and experiences inherently are associated with their views of these modalities. These individual differences can affect both personal choices regarding engagement with CHAs as well as practitioner perceptions and associated clinical decision making (Zörgő, Purebl, & Zana, 2018).

In the United States healthcare system, integrating CHAs alongside conventional healthcare practices has been debated for several decades (Berman et al., 2000; Ventola, 2010). Proponents of CHA integration assert that these modalities offer opportunities to expand treatment options and provide a more holistic approach to health and wellness (Barnett & Shale, 2012; Park, 2013). Critics contend that integration of CHAs is being rushed, and that to ensure

client safety, more empirical support is needed for many of these modalities (Boyle, 2013; Lilienfeld, 2012; Lilienfeld et al., 2014).

This issue of CHA integration is further complicated by the unpredictable state of the United States healthcare system (Cai et al., 2020). Personal and public healthcare issues have been politicized, and many Americans report feeling disenfranchised and neglected by a system that limits access to providers and treatments (Anderson, Hussey, & Petrosyan, 2019). More people are taking their personal health and wellness into their own hands – whether due to preference or out of necessity – and this trend appears likely to persist (Wiley, 2019). When facing barriers to traditional western medicine, CHAs can seem more affordable and accessible. However, many see CHAs as more than just alternatives or replacements for conventional medical practices. As their name implies, these interventions also may complement individuals' existing health and wellness regimens when used in tandem with more standardized and broadly accepted methods of treatment (Barnette et al., 2014; Park, 2013). With that in mind, understanding the factors that contribute to diverse perceptions of CHAs is essential for safeguarding patient well-being when considering integration.

For students, many of whom may have limited finances or healthcare options, CHA practices may be especially appealing. This is reflected by elevated rates of CHA engagement among this population. For example, Nowak and colleagues reported that more than 80% of college students engage with some form of complementary healthcare (2015). For comparison, the National Center for Health Statistics (NCHS) and the National Center for Complementary and Integrative Health (NCCIH) reported that between 36–40% of adults in the United States were using some form of CHA as of 2024 (Barnes, Bloom, & Nahin, 2008; Clarke et al., 2015;

Nahin, Rhee, & Stussman, 2024; NCCIH, 2016). In short, students are utilizing these practices at more than double the rate of the general public.

To understand factors underlying CHA usage, it is necessary to first consider how individuals think about these approaches. CHAs range broadly in terms of their empirical support and purported efficacy; in the case of selected pharmacological approaches, level of regulation within conventional western health systems varies as well (Ng, 2021). Because patient care is the primary responsibility of clinical providers, it is particularly important to understand how practitioners perceive CHAs within the context of their professional roles. Several studies have shown that professional training and occupational affiliation associate with practitioner perceptions of CHAs (Frass et al., 2012; Nguyen et al., 2016). This is not surprising given that occupational incumbents often share similar patterns of thinking (e.g., Holland, 1996), and professionals from different fields might possess unique beliefs, values, and knowledge (e.g., Teixeira Medeiros et al., 2019; Zhao et al., 2022). Additional variables including age, gender, race, and ethnicity also have been shown to associate with CHA perceptions (e.g., Agu et al., 2019; Alwhaibi & Sambamoorthi, 2016; Groden et al., 2017).

When considering graduate training specifically, these students are generally required to engage in substantial academic and applied instruction prior to entry into even highly supervised occupational placements. During this training period, both personal and professional components of identity and associated patterns of thinking may come into focus (Gazley et al., 2014). However, little research has examined the associations among occupational training and graduate trainees' perceptions of CHAs, including views of their legitimacy in healthcare settings. Several studies have investigated medical students' views of CHAs (e.g., Ahmed et al., 2017; Greenfield et al., 2006; Healey, 2015), but these students represent only a subset of graduate trainees, and a

fraction of future clinical practitioners. Trainees from many additional programs, including graduate mental health trainees, go on to occupy patient-facing roles in the healthcare system as well (Baugniet, Boon, & Ostbye, 2000). With this in mind, the current study examined how CHA perceptions vary among graduate students from different professional training programs. It also explored the effects of trainees' personal identities on perceptions of CHAs through analysis of demographic characteristics.

Among students, graduate trainees represent a unique and important population to investigate when considering the future of the healthcare system. Not only do these students utilize CHAs at elevated rates, but they also become stakeholders in the healthcare industry when they advance professionally (Tong et al., 2022). Understanding associations among training program affiliation and demographic factors (i.e., age, gender, race, ethnicity) with CHA perceptions within this population is critical.

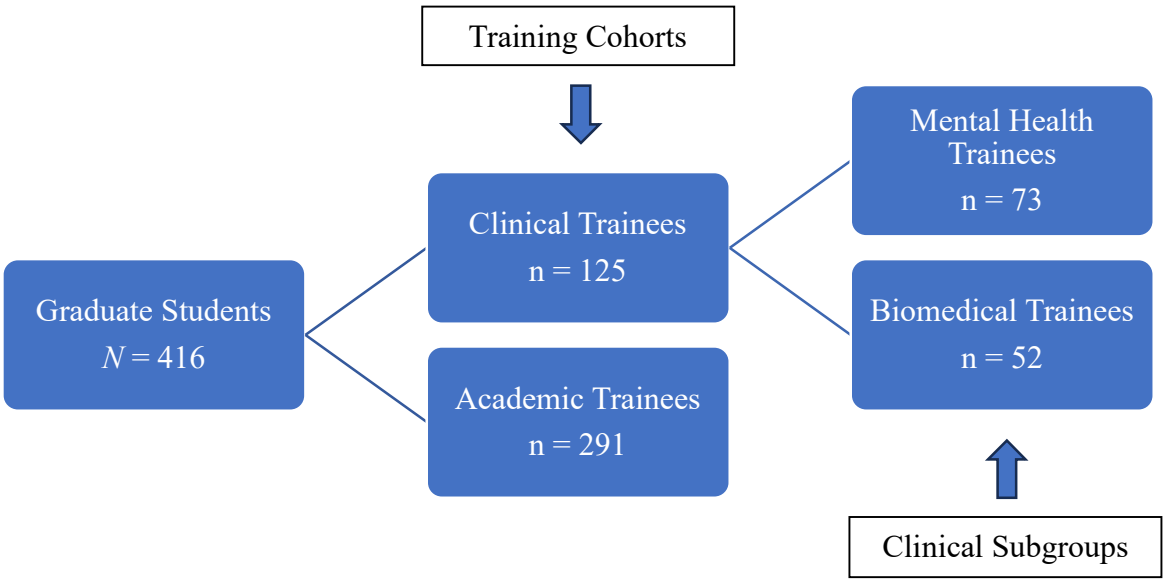
Trainees pursuing clinical degrees in healthcare-related fields (e.g., physicians, nurses, psychologists, social workers) will be providing patient care in the future (Gazley et al., 2014) and, as the next generation of healthcare providers, their attitudes towards CHAs will shape the integration of these modalities into medical practice. Their endorsement or rejection of these approaches will directly impact patient safety and well-being. Trainees tracking towards professional roles beyond clinical practice are also important to consider. Not only do they provide a comparison group with which to identify unique characteristics among clinical trainees, but these academic trainees themselves serve as stakeholders within Western medical systems. They will be conducting research, writing and implementing policy, auditing insurance standards and best practices, and engaging as healthcare consumers (Bishop & Lewith, 2010; Carmack & Serafin, 2018; Frass et al., 2012; Lewing & Sansgiry, 2018). To obtain an accurate

depiction of how CHA perceptions vary across professions, it is important to gather data from graduate students representing a broad array of training programs.

Research indicates that perceived legitimacy and familiarity are two key components contributing to perceptions of CHAs. For example, in a sample of medical trainees, Healey (2015) showed a positive association between CHA familiarity and perceptions of legitimacy, as well as a strong association between perceived legitimacy and willingness to integrate CHAs into clinical work. Results from additional surveys assessing CHA views in populations of both clinical and academic trainees (Green, Green, & Carroll, 2020; Tollefson et al., 2016) demonstrated that student perceptions vary with demographic factors.

Previous research regarding CHA perceptions has focused on comparing either working practitioners from specific clinical occupations (e.g., practicing physicians and psychologists) or non-clinical healthcare stakeholders (e.g., active patients and the general public). The current study examined graduate student trainees' perceptions of CHAs while they were immersed in a milieu populated with their training peers and supervisors. Rather than comparing established clinicians with their colleagues or patients across varying healthcare settings, this project examined differences among trainees during their graduate-level studies. Specifically, two cohorts of trainees (based on the nature of their programs of study) were studied: those training as healthcare practitioners are considered members of the "clinical" cohort, whereas trainees pursuing disciplines that are non-clinical in nature are members of the "academic" cohort (Figure 1).

Figure 1.
Organization of Graduate Students into Training Cohorts and Clinical Subgroups



Note: Sample initially broken into two "cohorts" (clinical trainees vs academic trainees); clinical cohort subsequently broken into two "subgroups" (mental health trainees vs biomedical trainees).

Consistent with previous research, each cohort's CHA perceptions were assessed uniquely. Furnham (2000) found that most people tend to make decisions about CHAs primarily based on familiarity, whereas Fries (2008) and Schulz and Hede (2018) showed that perceived legitimacy is also an important consideration for many. With that in mind, all trainees were asked to report both on their familiarity with individual CHAs as well as their perceptions of CHA legitimacy overall. Clinical trainees additionally were asked to report willingness to recommend each CHA modality.

Research also showed that among healthcare practitioners, individuals working in different professions may disagree about whether CHAs should be integrated into clinical practice (Baugniet, Boon, & Ostbye, 2000). For example, those with training as mental health providers (e.g., psychologists, social workers) more often report favorable views towards CHA integration, whereas those from biomedical backgrounds (e.g., physicians, nurses) tend to be less

willing to recommend CHAs (Berreta et al., 2020). Identification with training affiliation might help to explain this phenomenon. To assess the association between training program affiliation and willingness to recommend CHAs, the current study further investigated two subgroups of clinical trainees: mental health and biomedical trainees (Figure 1). Their responses to items assessing perceived legitimacy and willingness to recommend CHAs were compared.

Training program affiliation also might associate with the way individuals go about characterizing CHAs. Patterns from the complementary healthcare literature suggest that terminology used to describe CHAs may be related to training background (see Table C1). Specifically, authors from mental health backgrounds (e.g., psychology PhDs) appeared to more frequently associate CHAs with the term "complementary", whereas those from biomedical backgrounds (e.g., MDs) consistently used the term "alternative." Medical pluralism – the combining of conventional healthcare treatments with modalities not typically practiced in western medicine – has been described using a variety of terms over the past half century (Eisenberg et al., 1993; 2001; Gaboury, April, & Verhoef, 2012). Despite the informative nature of descriptive language within the field of complementary healthcare, research has yet to directly examine the relationship between terminological associations and CHA perceptions or recommendation behaviors. The current study assessed whether graduate trainees associated CHAs more with the term complementary or the term alternative. Terminological associations were compared among participants from different training backgrounds as well as to responses indicating willingness to recommend CHAs clinically.

In sum, although prior research has explored factors associated with healthcare practitioners' (e.g., Berreta et al., 2020; Fries, 2008; Swan et al., 2015) and students' perceptions of CHAs (e.g., Ahmed et al., 2017; Baugniet, Boon, & Ostbye, 2000; Green, Green, & Carroll,

2020; Healey, 2015; Liu et al., 2014; Nguyen et al., 2016; Teixeira Medeiros et al., 2019; Zhao et al., 2022), only a few projects have examined variations in CHA perceptions among graduate trainees by training program affiliation, and none have contrasted clinical versus academic, or mental health versus biomedical trainees. Graduate trainees' perceptions are important due to their high rates of CHA usage, their diverse backgrounds and experiences, and their developing identity and occupational incumbency, which position them as stakeholders in the United States healthcare industry (Cornett, Palermo, & Ashe, 2023; Gazley et al., 2014; Tollefson et al., 2016). Understanding differences in perceptions of CHAs between graduate students from different training backgrounds can provide insight into how providers' professional roles affect their CHA recommendation decisions (Tong et al., 2022).

Review of the Literature

This review is structured around five areas. The first section provides brief context regarding the evolution of language employed in the CHA literature. The second section covers a recent advancement in applied CHA research, reviewing Stussman and colleagues' (2020) examination of CHA perceptions among physicians. The third section discusses the interplay between the concept of occupational incumbency and CHA perceptions, highlighting variability in CHA conceptualizations between researchers and practitioners from different training backgrounds and professions. The fourth section explores how CHA perceptions and use differ among college students in comparison to other populations, providing important context in consideration of the current study's sample. The final section examines findings which indicate that various demographic factors (age, gender, race, ethnicity) play significant roles informing perceptions of CHAs.

Evolution of Terminology

Terminology used in the study of complementary health approaches (CHAs) is informative, and tracks with developments in the field. Some researchers use the terms complementary and integrative health (CIH) or complementary and alternative medicine (CAM); however, the National Center of Complimentary and Integrative Health (NCCIH; https://www.nccih.nih.gov/) largely has adopted use of CHA. In keeping consistent with the current state of the literature, the term CHA is primarily used in reference to non-traditional healthcare approaches for the purposes of this project.

Originally founded in 1991 as the National Institutes of Health's (NIH) Office of Alternative Medicine (OAM), NIH board members and congressional stakeholders expressed immediate concern with the potential for diminished rigor in OAM funded research programs (Marshall, 1994; Hurley, 2006). In 1998, OAM was renamed the National Center for Complementary and Alternative Medicine (NCCAM), a first step in reorienting the expanding organization away from the "alternative" label (Brown, 2009; Gorski, 2018). The NIH-led shift away from the term alternative became even more explicit in 2014 when NCCAM was renamed NCCIH. Since this rebranding, the language of the literature has followed suit, and the terms CHA and CIH have largely come to replace CAM, primarily to legitimize the field of complementary and integrative healthcare within the eyes of both the public and the scientific and medical communities (NIH, 2014; Ng et al., 2016; Ng, 2021).

Advancement in Applied Research

The lack of consensus within the scientific community regarding the validity of CHAs as treatment options seems associated with the reputability of these approaches (Ng, 2021). With neither an agreed upon operational definition, nor a universal system for categorizing modalities,

advancements in understanding perceptions of CHAs have slowed (Gray, Steel, & Adams, 2019). Over the past two decades, projects arguing either for or against CHA integration have predominated the literature (Sood et al., 2007; Veziari, Kumar, & Leach, 2021). One noteworthy exception to this is work conducted by Stussman and colleagues (2020) who explored CHA recommendation rates among active physicians in the United States. These investigators analyzed data from the Physician Induction Interview component of the National Ambulatory Medical Care Survey (NAMCS, 2012) and observed that several subject variables, namely age, gender, race, and occupational specialization, were associated with openness to CHA recommendations. Whereas most research has focused on specific subsets of patients or practitioners, by examining rates of recommendation across a broad range of provider specialties and demographics, Stussman et al. directly assessed perceived openness to CHAs in a less confined context. Their findings demonstrated that several subject variables may affect perceptions of CHAs from a practitioner perspective; most notably, occupational incumbency.

Training Background and CHA Perceptions

Stussman and colleagues' findings (2020) paved the way for further research into the potential effects of both identity and experiential factors on perceptions of CHAs. Vocational psychologists have shown that individuals who share similar occupational roles are likely to demonstrate similar personality characteristics, values, and interests (Holland, 1996). This observation that professionals in specific vocational or training roles frequently share similar values and perspectives is supported in findings from the CHA literature as well. For example, research exploring views of CHAs among health professions trainees shows students from specific programs share varying levels of skepticism or support for these practices (Baugniet, Boon, & Ostbye, 2000; Frass et al., 2012; Teixeira Medeiros et al., 2019; Zhao et al., 2022).

Comparing CHA perceptions among trainees from different graduate programs, then, seems an appropriate first step in more granular investigations of the relationship between work roles and CHA perceptions.

In addition to its effect on perceptions of CHA legitimacy, training affiliation also appears to inform how CHAs are characterized. Patterns observed in the literature indicate that individuals trained in the social sciences (e.g., psychology, social work, public policy) more commonly describe CHAs as "complementary", whereas those with biomedical training (e.g., physicians, nurses) instead identify CHAs as "alternative" (see Table C1). These terminological patterns show a relationship between training background and CHA perceptions. Without a broadly accepted way of operationalizing CHAs, research efforts have largely focused on legitimizing or discrediting the field of complementary healthcare (Ng, 2023). The substantial number of publications focused on these semantic issues (e.g., use of the terms complementary and alternative) seems a direct consequence of disagreement between those from differing training backgrounds as to whether CHAs can provide legitimate, measurable healthcare benefits (Frass et al., 2012).

Graduate Student Engagement with CHAs

The current study explored whether various aspects of personal and professional identity affected CHA perceptions within a sample of graduate student trainees. It was therefore necessary to acknowledge unique aspects of the experience of college students (including graduate trainees) that associate with perceptions of CHAs. Estimates of CHA use in college populations vary. Although some have found students to engage with these practices at levels comparable to the general population (e.g., Barnes, Bloom, & Nahin, 2008), most research

suggests student engagement with CHAs is comparatively higher (e.g., Liu et al., 2014); findings from Nowack and colleagues (2015) indicate student rates may be twice as high.

Research also shows that in comparison to undergraduates, graduate trainees hold more favorable views of CHA engagement and integration (Green, Green, & Carroll, 2020). Graduate trainees seem more interested in receiving education regarding CHAs than undergraduates and are more likely to accept them as legitimate treatments, especially if covered under insurance (Carmack & Serafin, 2018; Nguyen et al., 2016). Among medical trainees, three in four see benefit in integrating CHAs with conventional medical practices (Ahmed et al., 2017). Findings indicate that approximately half of graduate trainees feel more formal training and exposure to CHAs as part of their graduate education is needed as well (Loh et al., 2013).

Demographic Factors and CHA Perceptions

Finally, research also demonstrates that perceptions of and engagement with CHAs can vary based upon aspects of individuals' identities and associated experiences. Each of the following demographic characteristics are included in the current study, and therefore they are discussed in turn.

Age. Findings from research regarding the effects of age on CHA perceptions appear contradictory at face value – some studies suggest increased age is predictive of elevated CHA engagement (e.g., Hasan et al., 2009; Ho et al., 2014; Ness et al., 2005); others indicate that younger individuals tend to demonstrate more interest and see these modalities as higher in legitimacy (e.g., Groden et al., 2017; Sharma, Holmes, & Sarkar, 2016). Numerous covariates may contribute to these confounding findings, such as generational influences, personal health needs and experiences, and variability in access to information about healthcare practices (Onyeaka et al., 2021). Age is also a frequently used criterion for defining career stages (Rhodes,

1983; Morrow & McElroy, 1987), and 35 years of age is a commonly cited cutoff point between earlier (e.g., exploration, establishment) and mid-later (e.g., maintenance, decline) stages (Hall & Mansfield, 1975; Rabinowitz & Hall, 1981; Raelin, 1985). This demarcation between younger (i.e., <35 years of age) and more advanced (i.e., ≥35 years of age) professionals was specifically accounted for in handling of age as a variable in the current study.

Gender. Gender is another facet of identity that covaries with CHA perceptions and use. Specifically, individuals who identify as women consistently demonstrate increased rates of CHA engagement (Alwhaibi & Sambamoorthi, 2016). These gender differences appear to transcend the impact of role-dependency as well – that is, women are more open to and familiar with CHAs than their male counterparts in both healthcare practitioner and non-clinical capacities (Keshet & Simchai, 2014). Although gender disparities do vary in effect between certain modalities, findings indicate that women exhibit greater overall openness and familiarity with CHAs across all practices included within the current study (Stussman et al., 2020).

Race and Ethnicity. Research shows that race and ethnicity each covary with perceived benefits of CHA use and rates of engagement with CHA practices; that said, findings from different projects contradict in terms of the nature of these associations. For example, a systematic review of 17 studies from Agu and colleagues (2019) found that racial minorities (i.e., individuals who self-identify as non-white) and ethnic minorities (those who identify as Hispanic/Latino) used CHAs at higher rates overall than white/non-Hispanic individuals. Conversely, Johnson and colleagues (2019) found that racial minorities possessed higher levels of skepticism and used CHAs at much lower rates. Findings from Ho and Nguyen (2015) further showed that among ethnic minorities, non-Hispanic Blacks exhibited the lowest CHA usage, followed by Hispanics; Graham et al. (2005) previously found that non-Hispanic whites engaged with CHAs at the

highest rates as well. The availability of research examining the effects of race and ethnicity vis-a-vis CHA perceptions is also relatively limited, as indicated by the small number of qualifying articles identified for Agu et al.'s systematic review (2019). For instance, although Stussman and colleagues (2020) included race as a variable of interest in their exploration of openness to CHAs among physicians, they did not have adequate variability in the sample to test hypotheses. The need for more focused research exploring associations among race, ethnicity, and CHA views and behaviors has been noted by numerous researchers (Cancio, 2021; Hsiao et al., 2006; Rhee et al., 2017).

Statement of Problem and Hypotheses

This study aimed to explore how perceptions of CHAs vary between graduate trainees from different training backgrounds (i.e., those from academically oriented programs and those from clinically oriented programs), and across several subject variables. First, trainees' familiarity with individual CHAs was assessed; trainees' perceptions of CHAs as legitimate healthcare practices were then evaluated. Next, for clinical trainees only, willingness to recommend CHAs within the scope of professional practice was assessed. Finer grained analyses included examining subgroup differences (i.e., comparing mental health versus biomedical trainees) which allowed for evaluation of differences in perceptions of legitimacy and willingness to recommend CHAs between cohorts of trainees. The potential effects of subject variables on perceptions of CHA legitimacy and willingness to recommend were also examined.

Hypothesis 1.

Graduate-level degree programs can vary broadly in terms of curriculum content. These programs seek to arm trainees with the necessary skills to succeed professionally within their respective fields (Gazley et al., 2014). To be prepared to serve in roles as healthcare practitioners,

clinical trainees should be exposed at least superficially to a variety of healthcare interventions and approaches. They also must learn to make decisions about which approaches or interventions are most appropriate for promoting patient safety and well-being. A key component of clinical decision-making is discerning the legitimacy of available healthcare treatment options prior to recommending or prescribing them. Graduate trainees' academic coursework and clinical experiences inform their knowledge, skills, and expectations (Tong et al., 2022). Since academic and clinical instruction may vary across graduate programs, mean differences in trainees' perceptions of CHA legitimacy were expected between clinical and academic cohorts (1).

Hypothesis 2.

Healey (2015) found that among medical students, perceptions of CHA legitimacy were positively associated with willingness to recommend. Baugniet, Boon, and Ostbye (2000) previously found that educational exposure to CHAs was correlated with their perceived utility, and that among clinical trainees, those from biomedically oriented programs typically received the least exposure to CHAs. Accordingly, between specific subgroups of the clinical cohort, mental health trainees were expected to perceive CHAs as more legitimate than biomedical trainees (2.a.). Additionally, mental health trainees also were anticipated to be more willing to recommend CHAs (2.b.).

Hypothesis 3 (Exploratory).

Patterns within existing literature (see Table C1) suggest that terminology for describing CHAs may vary between individuals from different professional or training backgrounds. In line with these observations, it was hypothesized that clinical trainees with mental health affiliations would associate CHAs more with the term "complementary", whereas their peers from biomedical backgrounds were expected to associate CHAs more with the term "alternative"

(3.a.). It was further hypothesized that clinical trainees associating CHAs as more complementary would be more willing to recommend these modalities (3.b.). Although these patterns of language appear across numerous studies, no prior research has provided evidence of a relationship between descriptive language and CHA perceptions. Keeping in mind this lack of empirical backing, Hypothesis 3 is considered exploratory.

Method

Participants

Participants were graduate trainees ($N = 416$) enrolled in one of 140 degree-seeking programs at a large Southeastern university. From a population of 5,550 graduate students (post-doctoral trainees excluded), a total of 482 respondents completed items from an online measure (an 8.7% response rate); 66 failed to report program affiliation so these individuals were excluded from the final sample. One hundred twenty-five participants (30.0%) were clinical trainees by program affiliation, whereas 291 (70.0%) were academic trainees. Demographic characteristics differentiate clinical versus academic trainees and are reported in Table 1.

Table 1.
Demographic Characteristics of Participants by Training Cohort (Clinical vs Academic)

Characteristic	Clinical		Academic	
	n	%	*n*	%
Age				
24 or under	24	17.6	63	21.6
25 – 34	63	50.4	141	48.5
35 – 44	28	22.4	44	15.1
45 – 54	10	8	29	10.0
55 or older	2	1.6	14	4.8
Gender				
Women	99	79.2	216	74.2
Men	15	12.0	62	21.3
Nonbinary/Other gender identity	11	8.8	13	4.4
Race				
White/Caucasian	105	84.0	216	74.2
Black/African American	6	4.8	30	10.3
Asian/Asian American	4	3.2	24	8.2
Other racial identity	10	8.0	21	7.1
Ethnicity				
Non-Hispanic/Latino	114	91.2	263	90.4
Hispanic/Latino	11	8.8	28	9.6

Note: $N = 416$. Percentages do not sum to 100 due to missing data.

CHA Modalities

The nine CHA modalities used in the judgment tasks were adopted from Stussman et al. (2020), and included massage, herbs/non-vitamin supplements, chiropractic/osteopathic manipulation, yoga, acupuncture, mind-body therapies, biofeedback/hypnosis, homeopathy, and naturopathy. Stussman and colleagues' list of modalities was used because the research aims and design of their project share many similarities with the current study, and their listing of modalities was representative of the CHAs clinicians and trainees are likely to encounter.

Design

The current project utilized a self-report questionnaire and had a cross-sectional correlational design.

Measure

Demographics. Demographic information including age, gender identity, racial identity, and ethnicity was collected using fixed alternative items. Data regarding degree program were collected via an open response item, which asked trainees whether they engaged in clinical work as part of their current degree program. Individuals who answered "Yes" were presented with the questionnaire item regarding willingness to recommend CHAs in clinical context section; those who answered "No" were taken directly to the perceptions of CHA legitimacy section.

Familiarity. Familiarity ratings were collected across the nine CHA modalities. Participants used a slider to indicate their familiarity with each CHA. In electronically administered surveys, sliders allow for collection of continuous variable data rather than forcing respondents to use scale anchors. Scale anchors were "Totally Unfamiliar" and "Very Familiar."

Willingness to Recommend. Ratings of willingness to recommend CHAs in clinical settings were collected across the nine CHA modalities only from clinical trainees. Participants also used a slider here to indicate their willingness to recommend each CHA when working with clients in their respective fields. Scale endpoints were "Extremely Unlikely" and "Extremely Likely."

Perceptions of Legitimacy. In measuring participants' perceptions of CHA legitimacy, the following definition of CHAs was presented: "Complementary Health Approaches refer to a spectrum of non-traditional healthcare practices and perspectives that purport to mitigate or prevent negative health outcomes, and which may be demonstrated as effective when implemented either independently or in conjunction with more standard techniques from traditional western medicine." This conceptualization was developed as an amalgamation of several existing definitions from relevant, similarly aligned research projects (Barnes, Bloom, &

Nahin, 2008; Ventola, 2010; Ng, 2021), and is original to this study. All participants were asked to use a sliding scale to rate CHA legitimacy based upon this definition. Scale endpoints were "Not at All" and "Completely."

***Descriptive Terminology*.** Ratings for association of CHAs with the term "complementary" versus the term "alternative" were collected only from clinical trainees. Again, a slider was used to collect ratings. Scale endpoints were "Complementary" and "Alternative." Participants were asked when rating their terminological association to consider that CHAs have previously been referred to as "Complementary and Alternative Medicine" (a descriptor that is inclusive of both terms).

Procedure

Approval was obtained from the university Institutional Review Board (IRB) prior to dissemination of recruitment materials. An email message describing the study and inviting graduate trainees to participate was sent through the graduate student listserv in November 2022 and January 2023. Participation was completely voluntary and was not incentivized. See Appendix B for recruitment materials. The questionnaire was deployed electronically using Qualtrics online software (Qualtrics, 2023). Participants were required to affirmatively consent to participation by selecting "I consent" on the first page of the Qualtrics form. Those who failed to consent were unable to access the remainder of the questionnaire.

Results

Preliminary Analyses

Analyses were conducted using SPSS, v.29.1 (IBM, 2023) and the SuperRanker package (Ekstrøm, Gerds, & Jensen, 2019) written for use in R, v.4.3.2 (R Core Team, 2023). Data were

exported from Qualtrics to SPSS and RStudio and stored in compliance with IRB requirements. All data were cleaned and patterns of missing data were analyzed and addressed. Study variables fell within acceptable ranges for skewness and kurtosis (Hair et al., 2010; Tabachnick & Fidell, 2013). Descriptive statistics were computed for familiarity with CHAs, perceptions of CHA legitimacy, and willingness to recommend CHAs. Sequential rank agreement (SRA) analyses were conducted to a) compare rankings of familiarity with CHAs between cohorts of clinical versus academic trainees, and b) compare rankings of willingness to recommend CHAs between clinical subgroups of mental health and biomedical trainees.

Handling of Missing Data. Inspection of the data showed both clinical and academic trainees omitted items that assessed familiarity with CHAs. Nonresponse ranges (26.9% and 34.6% respectively) were observed chiefly in visual analog slider-type items where Little's (1988) test results confirmed (p = .001) that response patterns were not random (i.e., MNAR). Funke's (2016) options for missing data on slider-type items were considered; that is either to exclude cases from analysis or treat nonresponses as ratings of middle intensity. Data imputation procedures for unanswered items were achieved by using the mean of all other responses to the same item. After comparing familiarity ratings between clinical and academic trainees, significant mean differences were found between these two cohorts. When dealing with MNAR data, failure to address group differences during the imputation process can increase the risk of biased estimates (Greenland & Finkle, 1995). Thus, to best address this MNAR pattern, the decision was made to impute separate mean values for clinical versus academic trainees (see Table A1).

Descriptive Statistics

Descriptive statistics for ratings of familiarity, perceived legitimacy, and willingness to recommend are presented in Tables A2–A4. For the familiarity and legitimacy variables, measures of central tendency and dispersion were calculated separately for cohorts of academic and clinical trainees. For the legitimacy and willingness to recommend variables, descriptives were calculated separately among subgroups of clinical mental health and clinical biomedical trainees. Familiarity is discussed in more detail below; perceived legitimacy and willingness to recommend are subsequently addressed within the context of hypothesis testing.

Familiarity. Familiarity with each modality was assessed to understand participants' awareness of CHAs. Descriptive statistics for familiarity with individual modalities are presented in Table A2. Means for overall familiarity with CHAs were calculated by summing familiarity ratings for individual modalities and dividing by nine. Overall, clinical trainees (M = .45, SD = .13) were significantly more familiar with CHAs than their academic counterparts (M = .41, SD = .11), $t(414) = 3.17$, p = .03. In addition, specifically within the clinical cohort, mental health trainees (M = .46, SD = .10) were significantly more familiar overall with CHAs than biomedical trainees (M = .44, SD = .15), $t(123) = 1.23$, p = .01.

Sequential Rank Agreement (SRA; Ekstrøm, Gerds, & Jensen, 2019)

To determine whether clinical versus academic trainees differed in familiarity with CHAs, the mean ratings for each modality were reallocated into a ranked listing from highest to lowest familiarity. This was done for each cohort: clinical and academic trainees. This procedure also was followed to create ranked listings for overall willingness to recommend CHAs between clinical subgroups (mental health and biomedical trainees). SRA analyses (Ekstrøm, Gerds, & Jensen, 2019) then were employed to quantify agreement among these ordered lists. Ekstrøm et

al.'s procedures allow for analytic evaluation or a graphical comparison to a permutation-based reference set.

Clinical trainees' familiarity with the nine were ordered (most to least) as follows: 1) massage, 2) yoga, 3) chiropractic/osteopathic manipulation, 4) acupuncture, 5) mind-body therapies, 6) herbs/nonvitamin supplements, 7) homeopathy, 8) biofeedback/hypnosis, 9) naturopathy; whereas academic trainees' familiarity was: 1) massage, 2) yoga, 3) chiropractic/osteopathic manipulation, 4) herbs/nonvitamin supplements, 5) acupuncture, 6) mind-body therapies, 7) homeopathy, 8) naturopathy, 9) biofeedback/hypnosis. Results from the SRA analysis of familiarity are reported in Table 2.

Table 2.
SRA Analysis for Familiarity Between Clinical and Academic Trainees

Modality	Clinical Rank	Academic Rank	SRA
Massage	1	1	0
Chiropractic/Osteopathic Manipulation	3	3	0
Herbs/Non-vitamin Supplements	6	4	.71
Yoga	2	2	0
Acupuncture	4	5	.71
Mind-Body Therapies	5	6	.71
Biofeedback/Hypnosis	8	9	.67
Homeopathy	7	7	.67
Naturopathy	9	8	.65

Note: SRA places higher weight on items ranked near top of list; SRA values represent difference between actual ranking distance among observations and expected distance based on permutations.

In a parallel fashion, a second SRA was conducted to assess agreement in ranked listings of willingness to recommend CHAs from mental health versus biomedical subgroups. Mental health trainees' ranking was: 1) yoga, 2) massage, 3) mind-body therapies, 4) acupuncture, 5) chiropractic/ osteopathic manipulation, 6) herbs/non-vitamin supplements, 7) biofeedback/hypnosis, 8) homeopathy, 9) naturopathy; whereas biomedical trainees' ordering was: 1) yoga, 2) massage, 3) mind-body therapies, 4) chiropractic/ osteopathic manipulation,

5) acupuncture, 6) herbs/non-vitamin supplements, 7) homeopathy, 8) naturopathy, 9) biofeedback/hypnosis. Results from the SRA analyses of willingness to recommend are reported in Table 3.

Table 3.
SRA Analysis for Willingness to Recommend Between Mental Health and Biomedical Trainees

Modality	Mental Health Rank	Biomedical Rank	SRA
Massage	2	2	0
Chiropractic/Osteopathic Manipulation	5	4	.45
Herbs/Non-vitamin Supplements	6	6	.41
Yoga	1	1	0
Acupuncture	4	5	.45
Mind-Body Therapies	3	3	0
Biofeedback/Hypnosis	7	9	.79
Homeopathy	9	7	.75
Naturopathy	8	8	.75

Note: SRA places higher weight on items ranked near top of list; SRA values represent difference between actual ranking distance among observations and expected distance based on permutations.

Testing of Hypotheses

Hypothesis 1. *Perceptions of CHA legitimacy will differ between clinical and academic trainees*. An independent samples *t*-test was conducted to examine whether mean perceptions of CHA legitimacy differed between trainees from clinical versus academic cohorts. No significant difference was found, $t(414) = 1.25$, $p = .21$; therefore Hypothesis 1 was not supported.

Hypothesis 2.a. *Mental health trainees will perceive CHAs as more legitimate than biomedical trainees*. An independent samples *t*-test was conducted to determine whether perceptions of CHA legitimacy differed between trainees from clinical subgroups (i.e., mental health versus biomedical). Results indicated a significant difference between these groups such that clinical mental health trainees perceived CHAs as more legitimate overall than clinical biomedical trainees; $t(123) = 7.77$, $p < .001$. Hypothesis 2.a. was therefore supported.

Hypothesis 2.b. *Mental health trainees will be more willing to recommend CHAs than biomedical trainees*. Overall willingness to recommend CHAs was calculated by summing ratings of willingness to recommend each modality and dividing by nine. Overall, mental health trainees (M = .37, SD = .23) were not significantly more willing to recommend CHAs than biomedical trainees (M = .27, SD = .22), $t(123) = 2.51$, p = .78. Hypothesis 2.b. was therefore not supported. Results from the SRA analysis further aligned with this finding, showing that the subgroups of clinical trainees agreed significantly more on willingness to recommend specific CHAs than would be expected at random, p = .02.

Hypothesis 3.a. *Mental health clinical trainees will associate CHAs more with the term "complementary" whereas biomedical clinical trainees will associate them more with the term "alternative."* An independent samples t-test was used to assess differences in terminological association between subgroups of clinical trainees. As a reminder, terminological association was collected using a single item (see Appendix D) and pertains to views of CHAs overall; ratings of terminological association for individual CHA modalities were not collected for this study. Results indicated that clinical mental health trainees were more likely to associate CHAs with the term "complementary" (M = .63, SD = .16), whereas clinical biomedical trainees were more likely to associate them with the term "alternative" (M = .36, SD = .15). Mean differences between clinical subgroups were found to be significant, $t(123) = 10.17$, $p < .001$, therefore Hypothesis 3.a. was supported.

Hypothesis 3.b. *Clinical trainees who associate CHAs more with the term "complementary" will be more willing to recommend them*. The relationship between terminological association and willingness to recommend CHAs among clinical trainees was assessed via correlation.

Association of CHAs with the term "complementary" positively correlated with higher ratings of willingness to recommend, $r(123) = .45$, $p < .001$; therefore Hypothesis 3.b. was supported.

Subject Variables

Differences in ratings of primary study variables (CHA familiarity, perceived legitimacy, willingness to recommend) were examined in relation to subject variables (age, gender, race, ethnicity) via analyses of variance (ANOVAs) and multivariate analyses of variance (MANOVAs). A one-way, between-subjects ANOVA was conducted to assess differences in ratings of CHA familiarity by age. Age was collected categorically to protect participants' identities, per IRB requirements, and subsequently dichotomized at age 35. CHA familiarity ratings did not differ significantly between younger (<35) and more advanced (≥ 35) trainees, $F(2, 414) = 2.89$, $p = .09$. A between-subjects factorial ANOVA was conducted to assess differences in ratings of CHA familiarity across the three remaining subject variables: gender (three levels), race (four levels), and ethnicity (two-levels). Race originally was collected across six categories, however three of these (American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, Other Racial Identity) were combined to protect participant identities due to low selection rates. Main effects for gender, race, and ethnicity were not significant, indicating CHA familiarity did not differ across subject variables (Table B1).

Between subjects MANOVAs were conducted to assess differences in ratings of perceived legitimacy and willingness to recommend CHAs across the same subject variables among a) clinical mental health trainees and b) clinical biomedical trainees. Four MANOVAs were conducted in total, two for each clinical subgroup. Among clinical mental health trainees, one MANOVA used age as predictor, and the other included gender, race, and ethnicity as predictors. Among clinical biomedical trainees, predictors were similarly structured, with age

used in one MANOVA and gender, race, and ethnicity included in the other. For all four MANOVAs, legitimacy and willingness were used as dependent variables. Prior to running each MANOVA, Box's M Test (1949) was conducted to examine covariance among dependent variables. Levene's Test of Equality of Variances (1960) was conducted for analyses including gender, race, and ethnicity to assess covariance among groups of the independent variable. Assumptions of homogeneity of covariance held across variables. Because *F*-test assumptions held and a linear relationship was shown among dependent variables (perceived legitimacy and willingness to recommend CHAs), Roy's Largest Root was selected as test statistic (Olson, 1974; 1976; Roy, 1957).

Among clinical mental health trainees, no significant difference in ratings of legitimacy and willingness to recommend was found between older and younger trainees, F (2, 71) = .874, p = .42, Roy's θ = .03, η^2 = .02. Main effects did not indicate significant differences in legitimacy and willingness ratings for gender, race, or ethnicity either (Table B2). Among clinical biomedical trainees, those 35 years of age and above rated CHA legitimacy and willingness to recommend significantly higher than their younger peers, F (2, 50) = 8.78, p < .001, Roy's θ = .36, η^2 = .26. Main effects did not indicate significant differences in legitimacy and willingness ratings for gender, race, or ethnicity (Table B3).

Discussion

Over the past several decades, interest in CHAs has grown steadily (Barnes, Bloom, & Nahin, 2008; Clarke et al., 2015; Nahin, Rhee, & Stussman, 2024; NCCIH, 2016). With more individuals taking health and wellness into their own hands, CHAs have become an increasingly attractive option, as they can seem more affordable and accessible than conventional medical care (Wiley, 2019). Many scholars envision a future United States healthcare system

characterized by integration of CHAs into clinical practice (e.g., Bishop & Lewith, 2010). If this prediction holds, then a more flexible and holistic medical training model will be necessary to meet evolving patient needs and demand (Cai et al., 2020). Understanding the factors associated with CHA familiarity, perceptions of legitimacy, and willingness to recommend is imperative, as these variables help to inform perspectives and associated treatment decisions among healthcare practitioners and consumers. Graduate trainees, who naturally represent a range of different training programs, identities, and experiences, offer a unique opportunity to examine CHA perceptions.

Discussion of Findings

The primary purpose of this study was to examine perceptions of CHA legitimacy and willingness to recommend CHAs in a sample of graduate students from different training backgrounds. Existing research showed that graduate students receive varying levels of exposure to CHAs as part of their professional training. For example, clinical trainees may be directly introduced to certain CHA practices during their program of study (Gazley et al., 2014), whereas this would be less likely for academic trainees. In turn, these exposures may inform clinical trainees' knowledge, skills, and expectations regarding CHAs (Tong et al., 2022). To make educated judgements regarding CHA legitimacy and appropriateness for use in clinical practice, familiarity with CHAs is a necessary precondition. The current study therefore collected data on familiarity with nine CHA modalities among students from various training programs.

Among medical students, a subset of clinical trainees not included in the current study, Healey (2015) demonstrated a relationship between perceptions of CHA legitimacy and willingness to recommend CHAs in clinical settings. Given these findings, it was hypothesized that perceptions of CHA legitimacy would vary, in the current sample, between trainees from

clinical versus academic backgrounds. It was further hypothesized that among specific subgroups of clinical trainees, those in training for mental healthcare fields would perceive CHAs as more legitimate and be more willing to recommend these practices than their peers from biomedical training backgrounds.

Results showed that overall levels of familiarity varied substantially across the nine CHAs assessed. Consistent with prior research, clinical trainees were found to be more familiar with all nine modalities, and the difference in overall familiarity between clinical and academic cohorts was significant. Among subgroups of clinical trainees, those in training for mental healthcare professions were significantly more familiar with all nine CHAs than those training in biomedicine. These results suggest several possibilities. First, it is possible that clinical programs provide more exposure to CHAs than academic programs, and that among these clinical programs, those with a mental health focus may further expose their trainees to these modalities. Second, it is possible that clinical trainees with more openness to and/or familiarity with CHAs self-select into mental healthcare training programs.

Among academic trainees, a significant relationship was found between familiarity and perceptions of CHA legitimacy, however no significant relationship was found for clinical trainees. Given academic trainees were less familiar with CHAs overall, these findings suggest that the relationship between familiarity and perceived legitimacy is stronger when familiarity is lower. This finding aligns with research by Furnham (2000) and Schulz and Hede (2018), who showed that although people in general rely primarily on familiarity when making CHA decisions, clinicians instead tend to rely more strongly on perceived legitimacy.

A significant relationship between perceptions of CHA legitimacy and overall willingness to recommend also was found. This is not surprising as one would expect future clinicians to be

more willing to recommend practices that they perceive as legitimate. These findings are consistent with Healey's (2015) research which outlined a similarly strong relationship between perceptions of CHA legitimacy and willingness to recommend among medical students. Since medical students are a subgroup of clinical trainees, the results from the current study now allow Healey's initial findings to be generalized across a more expansive clinical trainee population.

Perceptions of CHA legitimacy did not differ significantly between clinical and academic cohorts; however, within clinical subgroups, differences were observed such that mental health trainees perceived CHAs as significantly more legitimate than their biomedical peers. This finding underscores the importance of examining differences in terminology used to characterize CHAs among those from different clinical backgrounds.

As noted earlier, researchers from mental health training backgrounds (e.g., psychology PhDs) appear to more consistently described CHAs as "complementary" in nature, whereas those from biomedical backgrounds (e.g., MDs) instead characterize them as "alternative." In alignment with this observation, trainees from mental health backgrounds were found to associate CHAs more with the term "complementary," whereas trainees from biomedical backgrounds instead associated with the term "alternative;" mean differences in terminological associations between subgroups of clinical trainees were significant. Trainees who characterized CHAs as more complementary were also found to be significantly more willing to recommend them. This is consistent with prior findings that mental health trainees are typically more willing to recommend CHAs (e.g., Baugniet, Boon, & Ostbye, 2000; Teixeira Medeiros et al., 2019; Zhao et al., 2022), and further suggests that terminology used within the mental health field to describe CHAs may associate with positive views of their integration into clinical practice.

Finally, several exploratory analyses were conducted to examine the effects of demographic characteristics on CHA perceptions. Some research showed that age, gender, race, and ethnicity each associate with how individuals view CHAs; however findings have been inconsistent (e.g., Graham et al., 2005; Groden et al., 2017; Ho et al., 2014; Johnson et al., 2019; Keshet & Simchai, 2014; Stussman et al., 2020). Demographic factors were included in the current study as exploratory analyses. After analyzing ratings of primary study variables (CHA familiarity, perceived legitimacy, willingness to recommend) among levels of each demographic factor, no significant differences in ratings were found across gender, race, and ethnicity. Within the clinical biomedical subgroup specifically, older trainees rated CHAs as significantly more legitimate and were more willing to recommend them than younger trainees. Differences in ratings of primary study variable by age were not significant for the other clinical subgroup (clinical mental health trainees) or broader training cohorts (clinical trainees, academic trainees).

Limitations

Several limitations of this study exist. First, the use of sliders for measurement of study variables posed response rate and associated missing data concerns. In accordance with recommendations from Liu and Conrad (2019) the chosen starting point for slider items was scale midpoint. Advocates of this item type (e.g., Chyung et al., 2018) have argued that sliders increase data quality while reducing potential rater bias; whereas others (e.g., Cook et al., 2001; Couper et al., 2006) have noted that these scales may reduce participant response times. Patterns of missing data were found in measurement of familiarity – a variable which relied on respondents engaging with nine slider scales (one per modality). Numerous respondents left midpoint ratings of familiarity which required subsequent adjustment via series mean imputations. Despite imputations being indicated for avoidance of abundant case deletions and

sample size reduction, mean imputations have been shown to potentially reduce dispersion statistics and overall data accuracy (Cheema et al., 2014; Funke, 2016; Pedersen et al., 2017).

Second, participants were not explicitly asked to rank CHAs by familiarity or willingness to recommend. Instead, they were instructed to rate each modality on scales ranging from totally unfamiliar to very familiar (for familiarity) and extremely likely to extremely unlikely (for willingness to recommend). Data then were reallocated into rankings by the investigator. SRA was originally developed for quantifying the rank agreement of multiple ordered lists (Ekstrøm, Gerds, & Jensen, 2019), however these lists are typically created by having participants rank a set of items directly (e.g., Chang & Antwi-Afari, 2023; Chen, Calabrese, & Belén Martín-Barragán, 2024; Spudić et al. 2021). Use of SRA for comparing CHA familiarity and willingness to recommend among training cohorts and clinical subgroups is a unique innovation within this study to be sure, however failure to initially collect CHA ratings in rank form could be seen as a limitation.

Third, participants were not provided with definitions for each of the modalities included in the study. Although a general definition for CHAs was included within the questionnaire, no additional details were presented to clarify the nature or scope of the nine individual modalities. This is particularly noteworthy considering participants self-reported regarding familiarity with each modality – with no definitional guidance, participants could have inaccurate depictions of these CHAs. Additionally, since participants self-selected into this study with no incentivization, it is also likely that the sample is over-representative of those with an interest in (and/or familiarity with) CHAs.

Finally, the sample was drawn from a single university, limiting generalizability. Trainees included in the study were predominantly younger, woman-identifying, white/Caucasian, and

non-Hispanic/Latino. Clinical trainees (30%) and academic trainees (70%) were also not equally represented, although the sample was roughly representative of the broader graduate student population at the university from which it was recruited, both with regard to demographics and proportionality of training cohorts. It is further worth noting that 128 participants (30.1%) were doctoral trainees, and therefore mandated by the university to be enrolled in a qualifying health insurance program. Lewing and Sansgiry (2018) found that uninsured individuals are 50% more likely to seek out and engage with CHAs than those with insurance coverage; that said, many CHAs practices are not covered regardless of insurance status (NCCIH, 2016; Cai et al, 2020).

Implications

This study has implications for graduate trainees and instructors, as well as clinical practitioners and researchers. Each domain for which the current study's findings are applicable is discussed in further detail below.

Implications for Training. Findings indicated that program affiliation correlated with perceptions of CHA legitimacy, as well as willingness to recommend specific CHAs in the case of clinical trainees. Results showed that clinical students generally are more familiar with CHAs than are their academic peers. This is unsurprising, given the general focus of these programs on preparing competent and knowledgeable healthcare practitioners. What is surprising is that these differences in familiarity do not map onto differences in perceived legitimacy. In fact, the current study found that differences in CHA perceptions between clinical and academic cohorts were minimal, whereas differences between subgroups of clinical trainees were significant. Clinical trainees from mental health versus biomedical programs were further found to differ in their willingness to recommend CHAs, as well as in how they characterize these practices terminologically. Awareness of these differences in the connotations and consequences

associated with use of specific CHA descriptors is of particular importance to clinical trainees, as these students may find themselves navigating an array of healthcare contexts throughout their graduate training and professional placements.

Implications for Clinical Practice. Findings showed that among current clinical trainees, those from mental health backgrounds a) perceive CHAs as more legitimate, and b) may be more willing to recommend them in practice. Knowledge of differences in perceptions and recommendation tendencies among various types of healthcare providers may help current clinical trainees to gauge the settings which best align with their own perceptions – especially as they consider advanced training opportunities and eventual career placements. Awareness of the association between training background and CHA perceptions also may serve as a catalyst for existing clinical practitioners to re-evaluate their own views of these practices and consider when/how they originated. Regarding variations in terminology used to describe CHAs within specific clinical settings, the current study's findings may allow for establishment of more universally understood characterizations of CHAs across healthcare systems. For example, CHAs that are nearing status as evidence-based practices may be appropriate to describe as "complementary," whereas those with less empirical support may still be appropriate to characterized as "alternative."

Implications for Theory. Findings demonstrating relationships between familiarity, perceptions of legitimacy, and willingness to recommend CHAs are not entirely novel. That said, the current study adds to the literature because it explores relationships among these variables and training background among current graduate trainees spanning a broad array of disciplines. Examination of terminological associations and their effects on CHA perceptions and future recommendation behaviors is also unique to this study. The field of complementary healthcare has long struggled

to organize CHA modalities, and language has evolved substantially in recent decades. With that in mind, the finding that terminology within the existing literature is already a strong indicator of CHA perceptions is critical, both for unifying and organizing existing research, as well as for designing and discussing future projects and findings with awareness to the effects of language.

Recommendations for Future Study

Results from this study inform several different ongoing areas of research interest and need within the evolving complementary health field. First, an expansion of the study sample to be more nationally representative as well as racially and ethnically diverse would be useful. Although no significant relationships were seen between primary study variables and these demographic factors, the lack of diversity within the sample limits generalizability of findings. National or international studies would further allow for clarification as to whether findings are broadly applicable, or rather unique to the specific institution from which the sample was drawn.

This study also only gathered limited demographic data from participants. A second recommendation is that future studies should expand background information collected from participants to include additional factors (e.g., socioeconomic status, religious/spiritual beliefs) which may affect CHA perceptions or engagement. Qualitative research that more closely examines cultural underpinnings of CHA views could help to further clarify factors that were not centered in the current project. Future research should also consider adapting or updating content from previously validated measures (e.g., CHBQ, NAMCS) to further examine CHA perceptions among trainees from varying backgrounds while avoiding potentially confounding language.

Finally, employing a different design may allow for the gathering of important contextual information not addressed in the current cross-sectional study. A longitudinal design examining

how perceptions of clinical graduate students evolve throughout the course of their training could provide an informative extension of this current research.

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Appendix A

Mean Imputation Values and Descriptive Statistics for Primary Study Variables

Table A1.
Imputation Values for Familiarity

Modality	Familiarity Imputation Clinical	Familiarity Imputation Academic
Massage	.76*	.69*
Chiropractic/Osteopathic Manipulation	.52	.47
Herbs/Non-vitamin Supplements	.38	.43
Yoga	.75*	.64*
Acupuncture	.49*	.40*
Mind-Body Therapies	.44*	.37*
Biofeedback/Hypnosis	.24	.21
Homeopathy	.27	.28
Naturopathy	.21	.23

Note: *difference between means for clinical and academic trainees statistically significant at .05 level (2-tailed).

Table A2.
Descriptive Statistics for Familiarity with Individual Modalities

Modality	Trainee Cohort			
	Clinical Trainees		Academic Trainees	
	Mean	*SD*	*Mean*	*SD*
Massage	.76	.22	.69	.19
Chiropractic/Osteopathic Manipulation	.52	.26	.47	.22
Herbs/Non-vitamin Supplements	.38	.24	.43	.22
Yoga	.75	.18	.64	.18
Acupuncture	.49	.27	.40	.21
Mind-Body Therapies	.44	.24	.37	.20
Biofeedback/Hypnosis	.24	.25	.21	.17
Homeopathy	.27	.25	.28	.18
Naturopathy	.21	.22	.23	.17
	Clinical Trainee Subgroup			
	Clinical Mental Health Trainees		Clinical Biomedical Trainees	
	Mean	*SD*	*Mean*	*SD*
Massage	.77	.18	.74	.26
Chiropractic/Osteopathic Manipulation	.53	.25	.52	.28
Herbs/Non-vitamin Supplements	.39	.22	.37	.27
Yoga	.76	.17	.74	.21
Acupuncture	.49	.25	.49	.30
Mind-Body Therapies	.46	.21	.42	.28
Biofeedback/Hypnosis	.25	.22	.23	.29
Homeopathy	.30	.22	.23	.29
Naturopathy	.22	.18	.20	27

Note: Measures of dispersion located in this table were calculated post imputation.

Table A3.

Descriptive Statistics for Perceptions of Legitimacy

Trainee Cohort	Clinical Trainees		Academic Trainees	
	Mean	*SD*	*Mean*	*SD*
	.48	.22	.45	.20
Clinical Trainee Subgroup	Clinical Mental Health Trainees		Clinical Biomedical Trainees	
	Mean	*SD*	*Mean*	*SD*
	.59	.18	.34	.17

Table A4.

Descriptive Statistics for Willingness to Recommend Individual Modalities

Modality	Clinical Trainee Subgroup			
	Clinical Mental Health Trainees		Clinical Biomedical Trainees	
	Mean	*SD*	*Mean*	*SD*
Massage	.51	.33	.46	.35
Chiropractic/Osteopathic Manipulation	.33	.31	.21	.27
Herbs/Non-vitamin Supplements	.32	.31	.20	.25
Yoga	.64	.32	.49	.37
Acupuncture	.38	.32	.21	.23
Mind-Body Therapies	.45	.33	.31	.29
Biofeedback/Hypnosis	.26	.30	.16	.26
Homeopathy	.22	.27	.18	.25
Naturopathy	.23	.28	.17	.24

Appendix B

Subject Variable ANOVA/MANOVA Results Using Primary Study Variables as Criterion

Table B1.
ANOVA Results for Gender, Race, and Ethnicity Using Familiarity as Criterion

Predictor	Type III Sum of Squares	df	Mean Square	*F*	Sig.	Partial η^2
Intercept	3.76	1	3.76	271.72	<.001	.40
Gender	.01	2	.01	.45	.64	.002
Race	.01	3	.01	.33	.80	.002
Ethnicity	.01	1	.01	.36	.55	.001
Error	5.56	402	.01			

Table B2.
Clinical Mental Health Trainee MANOVA Results for Gender, Race, and Ethnicity Using Legitimacy/Willingness to Recommend as Criterion

Predictor	Dependent Variable	Type III Sum of Squares	df	Mean Square	*F*	Sig.	Partial η^2
Intercept	Legitimacy	4.67	1	4.67	132.48	<.001	.67
	Willingness	1.37	1	1.37	24.58	<.001	.28
Gender	Legitimacy	.06	2	.03	.81	.45	.03
	Willingness	.07	2	.04	.66	.52	.02
Race	Legitimacy	.10	2	.05	1.37	.26	.04
	Willingness	.04	2	.02	.34	.71	.01
Ethnicity	Legitimacy	.02	1	.02	.69	.41	.01
	Willingness	.02	1	.02	.34	.56	.01
Error	Legitimacy	2.26	64	.04			
	Willingness	3.56	64	.06			

Table B3.
Clinical Biomedical Trainee MANOVA Results for Gender, Race, and Ethnicity Using Legitimacy/Willingness to Recommend as Criterion

Predictor	Dependent Variable	Type III Sum of Squares	df	Mean Square	*F*	Sig.	Partial η^2
Intercept	Legitimacy	.51	1	.51	17.18	<.001	.27
	Willingness	.21	1	.21	4.14	.05	.08
Gender	Legitimacy	.03	2	.01	.43	.65	.02
	Willingness	.04	2	.02	.36	.70	.02
Race	Legitimacy	.003	2	.002	.06	.94	.003
	Willingness	.05	2	.02	.46	.64	.02
Ethnicity	Legitimacy	.02	1	.02	.54	.46	.01
	Willingness	.02	1	.02	.29	.59	.01
Error	Legitimacy	1.37	64	.05			
	Willingness	2.32	64	.03			

Appendix C

Table C1.
CHA Studies Organized by Author Training Background and Conceptualization as Complementary vs. Alternative

Article	Author(s) Background	Orientation (Complementary vs Alternative)	Indication of Orientation
Eisenberg et al., 1993	MD (3), PhD (1), MPH (2), MPP (1)	Alternative	Primary use of terms "unconventional", "alternative", "unorthodox"; focus on "costs" rather than benefits of CAM/CHA use; CAM defined generally as referring to modalities "neither taught widely in medical schools nor generally available in hospitals."
Ernst et al., 1995	MD (6), PhD (3)	Complementary	CAM is defined as "diagnosis, treatment and/or prevention which complements mainstream medicine by contributing to a common whole, satisfying a demand not met by orthodox, or diversifying the conceptual framework of medicine."
Dalen, 1998	MD, MPH	Alternative	Focus on terms "conventional" and "unconventional" (inclusion of "alternative" but never "complementary"); criticism of unconventional approaches to healthcare as "unproven scientifically" and insufficiently "scrutinized."
Gevitz, 1998	PhD	Alternative	CAM is defined as referring to modalities which fail to be broadly accepted as "correct, proper, or appropriate", and which run counter to "standards of the dominant group of medical practitioners in society."
Turner, 1998	DO	Complementary	Emphasis of need to define non-allopathic medicine as "complementary" and to move away from terms such as "alternative" or "fringe."
Ernst & Fugh-Berman, 2002	MD (2), PhD	Both terms used interchangeably	"CAM" is the primary term used (rather than either one of its components); terms "complementary" and "alternative" also appear independently at times; authors conclude current evidentiary base for most CAM modalities is insufficient for endorsement by practitioners

Tataryn, 2002	PhD	Complementary	Value of the plurality of CAM for broadening Western medical practices is discussed; paradigm classification model for organizing CAM is proposed as system which may expand the field's practical utility and further bolster its theoretical foundations
Jones, 2005	PhD	Complementary	A classification system is proposed with the intention of establishing a manner for sorting both Western medical practices and CAM/CHAs by the same process, thus lessening the perceived divide which exists between mainstream and complementary healthcare
Porcino & MacDougall, 2009	BS	Complementary	Recognition of CAM/CHAs as part of the general field of healthcare is promoted; a vertical taxonomy for classifying both Western and complementary healthcare practices via the same process is proposed

Note: This table presents a number of extant research projects and notes the background of the authors as well as the general orientation of each article as it pertains to conceptualizing CHA modalities as "complementary" versus "alternative." Publications explicitly based around either promoting or detracting from integration of CHAs into mainstream Western medicine are excluded. Articles are presented chronologically by publication date. This table is not exhaustive and is merely intended to serve as a representation of patterns observed within the literature during the review process.

Appendix D

Approaches to Healthcare Measure

Informed Consent

You are invited to participate in a research study about Complementary Health Approaches!

Please note, if you are under 18 years of age and/or are not actively enrolled in a VCU degree program, you are not eligible to participate in this study. If you are over the age of 18 and enrolled in a degree program at VCU, your participation in this study is encouraged, however it is entirely voluntary.

Should you decide to participate in our study, you will be asked to do the following:

Complete a brief survey and answer questions about

1. Familiarity with and general perceptions of various Complementary Health Approaches
2. Basic demographic information (age, race/ethnicity, gender identity, etc.)
3. Current VCU program of study.

We estimate the entire survey will take you no more than 10 minutes to complete.

By selecting "I consent" below, you may access this survey. In doing so, you consent to participation in our study and to having your responses recorded and analyzed for its purposes. Data collected from this survey will only be used for this study and will be stored securely and subsequently destroyed upon study completion.

Should you wish to withdraw your participation either during or after completing the survey, you may do so by contacting XX by phone: ____or email: _____

We thank you for your interest in our research!

- ○ I consent.
- ○ I do not consent.

Degree of Familiarity

We would like to understand your perceptions of the nine healthcare approaches listed in the table below. Using the blue slider, please rate the degree to which you are **familiar** with each healthcare modality (from totally unfamiliar to very familiar).

	Totally Unfamiliar	Neutral	Very Familiar
Massage ()			
Chiropractic/Osteopathic Manipulation ()			
Herbs/Non-vitamin Supplements ()			
Yoga ()			
Acupuncture ()			
Mind-Body Therapies ()			
Biofeedback/Hypnosis ()			
Homeopathy ()			
Naturopathy ()			

Training Background

Students from many different fields are responding to this survey. This question pertains to whether or not you have **direct clinical contact** with patients or clients as part of your training. That is, **does your degree program teach you to provide healthcare services to patients or clients?**

○ No, in my present program of study I will not have experience working directly with patients/clients.

○ Yes, in my present program of study I have had or will have experiences working directly with patients/clients.

Willingness to Recommend CHAs in clinical context

Imagine that you have completed your degree and are now practicing as a licensed professional in your field. How likely would **<u>you</u>** be to ***recommend*** these healthcare approaches to a patient or client in the course of your day-to-day work?

	Extremely unlikely	Neither likely nor unlikely	Extremely likely
Massage ()			
Chiropractic/Osteopathic Manipulation ()			
Herbs/Non-vitamin Supplements ()			
Yoga ()			
Acupuncture ()			
Mind-Body Therapies ()			
Biofeedback/Hypnosis ()			
Homeopathy ()			
Naturopathy ()			

Perceptions of CHA Legitimacy

Please consider the following definition of Complementary Health Approaches (CHAs):

"Complementary Health Approaches refer to a spectrum of non-traditional healthcare practices and perspectives that purport to mitigate or prevent negative health outcomes, and which may be demonstrated as effective when implemented either independently or in conjunction with more standard techniques from traditional western medicine."

Given this definition, please indicate on the slider provided below how ***legitimate*** you *consider these approaches to be generally* in comparison to traditional Western (allopathic) medicine.

	Not at All	Neutral	Completely
CHAs ()			

Descriptive Terminology(Complementary vs Alternative)

Terminology relating to CHAs has evolved over the course of the past several decades, and many individuals may be more familiar with the term ***CAM*** (*Complementary* and *Alternative Medicine*), which was largely used instead of CHA within the literature until recently.

Considering the various modalities previously presented within this survey, please indicate on the slider provided the degree to which you associate CHAs more strongly with the term "*Alternative*" or the term "*Complementary.*"

	Alternative	Complementary
CHAs ()		

Demographic Information

In the space provided below, please indicate the degree program in which you are ***currently*** enrolled.

_____

Please select your age using the following ranges

- ○ 24 or under (1)
- ○ 25 - 34 (2)
- ○ 35 - 44 (3)
- ○ 45 - 54 (4)
- ○ 55 or above (5)

Please select the gender with which you most closely identify

- ○ Man (1)
- ○ Woman (2)
- ○ Non-binary / third gender (3)

Please select the race with which you most closely identify

- ○ American Indian or Alaska Native (1)
- ○ Asian / Asian American (2)
- ○ Black or African American (3)
- ○ Native Hawaiian or Other Pacific Islander (4)
- ○ White or Caucasian (5)
- ○ Other

Please select the ethnicity with which you most closely identify

- ○ Hispanic or Latino (1)
- ○ Not Hispanic or Latino (2)

Vita

Delaney Christopher Bilodeau was born on March 23, 1997, in Providence, RI and is an American citizen. He graduated from Keene High School in Keene, New Hampshire in 2015, and received a Bachelor of Arts in Psychology with minors in Justice Studies and Forensic Science from the University of New Hampshire in Durham, NH in 2019. He subsequently earned a Master of Arts in Clinical Mental Health Counseling from Boston College in Chestnut Hill, MA in 2021. Delaney was formerly employed as a clinical case manager at CapeAbilities in Hyannis, MA and at Monadnock Family Services in Keene, NH. He also served in roles as a Life Skills/Career Coach for the Department of Developmental Services in Rochester, NH and as an Adult Psychotherapist at Community Partners in Dover, NH. While completing graduate coursework at Virginia Commonwealth University, Delaney served as a teaching assistant, a practicum clinician at VCU University Counseling Services, and is presently completing a practicum experience at the Center for Psychological Services and Development, where he will assume the role of Assistant Director in 2024. Delaney also began teaching undergraduate courses as an Adjunct Instructor in the VCU Psychology Department in May 2023.