Influence of the Global Health Crisis on Health Behaviour and Adoption of Complementary and Alternative Medicine[1]

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Influence of the Global Health Crisis on Health Behaviour and Adoption of Complementary and Alternative Medicine. Various studies indicate that the utilization of complementary and alternative medicine (CAM) in European nations has either shown an upward trend or remained stable in recent years. Representing a significant global health crisis, COVID-19 has increased the urgency of monitoring the use of various CAM modalities. Some sociological perspectives on the use of CAM in Slovakia reveal that perceptions of CAM in Slovakia have undergone different stages. Our objective was to analyse the patterns and changes in CAM (complementary and alternative medicine) usage among the Slovakian population from 2019 to 2023. Therefore, we replicated a similar survey from the year 2019 to the year 2023. In 2019, 82.4% of the participants, totalling 846 (N = 1027) individuals, reported regular use of a certain type of CAM. By contrast, in 2023, the figure rose to 90.3%, with 916 (N = 1014) respondents indicating regular CAM usage. The whole medical system (WMS) was identified as the CAM subgroup with the highest growth in users. The use of CAM is now regarded as a mainstream and normalized approach to addressing health-related concerns and is no longer considered uncommon or marginalized.

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Introduction

The growing interest in sociological research on complementary and alternative medicine (CAM) mirrors larger cultural and systemic changes in healthcare practices in different societies. Sociological concepts regarding health and illness, such as the medicalisation of society and the move from biomedical to spiritual and holistic health models, offer a useful way to understand these patterns. Moreover, different studies highlight that the use of complementary and alternative medicine (CAM) in European countries has either been increasing or has stabilized in recent years (Fjær et al. 2020; Kemppainen et al. 2018). A follow-up study conducted on a representative sample of the general population in the Czech Republic confirmed that the prevalence of CAM (23 CAM modalities) use is increasing (Pokladnikova – Selke-Krulichova 2018). Results from a follow-up national survey in England show a substantial increase in the 'in-house' provision of CAMs in UK primary care over the past six

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years (Thomas et al. 2003). According to an investigation of changes in the use of practitioner-based CAM over time in Canada, there has been a trend of increasing CAM (consulting 11 types of CAM practitioners) use over the years, irrespective of age and cohort (Canizares et al. 2017). Moreover, a series of surveys, published by the Fraser Institute and undertaken in Canada in 1997, 2006 and 2016, reported on the use of and public attitudes towards CAM, and revealed an increased use of almost every alternative therapy (22 selected CAM methods) (Esmail 2017). Research into the use of CAM in Iceland showed that the overall use of CAM providers (9 types of providers) increased by 8.4% during the nine-year period of study (Gunnarsdottir et al. 2020). Similar trends have been observed in the USA, where CAM use and expenditure increased substantially between 1990 and 1997 (Eisenberg et al. 1998). A survey in South Australia, monitoring the trend in CAM, confirmed high levels of continuing use of CAMs (7 main types) and CAM therapists (10 types of therapists) (MacLennan et al. 2006). The results of the Swiss Health Survey 2012 and development since 2007 have shown that the usage of CAM (8 selected CAM therapies) remained unchanged (Klein et al. 2015).

Some of the sociological perspectives on the use of CAM in Slovakia reveal that, over the years, the perceptions of CAM in Slovakia have undergone various stages (Souček – Hofreiter 2017, 2022b). During the era of socialism, non-traditional healthcare methods, with few exceptions (Souček 2020; Stöckelová – Klepal 2018), were viewed as outdated and superstitious. Nevertheless, with the shift in political regimes in 1989, the adoption of diverse CAM therapies has gained broader acceptance. In the early 1990s in Czechoslovakia, several efforts were made to legitimize CAM, with homeopathy and acupuncture being recognized as medical treatments (Křížová 2015). However, only limited data regarding the prevalence of CAM usage in this period in Slovakia are available. The first study examining the overall prevalence of CAM use in Slovakia dates back to 2019. According to research conducted in 2019 in Slovakia, 82.4% of the respondents reported either regular CAM method use or the lifetime prevalence of such use (Souček – Hofreiter 2022a). The most commonly reported group of methods were biologically based treatments (78.9%), followed by manipulative and body-based methods (54.4%), mind-body interventions (31.9%), whole medical systems (18.2%) and energy therapies (4.2%). The five most commonly preferred CAM modalities were vitamins (71.1%), herbal teas (68.1%), massages (53.6%), religious healing (20.3%) and special diets (18.8%). It was confirmed that female gender, higher income and higher education are significant predictors of CAM use. From a sociological point of view, previous findings showed that CAM use corresponds with higher socioeconomic status and higher education and is preferred by

residents of larger cities. Moreover, the research revealed the relationship between satisfaction with the healthcare system, one's own health situation and the use of CAM. This discovery aligns with the concept of healthy lifestyles, suggesting that the social status and cultural knowledge shape people´s health habits. The study concluded that to obtain a further insight into the topic, follow-up research in this area is recommended (Souček – Hofreiter 2022a). In another study based on qualitative data from Slovakia, the authors conclude that CAM users may consider a CAM method effective even if it does not fully eliminate the problem (Jerotijević et al. 2022).

The need to monitor the use of different CAM modalities over time has become more urgent following COVID-19, which was first confirmed as having spread to Slovakia in 2020. To limit the spread of the virus, lockdown and quarantine measures were imposed. During the second wave in spring 2020, the fatality rate caused by COVID-19 was among the highest in the world.The consequences of the pandemic significantly affected many aspects of social and economic life in many countries, including medical healthcare. Subsequently, some research confirmed that during the COVID-19 pandemic, many people worldwide were turning to CAM, not just to prevent and cure COVID-19 (Karataş et al. 2021; Parvizi et al. 2022) but also to cope with other physical and mental conditions (Badakhsh et al. 2021). Additional investigations conducted during the first wave of the COVID-19 pandemic confirmed that CAM was more often used to treat a long-term health condition and improve well-being rather than prevent or cure COVID-19 (Kristoffersen et al. 2022; Mulder et al. 2022). Sociological theories of risk and resilience can provide insight into why there is a growing dependence on CAM during this time (Estêvão et al. 2017). Moreover, a cross-sectional survey concluded that the impact of COVID-19 on clinical practice was considerable (Stub et al. 2021). Overall, the research outcomes show that the COVID-19 pandemic has had a crucial impact on the health strategies of populations across Europe. Therefore, more specific information on the prevalence and reasons for the use of CAM is needed. This study aimed to compare the prevalence rate of CAM use, the socio-demographic and socio-economic characteristics, and other related factors of CAM users between 2019 and 2023, before and after the restrictions and lockdown measures were implemented. Consequently, the study attempts to expand sociological knowledge of how global health crises impact the health behaviours of individuals and the embrace of CAM treatment methods in society.

Study design and analysis

Two identical representative surveys were conducted among the Slovak population aged 18 and older in partnership with the polling company FOCUS in 2019 and 2023. In both cases, the surveys employed a quota sampling methodology, where quotas were established based on key demographic variables such as age, education level, place of residence, and region. This approach ensured that the sample accurately reflected the diversity of the Slovak population, thereby enhancing the representativeness and reliability of the findings (samples was representative with a 95% confidence level and a 3% confidence interval). Respondents were randomly recruited through personal interviews using Computer-Assisted Personal Interviewing (CAPI). (Souček – Hofreiter 2022a). Apart from the socio-demographic characteristics related to quota sampling, both surveys encompassed supplementary details concerning marital status, monthly household income, religious affiliation, household size, employment status and political perspective. Table 1 summarizes the socio-demographic characteristics of all respondents in 2019 and 2023. The design of the initial questionnaire from 2019, inspired by I-CAM-Q (International Questionary to Measure the Use of Complementary and Alternative Medicine) The I-CAM-Q was created to compare the prevalence of treatments outside orthodox medicine or biomedicine internationally. The authors opted for a more comprehensive selection of items due to the complexity of various complementary and alternative medicine (CAM) methods. This approach enables researchers to identify specific traditional and accepted treatment methods in different countries. Simultaneously, it allows for the exploration of non-traditional health approaches based on culturally diverse concepts. For example, in Czechia or Slovakia, herbal remedies or herbal teas are commonly used, whereas they are much less prevalent in the UK or Scandinavia. (Quandt et. al. 2009; Re et al. 2012; Wemrel et al. 2017; data ESS round 7 2014 Immigration, Social Inequalities in Health).

Table 1: **Sociodemographic characteristics of the sample**

	2019 All respondents, N = 1,027		CAM users, N = 846		CAM non-users, N = 181		2023 All respondents, N = 1,014		CAM users, N = 916		CAM non-users, N = 98	
	N	%	N	%	N	%	N	%	N	%	N	%
Gender												
Male	494	48.1	398	47	96	54.1	491	48,4	428	46,7	63	64,3
Female	533	51.9	448	53	85	46.9	523	51,6	488	53,3	35	35,7
Age (years)												
18-34	288	28	232	27.4	56	30.7	259	25,6	234	25,5	25	25,5
35-54	377	36.7	308	36.4	69	37.9	382	37,7	354	38,6	28	28,6
55 and over	363	35.3	306	36.1	57	31.3	373	36,8	328	35,8	45	45,9
Education												
Less than high school	415	40.4	322	38	93	51.3	379	37,4	330	36	49	50
High school	384	37.4	327	38.6	57	31.4	391	38,6	357	39	34	34,7
University	227	22.1	197	23.2	31	17.1	244	24,1	229	25	15	15,3
Marital status												
Single	241	23.4	195	23	46	25.4	199	19,6	174	19	25	25,5
Married	606	59.1	496	58.6	110	60.7	577	56,9	519	56,7	58	59,2
Living with spouse							101	10	94	10,3	7	7,1
Divorced /widowed	179	17.5	155	18.3	25	13.8	137	13,5	129	14,1	8	8,2
Household monthly income (EUR)												
1 - 1000 €	296	31.2	234	30	62	36.6	208	21,7	184	21,3	24	25,3
1 001 -1500 €	292	30.8	242	31.1	49	29	438	45,8	389	45,1	49	51,6
1 501 € and over	360	38	302	38.8	58	34.3	311	32,5	289	33,5	22	23,2

	2019 All respondents, N = 1,027		CAM users, N = 846		CAM non-users, N = 181		2023 All respondents, N = 1,014		CAM users, N = 916		CAM non-users, N = 98	
	N	%	N	%	N	%	N	%	N	%	N	%
Religious identity *												
Strong belief	116	11.2	94	11,1	22	12.2	141	13,9	126	13,8	15	15,3
Others	911	88.7	752	88.9	159	87.8	852	86,1	790	86,2	83	84,7
Place of residence												
100,000 and less	899	87.6	742	87.7	157	86.7	882	87	703	76,7	87	88,8
100,000 and over	128	12.4	104	12.3	24	13.3	132	13	213	23,3	11	11,2
Satisfaction with healthcare **												
High	591	57.5	471	55.7	120	66.3	492	48,5	450	49,1	42	42,9
Low	436	42.5	375	44.3	61	33.7	522	51,5	466	50,9	56	57,1
Own health satisfaction ***												
High	664	64.7	532	62.9	132	73	639	66	607	66,3	62	63,3
Low	363	35.3	314	37.1	49	27	375	33,7	309	33,7	36	36,7

* Religious identity was recoded into a binary category (1 stands for strong beliefs and 0 stands for all other expressions of religious identity).
** The five-point scale on satisfaction with healthcare was modified into a binary variable (1 very satisfied 2 satisfied 3 neither satisfied / nor dissatisfied 4 dissatisfied 5 very dissatisfied).
*** The five-point scale on own health satisfaction was modified into a binary variable (1 very satisfied 2 satisfied 3 neither satisfied / nor dissatisfied 4 dissatisfied 5 very dissatisfied).

The respondents in presented research were asked about CAM usage in the following question: How often do you use, or have you used the following forms of unconventional healthcare? The list reflected country-specific terminology and included 18 different options from which respondents were able to make their preferred selection. To ensure comparability of data, the same CAM modalities as in 2019 were used in 2023. The list included the following CAM modalities: acupuncture, homeopathy, Chinese medicine, Ayurveda, chiropraxis, massage, reflexology, meditation, yoga, visual imagery, psychotherapy, herbal teas, vitamins, minerals and dietary supplements, special diets and detoxification, Bach flower remedies, energy healing, religious healing and spiritual ceremonies. To facilitate analysis, the research adopted the widely acknowledged CAM classification established by the NCCIH – National Center for Complementary and Integrative Health (Table 2). Therefore, during analysis the CAM therapies were categorized into five distinct groups: mind-body interventions, biologically based treatments, manipulative and body-based methods, energy therapies and whole medical systems. The respondents were asked to indicate how often they used the selected methods on the following scale: regularly, at least once a year, several times throughout their life, at least once in their lifetime and never. Instead of asking about procedures used during specific periods (past 30 days, last 12 months), we decided to use a four-point proportion scale, as this reflects the fact that health issues may occur irregularly during a lifetime. To eliminate order-based bias, the order of modalities was randomly rotated during both data collections.

For this study, those respondents showing a tendency towards regular or semi-regular intervals in CAM use were defined as CAM users, as these individuals were assumed to have a habitual nature in CAM use. Therefore, individuals who reported using CAM therapies regularly, at least once a year or several times during their lives, were categorized as CAM users and assigned a code of 1. Conversely, those who reported using CAM at least once in their lifetime or never were classified as non-users and were assigned a code of 0.

Table 1: **CAM users by groups and types of therapy in 2019 and 2023**

	All CAM users, (2019) N = 846 (82.4%)		All CAM users, (2023) N = 916 (%)		P (chi sq)
	N	%	N	%	
ind-body interventions	**328**	**31.9**	**402**	**42.2**	**<0.001**
Yoga	109	10.6	156	15.1	<0.01
Visual imagery	33	3.2	54	5.5	<0.05
Meditation	62	6.1	138	13.8	<0.001
Psychotherapies	36	3.5	81	8	<0.001
Religious healing	209	20.3	234	23.5	<0.05
Acupuncture	56	5.5	115	11.5	<0.001
Spiritual ceremonies	34	3.4	46	4.1	<0.05
Biologically based treatments	**810**	**78.9**	**889**	**88.4**	**<0.001**
Herbal teas	700	68.1	790	78.1	<0.001
Special diet, detoxification	194	18.8	295	29.3	<0.001
Vitamins, minerals, food supplements	730	71.1	815	80.7	<0.001
Manipulative and body-based methods	**559**	**54.4**	**632**	**65**	**<0.001**
Massage	550	53.6	644	63.7	<0.001
Chiropraxis	43	4.2	90	9.2	<0.001
Reflexology	64	6.2	127	12.7	<0.001
Energy therapies	**43**	**4.2**	**83**	**8.3**	
Energy healing	43	4.1	83	8.3	<0.001
Whole medical systems	**187**	**18.2**	**341**	**36**	**<0.001**
Homeopathy	148	14.4	284	28.3	<0.001
Chinese medicine	34	3.3	91	9.1	<0.001
Ayurveda	21	2.1	35	3.6	NS
Bach flower remedies	52	5.1	122	12.3	<0.001

Source: Based on surveys CAM in Slovakia 2019, CAM in Slovakia 2023

Moreover, the respondents were asked to identify the level of importance of the reasons for CAM use based on the following question: To what extent were the following reasons important to you, on the basis of which you decided to use an unconventional form of care last time? On a four-point scale (strongly important—strongly unimportant), the importance of the following reasons was reported: fewer side effects, financial availability, complementary use with conventional medicine, connection to one's worldview and beliefs, unknown

medical condition, greater efficiency in comparison to conventional medicine, absence of trust in conventional medicine and a prior positive experience. To compare patterns of CAM use in 2019 and 2023, the respondents' satisfaction with the healthcare system and their health were investigated on a five-point Likert scale, with the following two questions: (1) How satisfied are you with the healthcare system in Slovakia? (very satisfied—very dissatisfied) and (2) How satisfied are you with your health? (very satisfied—very dissatisfied). During the statistical analysis, a five-point Likert scale was transformed into a binary variable for both questions. Respondents indicating dissatisfaction or considerable dissatisfaction were assigned a code of 0. At the same time, the remaining responses (very satisfied, satisfied, neither satisfied nor dissatisfied) were designated as the reference category and coded as 1. We also examined the influence of religiosity on higher prevalnce of CAM. In this instance, rather than focusing on confessional affiliation, we assessed how respondents rate own religiosity on a 5-point scale. The scale ranges from one extreme, indicating a strongly religious person, to the other extreme, indicating a strongly non-religious person. Also in this case, the five point Likert scale was recoded so that a score of 1 and 2 indicated people identified themselves as religious person, while all other manifestations of strength of religious belief were allocated a code of 0.

The analysis was carried out in two steps. In the first part, we performed a chi-square test to determine the statistical significance of changes in the use of CAM between 2019 and 2023. We chose the same CAM modalities in 2023 as in 2019 to ensure consistency of the data comparison (Table 2).

In the second step of the analysis, we identified the Whole medical system (WMS in Table 2) as the CAM subgroup with the highest growth in users. Based on NCCIH classification the WMS includes – homeopathy, Chinese medicine, ayurveda, Bach flower remedies. Thus, in this part of analysis, we focused on examining changes in the use of whole medical systems among primary sociodemographic groups between 2019 and 2023. Furthermore, we also examined whether dissatisfaction with the healthcare system in 2023 is a significant predictor of use, as it was in 2019. For this, we merged data from both surveys, and we conducted a logistic regression in which the main dependent variable is the usage of Whole medical systems (0 non-users, 1 user). The variable is constructed from respondents who regularly use at least one CAM modality that NCCIH defines as WMS. The independent variables selected for the analysis included gender, age, education, income, and place of residence of the respondents (Table 3). The model also includes variables measuring satisfaction with one´s own health and healthcare, as well as the year of data collection. The primary classification variable used when plotting predicted

probabilities from the model was the year of data collection. This allowed us to visualise changes in whole medical systems (WMS) use in selected sociodemographic characteristics and satisfaction of the respondents (Figure 1, 2).

Transformations and trends in CAM utilization

In total, 916 participants, making up 90.3% of the 1,014 surveyed individuals, reported regular use of CAM. This means they engaged with CAM practices at least once annually or multiple times throughout their lives. Table 1 summarizes the socio-demographic traits of these CAM users. The most commonly used methods were biologically based treatments (88.9%), followed by manipulative and body-based approaches (65%), mind-body techniques (42.2%), whole medical systems (36%), and energy therapies (8.3%) (Table 2). Among CAM users, the primary choices included taking vitamins, minerals, and dietary supplements (80.7%), herbal teas (78.1%) and massages (63.7%). Following this, special diets (29.3%), homeopathy (28.3%), religious healing (23.5%), yoga (15.1%), meditation (13.8%), reflexology (12.7%), Bach flower remedies (12.3%), and acupuncture (11.5%) were frequently cited methods. Other techniques such as chiropraxis, Chinese medicine, energy healing, psychotherapies, visual imagery, spiritual ceremonies, and Ayurveda were used by roughly 9% or less of the participants (Table 2).

In 2019, 846 participants, accounting for 82.4% of the sample, and in 2023, 916 respondents, making up 90.3%, indicated the regular use of some form of CAM. In both investigations, biologically based treatments were the most prevalent cluster of methods (2019: 78.9% - 2023: 88.4%), followed by manipulative and body-based approaches (54.4% - 65%), mind-body techniques (31.9% - 42.2%), whole medical systems (18.2% - 36%) and energy therapies (4.2% - 8.3%). Regarding the prevalence of the first three methods, the order also remains unchanged. However, we observed a change in the position of other particular CAM modalities between 2019 and 2023. In the case of religious healing, there was a drastic drop in its ranking and, in the recent investigation, it was placed sixth, while previously, it was in fourth place.

Crucially, by comparing data with a time interval of four years, there is a significant increase in the use of almost every CAM modality. Most obvious is the increase in use of Chinese medicine (3.3% - 9.1%), psychotherapies (3.5% - 8%), Bach flower remedies (5.1% - 12.3%), acupuncture (5.5% - 11.5%), chiropraxis (4.2% - 9.2%), meditation (6.1% - 13.8%), reflexology (6.2% - 12.7%), energy healing (4.1% - 8.3%) and homeopathy (14.4% - 28.3%), where the increase is approximately twofold and greater. The prevalence of CAM users by therapy over time is shown in Table 2.

In 2019 and 2023, the respondents were able to determine the level of importance of reasons for CAM use. The results show that every option showed a decrease and there was a change in several positions. Fewer side effects, the primary reason for the respondents' last use of a CAM treatment method in 2019 (85% - 74.4%), were replaced by complementary use with conventional medicine (84.4% - 81.6%), followed by a prior positive experience (82.3% - 79.3%). The other reasons for CAM use were the connection to one's worldview and beliefs (63% - 52.6%), greater efficiency in comparison to conventional medicine (57.5% - 55.1%) and financial availability (55% - 40.5%). A total of 29.3% - 26.1% of the respondents employed CAM because they had no trust in conventional medicine.

Comparative analysis of pre-and post-pandemic usage from 2019 to 2023

The study represents a follow-up investigation on CAM use in Slovakia, using surveys from 2019 and 2023. The objective of the study was to determine the usage of CAM in Slovakia and to analyse the development and changes in the socio-demographic and socio-economic characteristics of CAM users before and after the COVID-19 pandemic. This study is one of the first attempts to investigate the change in the prevalence of CAM in pre-pandemic and post-pandemic conditions. Most studies that focused on investigating the predictive factors of CAM use during the COVID-19 pandemic were conducted during the critical months of the pandemic when several restrictions and lockdowns were imposed. Much research was conducted shortly after the outbreak of COVID-19 and thus provides a biased insight into CAM use, as the respondents were being directly impacted by a new and deadly threat (Kim et al. 2022). However, the strength of this study is that the data were collected with a time gap from the peak of the pandemic, which allowed the respondents to better evaluate their behaviour and self-management strategies regarding the use of CAM. This was supported by the method investigating respondents' experience with CAM treatments when survey participants were asked to indicate how often they used the selected method. The results show that the overall prevalence increased significantly by 7.9% in 2023 when compared to the results of the study conducted in 2019. The overall higher use of CAM methods over time corresponds with the trend in other countries and reflects various social and cultural changes that occurred over the last few decades. Moreover, this reflects a more recent trend that has been observed in studies, indicating the patients' growing requests for CAM information from physicians, pharmacists and other healthcare personnel during the COVID-19 pandemic. Several studies have confirmed that overall, worldwide CAM use during the COVID-

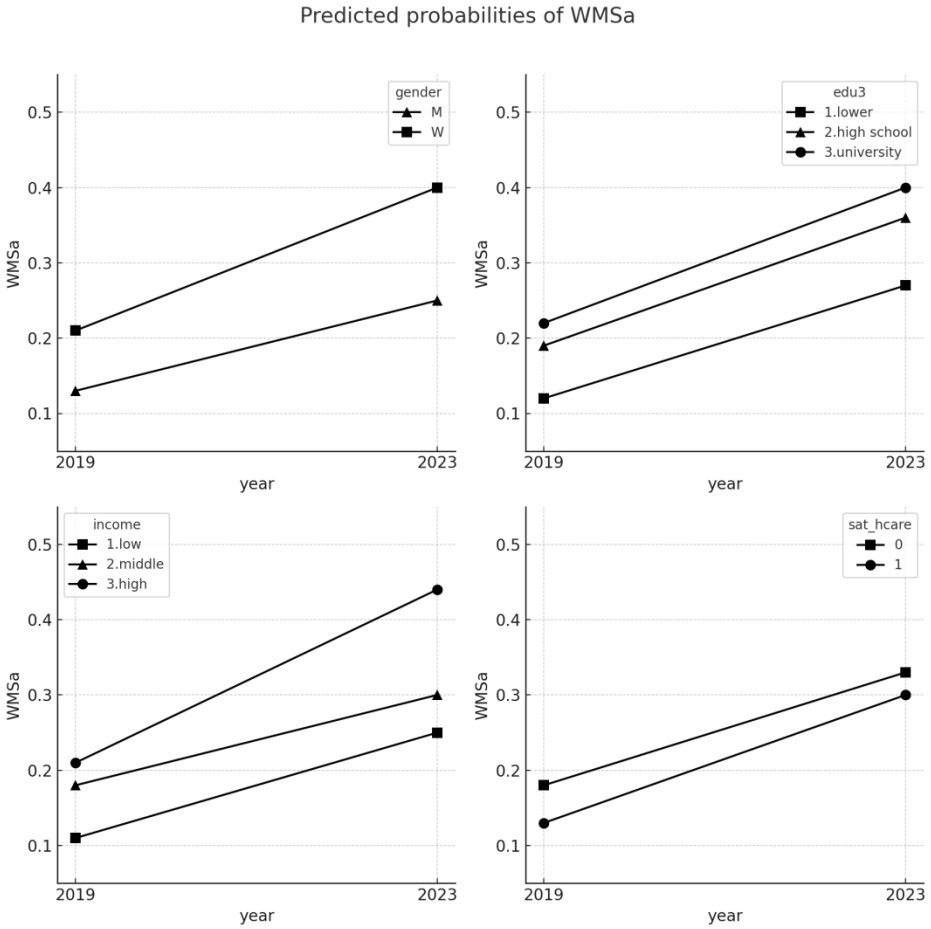
19 pandemic was higher than in similar populations before the pandemic started (Kristoffersen et al. 2022; Özlü et al. 2022; Rokhmah et al. 2020).

The general rise in CAM prevalence over the follow-up period is more pronounced in Slovakia (2019 vs. 2023: Δ 7.9%, $p < 0.001$) compared to other follow-up investigations in Canada (5% - 22 commonly used CAM therapies) (Esmail 2017) or Australia (3.2% - 10 types of CAM therapists) (MacLennan et al. 2006). However, other follow-up investigations show an even higher rise in CAM prevalence, with the greatest difference in evidence in the Czech Republic (10.7%) (Pokladnikova – Selke-Krulichova 2018) and Iceland (8.4%) (Gunnarsdottir et al. 2020). Nevertheless, it is essential to acknowledge that various studies on CAM employed distinct CAM definitions and follow-up periods. Taken together, this makes direct comparisons between countries challenging. However, the results of the prevalence of CAM use are testament to the positive attitudes and confidence of the Slovak population towards CAM.

Respondents from 2023 were more likely to indicate the use of CAM in every modality included in the list. The most substantial increase was noted in the utilization of whole medical systems and manipulative and body-based approaches, with the adoption of mind-body technique therapies following closely behind. The top four reported modalities in 2023 were vitamins, minerals and dietary supplements (80.7%), herbal teas (78.1%) and massages. In Slovak context, all of them represent accepted forms of self-health care on the border between conventional and traditional medicine. The most significant increase between 2019 and 2023 can be observed in the cases of Chinese medicine, psychotherapies, Bach flower remedies, acupuncture, chiropraxis and meditation. In the case of a group of therapies, the survey recorded the greatest increase in the use of whole medical systems (homeopathy, Chinese medicine, Bach flower remedies and Ayurveda) from 18.2% in 2019 to 36% in 2023. This group of CAM modalities encompasses comprehensive sets of theories and practices that have developed independently from or run parallel to conventional medicine. Some of them are based on old traditions and strive for preventive and curative health promotion (Baars – Hamre 2017).

Based on logistic regression analysis with added interactions, the predicted probability of whole medical systems (WMS) use in 2023 varies and is higher than in 2019 for gender, education, income, and healthcare satisfaction (Figure 1). However, the main pattern is similar in both compared years. Women, respondents with higher education and income tend to use whole medical systems (WMS) more. In both years, individuals who were dissatisfied with the healthcare system used whole medical systems (WMS) more frequently.

Figure 1: **Predicted probabilities for gender, education, income, and healthcare satisfaction**

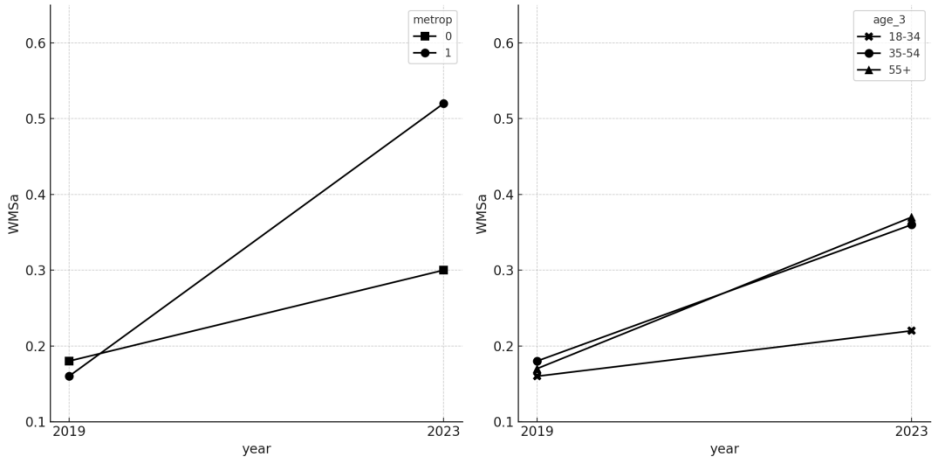


Source: Based on surveys CAM in Slovakia 2019, CAM in Slovakia 2023

Figure 2 illustrates that the use of whole medical systems (WMS) increased among residents of large cities (more than 100,000 inhabitants) and individuals over 35 years of age. The higher concentration of CAM providers and practitioners in larger cities can be attributed to the greater purchasing power in these areas. The increased preference for this category of methods during the pandemic is associated with the prescription of various CAM interventions, such as Chinese medicine and homeopathy, for both COVID-19 patients and the general population, demonstrating a significant prevalence in usage. Systematic reviews and meta-analyses, which aimed to evaluate the effect of CAM

therapies on COVID-19 patients, concluded that CAM interventions like Chinese medicine or acupuncture improved the psychological and physical conditions of COVID-19 patients (Badakhsh et al. 2021; Badanta et al. 2023; Jeon et al. 2022; Zhou et al. 2021).

Figure 2: **Predicted probabilities for place of residence and age**



Source: Based on surveys CAM in Slovakia 2019, CAM in Slovakia 2023

In the survey, participants were also asked about the reasons for their use of CAM. Interestingly, the primary reason of lessened side effects in 2019 was replaced by complementary use with conventional medicine in 2023. This shows a positive pattern if CAM is not being used in place of conventional medicine but as a complement to conventional therapies. Some of the sociological works in this area emphasize the role of the individual in understanding CAM use (Stratton – McGivern-Snofsky 2008). However, other studies often emphasize a macro-structural approach or a broader perspective to understand the emergence and growth of CAM therapies (Gale 2014). The significant rise in CAM use and the changing importance of reasons for its use, compared to previous studies, may reflect the broader consequences of major societal shifts, such as limited access to conventional healthcare during the pandemic. Findings from the study on access to health services during the COVID-19 pandemic unmistakably indicate an overall decrease in the utilization of services in the initial phases of the pandemic, alongside the emergence of new barriers affecting access and the worsening of pre-existing barriers (Pujolar et al. 2022). This is also reflected in the decrease in the number of responses given by respondents in relation to the two other options indicated in the survey

regarding the reason for CAM use. The reasons of greater efficiency in comparison to conventional medicine and lack of trust in conventional medicine dropped in comparison to previous results. These results suggest that dissatisfaction with conventional medicine plays a less important role overall than in previous research.

The key strength of this follow-up study, using a nationwide, representative survey that was conducted on the Slovakian adult population, is that it relies on the same methodology in 2019 and 2023. However, several important limitations need to be considered. The first may be identified in the broader definition of CAM, which includes vitamins, food supplements, massages or psychotherapies. According to experts in this field, due to the diversity of theories and practices in the nonconventional healthcare sector, there is no clear scientific *consensus* as to *what should be considered part of CAM*. Given that the use of herbal treatments represents an integral part of traditional medicine in many European countries, including Slovakia, there was a reason to include a question on this form of treatment (Penkala-Gawęcka 1995). The spirituality of individuals might represent an integral part of the healing process (Tippens et al. 2009). As a result, the questionnaire also includes religious healing, with the term used in the questionnaire being literally translated as "healing prayer". Psychotherapy is not typically considered as a form of CAM. However, certain types of therapy that integrate holistic or alternative approaches, such as biofeedback or family constellations, may fall under the CAM umbrella (Gyimesi 2023). Notwithstanding this, it is clear that excluding the above-mentioned methods would have a significant impact on the overall analysis presented in the study. However, other research on the use of CAM by the general population has worked with a broad definition of CAM. To ensure data comparability with studies conducted on CAM prevalence development in other countries, a similar approach was adopted in this investigation. Another problem with the list of CAM modalities is that some of the categories were unusually separated or grouped. This reflects the results of our pretest investigation in which some respondents suggested that they did not understand the meaning of the terminology. Based on these data, we decided to list, for example, acupuncture and Chinese medicine as two separate modalities, even though this may be considered unusual. Another drawback of the study is that only a limited number of reasons for CAM use were examined. Other reasons for CAM use could potentially change the interpretation of the results. One prevalent issue observed in nearly all survey studies stems from the bias introduced by the individuals willing to participate. It is essential to consider this factor during the interpretation of the obtained results.

Conclusion

Sociology discipline with a wide range of theoretical perspectives is well-positioned to contribute to understanding the social factors that shape individual use CAM therapies (Stratton – McGivern-Snofsky 2008). In a critical review of the sociology of CAM, Siahpush argued that among the key explanations relevant for CAM use are dissatisfaction with orthodox medicine's outcomes and postmodern value system, including the compatibility of CAM therapies with people's values and beliefs (Siahpush 2000). All the evidence provided in this study suggests that CAM prevalence increased significantly between 2019 and 2023. The most notable difference was observed in the case of whole medical systems, in which the increase in users recorded in the comparison period doubled. However, further results indicate that dissatisfaction with conventional medicine and connection to one's worldview and beliefs play a less important role than previously thought. It is very true that every medical environment is socially rooted in the context of its time and culture. The rise in the use of CAM treatments can be viewed in light of wider social changes and influences that may empower CAM to increasingly challenge conventional medicine (Coulter – Willis 2004). As previously noted, given the unprecedented challenges encountered by individuals and societies worldwide during the COVID-19 pandemic, it is unsurprising that there were alterations in health-behaviour patterns, including the adoption of various CAM modalities. Accordingly, the utilization of CAM can no longer be considered an unusual or marginalized approach to addressing health-related issues. Instead of viewing CAM therapies as substitutes for conventional medical treatments, individuals often turn to them as supplementary practices when conventional, mainstream medical services are limited or not readily accessible, especially in times of need. However, several questions remain unanswered at present. Most importantly, the growing popularity of CAM underscores the need for qualitative research that has the ambition to explore social and cultural factors that influence use of CAM treatments.

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Statement of Ethics
All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee (UMB Ethical comitee, reference 363/2023).

Data availability statement
Research data is available if requested.

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