Self-Reported Health Characteristics and Medication Consumption by CAM Users and Nonusers: A Swiss Cross-Sectional Survey

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Abstract

Objectives: Complementary and alternative medicine (CAM) is very popular in Switzerland. The objective of this work was to find out whether the use of CAM therapies is associated with distinct health characteristics and altered consumption of conventional medications.

Design and participants: Self-reported data from the 2007 Swiss Health Survey were analyzed. Two groups of participants were defined and compared with each other: CAM users (those who had used CAM during the last 12 months, $n = 3333$) and nonusers (those who stated they had not used CAM during the last 12 months, $n = 9821$).

Outcome measures: Multivariate logistic regression models were used to determine the predictors of CAM use and to address relevance and magnitude of the differences in medication consumption between CAM users and nonusers.

Results: Comparatively lower body–mass index (BMI) values and migraine, arthritis, allergies, and depression were associated with increased probability of CAM use. Multivariate logistic regression models that adjusted for the effects of relevant demographic factors, BMI, and perceived health status showed that CAM users consumed fewer medications for cardiovascular diseases—high blood pressure and high cholesterol (and, by trend, heart problems and diabetes)—than nonusers. On the other hand, their consumption of analgesics and medications for depression and for constipation (and, by trend, sedatives and soporifics), was higher than that of nonusers.

Conclusions: Migraine, arthritis, depression, and constipation might lead patients to use CAM therapies and, in addition, to consume more of some conventional medications. Given the long intake period and considerable adverse effects of medications, the lower consumption of these agents for chronic cardiovascular problems by CAM users might be beneficial and deserves further investigations.

Introduction

COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM) is defined as a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine.[1] The use of CAM in Switzerland and its effectiveness, appropriateness, and efficiency were addressed in 2005 by the government Program of Evaluation of Complementary Medicine,[2–4] which showed that approximately half of the population uses CAM. The popularity of this type of medicine was corroborated by a people's vote in 2009 in which about two thirds of the citizens favored the possibility of using CAM. Residents in Switzerland have access to a basic health insurance coverage that includes a comprehensive basket of health benefits, including between 1999 and 2004 and newly since 2011 CAM therapies if prescribed by a physician with a recognized education on CAM. In addition, approximately 60% of the residents opt for additional insurance that covers, among other items, additional CAM-related expenses.

National cross-sectional population-based surveys are ordered by the Swiss government and performed by the Federal Office for Statistics every 5 years.[5] The goal of each Swiss Health Survey (SHS) is to collect data on demographic characteristics, health status, and utilization of health services, as well as on living conditions and lifestyle characteristics of the participants. The last available data were obtained in 2007, in which a representative sample of about

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30,000 households was defined and per household one person aged 15 years or older was randomly selected. This survey revealed among others that the medication consumption had increased markedly since the previous surveys of 2002 and 1997.

How the use of CAM affects the consumption of conventional medications is still not entirely clear. It is often assumed that CAM is used in addition to conventional medications. Several observational studies, however, have shown that the use of homeopathic medicines leads to a reduction in the intake of conventional medications.[6–11] According to data from the above-mentioned Program of Evaluation of Complementary Medicine in Switzerland, medication costs correspond to 35% of the total costs per primary care physician with CAM education but 53% of costs per physician practicing conventional medicine exclusively. These findings suggest that the former group of physicians might refrain from prescribing medications.

We have hypothesized that the use of CAM medication and therapies might be associated with lower use of conventional medications in a manner dependent on health conditions. To address this hypothesis, data of the SHS-2007 were used to compare both perceived health condition and the consumption of various medication groups among CAM users and nonusers. Moreover, demographic characteristics and some lifestyle measures of both CAM users and nonusers were characterized and possible predictors of CAM use identified.

Methods

The target population of the SHS-2007 was the residents in Switzerland aged 15 years and older who had a fixed telephone line and spoke at least one of the three national languages (German, French, or Italian). People living in homes for the elderly, prisons, or other similar institutions or collective households were not part of the study population. To assure a representative sampling of the Swiss population of approximately 8 million people, participants were selected by stratified random sampling, and participation denial upon invitation was punished with a fine. In the case of Switzerland, a small country in the center of Europe with various culturally distinct regions that in part translate in different national languages, this issue deserves special attention.

Information was collected both by standardized telephone interviews ($n = 18,760$) and by a self-administered questionnaire ($n = 14,393$). Because the information on CAM use was acquired via the self-administered questionnaire, the present data analysis concerns only the participants, who had sent duly completed self-administered questionnaires. It should be noted that although SHS-2007 comprises a very high number of questions, the present analysis is based only on those considered relevant to the addressed question. All data were self-reported (*i.e.*, reflect participants' interpretation of the questions and perceptions).

The primary variable in the present analysis, namely CAM use, was addressed by the question (number 10 of the questionnaire): "How many times did you use one of the following therapies during the last 12 months?": acupuncture, homeopathy, phytotherapy, Shiatsu/foot reflexology,

autogenic training/hypnoses, neural therapy, Traditional Chinese Medicine without acupuncture, anthroposophic medicine, bio-resonance, Indian medicine/*Ayurveda*, osteopathy, other (*e.g.*, kinesiology, Feldenkrais method). The participants using any of these therapies at least once were considered and are referred to throughout the text as CAM users, those who denied having used any of them are called nonusers, and those who did not answer this question are classified as "unknowns."

Further variables that were considered include various medication groups whose consumption frequency during the last 7 days was asked during the telephone interviews: cholesterol-lowering drugs; soporifics; analgesics; sedatives; hormone replacement; and medications for high blood pressure, heart, diabetes, depression, constipation, asthma, and osteoporosis. In each case, the consumption of medicaments from the mentioned groups was asked by the question, "How often did you take [a medication group] during the last 7 days?" Any declared use was considered a positive answer for the corresponding medication. Moreover, variables were included that addressed the following diseases: chronic diseases (in general), migraine, asthma, diabetes, high blood pressure, infarction, apoplectic stroke, cholesterol, arthritis, osteoporosis, cancer, allergies, and depression. Concerning high blood pressure, cholesterol, and diabetes, the survey comprised two questions: one on the present situation and the other on whether the participant had ever been notified by medicinal personnel. Finally, variables concerning demographic characteristics, perceived health condition, nutrition, and some lifestyle measures were addressed for descriptive purposes, to determine the predictors of the CAM use, and to account for their confounding effect on the comparison of medications use between CAM users and nonusers.

Numerous statistical analyses were performed. First, univariate analyses of CAM use versus each of the potential predictors identified in the SHS were performed, namely CAM use versus age, gender, language, nationality, income, household structure, education, and perceived health status. Second, multivariate analyses of CAM use versus several sets of these potential predictors were done: CAM use versus demographic variables, CAM use versus perceived health status, and CAM use versus demographic variables plus perceived health status plus body–mass index (BMI). Third, multivariate analyses of the consumption of each of the following medication groups versus CAM use plus demographic variables plus perceived health status plus BMI were performed: high blood pressure medications, heart medications, cholesterol-lowering drugs, medications for diabetes, soporifics, analgesics, sedatives, depression medications, medications for constipation, asthma medications, medications for osteoporosis, and hormone replacement. The explanatory power of the various predictors in all the above analyses was identified with multivariate logistic regression models, in which a selection of to-be-retained predictors was performed in a backwards elimination scheme using the Bayesian information criterion (BIC).[12] When adequate, the chi-square test was used to characterize the differences between CAM users and nonusers; statistical significance was set at $p \leq 0.05$. All data were analyzed using the programming language and software environment R.[13]

Results

Approximately one fourth of all survey participants answered that they had used at least once any of the mentioned CAM therapies during the last 12 months (3333 of 14,393 [23.2%]), whereas approximately two thirds answered not to have made any use thereof (9821 of 14,393 [68.2%]). A considerable number of participants did not answer the questions on use of CAM (1239 of 14,393 [8.6%], a group referred to as "unknowns"). Because of their demographic characteristics (see below), it is likely that at least a considerable portion did not answer these questions because they did not understand them; this might suggest that they did not know of the existence of CAM therapies and therefore did not use any of them. We opted not to include them among the nonusers, but their data are shown throughout this report and are briefly discussed.

Descriptive analysis of sociodemographic characteristics, nutrition, some lifestyle measures, and perceived health status

Table 1 shows the main sociodemographic characteristics of the study participants. The percentage of women among CAM users was markedly higher than among nonusers; in addition, the age groups between 30 and 60 years were overrepresented among CAM users at the expense of elderly participants. Although the majority of both CAM users and nonusers declared German as their national language, the relative portion of participants with French as a national language was higher among CAM users.

TABLE 1. SOCIODEMOGRAPHIC CHARACTERISTICS OF COMPLEMENTARY AND ALTERNATIVE
MEDICINE USERS, NONUSERS, AND UNKNOWNS

Characteristic	*CAM users* (n = 3333)		*Nonusers* (n = 9821)		*Unknowns* (n = 1239)	
Gender						
Female	**2383**	**71.5**	**4959**	**50.5**	743	60.0
Male	**950**	**28.5**	**4862**	**49.5**	496	40.0
Age group						
≤30 y	**492**	**14.8**	**1658**	**16.9**	76	6.1
30–40 y	**782**	**23.5**	**1718**	**17.5**	95	7.7
40–50 y	**733**	**22.0**	**1843**	**18.8**	143	11.5
50–60 y	**594**	**17.8**	**1595**	**16.2**	175	14.1
60–70 y	**450**	**13.5**	**1657**	**16.9**	280	22.6
70–80 y	**219**	**6.6**	**1013**	**10.3**	306	24.7
≥80 y	**63**	**1.9**	**337**	**3.4**	164	13.2
National language						
German	**1940**	**58.2**	**6315**	**64.3**	708	57.1
French	**1182**	**35.5**	**2756**	**28.1**	388	31.3
Italian	**211**	**6.3**	**750**	**7.6**	143	11.5
Nationality						
Swiss	3047	91.4	8780	89.4	1095	88.4
European Union	245	7.4	828	8.4	105	8.5
Balkan countries	11	0.3	89	0.9	18	1.5
Others	30	0.9	124	1.3	21	1.7
Income						
≤4500 SFr.	849	25.5	2721	27.7	623	50.3
>4500 and ≤6000 SFr.	645	19.4	1990	20.3	224	18.1
>6000 and ≤9000 SFr.	894	26.8	2352	23.9	152	12.3
>9000 SFr.	695	20.9	1855	18.9	110	8.9
unknown	250	7.5	903	9.2	130	10.5
Household structure						
Single	968	29.0	2682	27.3	497	40.1
Couple without children	967	29.0	3274	33.3	464	37.4
Couple with children	1151	34.5	3254	33.1	217	17.5
One parent family	207	6.2	510	5.2	57	4.6
Other	40	1.2	101	1.0	4	0.3
Highest education						
None	**24**	**0.7**	**100**	**1.0**	30	2.4
Obligatory school	**319**	**9.6**	**1412**	**14.4**	378	30.5
Middle (vocational training)	**1636**	**49.1**	**5203**	**53.0**	620	50.0
Qualification for higher education	**166**	**5.0**	**383**	**3.9**	34	2.7
High vocational	**564**	**16.9**	**1380**	**14.1**	100	8.1
Pedagogic	**158**	**4.7**	**237**	**2.4**	20	1.6
University	**466**	**14.0**	**1106**	**11.3**	57	4.6

Values are number and percentages of respondents. Boldface values denote the most predictive demographic variables for use of complementary and alternative medicine. Unknowns are defined as participants who did not answer the questions on CAM use.
CAM, complementary and alternative medicine; SFr., Swiss franc.

High-income and high-education groups, as well as couples with children, were overrepresented among CAM users, whereas Swiss nationality was similar between the two groups. The "unknowns" group was clearly distinct from both CAM users and nonusers: They were more often over 60 years old, more rarely spoke German as the national language, and were less frequently Swiss or EU citizens. Furthermore, the participants with very low income and very low education, as well as singles and couples without children, were overrepresented in this group.

As was expected, the prevalence of having additional health insurance to take over—among others—CAM costs that are not covered by the basic health insurance, differed in the various groups, with 77.7% (2589 of 3333) of CAM users, 48.9% (4806 of 9821) of nonusers, and 41.2% (510 of 1239) of the "unknown" group having one.

Several lifestyle measures, including nutrition, perceived physical activity, consideration of health concerns, and security on health-related subjects, were addressed in the SHS-2007 (Table 2). CAM users tended to pay more often attention to nutrition, to more frequently consume vegetables and fish and, more rarely, meat, and to be less frequently sure whether they made enough physical activity than nonusers. Interestingly, CAM users more often had the impression that their thoughts on health affected their lifestyle and felt more frequently sure about their health behavior.

Table 3 shows the main health-related characteristics of the various participant groups. The participants were asked to qualitatively classify their present health status as they perceived it, to state whether they had chronic diseases in general and to specify whether they were in medical

TABLE 2. NUTRITION AND LIFESTYLE MEASURES OF COMPLEMENTARY AND ALTERNATIVE
MEDICINE USERS, NONUSERS, AND UNKNOWNS

Characteristic	CAM users (n = 3333)		Nonusers (n = 9821)		Unknowns (n = 1239)	
Pays attention to nutrition	2683	80.5	6955	70.8	907	73.2
Consumption of vegetables (per day)						
Never	20	0.6	98	1.0	9	0.7
Less than once	256	7.7	1138	11.6	150	12.2
1–2 portions	2394	71.9	7350	75.1	929	75.6
3–4 portions	589	17.7	1083	11.1	125	10.2
5 portions	69	2.1	124	1.3	16	1.3
NA	5	–	28	–	10	–
Consumption of meat (days per week)						
Never	182	5.5	197	2.0	18	1.5
1	314	9.4	598	6.1	106	8.6
2	558	16.7	1352	13.8	193	15.6
3	756	22.7	2064	21.0	311	25.1
4	531	15.9	1678	17.1	187	15.1
5	348	10.4	1212	12.4	114	9.2
6	179	5.4	658	6.7	63	5.1
7	382	11.5	1865	19.0	221	17.8
More rarely	83	2.5	182	1.9	26	2.1
NA	0		15		0	
Consumption of fish (per week)						
Never	256	7.7	826	8.4	106	8.6
1	1577	47.3	4310	43.9	525	42.4
2	495	14.9	1,357	13.8	185	14.9
3	130	3.9	351	3.6	58	4.7
>3	49	1.5	140	1.4	25	2.0
More rarely	824	24.7	2826	28.8	340	27.4
NA	2	–	11	–	0	–
Performs enough physical activity	1846	55.8	5910	60.8	794	66.0
Health concerns affect lifestyle						
I live without thinking about health	194	6.0	1233	12.9	156	14.2
Thoughts about health affect lifestyle	2311	70.9	6570	68.7	600	54.5
Thoughts about health determine lifestyle	755	23.2	1759	18.4	345	31.3
NA	73	–	259	–	138	–
In a 1–5 scale on my health behavior, I feel						
1 (very sure)	1249	38.1	3306	34.2	376	36.1
2	1284	39.1	3619	37.5	254	24.4
3	566	17.2	1811	18.7	173	16.6
4	84	2.6	361	3.7	52	5.0
5 (very unsure)	46	1.4	187	1.9	62	6.0
Don't know	53	1.6	377	3.9	124	11.9
NA	51	–	160	–	198	–

Values are the number and percentage of respondents.
NA, no answer.

TABLE 3. HEALTH CONDITION OF COMPLEMENTARY AND ALTERNATIVE MEDICINE USERS, NONUSERS, AND UNKNOWNS

Characteristic	CAM users (n = 3333)		Nonusers (n = 9821)		Unknowns (n = 1239)	
Health status						
Very good	597	17.9	2,102	21.4	177	14.3
Good	2,238	67.2	6,641	67.6	732	59.1
Middle	383	11.5	874	8.9	252	20.4
Bad	92	2.8	172	1.8	68	5.5
Very bad	22	0.7	28	0.3	9	0.7
NA	1	–	4	–	1	–
Long-lasting or chronic diseases	1116	33.5	7157	27.0	484	39.1
Migraine	**176**	**5.6**	**159**	**1.7**	29	3.5
Asthma	116	3.5	231	2.4	37	3.0
High blood glucose	60	1.8	271	2.8	92	7.4
Diabetes*	109	3.3	469	4.8	142	11.5
High blood pressure	325	9.8	1338	13.6	271	21.9
High blood pressure*	625	18.8	2374	24.3	485	39.4
Infarction	29	0.9	121	1.2	25	2.0
Apoplectic stroke	32	1.0	104	1.1	33	2.7
Cholesterol (present value)						
Normal	2,580	94.4	7636	95.3	1037	95.4
Too high	153	5.6	373	4.7	50	4.6
Doesn't know	600	–	1812	–	152	–
NA	0	–	0	–	0	–
Cholesterol*						
Yes	564	17.1	1769	18.2	292	23.9
No	2743	82.9	7941	81.8	929	76.1
Doesn't know	26	–	111	–	18	–
NA	0	–	0	–	0	–
Arthritis	**333**	**10.5**	**683**	**7.3**	175	19.5
Osteoporosis	100	3.0	215	2.2	45	3.6
Cancer	58	1.7	155	1.6	32	2.6
Allergies	**344**	**10.3**	**490**	**5.0**	46	3.7
Depression	**267**	**8.0**	**338**	**3.4**	67	5.4
BMI						
Underweight	**146**	**4.4**	**335**	**3.4**	38	3.1
Normal	**2181**	**66.0**	**5591**	**57.4**	572	47.2
Overweight	**780**	**23.6**	**2979**	**30.6**	448	37.0
Adipositas	**200**	**6.0**	**827**	**8.5**	154	12.7
NA	**26**	**–**	**89**	**–**	27	

*Diagnosed by medical professionals.
Values are the number and percentage of respondents. Boldface denotes the most predictive specific diseases for the use of complementary and alternative medicine, as revealed by a Bayesian information criterion–based backward elimination in which sociodemographic variables were considered as well.

treatment due to several diseases (currently or during the last 12 months).

Although in all groups the majority of the participants believed they were in good health, the groups with bad or very bad perceived health were slightly more frequent among CAM users than among nonusers. Participants who used CAM seemed to more frequently have chronic diseases, migraine, allergies, asthma, osteoporosis, and depressions, and, more rarely, overweight/obesity, diabetes, and high blood pressure, than nonusers. Furthermore, slightly more CAM users currently had high cholesterol, somewhat less CAM users than nonusers answered that medicinal personnel had previously diagnosed high cholesterol and diabetes.

Determination of the predictors of CAM use

The demographic variables gender, age, national language, nationality, income, household structure, and education were considered in a multivariate logistic regression model and turned out to differ between CAM users and nonusers. In all cases the differences were statistically significant— gender ($p < 0.001$), age ($p < 0.001$), language ($p < 0.001$), nationality ($p < 0.01$), income ($p < 0.005$), household structure ($p < 0.01$), or education ($p < 0.001$) —as determined by likelihood ratio tests. After BIC-based backward elimination, gender, age, national language, and education remained and thus were the most predictive variables affecting use or nonuse of CAM (Table 1, in bold). The results showed that female gender, younger age, French as national language, and higher education were positive indicators for the use of CAM.

Thereafter, the various disease-related variables were integrated in the multivariate logistic regression analysis—in addition to demographic variables mentioned above—and the resulting data were also submitted to a BIC based backward elimination. This analysis revealed that the participants with migraine, arthritis, allergies, and depression

had a higher probability of CAM use, whereas high BMI was associated with lower probability of using CAM (Table 3, in bold). An intermediate analysis in which only the disease-related variables were considered—in the absence of any demographic variables—pointed toward more diseases as possibly being associated with CAM use, but their influence was markedly reduced or abolished by the concomitant integration of the demographic variables. This analysis revealed that their initial detection was probably related to a confounding influence of the demographic characteristics of CAM users and nonusers.

Data on the participants who did not answer the question on CAM use ("unknowns") were not considered in the multivariate analyses mentioned above. When they were incorporated in an extended, multinomial model, the results showed that the probability of being in this group increased with age and declined with higher income and education; in addition, the nationality groups "Balkan" and "others" were overrepresented among the "unknown" participants. A BIC-based backward elimination provided evidence that all these predictors had some explanatory power for the distinction of the three groups.

Use of conventional medications

The main focus of this work was to compare use of conventional medications by CAM users and nonusers. As depicted in Table 4, CAM users seemed to consume fewer of the medications related to cardiovascular diseases (CVD) than nonusers, namely those for high blood pressure (11.1% versus 16.5%), heart (4.8% versus 7.1%), high cholesterol (5.3% versus 8.4%), and diabetes (1.6 % versus 2.7%). In opposition, CAM users seemed to consume more of the

remaining medications (soporifics; analgesics; sedatives; medications for depression, constipation, asthma, and osteoporosis; and hormone replacement).

Given the markedly different sociodemographic characteristics of CAM users and nonusers (see above), however, only a multivariate analysis including the most predictive variables can definitely address the importance of the differences in medication consumption between CAM users and nonusers. For each medication group the most predictive variables were identified by performing a BIC-based backward elimination of the variables considered in the multivariate logistic regression models (Table 4). Odds ratio values calculated between the groups of CAM users and nonusers are also shown in Table 4; an odds ratio less than or greater than 1 means that the probability that CAM users consume a given type of medication is lower or higher than that of nonusers, respectively. CAM users consumed significantly less medication for high blood pressure and high cholesterol and tended to a lower use of heart and diabetes medications. In opposition, they consumed significantly more analgesics, medications for depression, and constipation than nonusers and tended to higher use of sedatives and soporifics.

Discussion

The present work reveals significant differences between medication consumption by CAM users and nonusers. The former consume fewer medications related to CVD, namely for high blood pressure and high cholesterol (with trends detected in the case of medications for heart diseases and diabetes). CAM users, however, made more use of other medications, namely of analgesics and medications for

TABLE 4. DIFFERENCES BETWEEN CONSUMPTION OF CONVENTIONAL MEDICATIONS BY COMPLEMENTARY AND ALTERNATIVE MEDICINE USERS AND NONUSERS

Medications	CAM users (n = 3333)		Nonusers (n = 9821)		Odds ratio[1]	p-Value	Most predictive variables	Unknowns (n = 1239)	
High blood pressure medications	**11.1**	**3**	**16.5**	**8**	**0.765**	**<0.001**	**Age, BMI, perceived health**	34.5	8
Heart medications	4.8	3	7.1	6	0.831	0.065	Gender, age, BMI, perceived health	17.0	1
Cholesterol-lowering drugs	**5.3**	**1**	**8.4**	**5**	**0.773**	**0.005**	**Gender, age, national language, BMI, perceived health**	16.0	5
Medications for diabetes	1.6	1	2.7	2	0.795	0.145	Gender, age, BMI, perceived health	8.1	2
Soporifics	6.4	1	5.5	5	1.171	0.088	Gender, age, national language, perceived health	14.1	3
Analgesics	**24.8**	**2**	**19.2**	**8**	**1.161**	**0.004**	**Age, national language, BMI, perceived health**	25.2	1
Sedatives	6.2	2	4.2	4	1.196	0.059	Gender, national language, household structure, perceived health	8.1	1
Depression medications	**5.8**	**1**	**3.4**	**3**	**1.294**	**0.012**	**Gender, age, national language, household structure, perceived health**	6.5	2
Medications for constipation	**2.8**	**1**	**2.1**	**3**	**1.315**	**0.046**	**Gender, age, perceived health**	4.8	1
Asthma medications	2.3	1	2.2	5	0.907	0.475	Perceived health	3.6	1
Medications for osteoporosis	3.9	1	3.2	2	1.147	0.238	Gender, age, perceived health	5.7	1
Hormone replacement	5.9	1	4.3	11	0.986	0.882	Gender, age, national language	4.8	1

Values are percentages and number of no answers unless otherwise noted. Boldface denotes medications for which statistically significant differences were detected, upon correction for the relevant variables. Relevant variables were determined in each case by a Bayesian information criterion–based backward elimination.

[1]Odds ratios, *p* values, and relevant variables were calculated only for complementary and alternative medicine users and nonusers; values for unknowns are shown on the right for comparison.

BMI, body–mass index; CAM, complementary and alternative medicine.

depression and for constipation (and tended to use more sedatives and soporifics), than nonusers. To understand these differences, several health-related characteristics of the survey participants—perceived global health, disease prevalence, and BMI—were considered in the present work. Moreover, the main sociodemographic differences between CAM users and nonusers had to be accounted for. In this regard the data confirm previous studies revealing that being female and middle-aged and having a high education are predictors for the use of CAM;[14–16] during preparation of this manuscript, an independent analysis of the SHS-2007 data was published, with similar conclusions on these predictors.[17]

The fact of having some diseases—namely migraine, arthritis, allergies, and depression—increased the probability of using CAM. This finding emerged even though the effects of demographic factors, BMI, and perceived global health status had been compensated for in multivariate logistic regression models. The results suggest therefore that suffering from these particular diseases—all long-lasting and likely to recur—has led patients not only to look for CAM therapies but also to consume more of the corresponding conventional medications. Indeed, both occurrence of depression and consumption of the corresponding medications were higher among CAM users. In addition, the markedly higher occurrence of migraine and arthritis among CAM users might be associated with the higher intake of analgesics. These observations are in line with previous work suggesting that CAM users might have a higher incidence of overall illness and report poorer health than nonusers.[15,16]

A similar rationale, however, cannot be applied to the less use of medications related to CVD by CAM users because diagnosed high cholesterol and infarction rates, as well as (after correcting for demographic confounders and BMI) prevalence of high blood pressure, were similar between CAM users and nonusers. The medications related to CVD-risk factors mentioned in the present study are to be taken in a prevention context, mostly every day, often for the rest of the patient's life, and are associated with well-known adverse effects.[18,19] No indications for a negative effect of a possible undersupply were found in the present analysis, and previous work on longevity has shown that patients whose general practitioner had additional training in complementary medicine live longer.[20] Data from the Swiss Program of Evaluation of Complementary Medicine revealed that although CAM physicians often relied on conventional therapies to treat CVD (most frequently hypertension, chronic ischemic heart disease, unspecified heart failure, atrial fibrillation, and flutter), about 13% of the patients visiting CAM physicians for CVD had been treated exclusively with CAM therapies.[21] The consequences of a reduced consumption of CVD-related medications by at least some CAM users should be addressed in studies designed specifically for this purpose. It would be interesting to find out what exactly CAM offers to the management of CVD, how CAM physicians are assessing the individual risk for CVD, or, alternatively, which favorable lifestyles factors are associated with CAM use (see below). The active participation of CAM physicians in the still-ongoing discussion about which patients should be treated with medications for high cholesterol[19] and for high blood pressure[22] is in any case requested. Finally, lower consumption of CVD-related medications might have direct economic consequences, especially if one considers that at least in

Switzerland, CVD medications make up 12.1 % of the factory levy prices,[23] medications against high blood pressure and cholesterol correspond to 15% of the total medication prices,[24] and 8 of the 25 most sold medications are for high blood pressure or high cholesterol.[25]

At present, therapeutic lifestyle changes—increase in physical activity, weight loss, smoking cessation, and adoption of a healthier diet—should already be the first measure in the standard strategy for cardiovascular risk reduction.[19,26] The present work indicates that CAM users more often pay attention to nutrition and more markedly consider health-related aspects while shaping their lifestyle. Moreover, their diet was different, comprising more vegetables and fish and more rarely meat. These characteristics might explain why CAM users had lower BMI than nonusers, a difference beyond what could be expected given the demographic characteristics of the two groups. This deserves further attention because a lower BMI might derive from still unknown lifestyle factors or from particular synergies between different factors associated with CAM use, whose identification could contribute to the prevention of CVD. Very recently, a Dutch cohort study indicated that women with alternative lifestyles exhibit more favorable body weight than those with conventional ones.[27] Interestingly, the former had been recruited via anthroposophic under-five clinics; anthroposophic clinicians and midwives; and advertisements in organic food shops, Rudolf Steiner schools, and relevant magazines. Therefore, they are at least in part likely to be CAM users.

Strengths of the present approach are the large number of participants and the independent data acquisition. The fact that the data were delivered from survey responses by the participants and therefore reflect their interpretation of the questions and perceptions—not clinical determinations—can be seen as a limitation. Moreover, the survey was not specifically designed to answer the questions addressed in the present work; this might have affected the results because, for example, of the different time frames addressed by the various questions (last 12 months for the use of CAM but last 7 days for the consumption of medications) or the need to dichotomously classify some variables (*e.g.*, consumption of medications). To account for the influence of health status on medication consumption, the analysis relied on perceived global health because the strong correlation between medication use and corresponding diseases prevented their incorporation in multivariate models; however, CAM users and nonusers might have had distinct expectations on health and therefore perceived global health differently.

Conclusions

CAM use was associated with the prevalence of certain diseases and with distinct use of conventional medications. CAM users more often had migraine, arthritis, allergies, and depression, as well as a lower BMI. They consumed fewer medications for cardiovascular problems—high blood pressure and high cholesterol (with trends for heart problems and diabetes) —even though the effects of demographic factors, BMI, and perceived health status had been compensated for. This lower consumption of medications for chronic cardiovascular problems by CAM users deserves further investigations.

Disclosure Statement

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