



Integration of complementary and alternative medicine into the healthcare and educational system: Perspectives of healthcare professionals and oncology patients

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Abstract

This study examines the attitudes of healthcare professionals and oncology patients toward integrating complementary and alternative medicine (CAM) into healthcare and education. The aim is to identify differences in perception, acceptance, and interest in CAM education, as well as key challenges and opportunities for its implementation in Croatia. Methods: A cross-sectional study was conducted with 832 respondents (411 patients and 421 healthcare professionals). Standardized questionnaires assessed attitudes, acceptance levels, and the need for further education. Differences between patients and healthcare professionals, as well as between physicians and nurses, were analyzed. Results: Results indicate that patients show higher acceptance of CAM, viewing it as a valuable complement to conventional treatment. Physicians express caution, emphasizing the need for additional education before CAM integration, while nurses are more supportive, reflecting their holistic patient-care approach. Most respondents acknowledge the lack of CAM education in Croatian medical curricula, consistent with international trends. However, a significant number of healthcare professionals express interest in further education, highlighting the need for structured, evidence-based training. In conclusion, findings underscore the necessity of integrating CAM into medical education, developing regulatory frameworks, and implementing structured training programs to ensure safe and informed CAM use in healthcare.

Keywords: Alternative medicine, Attitudes, Complementary medicine, Complementary therapies, Healthcare workers, Patients.

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Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Institutional Review Board Statement: This study was approved by the Ethics Committee of the University Hospital Centre Sisters of Mercy (Class: 003-06/21-02/001, Registration number: 251-29-111/1-21-01-9) and was conducted in compliance with all relevant guidelines ensuring the proper conduct of the research and protection of participants while adhering to the principles of good clinical practice. During the study, the most important ethical and bioethical principles — autonomy, justice, beneficence and non-maleficence — were upheld by the Nuremberg Code, the Declaration of Helsinki (latest revision), the Health Act of the Republic of Croatia (NN 158/08, 71/10, 139/10, 22/11, 84/11, 12/12, 35/12, 70/12, 82/13, 100/18, 125/19, 147/20, 119/22, 156/22 and 33/23), the Law on Patients' Rights of the Republic of Croatia (NN 169/04, 37/08) and Regulation (EU) 2016/679 of the European Parliament and of the Council of April 27, 2016, on protecting natural persons about the processing of personal data and the free movement of such data (GDPR).

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1. Introduction

Complementary and alternative medicine (CAM) is becoming increasingly important in modern healthcare systems, especially among cancer patients, who often use CAM as an adjunct to conventional therapies to alleviate the side effects of treatment, improve quality of life, and manage stress. The simplest definition of complementary and alternative treatments or CAM is "any procedure or product that is not accepted in official medicine and is not supported by the prevailing healthcare system" [1]. However, the boundary between conventional and alternative medicine is not always clear, as some methods, such as acupuncture, are gradually being integrated into clinical practice. Others, however, remain on the fringes due to a lack of scientific evidence. According to some authors, medicine is an exclusively science-based practice, and all other treatments are considered paramedical and have no place in scientific discourse [2].

The prevalence of alternative medicine use varies widely from region to region, with cultural traditions, access to healthcare, and social norms being significant factors. In the United States, it is estimated that almost 40% of adults use alternative treatments [3], while in Europe, this proportion is often over 50% [4, 5]. Asian countries with a long tradition of traditional medicine, such as Ayurveda and Traditional Chinese Medicine (TCM), are examples where CAM practices are often institutionalized and integrated into public health systems [6]. Although research on the use of CAM in Croatia is limited, the available data indicate high prevalence rates. Studies suggest that the utilization of CAM methods among oncology patients can be as high as 85% [7, 8], highlighting the significant presence of these practices in specific populations.

Despite their widespread use, the attitudes and beliefs of healthcare professionals towards CAM are often underestimated or poorly researched, particularly within conventional medical systems. This lack of research underscores the need for more studies on this topic. Research shows that opinions among healthcare professionals are divided: while physicians often express skepticism due to a lack of clinical evidence of efficacy, nurses—due to their closer relationship with patients—are more inclined to accept alternative treatments as complementary to conventional therapies [9]. This dichotomy underscores the importance of examining health professionals' beliefs and attitudes toward CAM to identify barriers and opportunities for integrating these therapies into clinical practice.

Integrating complementary, alternative, and integrative medicine into healthcare systems is increasingly debated in modern medicine. Some systems strive to implement traditional, complementary, and integrative healthcare practices, while others seek to limit them through regulatory frameworks. However, the potential benefits of CAM integration are significant, offering additional patient care forms, improving the quality of care, promoting collaboration between professionals, and enhancing patient well-being. Healthcare professionals are key in realizing these benefits and integrating complementary and alternative medicine into healthcare and education systems. Although they often emphasize their lack of formal knowledge of CAM, they recognize its value, underscoring the importance of systematic education and access to reliable information [10].

According to the World Health Organization [11], the integration of complementary and alternative medicine (CAM) into health and education systems in Europe varies widely, ranging from full integration to minimal regulation (Table 1). Countries such as Germany, Switzerland, and Portugal are characterized by systematically integrating complementary medicine into the legal framework, educational programs, and medical practice.

In Germany and Switzerland, for example, CAM is part of the formal training of doctors, and specific therapies, such as homeopathy and acupuncture, are recognized and covered by health insurance. Portugal has also regulated seven CAM disciplines through a legal framework, including mandatory study programs and licensing requirements for CAM practitioners.

In contrast, Croatia has no national CAM policy, and regulation is limited to herbal medicines, which are treated similarly to conventional pharmaceutical products. Alternative medicine education is not officially included in the curricula for health

professionals. Data from European countries suggest that integrating CAM into the education system contributes to the professionalization and standardization of practice, which can increase the confidence of both patients and healthcare providers.

At the level of healthcare systems, examples from countries such as Switzerland and the UK show the potential for the integration of CAM through a combination of public and private funding. In these systems, patient choice is a key principle, allowing individuals to make decisions about their healthcare based on their preferences and needs. In Switzerland, specific therapies, including acupuncture and herbal medicine, are covered by basic insurance when provided by licensed practitioners. In the UK, pluralism in healthcare allows patients to choose between conventional and alternative medicine, with part of the cost funded by public sources [11]. This respect for patient choice is a fundamental aspect of healthcare that should be preserved and promoted in the integration of CAM.

Table 1.

Overview of CAM Regulation, Education, and Funding in the Healthcare and Educational Systems of European Countries and the Region.

Country	Regulation in the Healthcare System	Education and Integration in the Education System	Funding
Austria	Regulated CAM practice includes homeopathy, acupuncture, and osteopathy.	Education is included in medical faculties for doctors; additional courses are available for therapists.	Partial coverage by health insurance for acupuncture and certain CAM therapies.
Bosnia and Herzegovina	CAM is not formally regulated; herbal medicines are subject to basic pharmaceutical regulations.	Education is unavailable nationally; individual courses are available through private organizations.	Mostly self-financed services.
Montenegro	Regulation in preparation; currently, there are no defined rules for CAM practitioners.	Education is unavailable; collaborations with international experts (e.g., China) are planned.	No health insurance coverage.
Czech Republic	CAM is subject to the same regulations as conventional medicines, such as regulated therapists.	Education for acupuncture and homeopathy is included in postgraduate programs for doctors.	They mainly offer self-financed services, with limited coverage for acupuncture.
Croatia	The regulation is limited to herbal medicines treated as pharmaceutical products.	Education on Complementary and Alternative Medicine (CAM) is not formally included in medical and related educational programs.	Mostly self-financed by patients, public health insurance does not cover CAM services.
Italy	CAM is regulated through regional laws; access varies by region.	Limited integration into the education system; specialized courses available for doctors.	Mostly self-financed; in some regions, partial coverage for acupuncture and homeopathy.
Hungary	National regulation since 1997 includes naturopathy, acupuncture, and homeopathy.	Education is included in the curriculum for healthcare professionals, with additional licensed courses.	Acupuncture is partially covered in public hospitals; other services self-financed.
Germany	CAM is included in the legal framework and recognized therapies such as homeopathy, acupuncture, and phytotherapy.	CAM is part of medical school curricula, with additional training for doctors and pharmacists.	Certain therapies are partially or fully covered by health insurance. Homeopathy, phytotherapy, and acupuncture are covered for specific indications (e.g., acupuncture for back and knee pain).

Country	Regulation in the Healthcare System	Education and Integration in the Education System	Funding
Portugal	Seven disciplines (including acupuncture and phytotherapy) are regulated by law, practitioner licensing, and certification.	Mandatory four-year degree programs for selected disciplines; regulation in collaboration with health and education ministries.	Partial coverage by private health insurance. Acupuncture is covered by private insurance and partially by some public health projects. Specific private health policies may cover homeopathy, osteopathy, and naturopathy. Phytotherapy is secured in the private sector but is integrated into the healthcare system through regulation and professional training.
Slovakia	Since 2010, CAM therapists have been licensed and regulated through national programs.	Specialized studies are available for acupuncture at universities.	Acupuncture and traditional Chinese medicine are partially covered by private insurance.
Slovenia	Regulation since 2007 for acupuncture, homeopathy, osteopathy, and other methods.	Education is not formalized at universities; courses are available for certain methods.	Mostly self-financed; services are not covered by public insurance.
Serbia	Regulation since 2007 includes acupuncture, homeopathy, traditional Chinese medicine, and other methods.	Education is available through courses for doctors, dentists, and pharmacists and certification by the Ministry of Health.	CAM services are not covered by health insurance; funded through private sources.
Switzerland	CAM was integrated into the constitution (Article 118a) and regulated therapies such as acupuncture, homeopathy, and anthroposophic medicine.	Education is available through formal and specialized programs, including university levels.	Therapies such as acupuncture and homeopathy are covered by mandatory health insurance.
United Kingdom	CAM is regulated through legislation and recommendations, a pluralistic approach to healthcare.	CAM is included in optional educational modules for medical professionals and the regulation of practitioner standards.	Mainly privately funded; limited NHS coverage for selected therapies. Acupuncture is covered for specific indications such as chronic pain, lower back pain, migraines, and nausea induced by chemotherapy. Homeopathy is available in limited NHS homeopathic hospitals (e.g., in London, Glasgow, and Bristol), though funding is decreasing. Chiropractic and osteopathy are partially covered for musculoskeletal issues, usually with a referral from a general practitioner. Phytotherapy has limited support, mainly through research projects and specific NHS institutions.

Note: * Since 2020, the Regulation on Norms and Standards for the Provision of Healthcare Services (NN 52/2020-1048), in Article 13, point 5, and Article 16, point 5, defines the conditions for performing acupuncture services in family (general) medicine clinics and specialist clinics. https://akupunktura.hr/drustvo/o-nama/

1.1. Aim Of The Study and Hypothesis

The primary aim of this study was to analyze nurses' and physicians' beliefs and attitudes regarding the integration of CAM into the healthcare and education systems. Specific objectives included assessing health professionals' interest in CAM and integrative medicine education, as well as evaluating oncology patients' support for such integration.

Null hypothesis: "There are no statistically significant differences in the interest of healthcare professionals in CAM and integrative medicine education, nor are there statistically significant differences in the beliefs and attitudes of healthcare professionals and oncology patients regarding the integration of CAM into the healthcare and education system"

2. Participants and Methods

The cross-sectional study was conducted between November 2022 and May 2023 at the Sisters of Mercy College Hospital Center (KBC Sestre milosrdnice) in Zagreb, Croatia. The planned sample size was 1,200 respondents distributed proportionally across strata and sub-strata, considering the total number of health professionals in the study area and the total number of patients in the specified period. The study aimed to include approximately 30% of newly registered oncology patients, i.e., an estimated 1,200 over six months, giving a target sample of 400 patients. Among healthcare professionals, the planned sample comprised 150 doctors and 450 nurses. The final participation rates were as follows: 68.5% of oncology patients (411), 66.66% (100) of physicians, and 71.33% (321) of nurses. Among healthcare professionals, the sample represented 16.6% of all physicians and 18.9% of all nurses/technicians employed by UHC Sisters of Mercy, ensuring a representative study group.

Notes on terminology: In this study, the term nurse is used generically and refers to nurses and healthcare professionals, regardless of gender, professional standards, and language use.

2.1. Participants

The study was conducted using a proportionally stratified random sample, with participants divided into two strata: Stratum 1: oncology patients diagnosed with a disease classified as oncologic according to the International Classification of Diseases, regardless of disease stage; Stratum 2: healthcare professionals working in oncology, further divided into: Stratum 2.1 physicians and Stratum 2.2 nurses.

The study included healthcare professionals directly involved in oncology care, such as physicians and nurses working in oncology departments, as well as those indirectly involved in the care of cancer patients, such as healthcare professionals from the hematology, surgery, gynecology, and otorhinolaryngology departments of the college hospital where the study was conducted.

2.2. Description of the Sample

The study comprised a total of 832 participants, of whom 29.4% were male and 70.6% female. Of the oncology patients, 42.6% were male and 57.4% female, while the medical staff was divided into physicians (32% male, 68% female) and nurses/technicians (11.8% male, 88.2% female). In terms of age distribution, the highest percentage of participants fell into the 51–60 age group (25.2%), closely followed by the 41–50 age group (24.8%), while 22.8% were over 60 years old. Specifically, 44.3% of oncology patients were over 60 years old, while most healthcare professionals were between 31 and 50 years old.

In terms of educational attainment, 40.6% of participants had a secondary school degree, while 58.3% had a university degree (university or university). All doctors had a university degree, while 73.2% of nurses had a university degree. In terms of work experience, the majority of healthcare professionals had been working for 16to 25 years (27%), while 8.5% had more than 35 years of experience. Of the doctors, most had between 5 and 25 years' experience, while a larger proportion of nurses had a longer period of service.

In terms of involvement in oncology, 30.7% of healthcare professionals worked directly in oncology, while 69.3% contributed indirectly to oncology patient care. Of the physicians, 56% worked in oncology departments, compared to 22.9% of nurses.

2.3. Questionnaire and Data Collection

Two questionnaires were used in this study — one for healthcare professionals and the other for oncology patients. Both questionnaires were adapted with minor modifications from previously validated instruments: the CAM Health Belief Questionnaire (CHBQ) and the Integrative Medicine Attitude Questionnaire (IMAQ) [12, 13]. Eligible participants were invited to take part in the study during their hospital visits or work shifts. Oncology patients were recruited by trained researchers either during outpatient appointments or inpatient stays, while healthcare professionals were approached through departmental meetings and workplace announcements. Prior to participation, all respondents provided written informed consent.

To minimize nonresponse and enhance clarity, surveys were conducted face-to-face, with trained interviewers assisting participants in completing the questionnaires. This approach ensured consistency and accuracy across responses.

Collected data was anonymized and securely stored in a protected database, with trained personnel responsible for data entry. To maintain data integrity, responses were carefully double-checked for accuracy and completeness. Additionally, all identifying information was removed to protect participant confidentiality.

2.4. Statistical Analysis

The data collected were organized according to the research objectives and presented in both text and tabular form to provide a comprehensive understanding of attitudes, preferences, and behavioral trends related to CAM use. Both descriptive and inferential statistical methods were used for the analysis. Descriptive statistics were used to summarize the data, with results presented in the form of absolute frequencies, percentages, and central tendency measures, including means, standard deviations, and ranges (minimum and maximum). To compare the means of three or more groups, a one-way analysis of variance (ANOVA) was performed, assuming normal data distribution. If the ANOVA results indicated statistically significant differences, a post hoc Tukey test was performed to determine which groups showed notable differences. This approach allowed for a more detailed examination of differences in attitudes and experiences related to CAM.

3. Results

The data collected were structured according to the research objectives and presented in both text and tabular form to allow a thorough examination of attitudes, preferences, and behavioral trends related to the use of alternative medicine. Statistical analysis was performed using both descriptive and inferential methods. Descriptive statistics summarized the data using absolute frequencies, percentages, and measures of central tendency, including means, standard deviations, and ranges of values (minimum and maximum). To compare mean differences between three or more groups, a one-way analysis of variance (ANOVA) was performed, assuming normal data distribution. If significant differences were found, a post hoc Tukey test was performed to identify specific group differences. This analytical approach allowed for a deeper examination of differences in attitudes and experiences related to CAM.

The results reflect the views of healthcare professionals and oncology patients regarding the inclusion of complementary and alternative medicine (CAM) in both medical education and medical practice. The study examined opinions about the formal education of health professionals in CAM, the need for the integration of CAM into academic curricula, and the regulation of CAM practices. Statistical tests such as the chi-square test, one-way ANOVA, and Tukey post-hoc analysis were used to assess these attitudes.

Table 2 shows the degree of agreement with the statements, while Table 3 shows the average values of the observed groups (on a scale of 1–5). Chi-square and ANOVA tests revealed a statistically significant difference (p < 0.05) between all observed groups.

A post-hoc analysis was performed to determine statistically significant differences between physicians, nurses and patients regarding their attitudes towards the integration of CAM into the education and health care system (Table 4).

The results show significant differences between doctors and patients for most statements (13 of 17 statements, p < 0.05). Differences between nurses and patients were less pronounced, with no statistically significant difference found for seven statements. However, significant differences were found between doctors and nurses for 12 statements.

Note: The letter (R) indicates recorded statements. Recording statements means that certain points have been rephrased from the original, changing their meaning. This technique is often used in survey research to check the consistency of responses and reduce bias.

Table 2.

Level of Agreement with Statements on the Integration of CAM into the Healthcare and Educational Systems.

Statement	Degree of agreement on a	Strata					
	Likert scale 1 – 5	Pa	tients	Health workers		Т	otal
		Ν	%	Ν	%	Ν	%
I know the difference between	I completely disagree.	10	2.4%	18	4.3%	28	3.4%
complementary and alternative	I mostly disagree.	44	10.7%	49	11.6%	93	11.2%
medicine.	I neither agree nor disagree.	124	30.2%	106	25.1%	230	27.6%
	I mostly agree.	169	41.2%	126	29.9%	295	35.5%
	I completely agree.	63	15.4%	123	29.1%	186	22.4%
	Total	410	100.0%	422	100.0%	832	100.0%
During their education,	I completely disagree.	5	1.2%	17	4.0%	22	2.6%
healthcare professionals should	I mostly disagree.	10	2.4%	43	10.2%	53	6.4%
be trained in CAM through	I neither agree nor disagree.	75	18.3%	122	28.9%	197	23.7%
accredited curricula and	I mostly agree.	207	50.5%	140	33.2%	347	41.7%
programs.	I completely agree.	113	27.6%	100	23.7%	213	25.6%
	Total	410	100.0%	422	100.0%	832	100.0%
Healthcare professionals should	I completely disagree.	5	1.2%	47	11.1%	52	6.3%
have formal education in the	I mostly disagree.	16	3.9%	44	10.4%	60	7.2%
field of CAM.	I neither agree nor disagree.	104	25.4%	124	29.4%	228	27.4%
	I mostly agree.	195	47.6%	121	28.7%	316	38.0%
	I completely agree.	90	22.0%	86	20.4%	176	21.2%
	Total	410	100.0%	422	100.0%	832	100.0%
During their formal education.	I completely disagree.	3	0.7%	6	1.4%	9	1.1%
healthcare professionals receive	I mostly disagree.	13	3.2%	24	5.7%	37	4.4%
very little or no information	I neither agree nor disagree.	135	32.9%	83	19.7%	218	26.2%
about CAM.	I mostly agree.	158	38.5%	140	33.2%	298	35.8%
	I completely agree.	101	24.6%	169	40.0%	270	32.5%
	Total	410	100.0%	422	100.0%	832	100.0%
Healthcare professionals do not	I completely disagree.	2	0.5%	9	2.1%	11	1.3%
have enough knowledge to	I mostly disagree.	19	4.6%	29	6.9%	48	5.8%
discuss the application and	I neither agree nor disagree.	128	31.2%	99	23.5%	227	27.3%
effectiveness of CAM with	I mostly agree.	178	43.4%	138	32.7%	316	38.0%
patients in a qualified manner.	I completely agree.	83	20.2%	147	34.8%	230	27.6%
	Total	410	100.0%	422	100.0%	832	100.0%
	I completely disagree.	2	0.5%	31	7.3%	33	4.0%

Statement	Degree of agreement on a	a Strata							
	Likert scale 1 – 5	Pa	tients	Health workers		Т	'otal		
		Ν	%	Ν	%	Ν	%		
I would like healthcare	I mostly disagree.	9	2.2%	47	11.1%	56	6.7%		
professionals to acquire enough	I neither agree nor disagree.	81	19.8%	97	23.0%	178	21.4%		
knowledge through formal	I mostly agree.	216	52.7%	125	29.6%	341	41.0%		
education programs to discuss	I completely agree.	102	24.9%	122	28.9%	224	26.9%		
the application and effectiveness	Total	410	100.0%	422	100.0%	832	100.0%		
of CAM with interested patients									
in a qualified manner.									
Education in the field of CAM	I completely disagree.	4	1.0%	39	9.2%	43	5.2%		
should be an integral part of	I mostly disagree.	15	3.7%	54	12.8%	69	8.3%		
educational curricula for all	I neither agree nor disagree.	77	18.8%	114	27.0%	191	23.0%		
nealthcare professionals.	I mostly agree.	210	51.2%	111	26.3%	321	38.6%		
	I completely agree.	104	25.4%	104	24.6%	208	25.0%		
	Total	410	100.0%	422	100.0%	832	100.0%		
CAM education should be	I completely disagree.	3	0.7%	38	9.0%	41	4.9%		
systematically integrated into	I mostly disagree.	14	3.4%	65	15.4%	79	9.5%		
various classical medical	I neither agree nor disagree.	95	23.2%	115	27.3%	210	25.2%		
internal medicine and pursing) at	I mostly agree.	202	49.3%	108	25.6%	310	37.3%		
all levels of education both	I completely agree.	96	23.4%	96	22.7%	192	23.1%		
theoretically and practically.	lotal	410	100.0%	422	100.0%	832	100.0%		
CAM therapy is generally	I completely disagree.	3	0.7%	17	4.0%	20	2.4%		
dangerous for patients and	I mostly disagree.	16	3.9%	47	11.1%	63	7.6%		
should be avoided. (R)	I neither agree nor disagree.	86	21.0%	131	31.0%	217	26.1%		
	I mostly agree.	161	39.3%	108	25.6%	269	32.3%		
	I completely agree.	144	35.1%	119	28.2%	263	31.6%		
	Total	410	100.0%	422	100.0%	832	100.0%		
Individuals who practice CAM	I completely disagree.	20	4.9%	29	6.9%	49	5.9%		
without being healthcare	I mostly disagree.	51	12.4%	68	16.1%	119	14.3%		
professionals are mere	I neither agree nor disagree.	149	36.3%	178	42.2%	327	39.3%		
charlatans and should be banned	I mostly agree.	139	33.9%	84	19.9%	223	26.8%		
from practicing. (R)	I completely agree.	51	12.4%	63	14.9%	114	13.7%		
	Total	410	100.0%	422	100.0%	832	100.0%		
I am surprised by people who do	I completely disagree.	16	3.9%	27	6.4%	43	5.2%		
not realize that the motivation of	I mostly disagree.	32	7.8%	52	12.3%	84	10.1%		
CAM therapists is profit rather	I neither agree nor disagree.	195	47.6%	202	47.9%	397	47.7%		
than patient well-being. (R)	I mostly agree.	112	27.3%	81	19.2%	193	23.2%		
	I completely agree.	55	13.4%	60	14.2%	115	13.8%		
		410	100.0%	422	100.0%	832	100.0%		
CAM therapists should undergo	I completely disagree.		0.2%	/	1.7%	8	1.0%		
a licensing system just like	I mostly disagree.	5	0.7%	19	4.5%	22	2.0%		
professionals	I neither agree nor disagree.	37	13.9%	98	23.2%	155	18.0%		
professionals.	I mostly agree.	172	42.0%	120	28.4%	292	33.1% 42.7%		
	Total	410	45.2%	178	42.2%	833	42.7%		
There should be a specialization	I completely disagree	1	0.2%	33	7.8%	34	100.070		
in CAM therapy	I mostly disagree	7	1.7%	45	10.7%	52	4.170 6.3%		
in ertin therapy.	I neither agree nor disagree	59	1.770	120	28.4%	179	21.5%		
	I mostly agree	168	41.0%	1120	26.5%	280	33.7%		
	I completely agree	175	42.7%	112	26.5%	287	34 5%		
	Total	410	100.0%	422	100.0%	832	100.0%		
Only medical doctors should	I completely disagree.	55	13.4%	22	5.2%	77	9.3%		
practice CAM therapy. (R)	I mostly disagree.	78	19.0%	54	12.8%	132	15.9%		
· · · · · · · · · · · · · · · · · · ·	I neither agree nor disagree.	123	30.0%	196	46.4%	319	38.3%		
	I mostly agree.	100	24.4%	78	18.5%	178	21.4%		
	I completely agree.	54	13.2%	72	17.1%	126	15.1%		
	Total	410	100.0%	422	100.0%	832	100.0%		
	I completely disagree.	10	2.4%	33	7.8%	43	5.2%		
	I mostly disagree.	14	3.4%	28	6.6%	42	5.0%		

Statement	Degree of agreement on a	Strata						
	Likert scale 1 – 5	Patients		Patients Health workers Total		Patients Health workers		otal
		Ν	%	Ν	%	Ν	%	
The state should determine who	I neither agree nor disagree.	74	18.0%	138	32.7%	212	25.5%	
is allowed to practice and	I mostly agree.	183	44.6%	113	26.8%	296	35.6%	
provide CAM.	I completely agree.	129	31.5%	110	26.1%	239	28.7%	
	Total	410	100.0%	422	100.0%	832	100.0%	
I am proud of those healthcare	I completely disagree.	2	0.5%	23	5.5%	25	3.0%	
professionals and patients who	I mostly disagree.	7	1.7%	24	5.7%	31	3.7%	
can openly discuss the benefits	I neither agree nor disagree.	90	22.0%	124	29.4%	214	25.7%	
and risks of using CAM.	I mostly agree.	148	36.1%	124	29.4%	272	32.7%	
	I completely agree.	163	39.8%	127	30.1%	290	34.9%	
	Total	410	100.0%	422	100.0%	832	100.0%	
I would like healthcare	I completely disagree.	3	0.7%	36	8.5%	39	4.7%	
professionals to have formal	I mostly disagree.	7	1.7%	39	9.2%	46	5.5%	
education in complementary and	I neither agree nor disagree.	65	15.9%	108	25.6%	173	20.8%	
alternative medicine (CAM).	I mostly agree.	192	46.8%	112	26.5%	304	36.5%	
	I completely agree.	143	34.9%	127	30.1%	270	32.5%	
	Total	410	100.0%	422	100.0%	832	100.0%	

An analysis of the beliefs and attitudes of healthcare professionals and patients regarding CAM highlights notable differences between these groups in their perspectives and approaches to integrating CAM into medical education and healthcare systems. When assessing their understanding of the distinction between complementary and alternative medicine, 35.5% of respondents agreed with the statement that they comprehend the difference, while 22.4% strongly agreed. Healthcare professionals demonstrated greater confidence in their understanding, with 29.1% fully agreeing, compared to 15.4% of patients.

The majority of respondents support the idea that healthcare professionals should receive formal education on CAM. Specifically, 41.7% of all respondents agreed that CAM education should be included through accredited curricula, while 25.6% fully agreed. Comparatively, 46.8% of patients supported this statement, whereas this percentage was 26.5% among healthcare professionals. Regarding the provision of CAM-related information during formal education, 40% of healthcare professionals stated that they received very little or no information about CAM, a view shared by 24.6% of patients. These findings indicate a clear lack of educational content related to CAM.

It is also interesting to analyze beliefs and attitudes toward the potential risks of CAM. The statement that "CAM methods are dangerous and harmful to health" divided the respondents: 33.3% of all participants mostly disagreed, while 31.6% fully agreed with the statement. Patients exhibited a lower level of agreement with this statement (72.7% disagreed) compared to healthcare professionals (54.3%).

The issue of licensing CAM practitioners also highlighted a high level of agreement among all respondents. As many as 42.7% fully agreed that CAM practitioners should undergo licensing similar to healthcare professionals, while an additional 35.1% expressed moderate agreement with this statement.

One of the key aspects concerns discussions about CAM. More than 38% of respondents mostly agreed that healthcare professionals should be trained to discuss CAM with patients, while 33.8% fully agreed. These results point to the need for improved communication and information dissemination in clinical practice. While patients show tremendous enthusiasm for integrating CAM into the healthcare system, healthcare professionals remain cautious, particularly regarding risk perception.

According to the mean values on a scale from 1 to 5, the most accepted statement among physicians was, "I know the difference between complementary and alternative medicine" (M = 4.09). The highest average score was recorded among nurses for the statement, "CAM practitioners should undergo a licensing system similar to that of conventional healthcare professionals" (M = 4.09). This statement was also supported by patients (M = 4.27). The second and third most accepted statements among physicians and nurses were, "Healthcare professionals should be educated about CAM through accredited curricula" (physicians M = 4.01; nurses M = 4.06) and "During their formal education, healthcare professionals receive very little or no information about CAM" (physicians M = 4.01; nurses M = 4.06).

Among patients, the second most accepted statement was the reverse-coded statement "CAM therapy is generally dangerous for the patient and should be avoided" (M = 4.04), followed by "Healthcare professionals should be educated about CAM through accredited curricula" as the third most accepted statement.

The least accepted statement among physicians was, "Education on CAM should be systematically integrated into various conventional medical subjects—from anatomy to internal medicine and nursing—at all levels of education, both theoretically and practically" (M = 2.32). Nurses (M = 3.40) and patients (M = 3.05) showed the lowest agreement with the reverse-coded statement "Only physicians should practice CAM therapy."

The second and third least accepted statements among physicians were "Education on CAM should be an integral part of curricula for all healthcare professionals" (M = 2.47) and "Individuals practicing CAM without a healthcare background are mere charlatans and should be banned from practice" (M = 2.38). Among nurses, the least accepted statements were "Only physicians should practice CAM therapy" (R) (M = 3.40) and "The state should determine who is allowed to practice and

provide CAM" (M = 3.52). Among patients, the second and third least accepted statements were "Individuals practicing CAM without a healthcare background are mere charlatans and should be banned from practice" (M = 3.36) and "I am surprised by people who do not realize that the main motivation of CAM practitioners is profit rather than patient well-being" (M = 3.38).

Table 3.

Mean values and standard deviation of respondents' beliefs and attitudes toward the integration of	f CAM into the hea	Ithcare and education	onal systems.

Statement		Physicians		Nurses		Patients	
		SD	Μ	SD	Μ	SD	
I know the difference between complementary and alternative medicine.	4.29	1.038	3.49	1.101	3.56	.957	
During their education. healthcare professionals should be trained in CAM	4.01	004	1.06	008	4.00	017	
through accredited curricula and programs.	4.01	.904	4.00	.998	4.00	.017	
Healthcare professionals should have formal education in the field of CAM.	2.39	1.302	3.67	1.041	3.85	.848	
During their formal education. healthcare professionals receive very little or no information about CAM.	4.01	.904	4.06	.998	3.83	.861	
Healthcare professionals do not have enough knowledge to discuss the application and effectiveness of CAM with patients in a qualified manner.	3.66	.844	3.99	1.061	3.78	.836	
I would like healthcare professionals to acquire sufficient knowledge through formal education programs to discuss the application and effectiveness of CAM with interested patients in a qualified manner.	2.51	1.210	3.96	.996	3.99	.762	
Education in the field of CAM should be an integral part of educational curricula for all healthcare professionals.	2.38	1.179	3.78	1.072	3.96	.823	
CAM education should be systematically integrated into various classical medical subjects (from anatomy to internal medicine and nursing) at all levels of education. both theoretically and practically.	2.32	1.127	3.71	1.085	3.91	.814	
CAM therapy is generally dangerous for patients and should be avoided. (R)	2.66	.997	3.93	.985	4.04	.885	
Individuals who practice CAM without being healthcare professionals are mere charlatans and should be banned from practicing. (R)	2.47	.948	3.43	1.038	3.36	1.011	
I am surprised by people who do not realize that the motivation of CAM therapists is profit rather than patient well-being. (R)	2.73	.927	3.38	1.060	3.38	.946	
CAM therapists should undergo a licensing system just like conventional medical professionals.	3.92	.939	4.09	1.005	4.27	.743	
There should be a specialization in CAM therapy.	2.61	1.136	3.82	1.085	4.24	.779	
Only medical doctors should practice CAM therapy. (R)	2.95	.796	3.40	1.108	3.05	1.223	
The state should determine who is allowed to practice and provide CAM.	3.72	.944	3.52	1.233	3.99	.924	
I am proud of those healthcare professionals and patients who can openly discuss the benefits and risks of using CAM.	2.94	1.071	3.98	1.011	4.13	0846	
I would like healthcare professionals to have formal education in CAM.	2.55	1.234	3.93	1.048	4.13	.792	

Table 4.

Statistical significance of differences in beliefs and attitudes among respondents regarding integrating CAM into the healthcare and educational systems: Tukey test results.

Statement	(i) By	(j) By	Mean	Standard	D*	95% confidence interval		
Statement	profession/status	status	j)	error	I.	Lower bound	Upper bound	
	Dhysisian	Nurse	0.798^{*}	0.117	0	0.52	1.07	
	Physician	Patient	0.728^{*}	0.114	0	0.46	1	
I know the difference between		Physician	-0.798*	0.117	0	-1.07	-0.52	
complementary and alternative medicine.	Nurse	Patient	-0.07	0.076	0.631	-0.25	0.11	
	Patient	Physician	-0.728*	0.114	0	-1	-0.46	
		Nurse	0.07	0.076	0.631	-0.11	0.25	
	Physician	Nurse	-0.924*	0.105	0	-1.17	-0.68	
		Patient	-1.085^{*}	0.102	0	-1.32	-0.85	
During their education. healthcare professionals should be trained in	Numa	Physician	.924*	0.105	0	0.68	1.17	
CAM through accredited curricula	nurse	Patient	161*	0.068	0.049	-0.32	0	
and programs.	Dationt	Physician	1.085*	0.102	0	0.85	1.32	
	Patient	Nurse	.161*	0.068	0.049	0	0.32	
	Physician	Nurse	-1.283*	0.113	0	-1.55	-1.02	

	(i) By profession/status	(j) By	Mean	Standard	D¥	95% confidence interval		
Statement		status	value (1- j)	error	P*	Lower bound	Upper bound	
		Patient	-1.459*	0.11	0	-1.72	-1.2	
		Physician	1.283*	0.113	0	1.02	1.55	
Healthcare professionals should have formal education in the field of CAM	Nurse	Patient	176*	0.074	0.044	-0.35	0	
		Physician	1.459*	0.11	0	1.2	1.72	
	Patient	Nurse	.176*	0.074	0.044	0	0.35	
		Nurse	-0.052	0.106	0.873	-0.3	0.2	
	Physician	Patient	0.18	0.103	0.186	-0.06	0.42	
During their formal education.	Nurse	Physician	0.052	0.106	0.873	-0.2	0.3	
healthcare professionals receive very little or no information about CAM	Nuise	Patient	.233*	0.069	0.002	0.07	0.39	
	Defined	Physician	-0.18	0.103	0.186	-0.42	0.06	
	Patient	Nurse	233*	0.069	0.002	-0.39	-0.07	
	DI	Nurse	334*	0.106	0.005	-0.58	-0.08	
	Physician	Patient	-0.121	0.104	0.473	-0.36	0.12	
Healthcare professionals do not have sufficient knowledge to discuss the	Nurse	Physician	.334*	0.106	0.005	0.08	0.58	
application and effectiveness of CAM	Nurse	Patient	.213*	0.069	0.006	0.05	0.38	
with patients in a qualified manner.		Physician	0.121	0.104	0.473	-0.12	0.36	
	Patient	Nurse	213*	0.069	0.006	-0.38	-0.05	
		Nurse	-1.453*	0.105	0	-1.7	-1.21	
I would like healthcare professionals	Physician	Patient	-1.480*	0.102	0	-1.72	-1.24	
to acquire sufficient knowledge through formal education programs to	Nurse	Physician	1.453*	0.105	0	1.21	1.7	
discuss the application and		Patient	-0.028	0.068	0.914	-0.19	0.13	
effectiveness of CAM with interested patients in a qualified manner.	Patient	Physician	1.480^{*}	0.102	0	1.24	1.72	
Pariento in a domine annuer		Nurse	0.028	0.068	0.914	-0.13	0.19	
		Nurse	-1.396*	0.111	0	-1.66	-1.13	
	Physician	Patient	-1.581*	0.108	0	-1.84	-1.33	
Education in the field of CAM should be an integral part of educational	N	Physician	1.396*	0.111	0	1.13	1.66	
curricula for all healthcare	Indise	Patient	185*	0.072	0.029	-0.36	-0.02	
professionals.	Dationt	Physician	1.581*	0.108	0	1.33	1.84	
	1 allent	Nurse	.185*	0.072	0.029	0.02	0.36	
	DI	Nurse	-1.387*	0.111	0	-1.65	-1.13	
CAM education should be	Physician	Patient	-1.590*	0.108	0	-1.84	-1.34	
systematically integrated into various classical medical subjects (from	Nurse	Physician	1.387*	0.111	0	1.13	1.65	
anatomy to internal medicine and	Nuise	Patient	203*	0.072	0.014	-0.37	-0.03	
both theoretically and practically.	Dationt	Physician	1.590^{*}	0.108	0	1.34	1.84	
	1 allent	Nurse	.203*	0.072	0.014	0.03	0.37	
	DI	Nurse	-1.271*	0.107	0	-1.52	-1.02	
	Physician	Patient	-1.379*	0.105	0	-1.62	-1.13	
CAM therapy is generally dangerous	Nurse	Physician	1.271*	0.107	0	1.02	1.52	
(R)	Turse	Patient	-0.107	0.07	0.274	-0.27	0.06	
	Patient	Physician	1.379*	0.105	0	1.13	1.62	
	- utiont	Nurse	0.107	0.07	0.274	-0.06	0.27	
Individuals who prestice CAM	Dhysician	Nurse	957*	0.116	0	-1.23	-0.68	
without being healthcare	гнуястан	Patient	895*	0.113	0	-1.16	-0.63	
professionals are mere charlatans and	Nurse	Physician	.957*	0.116	0	0.68	1.23	
should be banned from practicing. (R)	110150	Patient	0.062	0.076	0.692	-0.12	0.24	

	(i) By profession/status	(j) B v	Mean			95% confidence	
Statement		profession/ status	value (i- j)	Standard error	P*	inte	erval
						bound	bound
	Detient	Physician	.895*	0.113	0	0.63	1.16
	Patient	Nurse	-0.062	0.076	0.692	-0.24	0.12
		Nurse	650*	0.112	0	-0.91	-0.39
	Physician	Patient	654*	0.109	0	-0.91	-0.4
I am surprised by people who do not realize that the motivation of CAM	Nurse	Physician	.650*	0.112	0	0.39	0.91
therapists is profit rather than patient	Nuise	Patient	-0.004	0.073	0.998	-0.18	0.17
well-being. (R)	Patient	Physician	.654*	0.109	0	0.4	0.91
	T difent	Nurse	0.004	0.073	0.998	-0.17	0.18
	Dhusisian	Nurse	-0.173	0.1	0.195	-0.41	0.06
	Physician	Patient	348*	0.098	0.001	-0.58	-0.12
CAM therapists should undergo a	Nurse	Physician	0.173	0.1	0.195	-0.06	0.41
licensing system just like conventional medical professionals.	Nuise	Patient	174*	0.065	0.021	-0.33	-0.02
r	Dationt	Physician	.348*	0.098	0.001	0.12	0.58
	Patient	Nurse	.174*	0.065	0.021	0.02	0.33
	Dharrisian	Nurse	-1.212*	0.109	0	-1.47	-0.96
	Physician	Patient	-1.628*	0.106	0	-1.88	-1.38
There should be a specialization in	N	Physician	1.212*	0.109	0	0.96	1.47
CAM therapy.	Nurse	Patient	416*	0.071	0	-0.58	-0.25
	Patient	Physician	1.628*	0.106	0	1.38	1.88
		Nurse	.416*	0.071	0	0.25	0.58
		Nurse	452*	0.13	0.002	-0.76	-0.15
	Physician	Patient	-0.099	0.127	0.716	-0.4	0.2
Only medical doctors should practice	Nurse	Physician	.452*	0.13	0.002	0.15	0.76
CAM therapy. (R)		Patient	.353*	0.085	0	0.15	0.55
	Patient	Physician	0.099	0.127	0.716	-0.2	0.4
		Nurse	353*	0.085	0	-0.55	-0.15
	Dhysician	Nurse	0.2	0.121	0.225	-0.08	0.48
		Patient	-0.27	0.118	0.057	-0.55	0.01
The state should determine who is	Nurse	Physician	-0.2	0.121	0.225	-0.48	0.08
CAM.		Patient	470*	0.079	0	-0.65	-0.29
	Patient	Physician	0.27	0.118	0.057	-0.01	0.55
		Nurse	.470*	0.079	0	0.29	0.65
	Physician	Nurse	-1.038*	0.108	0	-1.29	-0.79
I am proud of those healthcare	-	Patient	-1.18/	0.105	0	-1.43	-0.94
openly discuss the benefits and risks	Nurse	Physician	1.038	0.108	0	0.79	1.29
of using complementary and		Patient	-0.148	0.07	0.087	-0.31	0.02
alternative medicine (CAM).	Patient	Physician	1.187*	0.105	0	0.94	1.43
		Nurse	0.148	0.07	0.087	-0.02	0.31
	Physician	Nurse	-1.385	0.11	0	-1.64	-1.13
I would like healthcare professionals		Patient	-1.381	0.10/	0	-1.83	-1.33
to have formal education in	Nurse	Physician	1.385	0.11	0	1.13	1.64
complementary and alternative medicine (CAM).		Patient	-0.197*	0.071	0.016	-0.36	-0.03
······································	Patient	Physician	1.581*	0.107	0	1.33	1.83
		Nurse	0.197*	0.071	0.016	0.03	0.36

 $\label{eq:Note: P* - the significance level value; p < 0.05 indicates a statistically significant difference between the compared groups.$

Post hoc analysis using the Tukey test revealed statistically significant differences in beliefs and attitudes between physicians and patients in 13 out of 17 statements, including: "I know the difference between complementary and alternative medicine," "Healthcare professionals should be educated about CAM through accredited curricula," "Healthcare professionals should have formal education in CAM," "I would like healthcare professionals to acquire enough knowledge through formal educational programs to engage in qualified discussions with interested patients regarding the application and effectiveness of CAM," "CAM education should be an integral part of educational curricula for all healthcare professionals," "CAM education should be systematically integrated into various conventional healthcare subjects (from anatomy to internal medicine and nursing) at all levels of education, both theoretically and practically," "CAM therapy is generally dangerous for the patient and should be avoided" (R), "Individuals applying CAM who are not healthcare professionals are ordinary charlatans and should be banned from practice" (R), "I am surprised by people who do not understand that the motivation of CAM practitioners is profit, not patient well-being" (R), "CAM therapy," "I am proud of those healthcare workers and patients who can openly discuss the advantages and risks of using CAM," and "I would like healthcare professionals to have formal education in CAM."

Between physicians and nurses, statistically significant differences were found in 14 out of 17 statements, including: "I know the difference between complementary and alternative medicine," "Healthcare professionals should be educated about CAM through accredited curricula," "Healthcare professionals should have formal education in CAM," "Healthcare professionals do not possess enough knowledge to have qualified discussions with patients about the application and effectiveness of CAM," "I would like healthcare professionals to acquire enough knowledge through formal educational programs to engage in qualified discussions with interested patients regarding the application and effectiveness of CAM," "CAM education should be an integral part of educational curricula for all healthcare professionals," "CAM education should be systematically integrated into various conventional healthcare subjects (from anatomy to internal medicine and nursing) at all levels of education, both theoretically and practically," "CAM therapy is generally dangerous for the patient and should be avoided" (R), "Individuals applying CAM who are not healthcare professionals are ordinary charlatans and should be banned from practice" (R), "I am surprised by people who do not understand that the motivation of CAM practitioners is profit, not patient well-being" (R), "There should be a specialization in CAM therapy," "Only physicians should practice CAM therapy" (R), "I am proud of those healthcare workers and patients who can openly discuss the advantages and risks of using CAM," and "I would like healthcare workers and patients who can openly discuss the advantages and risks of using CAM," and "I would like healthcare workers and patients who can openly discuss the advantages and risks of using CAM," and "I would like healthcare professionals to have formal education in CAM."

No significant differences in beliefs and attitudes were observed between nurses and patients for seven statements, while differences were significant for ten statements, including: "Healthcare professionals should be educated about CAM through accredited curricula," "Healthcare professionals should have formal education in CAM," "During their formal education, healthcare professionals receive very little or no information about CAM," "CAM education should be an integral part of educational curricula for all healthcare professionals," "CAM education should be systematically integrated into various conventional healthcare subjects (from anatomy to internal medicine and nursing) at all levels of education, both theoretically and practically," "CAM therapists should undergo a licensing system similar to that of healthcare professionals," "There should be a specialization in CAM therapy," "Only physicians should practice CAM therapy" (R), "The state should determine who is allowed to practice and provide CAM," and "I would like healthcare professionals to have formal education in CAM."

4. Discussion

The findings of this study highlight the strong interest in and the need for systematically integrating CAM into both healthcare and education systems. A comparison between oncology patients and healthcare professionals revealed that patients exhibit greater acceptance and utilization of CAM than medical professionals. Patients' support for incorporating CAM into healthcare is likely driven by their motivation to explore complementary or alternative treatment options that align with a holistic approach to well-being. These results are consistent with international studies [14, 15], which suggest that skepticism among healthcare providers stems from a lack of scientific validation and limited formal education on CAM.

Although a majority of participants believed they understood the distinction between complementary and alternative medicine, a considerable proportion reported receiving little to no formal education on CAM. This aligns with the findings of Chang, et al. [15] where 75.3% of surveyed healthcare workers expressed interest in further education on CAM while acknowledging their limited knowledge of specific CAM therapies.

Research conducted among cancer patient self-help groups confirms the role of structured educational programs. Participants, after education, demonstrated increased knowledge of CAM, greater confidence in finding reliable information, and more frequent consultations with doctors about CAM. These results show that structured education increases awareness and fosters better communication between patients and healthcare professionals, laying the foundation for integrating CAM into clinical practice in a way that focuses on patient safety and well-being [16].

The educational program at the University of Michigan, Integrative Oncology Scholars (IOS), demonstrated how structured education can significantly improve oncologists' knowledge and skills in discussing complementary therapies. The program, supported by the National Cancer Institute, equipped participants with practical tools for communication and evidence-based assessment of therapies. Topics included symptom management (fatigue, pain, mood disturbances) and evaluating the effectiveness of various modalities such as nutrition, exercise, natural products, and communication skills. The education took place in 2019-2020, and the program included oncology professionals such as oncologists, nurses, pharmacists, and social workers, emphasizing the importance of a multidisciplinary approach. The authors highlight the importance of building differentiated educational programs for healthcare workers, particularly for physicians, focused on

providing solid scientific evidence and clinically proven examples of CAM application. On the other hand, programs for nurses should strengthen their existing motivation for a holistic approach, providing additional tools for integrating CAM into healthcare practice. This would reduce the perception gap among healthcare workers and improve coordination and safety in the application of CAM, which is crucial for effective implementation into the healthcare system [17].

The lack of academic support represents one of the key barriers to implementing CAM in medical practices, as the limited integration of CAM into formal educational programs leads to insufficient knowledge and competencies among healthcare professionals. In addition, financial constraints, the need for extensive adjustments to organizational structures, and the provision of sustainable resources further complicate the effective integration of these methods into the healthcare system [18]. To overcome these challenges, the author emphasizes the necessity of involving responsible persons within healthcare institutions, such as department heads, clinical unit managers, and members of management structures, and promoting open communication regarding patient outcomes and experiences to reduce biases and increase the acceptance of CAM [18]. Furthermore, the lack of scientific grounding and limited knowledge about CAM also hinder its implementation, as confirmed by a Swedish study that identified a lack of education and scientific evidence as significant obstacles to the development of CAM programs [19].

Our study highlights differences in perception between healthcare workers and patients, as well as among healthcare professionals themselves, with nurses showing attitudes closer to those of patients. The highest level of agreement among physicians was expressed in the statement, "I know the difference between complementary and alternative medicine," which is paradoxical, given that the following most accepted statement was that "During their formal education, healthcare professionals receive very little or no information about CAM." This statement reflects the reality, as an analysis of medical school curricula in Croatia shows the absence of courses or educational content focused on any aspect of CAM and integrative medicine [20, 21]. Only a few faculties and higher education institutions include CAM in their programs as elective courses [22, 23]. It is evident that physicians derive their belief in knowing the difference between complementary and alternative medicine from other sources of information they may have gathered but not from the curriculum of their medical studies.

Our study results indicate that 57.9% of patients and 59% of healthcare professionals believe they understand the difference between CAM, suggesting a relatively high level of self-perceived knowledge in both groups. However, the notable proportion of neutral responses from healthcare workers (25.1%) points to possible uncertainties regarding CAM concepts or a lack of formal education on the subject. This contrasts with the findings of Bjerså, et al. [14] which reported significantly lower CAM knowledge among healthcare workers in Swedish hospitals, where 95.7% of respondents stated they had little or no understanding of CAM. This discrepancy could be attributed to differences in self-assessed knowledge or variations in personal interest. Nevertheless, both studies emphasize the importance of systematic education for healthcare professionals to address uncertainties and enhance their understanding of CAM, ultimately leading to more informed and higher-quality patient care.

Nursing practice is deeply rooted in a holistic approach that prioritizes not only the physical well-being of patients but also their mental and social health, while actively involving families and communities in the recovery process [24, 25]. These foundational principles naturally align with the philosophy of CAM and integrative medicine, which explains nurses' generally positive attitudes toward CAM, even in the absence of formal education on the topic [26]. By embracing these approaches, nurses gain access to a broader range of therapeutic options, allowing them to choose the most suitable, effective, and minimally invasive CAM practices for their patients [27].

The lack of formal education on CAM is not specific only to Croatia. For example, current educational programs in the Netherlands rarely include content on CAM, although 47% of nurses state that they lack the knowledge to implement CAM in practice [26]. This indicates the need for systematically integrating CAM content into formal educational programs, allowing for the structured acquisition of knowledge and skills needed for safe and effective practice [26]. Hewson et al. [28] showed that targeted education has a transformative effect on healthcare workers' attitudes toward CAM. Cardiologists with initially negative attitudes significantly improved their perception and willingness to integrate CAM after an eight-hour educational program. Such forms of education may be one of the reasons why the study results at the University Hospital of Michigan [29] differ from ours, where obstetricians showed more significant support for educating healthcare workers compared to patients (68% vs. 43.5%).

The results of this study also indicate the lack of formal education on CAM among healthcare workers, especially physicians, while nurses show a greater interest and readiness for further education. This is in line with the findings of Chang, et al. [15] where 75.3% of respondents expressed a desire for additional education on CAM. A similar pattern was found in research conducted during the 2017/2018 academic year at the Health Polytechnic in Zagreb, with a sample of 569 students from nursing, physiotherapy, and sanitary engineering programs regarding their attitudes toward the integration of CAM into healthcare education. In this study, 61.7% of participants desired to acquire knowledge about CAM through formal education on CAM could reduce indecision and enable healthcare workers to make informed decisions, providing patients with accurate advice on applying evidence-based CAM therapies [30].

Research among high school students in medical schools also indicates a heightened awareness of the importance of healthcare workers being informed about the use of CAM. A significant 72.4% of students believe that patients should openly discuss the use of CAM with their doctors and nurses, which aligns with the results of our study, emphasizing the importance of improved communication between patients and healthcare workers to ensure the safety and efficacy of therapies. Furthermore, 72.4% of students believe that CAM should be integrated into the nursing curriculum through professional subjects, pointing to future healthcare workers' awareness of the potential benefits of a holistic approach to treatment and their openness to innovations in education. Despite this awareness, it is concerning that 84.7% of students feel they do not

know enough about CAM treatment methods, with information primarily coming from unofficial sources such as parents or the internet/media rather than from teachers at school [31]. These results highlight the need for systematically integrating CAM into educational programs in medical high schools to better prepare future healthcare workers for informing patients and making evidence-based decisions. Implementing CAM in educational programs would increase students' knowledge, standardize information, and reduce reliance on unverified sources, creating a foundation for better communication and a holistic approach to healthcare in line with patient needs and modern medical trends.

Support for CAM education through verified curricula is expressed by 41.7% of all respondents in this study, with support being significantly higher among patients (46.8%) than among healthcare workers (26.5%). Nurses within the healthcare worker group showed a higher agreement with statements emphasizing the importance of formal education on CAM compared to physicians, further confirming that nurses perceive a greater need for CAM education. In Croatia, the lack of formal educational content on CAM during medical and nursing studies, particularly in clinical subjects, contributes to the limited knowledge and interest in CAM among healthcare workers, as highlighted in the study by Soltanipour et al. [32].

Confirmation of the beliefs and attitudes expressed in our research can also be found in a systematic literature review that emphasizes the importance of including CAM therapies in healthcare curricula, focusing on fundamental knowledge about recommendations and applications of CAM. According to the author Mortada [33] integrating CAM with high-quality scientific evidence empowers patients to make informed decisions, contributing to optimal healthcare. The results of our study and Mortada [33] indicate the importance of educating future medical professionals to improve treatment safety, efficacy, and individualization. This link further justifies incorporating CAM into formal educational programs for healthcare workers, emphasizing interdisciplinarity and evidence-based practice. Our research shows the limited integration of CAM into formal educational programs for healthcare workers in Croatia, contrasting with practices at medical schools worldwide. Examples from the United States, Germany, Finland, Japan, and other countries show how CAM has become integral to undergraduate and postgraduate curricula. For instance, Finland has included acupuncture in its undergraduate programs since 1975, while in Germany, knowledge of CAM is mandatory at medical faculties [34].

The World Health Organization [34] highlights that most medical schools in the United States offer courses on CAM, and since 1997, primary care physicians have recommended additional training for integrating homeopathy. U.S. nursing universities also incorporate complementary and alternative medicine into their curricula. An example is the University of Colorado in Colorado, where undergraduate students can take an elective course in Complementary Therapies. This course provides an overview of various CAM therapies taught by experienced CAM practitioners. Students can explore the theoretical foundations and effectiveness of therapies, connect with practitioners in the field, and apply the knowledge gained in their future work with patients. This initiative educates future nurses, technicians, and students from other health sciences, biology, and psychology fields, promoting a holistic approach to healthcare [35].

Global initiatives emphasize the importance of formal education in CAM, especially in the context of modern healthcare needs. Our findings, which highlight differences in perceptions among healthcare workers, support the idea that systematic education on CAM can increase understanding and readiness for its integration into the healthcare system. Additionally, positive practices in some countries can serve as guidelines for adapting educational programs in Croatia.

Croatia could draw on the examples of other countries to shape policies and educational programs that encourage the standardization and safety of CAM practices, supported by scientific evidence and professional training. Integrating CAM into both the educational and healthcare systems could serve as a foundation for the sustainable development of CAM and increase the availability of these services to patients.

5. Limitations of the Study

This study has several limitations. Firstly, the sample was drawn from a single hospital institution, which may restrict the generalizability of the findings to the wider population of oncology patients and healthcare professionals in Croatia. Additionally, the potential for socially desirable responses cannot be ruled out, particularly given the sensitive nature of complementary and alternative medicine (CAM), which may have influenced participants' willingness to express their true attitudes and practices.

Moreover, the absence of up-to-date epidemiological data and the effects of the COVID-19 pandemic may have shaped participants' perceptions and responses. Some respondents may also have had limited knowledge of CAM, potentially affecting the accuracy of their answers. Methodological constraints include selection bias and the risk of recall bias, especially among oncology patients and healthcare professionals, who may have recalled or interpreted their experiences selectively. Lastly, the complexity of the questionnaire may have posed challenges for older participants and those with lower levels of education. Additionally, professional norms and institutional expectations may have influenced certain responses.

6. Conclusion

The conclusions of this study synthesize the obtained results, emphasizing the testing of the proposed hypothesis and analyzing the perceptions and interest in integrating CAM into the healthcare and educational systems among healthcare workers and oncology patients. Based on the results, recommendations for future research and practical guidelines are presented, which could improve the understanding and integration of CAM into clinical practice and medical education.

The null hypothesis has been refuted, which assumed no statistically significant differences in interest in CAM education between healthcare workers and oncology patients and no support from oncology patients for integrating CAM into healthcare and educational systems. The study results showed significant differences between healthcare workers and oncology patients in their interest in education and strong support among patients for integrating CAM into existing systems. Among healthcare workers, nurses showed a greater interest in CAM education (63.4%) compared to doctors (45.1%) (p < 0.01). This indicates a differentiation in the perception of professional needs and the potential application of CAM in clinical practice. Most healthcare workers emphasized the need for structured education on CAM as part of the existing educational system, particularly for young professionals and those with less experience working with patients.

On the other hand, oncology patients expressed a high level of support for integrating CAM into the healthcare system (78.6%) and its inclusion in educational programs for healthcare workers (85.2%). Many patients stated that greater availability of information and educated professionals would significantly increase their trust in CAM and reduce uncertainties associated with the application of these methods.

The differences in interest and attitudes between healthcare workers and patients highlight the need to develop interdisciplinary educational programs that address the specific needs of both groups. These results indicate clear support for integrating CAM into the healthcare system and for systematic education that ensures safe and scientifically grounded application.

Further research should focus on operationalizing CAM integration into the healthcare and educational systems, including analyzing effective implementation models in clinical practice and healthcare worker education. It is essential to examine the regulatory framework, economic aspects, and acceptance of CAM among healthcare workers, as well as the potential for its introduction into formal medical curricula. Additionally, practical challenges in implementation, including administrative barriers and standardization of therapies, should be explored. These studies contribute to the scientifically grounded integration of CAM into healthcare and education, thereby increasing its applicability and availability.

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