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EVALUATION OF COMPLEMENTARY AND ALTERNATIVE TREATMENTS VERSUS CONVENTIONAL MEDICINE IN TERMS OF IMPROVING QUALITY OF LIFE

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Modern medicine records remarkable progress in the diagnosis and treatment of various diseases. However, despite these achievements, there is growing awareness of its limitations, especially when it comes to chronic, degenerative and functional disorders. At the same time, there is an increasing interest in modalities provided by complementary and alternative medicine (CAM). Therefore, the main goal of the research was to determine whether there is a difference in the quality of life of patients exclusively using conventional medicine compared to users of complementary and alternative treatment methods.
Extensive research was conducted at the Institute of Public Health of Niš, from January 2025 to March 2026. The examined characteristics of all participants were assessed using appropriate standardized questionnaires. The study included 2,348 randomly selected respondents, who were participants of various courses of some of the CAM, as well as health workers of state and private health institutions. Data were analyzed using appropriate descriptive and analytical statistical methods in the program package "Jamovi Open Statistical Software", version 2.7.12.0 (Sydney, Australia). Univariate and multivariate linear regression analysis using the enter method was used to analyze the relationship between the quality-of-life indicators and the investigated characteristics. Statistical significance is defined at the $p<0.05$ level.
It was established that CAM users represent a specific socio-demographic and value profile – older ones, more educated, more religious, with less conventional physical activity, but with a greater preference for mentally-directed techniques. Most of them report improvement in terms of increased vigor and decreased depression. Mental benefits are the most consistent and most frequently reported effects of CAM. The most common reason for starting CAM is "the possibility of self-help", stated by the majority of all respondents. This reason is particularly pronounced with Reiki and Quantum Medicine, while it is somewhat less common with Yoga and Homeopathy. The second most common reason is the recommendation of a close person or "taught by someone else's experience", especially expressed in Yoga. Dissatisfaction with conventional medicine is present in a very small number of respondents, with the highest frequency in the Homeopathy group. These findings suggest that the decision to use CAM is not predominantly driven by disillusionment with conventional medicine, but rather by the need for active participation in the care of one's own health and the influence of the social environment. Overall, psychological and subjective benefits (stress, spiritual growth) dominate over somatic effects. The majority of respondents state that they did not feel an improvement

in terms of reduction of chronic complaints. Among those who report improvements, the cardiovascular and bone-joint systems are most often cited.
The results indicate a discrepancy between expectations and perceived effects, as well as heterogeneity of subjective experiences, so these findings have significant implications for clinical practice and public health, as they indicate the need for an integrative approach, which takes into account both conventional and alternative models.

Keywords: CAM, complementary medicine, alternative medicine, conventional medicine, public health

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PROCENA KOMPLEMENTARNIH I ALTERNATIVNIH METODA LEČENJA NASPRAM KONVENCIONALNE MEDICINE U CILJU POBOLJŠANJA KVALITETA ŽIVOTA

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Savremena medicina beleži izuzetan napredak u dijagnostici i lečenju raznih oboljenja. Međutim, uprkos ovim dostignućima, raste i svest o njenim ograničenjima, posebno kada je reč o hroničnim, degenerativnim i funkcionalnim poremećajima. Istovremeno, beleži se i sve veće interesovanje za modalitete koje pružaju komplementarna i alternativna medicina (KAM). Zato je osnovni cilj istraživanja bio da se utvrdi da li postoji razlika u kvalitetu života pacijenata isključivo konvencionalne medicine u odnosu na korisnike komplementarnih i alternativnih metoda lečenja.

Opsežno istraživanje je sprovedeno na Institutu za javno zdravlje Niš, od januara 2025. do marta 2026. godine. Ispitivane karakteristike svih učesnika ocenjivane su korišćenjem odgovarajućih standardizovanih upitnika. Studijom je obuhvaćeno 2.348 nasumično odabranih ispitanika, koji su bili polaznici raznih kurseva nekih od KAM-a, kao i zdravstveni radnici državnih i privatnih zdravstvenih ustanova. Podaci su analizirani korišćenjem odgovarajućih deskriptivnih i analitičkih statističkih metoda u programskom paketu "Jamovi open statistical software", version 2.7.12.0 (Sydney, Australia). Za analizu povezanosti pokazatelja kvaliteta života sa ispitivanim karakteristikama, korišćena je univarijantna i multivarijantna linearna regresiona analiza uz primenu enter metode. Statistička značajnost definisana je na nivou $p<0,05$.

Utvrđeno je da korisnici KAM-a predstavljaju specifičan sociodemografski i vrednosni profil – stariji, više obrazovani, religiozniji, sa manje zastupljenom konvencionalnom fizičkom aktivnošću, ali sa većom sklonošću ka mentalno-usmerenim tehnikama. Većina njih navodi poboljšanje u smislu povećanja elana i smanjenja depresije. Mentalni benefiti su najkonzistentniji i najčešće prijavljeni efekti KAM-a. Najčešći razlog za započinjanje KAM-a je „mogućnost samopomoći", koju navodi većina svih ispitanika. Ovaj razlog je naročito izražen kod Reiki i Kvantne medicine, dok je nešto ređi kod Joge i Homeopatije. Drugi najčešći razlog je preporuka bliske osobe iliti „poučeni tuđim iskustvom", posebno izražena kod Joge. Nezadovoljstvo konvencionalnom medicinom prisutno je kod vrlo manjeg broja ispitanika, sa najvišom učestalošću u grupi Homeopatije. Ovi nalazi sugerišu da odluka o korišćenju KAM-a nije dominantno vođena razočaranjem u konvencionalnu medicinu, već pre potrebom za aktivnim učešćem u brizi o sopstvenom zdravlju i uticajem socijalne okoline. U celini,

psihološki i subjektivni benefiti (stres, duhovni rast) dominiraju nad somatskim efektima. Većina ispitanika navodi da nije osetila poboljšanje u smislu smanjenja hroničnih tegoba. Među onima koji prijavljuju poboljšanja, najčešće se navode kardiovaskularni i koštano-zglobni sistem.
Rezultati ukazuju na diskrepanciju između očekivanja i percipiranih efekata, kao i na heterogenost subjektivnih iskustava, tako da ovi nalazi imaju značajne implikacije za kliničku praksu i javno zdravlje, jer ukazuju na potrebu integrativnog pristupa, koji uzima u obzir i konvencionalne i alternativne modele.

Ključne reči: KAM, komplementarna medicina, alternativna medicina, konvencionalna medicina, javno zdravlje

INTRODUCTION

Nowadays medicine records remarkable progress in the diagnosis and treatment of acute and chronic diseases. However, despite these achievements, the awareness of its limitations is growing, especially when it comes to chronic, degenerative and functional disorders that significantly reduce the quality of life of patients (1,2). At the same time, there is an increasing public interest in modalities that go beyond the scope of conventional, so called “western medicine” - this is complementary and alternative medicine (CAM). Contemporary research shows that in countries like Germany, about 70% of the population report lifetime use of CAM, with 32% using it within the last 12 months and 18% currently (3). This global phenomenon is not just a passing trend, but indicates a profound change in the healthcare paradigm, where patients increasingly take an active role in taking care of their own health and seek a more holistic approach.

The reasons for turning to CAM are multiple and complex. In addition to dissatisfaction with conventional treatments, key motivators include "perceived utility" – that is, the belief that a particular CAM method can meet specific health needs, even when this is not supported by solid scientific evidence (4). Patients are also often attracted by the philosophy of CAM, which views the body, mind and spirit as a single entity, emphasizing the strengthening of the organism's own capacities for self-healing, prevention and achieving general well-being (5). Research has shown that certain CAM methods, such as yoga, tai chi and qigong, can be very effective in managing stress, reducing anxiety and improving quality of life, especially in neurological and oncological patients (6).

Data from large population studies, however, reveal a complex relationship between CAM and quality of life. Although CAM users often have a higher burden of chronic diseases (especially musculoskeletal and neurological disorders), their quality of life may be significantly lower compared to non-users, suggesting that CAM is often chosen by people with pre-existing health conditions and unmet needs (3). On the other hand, randomized controlled trials and meta-analyses provide increasing evidence that integrative approaches, including creative therapies, acupuncture, aromatherapy, and massage, can significantly improve symptoms of anxiety, pain, fatigue, and mood, with effect sizes ranging from moderate to large (7,8). However, despite its increasing popularity and positive effects, CAM in practice often remains outside the mainstream of the health system, and communication between CAM users and conventional doctors is insufficient. Many patients do not report to their doctors that they are using these therapies, which carries the risk of potential interactions or delays in effective treatment (9). From a public health point of view, CAM represents both a challenge and an opportunity. On the one hand, unregulated use may lead to side effects and economic burden, but on the other hand, the integration of safe and effective CAM methods into conventional practice could improve treatment outcomes and increase the availability of health care.

Research indicates that the users of CAM are often older ones, with a higher educational level and with a more pronounced religiosity, which suggests the existence of a specific sociodemographic and value profile (10,11). Also, it was noticed that these people more often opt for mind and body techniques (meditation, yoga) as a form of health improvement, while conventional physical activity is less common among them (12). Differences between individual CAM modalities, such as acupuncture, reflexology, creative therapies and aromatherapy, can be significant both in motivation for use and in subjectively reported benefits, which indicates the need for a detailed analysis of each method individually (13,14). In addition, there is increasing evidence that oriental exercises (tai chi, qigong) significantly improve cognitive functions, neuropsychiatric symptoms and quality of life in patients with

Parkinson's disease (15), while reflexology shows positive effects in conditions such as chronic back pain, irritable bowel syndrome, menopause and multiple sclerosis (16).
The main goal of this research is to determine whether there is a significant difference in the quality of life of users of exclusively conventional medicine compared to users of CAM.

METHODS

Participants

The entire extensive research was conducted at the Institute of Public Health of Niš from January 2025 to March 2026. The examined characteristics of all participants were assessed using appropriate standardized questionnaires. The study included 2,348 randomly selected respondents, who were participants in various courses of some of the CAM, as well as health workers of government and private health institutions from the territory of the Nišava and Toplica districts.

Statistical data processing

Data were analyzed using appropriate descriptive and analytical statistical methods. Continuous variables are presented as arithmetic mean ± standard deviation and median with interquartile range, while categorical variables are presented as absolute and relative frequencies. The normality of the distribution was tested using the Kolmogorov–Smirnov test. As the values of all numerical variables showed a significant deviation from the normal distribution, the Kruskal–Wallis (Kruskal–Wallis) test with post hoc analysis Mann–Whitney U test was used to compare multiple groups of respondents. Univariate and multivariate linear regression analysis using the enter method was used to analyze the relationship between quality-of-life indicators and the investigated characteristics. Multivariate hierarchical models were formed in blocks: (i) demographic characteristics, (ii) use of complementary and alternative methods, and (iii) lifestyle and health factors.
The results of the regression analysis are presented as unstandardized coefficients (B) with 95% confidence intervals. The quality of the model was assessed using the coefficient of determination (R^2) and its change (ΔR^2) between blocks. In multivariate regression models, the reference category for the type of CAM is - quantum medicine and other, the reference category for the duration of application is - up to one year, and the reference category for education is - primary and secondary school (combined due to the small number of respondents with primary school). In univariate regressions, reference categories are not defined, so each category for the type of CAM, duration of application and education is analyzed in relation to all other categories of that feature. All analyzes were carried out in the program package “Jamovi Open Statistical Software”, version 2.7.12.0 (Sydney, Australia). Statistical significance is defined at the $p<0.05$ level.

RESULTS

Out of a total of 2348 respondents, 1283 (54.7%) do not use CAM, while 1065 (45.3%) use some CAM (Table 1). Statistically significant differences were found in most of the analyzed features. CAM users are significantly older (average 47.5 years) than non-users (41.5 years; Mann-Whitney test: $p<0.001$). The educational structure also differs: among CAM users, there is a higher proportion of people with higher education (38.3% vs. 24.0%; Chi-square test: $p<0.001$) and doctorate (18.6% vs. 14.0%; $p=0.003$), while among non-users there are more people with high school education (33.2%; $p<0.001$) and college (28.0%; $p<0.001$). $p<0.001$). Religiosity is more pronounced in the group of CAM users - 51.5% of them actively practice some religion, compared to 34.1% of non-users ($p<0.001$). When it comes to activities to improve health, CAM users opt for meditation and other similar techniques significantly more often (38.7% vs. 9.4%; $p<0.001$) and less often for regular physical activity (32.1% vs. 54.2%; $p<0.001$) or a special diet (17.0% vs. 23.8%; $p<0.001$). No statistically significant difference was found in terms of gender, social engagement, or the presence of sleep problems between the two groups. These findings indicate that CAM users represent a specific socio-demographic and value profile - older, more educated, more religious, with less conventional physical activity, but with a greater preference for mentally-directed techniques (meditation).

Table 1. Comparison of the values of the characteristics of respondents who do not use and who use one of the CAM

Feature	Don't use CAM (n=1283)	Use one of the CAM (n=1065)	Total (n=2348)	p
Age	41,54±10,62 42,00 (32,00 – 50,00)	47,54±9,94 49,00 (42,00 – 53,00)	44,26±10,746 46,00 (35,00 – 50,00)	**<0,001**
Gender				
Female	757 (59,0%)	593 (55,7%)	1350 (57,5%)	
Male	526 (41,0%)	472 (44,3%)	998 (42,5%)	0,105
Last completed degree of education				
Primary school	10 (0,8%)	4 (0,4%)	14 (0,6%)	0,206
Secondary school	426 (33,2%)	234 (22,0%)	660 (28,1%)	**<0,001**
High school	308 (24,0%)	408 (38,3%)	716 (30,5%)	**<0,001**
Faculty	359 (28,0%)	221 (20,8%)	580 (24,7%)	**<0,001**
PhD	180 (14,0%)	198 (18,6%)	378 (16,1%)	**0,003**
Do you actively practice any religion?				
No	845 (65,9%)	516 (48,5%)	1361 (58,0%)	
Yes	438 (34,1%)	549 (51,5%)	987 (42,0%)	**<0,001**
Are you doing any of the following to improve your health?				
Nothing	162 (12,6%)	130 (12,2%)	292 (12,4%)	0,759
Regular physical activity	696 (54,2%)	342 (32,1%)	1038 (44,2%)	**<0,001**
Meditation and similar	120 (9,4%)	412 (38,7%)	532 (22,7%)	**<0,001**
A special diet	305 (23,8%)	181 (17,0%)	486 (20,7%)	**<0,001**
Are you socially engaged?				
No	1093 (85,2%)	917 (86,1%)	2010 (85,6%)	
Yes	190 (14,8%)	148 (13,9%)	338 (14,4%)	0,531
Do you have trouble sleeping?				
No	913 (71,2%)	781 (73,3%)	1694 (72,1%)	
Yes	370 (28,8%)	284 (26,7%)	654 (27,9%)	0,242

Table 2. provides an insight into the characteristics of respondents who use different types of CAM. The distribution of duration of use of CAM shows that the majority of respondents use the chosen method for more than three years (60.46% in total), with this percentage being the highest in the group of quantum medicine and others (64.9%) and homeopathy (61.3%), and somewhat lower in yoga (56.8%) and Reiki (52.2%). Differences between groups are statistically significant (Chi square test: $p<0.001$). In contrast, a shorter duration (up to a year) is represented by about 16.6% of respondents, without significant differences between groups ($p = 0.565$), while the category "not sure" is negligibly represented. This finding indicates that CAM is largely not used experimentally or in the short term, but as a long-term practice, which suggests a stable commitment of respondents to these methods.

Table 2. Comparison of characteristics between participants using different CAM

methods

Feature	Reiki (n=180)	Yoga (176)	Homeopathy (248)	Quantum medicine and others (433)	Total	p
How long have you been using that method						
I'm not sure	0 (0,0%)	0 (0,0%)	2 (0,8%)	6 (1,4%)	8 (0,8%)	0,712
Up to a year	30 (16,7%)	26 (14,8%)	46 (18,5%)	70 (16,2%)	172 (16,6%)	0,565
One to three years	56 (31,1%)	50 (28,4%)	48 (19,4%)	76 (17,6%)	230 (22,2%)	**<0,001**
Three and more years	94 (52,2%)	100 (56,8%)	152 (61,3%)	281 (64,9%)	627 (60,46%)	**<0,001**
How/why did you start using that method?						
I'm not sure	0 (0,0%)	6 (3,4%)	0 (0,0%)	2 (0,5%)	8 (0,8%)	0,154
Recommendation of a close person	24 (13,3%)	50 (28,4%)	50 (20,2%)	95 (21,9%)	219 (21,1%)	**<0,001**
Dissatisfaction with conventional medicine	18 (10,0%)	16 (9,1%)	46 (18,5%)	46 (10,6%)	126 (12,2%)	**0,002**
Possibility of self-help	116 (64,4%)	84 (47,7%)	116 (46,8%)	240 (55,4%)	556 (53,6%)	**<0,001**
Taught by someone else's experience	22 (12,2%)	20 (11,4%)	36 (14,5%)	50 (11,5%)	128 (12,3%)	0,700
In which segment did you feel the most positive health effects?						
I didn't feel it	0 (0,0%)	4 (2,3%)	4 (1,6%)	15 (3,5%)	23 (2,2%)	0,092
Spiritual growth	44 (24,4%)	24 (13,6%)	68 (27,4%)	76 (17,6%)	212 (20,4%)	**0,001**
Stress reduction	78 (43,3%)	64 (36,4%)	80 (32,3%)	188 (43,4%)	410 (39,5%)	**<0,001**
Improving immunity	42 (23,3%)	54 (30,7%)	62 (25,0%)	118 (27,3%)	276 (26,6%)	0,081
Relief of physical pain	16 (8,9%)	30 (17,0%)	34 (13,7%)	36 (8,3%)	116 (11,2%)	**0,003**
In terms of reducing chronic ailments and improving chronic diseases						
I didn't feel it	90 (50,0%)	114 (64,8%)	158 (63,7%)	253 (58,4%)	615 (59,3%)	**<0,001**
Improvement in the entire sphere of the cardiovascular system	26 (14,4%)	2 (1,1%)	10 (4,0%)	73 (16,9%)	111 (10,7%)	**<0,001**
Bone joint system	42 (23,3%)	24 (13,6%)	50 (20,2%)	80 (18,5%)	196 (18,9%)	0,079

Tumors	22 (12,2%)	36 (20,5%)	30 (12,1%)	27 (6,2%)	115 (11,1%)	**<0,001**
In terms of mental illnesses						
I didn't feel it	24 (13,3%)	54 (30,7%)	86 (34,7%)	155 (35,8%)	319 (30,8%)	**<0,001**
Increase in vigor, decrease in depression	156 (86,7%)	122 (69,3%)	162 (65,3%)	278 (64,2%)	718 (69,2%)	
Have you noticed any side effects?						
No	178 (98,9%)	170 (96,6%)	240 (96,8%)	410 (96,7%)	1035 (97,2%)	0,497
Yes	2 (1,1%)	6 (3,4%)	8 (3,2%)	14 (3,2%)	30 (2,8%)	

The most common reason for starting CAM is the "possibility of self-help", stated by 53.6% of all respondents. This reason is particularly pronounced with Reiki (64.4%) and quantum medicine (55.4%), while it is somewhat less common with yoga (47.7%) and homeopathy (46.8%) ($p<0.001$). The second most common reason is the recommendation of a close person (21.1%), especially expressed in the case of yoga (28.4%), which may indicate the social aspect of this method. Dissatisfaction with conventional medicine is present in 12.2% of respondents, with the highest frequency in the homeopathy group (18.5%) ($p = 0.002$). The reason "taught by someone else's experience" is represented in about 12.3% of cases, without significant differences between groups ($p = 0.700$). These findings suggest that the decision to use CAM is not predominantly driven by disillusionment with conventional medicine, but rather by the need for active participation in the care of one's own health and the influence of the social environment.

The largest number of respondents cited stress reduction as the main benefit (39.5%), with a particularly high prevalence of Reiki (43.3%) and quantum medicine (43.4%) ($p < 0.001$). Spiritual growth is mentioned by 20.4% of respondents, with homeopathy (27.4%) and Reiki (24.4%) being the most pronounced ($p = 0.001$). Improvement of immunity is reported by 26.6% of respondents, without significant differences between groups ($p = 0.081$). Relief of physical pain was reported by 11.2% of respondents, significantly more often in the group of yoga (17.0%) and homeopathy (13.7%) compared to Reiki (8.9%) and quantum medicine (8.3%) ($p = 0.003$). Overall, psychological and subjective benefits (stress, spiritual growth) dominate over somatic effects.

The majority of respondents (59.3%) stated that they did not feel an improvement in terms of reduction of chronic complaints. This percentage is particularly high for yoga (64.8%) and homeopathy (63.7%), while it is somewhat lower for Reiki (50.0%) and quantum medicine (58.4%) ($p < 0.001$). Among those who report improvements, the following are most often mentioned: cardiovascular system (10.7%) - mostly with quantum medicine (16.9%) and Reiki (14.4%), bone-joint system (18.9%) - without significant differences ($p = 0.079$), tumors (11.1%) - mostly with yoga (20.5%) ($p < 0.001$). These results indicate a discrepancy between expectations and perceived effects, as well as heterogeneity of subjective experiences.

The majority of respondents (69.2%) reported improvement in terms of increased vigor and decreased depression. This effect is most pronounced with Reiki (86.7%), and least with quantum medicine (64.2%). At the same time, 30.8% of respondents stated that they did not feel an improvement in the mental domain, which is most common with homeopathy (34.7%) and quantum medicine (35.8%) ($p < 0.001$). Mental benefits are the most consistent and most frequently reported effects of CAM. Counter-effects are rare (only 2.8% overall) and do not differ significantly between methods. This table indicates great heterogeneity among CAM methods, both in terms of motives for use, and subjectively reported benefits.

Table 3. Comparison of characteristics between respondents who do not use and who use different CAM methods

Feature	Do not use CAM (n=1283)	Reiki (n=180)	Yoga (176)	Homeopathy (248)	Quantum medicine and other (433)	p
Age (years)	41,62±10,65 42,00 (32,00 – 50,00)	49,01±8,71 48,00 (45,00 – 54,00)	46,69±10,51 48,00 (42,00 – 52,00)	46,77±9,58 49,00 (39,50 – 52,00)	47,62±10,34 50,00 (42,00 – 54,00)	**<0,001** A***, B***, C***, D***
Gender						
Female	763 (59,1%)	94 (52,2%)	86 (48,3%)	150 (58,6%)	257 (58,0%)	**0,045**
Male	528 (40,9%)	86 (47,8%)	92 (51,7%)	106 (41,4%)	186 (42,0%)	
Last completed degree of education						
Primary school	10 (0,8%)	0 (0,0%)	0 (0,0%)	4 (1,6%)	0 (0,0%)	**0,049**
Secondary school	438 (33,9%)	22 (12,2%)	34 (19,1%)	42 (16,4%)	124 (28,0%)	**<0,001**
High school	306 (23,7%)	88 (48,9%)	80 (44,9%)	110 (43,0%)	132 (29,8%)	**<0,001**
Faculty	355 (27,5%)	40 (22,2%)	24 (13,5%)	54 (21,1%)	107 (24,2%)	**0,001**
PhD	182 (14,1%)	30 (16,7%)	40 (22,5%)	46 (18,0%)	80 (18,1%)	**0,025**
Do you actively practice some religion?						
No	861 (66,7%)	88 (48,9%)	100 (56,2%)	112 (43,8%)	200 (45,1%)	**<0,001**
Yes	430 (33,3%)	92 (51,1%)	78 (43,8%)	144 (56,3%)	243 (54,9%)	
Are you doing any of the following to improve your health?						
Nothing	160 (12,4%)	32 (17,8%)	32 (18,0%)	30 (11,7%)	38 (8,6%)	**0,003**
Regular physical activity	702 (54,4%)	22 (12,2%)	82 (46,1%)	94 (36,7%)	138 (31,2%)	**<0,001**
Meditation and similar	120 (9,3%)	110 (61,1%)	46 (25,8%)	94 (36,7%)	162 (36,6%)	**<0,001**
A special diet	309 (23,9%)	16 (8,9%)	18 (10,1%)	38 (14,8%)	105 (23,7%)	**<0,001**
Are you socially engaged?						
No	1097 (85,0%)	148 (82,2%)	148 (83,1%)	230 (89,8%)	387 (87,4%)	0,099
Yes	194 (15,0%)	32 (17,8%)	30 (16,9%)	26 (10,2%)	56 (12,6%)	
Do you have trouble sleeping?						
No	921 (71,3%)	122 (67,8%)	140 (78,7%)	180 (70,3%)	331 (74,7%)	0,101
Yes	370 (28,7%)	58 (32,2%)	38 (21,3%)	76 (29,7%)	112 (25,3%)	

NOTES: A–D indicate pairs of groups in post hoc analysis: A - No CAM vs Raiki, B - No CAM vs Yoga, C - No CAM vs Homeopathy, D - No CAM vs Quantum Medicine and other. Statistical significance: *** - $p < 0.001$.

Table 3. compares sociodemographic and lifestyle characteristics between non-users of CAM and users of individual methods. Age is significantly different (Kruskal-Wallis test: p<0.001): all groups of CAM users are older than non-users, with a mean of 46.7 to 49.0 years versus 41.6 years. Post-hoc analysis using the Mann-Whitney test shows that all four CAM groups are statistically significantly older compared to non-users (p<0.001). The gender structure differs at the limit of significance (Chi square test: p=0.045): among yoga users, the smallest share is women (48.3%), while among non-users, 59.1% are women. The educational structure differs significantly: users of Reiki and yoga have the highest level of education (high school in 48.9% and 44.9% respectively), while non-users dominate in the secondary school category (33.9%). Religiosity is most prevalent among users of homeopathy (56.3%) and quantum medicine (54.9%), and least among non-users (33.3%). Health-enhancing activities also differ: meditation is most commonly practiced by Reiki users (61.1%), while regular physical activity is most commonly reported by non-users (54.4%).

Table 4. Multivariate hierarchical linear regression analysis of the association between the physical pain domain and the investigated characteristics in all subjects

Feature	B	CI 95%		p
		Lower	Upper	
Block 1: Demographic characteristics				
Gender (0=females, 1=males)	-0,754	-2,397	0,889	0,368
Age (years)	-0,154	-0,232	-0,076	**<0,001**
High school	2,060	-0,029	4,149	0,053
Faculty	0,684	-1,477	2,845	0,535
PhD	5,545	3,004	8,085	**<0,001**
Block 2: Using one of the CAM				
CAM (0=no, 1=yes)	-0,677	-2,460	1,105	0,456
Block 3: Lifestyle and health				
Regular physical activity	-0,401	-2,932	2,130	0,756
Mediation and similar	-5,163	-8,030	-2,296	**<0,001**
A special diet	-2,360	-5,234	0,513	0,107
Socially engaged	-3,752	-5,976	-1,527	**0,001**
Having trouble sleeping	-14,875	-16,640	-13,110	**<0,001**
Actively practicing some religion	-0,308	-1,934	1,318	0,710

NOTES: Reference category for Education: Primary and Secondary school. Reference category for “Do you do anything to improve your health”: None. B – unstandardized coefficient of linear regression; CI - confidence interval.

Table 4. shows the results of the multivariate hierarchical model for the bodily pain domain. The model explains 13.1% of the variance (R^2=0.131, F=29.258, p<0.001). Age (B=-0.154, p<0.001) and sleep problems (B=-14.875, p<0.001) were most consistently associated with the bodily pain domain. CAM is not significant after the introduction of block 3 (p=0.456). Meditation (B=-5.163, p<0.001) and social engagement (B=-3.752, p=0.001) remain significant negative predictors. Change in R^2: Block 1: 1.5%, Block 2: 0.3%, Block 3: 11.4%.

Table 5. Multivariate hierarchical linear regression analysis of the connection between the vitality/energy domain and the examined features in all subjects

Feature	B	CI 95%		p
		Lower	Upper	
Block 1: Demographic characteristics				
Gender (0=females, 1=males)	2,023	0,515	3,531	**0,009**
Age (years)	0,121	0,049	0,193	**0,001**
High school	0,172	-1,745	2,090	0,860
Faculty	-1,070	-3,054	0,913	0,290
PhD	2,630	0,298	4,962	**0,027**
Block 2: Using one of the CAM				
CAM (0=no, 1=yes)	1,767	0,131	3,404	**0,034**
Block 3: Lifestyle and health				
Regular physical activity	5,869	3,547	8,192	**<0,001**
Mediation and similar	5,065	2,434	7,697	**<0,001**
A special diet	3,555	0,917	6,193	**0,008**
Socially engaged	1,178	-0,864	3,220	0,258
Having trouble sleeping	-12,984	-14,604	-11,364	**<0,001**
Actively practicing some religion	-0,871	-2,363	0,622	0,253

NOTES: Reference category for Education: Primary and Secondary school. Reference category for Do you do anything to improve your health: No. B – unstandardized coefficient of linear regression; CI - confidence interval.

Table 5 shows the results of the multivariate hierarchical model for vitality. The model explains 12.8% of the variance (R^2=0.128, F=28.690, p<0.001). In Block 1, gender (B=2.023, p=0.009), age (B=0.121, p=0.001) and PhD (B=2.630, p=0.027) are significant predictors. In block 2, KAM is significant (B=1.767, p=0.034). In block 3, physical activity (B=5.869, p<0.001), meditation (B=5.065, p<0.001), special diet (B=3.555, p=0.008) and sleep problems (B=-12.984, p<0.001) are all significant. Change in R^2: Block 1: 2.0%, Block 2: 0.1%, Block 3: 10.7%.

DISCUSSION

The results of this research indicate a complex and multi-layered relationship between the use of complementary and alternative methods/medicine (CAM) and quality of life. Although statistically significant differences were observed between respondents who use and those who do not use CAM, the nature of these differences suggests that it is a heterogeneous phenomenon influenced by several interrelated factors, primarily demographic characteristics, lifestyle and subjective perception of health.

Main findings and its interpretation

One of the key findings of this research is that respondents who use CAM have higher values in certain domains of mental health (vitality, resilience), while at the same time achieving lower values in certain domains of physical health. This pattern may indicate a selection effect, i.e. the fact that people who opt for CAM more often belong to the population with already existing health problems, but also with a more pronounced need for active participation in taking care of their own health.

This is supported by the finding that CAM users in this sample are statistically significantly older, more often religious and more inclined to practice techniques such as meditation, while at the same time they practice less conventional forms of physical activity. This profile indicates a specific health and value pattern of behavior, which can be an important mediator between CAM and quality of life.

Differences between individual CAM methods

Analysis of different types of CAM showed significant differences in the patterns of effects. Yoga is associated with higher scores in mental domains, which is consistent with its known role in reducing stress and improving psychological well-being (17). On the other hand, homeopathy showed a positive association with the physical component of health, which may reflect a specific perception of the therapeutic effect or the selection of respondents with certain health problems (18).

In contrast, respondents who use Reiki and related methods score lower in the physical domains, which may indicate that these methods are more often used by people with more pronounced health problems or chronic conditions. This finding additionally confirms the assumption of a selection effect and emphasizes the need for careful interpretation of cause-and-effect relationships.

The role of duration of use of CAM

The duration of CAM application showed divergent effects on the physical and mental components of health. Longer use is associated with better mental health, but also with worse physical scores. This finding may indicate an adaptive process in which the long-term use of CAM contributes to psychological stabilization and a subjective sense of control over the disease, while simultaneously reflecting the presence of chronic conditions that affect physical functioning (19).

Results of regression analyses

Multivariate analyzes additionally shed light on the relationships between the examined variables. After controlling for demographic factors and lifestyle, everything points to the presence of confounding effects, that is, to the fact that initially observed differences in mental health may be mediated by other factors, such as physical activity or sleep problems, as it was being described a little in previous literature (19,20).

Of particular note is the finding that sleep problems are the strongest and most consistent negative predictor of all domains of quality of life. This result is consistent with existing literature and emphasizes the central role of sleep as a determinant of both physical and mental health (21,22). Physical activity shows the expected positive association with the physical component of health, while its association with mental health is more pronounced in multivariate models, which is similar to some other reports (21-23). On the other hand, the practice of meditation and similar techniques shows a complex pattern - negative association with physical, but potentially positive with mental domains, which may reflect the selection of respondents who use these methods in response to already existing health problems, as reported by other recent studies (24,25).

Limitations

Cross-sectional research design makes it impossible to draw conclusions about causation, but only about association. The observed associations may be due to reverse causality or selection effects. The use of self-report questionnaires carries the risk of subjective and recall biases, as well as socially desirable responding. The relatively low coefficient of determination in the regression models indicates that a significant part of the variance in quality of life remains unexplained, which suggests the need to include additional variables in future research.

Conclusions

The results of this study indicate that the use of CAM is not unequivocally associated with a better quality of life, but that its effect is differentiated and strongly conditioned by the user's characteristics. While certain methods, such as yoga, can have a positive impact on mental health, overall patterns suggest that CAM is often used by people with already impaired physical health. In this sense, CAM can be seen as an indicator of specific health needs and styles of coping with the disease, rather than as an independent factor in improving the quality of life.

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