

## Health Service Research

# Belief in and use of complementary therapies among family physicians, internists and orthopaedists in Germany – cross-sectional survey

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### Abstract

**Background.** Few studies have compared the belief in and the use of complementary and alternative medicine (CAM) across different medical specialties.

**Objective.** To investigate to what extent family physicians, internists and orthopaedists working in private practice in Germany (i) belief in the efficacy of CAM therapies; (ii) use these therapies for treating patients and (iii) whether beliefs and use are associated with basic professional attitudes.

**Methods.** A four-page questionnaire was sent to nation-wide random samples of the three groups of physicians. Participants were asked to indicate their belief in the efficacy and their use of seven CAM treatments and to rate their agreement to statements on orthodox and heterodox professional views, patient–provider relationship and placebo effects.

**Results.** A total of 935 of 2018 (46%) physicians contacted sent back a questionnaire. The belief in specific effects of CAM therapies varied strongly within and between specialties, but overall many physicians hold positive views. Internists were more skeptic than family physicians and orthopaedists ( $P < 0.001$ ); 23% of family physicians, 6% of internists and 31% of orthopaedists reported to use four or more CAM therapies more often than once a week. Frequent CAM use was strongly associated with being an orthopaedist and a higher overall belief in CAM modalities. Holding orthodox professional views predicted low CAM use.

**Conclusions.** Many physicians (particularly, family physicians and orthopaedists) working in private practice in Germany use CAM therapies frequently and believe in their efficacy. Professional views and the specific working situation seem to influence use and believe strongly.

**Key words:** Attitudes of health personnel, complementary therapies, general practice, internal medicine, orthopaedics, physicians.

### Introduction

Complementary and alternative medicine (CAM) modalities are widely used but controversial. Skeptics consider the theories underlying most of these therapies to be highly questionable or even completely implausible and the evidence for effects over placebo or sham interventions as weak or negative (1,2). CAM researchers consider

the evidence less negative but agree that it is convincing only in rare cases (3). Although basic information on CAM is now provided in medical schools in some industrialized countries these therapies clearly do not have a major role in the curriculum, in major textbooks or practice guidelines. Yet, among medical doctors the use and the belief in the efficacy of CAM treatments is considerable (4,5).

Research on why some physicians are open to CAM and others not is relatively limited. In quantitative surveys among physicians the most important reasons reported for the practical use of, referral for, or interest in CAM were patient's lack of response to conventional treatment, patient's request or preference, belief in efficacy and fewer adverse effects (4). In qualitative studies physicians also report own positive experiences, an improved patient–physician communication, a more holistic view, limitations of the scientific worldview, placebo effects and a synergy between CAM and the patient's beliefs as reasons for using CAM (6,7). The main reason for a skeptical attitude is clearly the lack of scientific evidence and the often low plausibility of CAM treatments, but also raising false hopes is considered an important problem (6–8).

There are only few surveys comparing CAM use among various medical specialties (e.g. Perkin *et al.* (9) and Franklin (10)) but the results of these studies and indirect comparison of findings of systematic reviews (4,5) suggest that family physicians might be more open to CAM than the majority of other disciplines. This seems plausible. Family physicians see many patients for whom it is difficult to make a clear diagnosis, who have minor ailments or suffer from chronic diseases (11,12). For those believing in CAM such treatments provide (or seem to provide) additional specific diagnostic and therapeutic strategies and reduce uncertainty. CAM treatments should be a less relevant option for a specialist for internal medicine who often sees pre-selected cases with more advanced, clearly defined diseases. One would also expect that within a specific group of physicians those who are strongly oriented towards scientific principles are less likely to use CAM treatments while those who feel less satisfied with biomedicine are more likely to use such treatments (6–8).

In the study reported in this article we aimed to investigate to what extent family physicians, internists and orthopaedists working in private practice in Germany (i) belief in the efficacy of CAM therapies; (ii) use these therapies for treating patients and (iii) whether beliefs and use are associated with basic professional attitudes. The study also addressed the use of placebos (interventions not containing any active components, such as saline injections or sugar pills) and non-specific therapies (treatments containing active or potentially active components that do not have a specific effect on the condition treated, such as antibiotics for viral infections); these results and details of the questionnaire have been reported elsewhere (13,14).

## Methods

### Design

The study was a nationwide postal cross-sectional survey. It was approved by the Ethics Review Board of the Medical Faculty of the Technische Universität München. A total of 700 family physicians, 700 internists and 700 orthopaedists were randomly (using the random sampling function in SPSS) selected from a commercially available database (<http://www.adressendiscout.de/aerzteadressen.html>) with the addresses and accredited specializations of >90% of all physicians based in private practice providing ambulatory care in Germany. In late October 2012 these physicians were sent a letter with information on the study, a four-page questionnaire and a pre-stamped envelope. Non-responders received up to two reminders until early December 2012. Anonymized data was entered into an SPSS database which was closed on 28 February 2013.

### Questionnaire

Details of the questionnaire and its development have been reported elsewhere (13). Briefly, the questionnaire consisted of 50 items divided in five blocks. Block A consisted of four questions on the use

of placebos and block B of three questions on the use of non-specific treatment.

Block C included 21 questions on the belief in the specific effects and on the use of seven complementary therapies of particular relevance in Germany (homeopathy, vitamins/microelements, herbal medicine, other classical natural healing procedures, acupuncture, chirotherapy, osteopathy; further treatments could be added), and on qualifications for these therapies (see Box). Believe was rated on a 5-point verbal rating scale as 'is a placebo', 'is rather a placebo', 'partly/uncertain', 'is rather specifically active' or 'is specifically active'. For calculating summary scores these ratings were coded as -2, -1, 0, 1 or 2 with positive values indicating positive views and negative values skeptic views. Use of CAM treatments in practical medical work for treating patients could be indicated as never, less than once per month, 1–4 times per month, >4 times per month and daily.

Block D consisted of 13 statements on basic treatment-related professional views. Physicians were asked to indicate the level of agreement on a 4-point scale. Based on theoretical considerations (13,15) and factor analysis answers to 12 statements were summarized on three scales: orthodox views (five statements expressing conventional medico-scientific views, e.g. 'whenever possible only evidence-based treatments should be used'); heterodox views (three statements related to limitations of conventional medicine and usefulness of CAM, e.g. 'in my daily practice I am confronted with many patients in which the classical knowledge from textbooks is insufficient') and time/patient–doctor relationship (four items addressing the need of time and the relevance of the patient–doctor relationship). We analyzed the statement on harnessing placebo effects ['as a physician one should intensively harness positive psychological effects (e.g. "drug physician")'] separately as it was considered central for our analysis on placebo use (14).

In block E socio-demographic and practice characteristics were documented.

### Statistics

All analyses were performed using IBM SPSS Statistics 21. Missing data were not replaced. Data were analyzed descriptively for the three physician groups using absolute counts, percentages, means and SD, medians and quartiles as appropriate. *P* values for comparisons between the three specialties were calculated using Chi<sup>2</sup> tests, Kruskal–Wallis tests and analyses of variance. For pairwise comparisons of physician groups we used Fisher's exact tests, Chi<sup>2</sup> tests, Mann–Whitney *U*-tests or Student's *t*-tests. We did not adjust for multiple testing; *P* values are presented only as orientation to facilitate reading and have to be interpreted in a strictly explorative manner.

To investigate which physician characteristics were associated with frequent (defined as use more often than once per week) CAM use we performed multivariate multinomial regression (using no CAM therapy used frequently as reference category). Predefined independent variables for the model were age, sex, location of practice, financial status of the patient population of the practice, specialty (using internists as reference group), the four scales regarding basic professional attitudes and overall CAM belief. In addition, we performed multivariate logistic regression with forward selection according to Wald among the independent variables listed above to investigate which variables were associated with frequent use of the individual therapies.

Assuming a response rate of ~40% (based on experiences from a previous regional survey (16)), we had sent out 700 questionnaires in order to have 80% power to detect a 12% difference in the use of non-specific

### Box: Complementary therapies as used and accredited in Germany

**Homeopathy** seeks to stimulate the body's own ability to heal itself by giving very small doses of highly diluted substances that in larger doses would produce illness of symptoms (an approach called 'like cures like').<sup>1</sup> Additional qualification currently certified by the German Medical Associations (GMA) after 160 hours of training + 6 months work with a certified homeopathic physician/100 hours supervised case seminars.<sup>2</sup> Number of certified German physicians December 2012: 7006.<sup>3</sup>

**Vitamins/micronutrients** in this context denotes the use of such supplements or preparations in individuals without clear deficiency or other clear indication from the point of view of conventional medicine. There is no specific additional qualification.

**Herbal medicine or phytotherapy** denotes the use of plants, their parts or preparation based on plants for medical purposes. Many plant preparations used by physicians are licensed as drugs in Germany and distributed exclusively by pharmacies. There is no specific training or additional qualification, but phytotherapy is a major component of Natural Healing Procedures (NHP).

**Acupuncture** is a technique in which practitioners stimulate specific points on the body—most often by inserting thin needles through the skin.<sup>1</sup> German style acupuncture often refers to principles of traditional Chinese medicine. An additional qualification 'Acupuncture' is certified by the regional GMA after 200 hours of training.<sup>2</sup> Number of certified physicians December 2012: 13 488.<sup>3</sup>

**Classical NHP ('Naturheilverfahren')** includes herbal medicine, use of water (hydrotherapy), healthy nutrition, physical activity and other lifestyle elements for therapeutic purposes. Additional qualification currently certified by the GMA after 160 hours of training + 6 months work with a qualified physician or 100 hours supervised case seminars.<sup>2</sup> Number of certified German physicians December 2012: 16 107.<sup>3</sup>

**Chirotherapy**, nowadays often also referred to as manual therapy, is a type of treatment that involves releasing painful dysfunctions of the musculoskeletal system (joints, spine, sacroiliac joints, etc.) with manual manipulation and thereby relieving pain. There is no specific chirotherapy training in Germany. However, there is an additional qualification 'Manual Medicine/Chirotherapy' in which chirotherapy is a key element. It is certified by the GMA after 320 hours of training.<sup>2</sup> Number of certified German physicians December 2012: 20 198.<sup>3</sup>

**Osteopathy** uses manual interventions (usually in a smoother manner than chirotherapy) for treating and strengthening the musculoskeletal framework to improve the body's health and treat a variety of diseases (not limited to the musculoskeletal system). There is no specific training or additional qualification but osteopathic interventions have recently become a part in many manual medicine/chirotherapy courses.

<sup>1</sup><http://nccam.nih.gov/health/whatisacam#vision>

<sup>2</sup><http://www.blaek.de/>

<sup>3</sup><http://www.gbe-bund.de/>

treatments between family physicians (assumed prevalence 60%) and internists (48%) using a two-tailed *P* value of 0.05 (*n* per group 288 doctors, calculation with G\*Power 3.1.2 for Fisher's exact test).

## Results

Of the 2100 questionnaires sent out 72 could not be delivered (address no longer valid); furthermore six physicians were actually working in a hospital, three had retired and one had died. Thus, our final sample included 2018 physicians (686 family physicians, 663 internists and 669 orthopaedists); 935 (46%; 319 family physicians, 311 internists and 305 orthopaedists) sent back a completed questionnaire until the closing of the database.

Characteristics of the respondents and their practices in relation to medical specialty are summarized in Table 1. On average, internists agreed more with orthodox views and less with heterodox views than the two other groups. Family physicians agreed with heterodox views more than orthopaedists and clearly more than internists. Family physicians also agreed more with statements on the need of more time and the patient–doctor relationship and they were more positive about harnessing placebo effects than internists and orthopaedists.

The belief in specific effects of CAM therapies varied strongly within and between physician disciplines, and between different CAM therapies. However, overall many physicians hold positive views. On average, internists were more skeptic (with a mean summary score over all seven CAM therapies of 0.1) than family physicians (0.5) and

orthopaedists (0.5; *P* < 0.001; see Table 2). Physicians were most skeptic about homeopathy (mean score across all three disciplines: −0.4) and vitamins/micronutrients (−0.3), yet 27% and 26%, respectively, considered these approaches to be at least rather specifically active (see online supplementary Table 1 for details). Chirotherapy was considered most often as a specifically active therapy (1.3), followed by herbal medicine (0.7), osteopathy (0.6) and acupuncture (0.5).

Also the use of single CAM modalities differed strongly between disciplines (Table 3 and see online supplementary Table 2). For example, 91% of orthopaedists reported to use of chirotherapy compared to 29% of family physicians and 11% of internists more often than once a week. Orthopaedists also use acupuncture and osteopathy more often than family physicians and internists. Instead, frequent use of herbal medicines is highly prevalent among family physicians. Among family physicians 15% do not use any CAM treatment more often than once per week, among internists 51% and among orthopaedists 4%. Frequent use of one CAM treatment was reported by 17%, 28% and 11%, respectively, and use of two or three CAM treatments by 45%, 15% and 54%, respectively; 23% of family physicians, 6% of internists and 31% of orthopaedists use four or more CAM therapies frequently.

Descriptive analyses stratified by physician specialty and belief clearly showed that the use of the single complementary therapies is strongly related to these factors. However, some physicians use homeopathic remedies and vitamins/micronutrients often although they consider them to have little effect over placebo. In multivariate

**Table 1.** Characteristics, additional qualifications and professional attitudes of participating physicians

Variable (missing observations)	Family physicians ( <i>n</i> = 319)	Internists ( <i>n</i> = 305)	Orthopaedists ( <i>n</i> = 311)	Total ( <i>n</i> = 935)	<i>P</i> value, three groups (pairwise)
Female (2)	129 (41%)	62 (20%)	30 (10%)	221 (24%)	<0.001 (**/**/**)
Age (7)	55.5 (8.2)	54 (7.9)	55 (7.3)	55 (7.8)	0.193 (-/-/-)
Years in private practice (2)	18.2 (9.2)	14.2 (8.7)	16.7 (7.7)	16.4 (8.7)	<0.001 (**/**/**)
Working full-time (4)	294 (93%)	286 (94%)	295 (96%)	875 (94%)	0.28 (-/-/-)
Location of practice (1)					
City (>100 000 inhabitants)	80 (25%)	121 (40%)	144 (46%)	345 (37%)	<0.001 (**/**/**)
Town (10–100 000 inhabitants)	124 (39%)	135 (44%)	149 (48%)	408 (44%)	
Village (<10 000 inhabitants)	115 (36%)	48 (16%)	18 (6%)	181 (19%)	
Financial situation patients (3)					
Tendency rich	19 (6%)	41 (14%)	26 (8%)	86 (9%)	0.10 (-/**/-)
Very mixed	214 (67%)	185 (61%)	218 (71%)	617 (66%)	
Tendency poor	86 (27%)	78 (26%)	65 (21%)	229 (25%)	
Additional qualifications (0)					
Acupuncture	99 (28%)	44 (14%)	213 (69%)	346 (37%)	<0.001 (**/**/**)
Homeopathy	25 (8%)	13 (4%)	5 (2%)	44 (5%)	<0.001 (**/**/-)
Manual medicine/chirotherapy	71 (22%)	21 (7%)	278 (89%)	370 (40%)	<0.001 (**/**/**)
Natural healing procedures	74 (23%)	22 (7%)	20 (6%)	116 (14%)	<0.001 (**/**/-)
Basic professional attitudes					
Orthodox views (15)	2.05 (0.52)	1.81 (0.47)	2.06 (0.47)	1.97 (0.50)	<0.001 (**/**/**)
Heterodox views (15)	2.38 (0.60)	2.88 (0.59)	2.56 (0.54)	2.61 (0.61)	<0.001 (**/**/**)
Time/relationship (12)	1.58 (0.46)	1.72 (0.53)	1.67 (0.54)	1.65 (0.51)	0.009 (**/**/-)
Harnessing placebo effects (3)	2.44 (0.77)	2.86 (0.68)	2.86 (0.68)	2.72 (0.74)	0.02 (**/**/-)

Values are absolute frequencies (percentages) or means (SD). *P* values for comparisons of all three groups from Chi<sup>2</sup> tests (nominal data) or Kruskal–Wallis tests (rank data). Symbols in parentheses indicate levels of significance (derived from Fisher's exact, Chi<sup>2</sup> or Mann–Whitney *U*-tests) for pairwise comparisons between physician groups: - *P* ≥ 0.05; \* *P* = 0.002–0.049; \*\* *P* ≤ 0.001 (symbol 1: family physicians versus internists/symbol 2: family physicians versus orthopaedists/symbol 3: internists versus orthopaedists). Scale for answering professional attitudes: 1 = fully agree, 2 = tend to agree, 3 = tend to disagree, 4 = disagree.

**Table 2.** Belief in the specific effects of CAM therapies (scale from -2 = is a placebo to 2 = is specifically active)

Therapy (missing observations)	Family physicians ( <i>n</i> = 319)	Internists ( <i>n</i> = 305)	Orthopaedists ( <i>n</i> = 311)	Total ( <i>n</i> = 935)	<i>P</i> value, three groups (pairwise)
Homeopathy (23)	-0.2 (1.4)	-0.8 (1.2)	-0.2 (1.2)	-0.4 (1.3)	<0.001 (**/**/**)
Vitamins/supplements (12)	-0.1 (1.2)	-0.4 (1.2)	-0.2 (0.9)	-0.3 (1.1)	<0.001 (**/**/**)
Herbal remedies (19)	0.9 (0.9)	0.6 (1.0)	0.5 (0.9)	0.7 (0.9)	<0.001 (**/**/**)
Other classical NHP (38)	0.3 (1.0)	0.0 (1.0)	0.2 (0.9)	0.2 (1.0)	<0.001 (**/**/**)
Acupuncture (12)	0.5 (1.2)	0.2 (1.1)	0.9 (1.0)	0.5 (1.2)	<0.001 (**/**/**)
Chirotherapy (12)	1.4 (0.8)	0.9 (0.9)	1.6 (0.7)	1.3 (0.9)	<0.001 (**/**/**)
Osteopathy (18)	0.7 (1.2)	0.2 (1.2)	0.9 (1.0)	0.6 (1.2)	<0.001 (**/**/**)
Mean score across all seven therapies (59)	0.5 (0.7)	0.1 (0.8)	0.5 (0.6)	0.4 (0.7)	<0.001 (**/**/**)
Mean score across therapies from all physicians rating at least three therapies (0)	0.4 (0.8)	0.0 (0.8)	0.4 (0.7)	0.3 (0.8)	<0.001 (**/**/**)

For legend see Table 1. Values are means (SD). *P* values are from Kruskal–Wallis test (three-group comparisons) and Mann–Whitney *U*-tests (two-group comparisons). For full data (absolute frequencies of single answers) per answer option see online [supplementary data](#). NHP, Natural Healing Procedure.

multinomial regression analyses physician's age and gender, estimated financial situation of the patient population of a practice and attitudes towards the use of placebo effects in general were not associated with CAM use (Table 4). Being an orthopaedist and a higher overall belief in CAM modalities were most consistently associated with frequent CAM use and holding orthodox professional views with lower CAM use. Physicians using more than one CAM therapy frequently also were more often family physicians, hold heterodox views and were less frequently working in an inner city practice. Associations got stronger with increasing use of CAM therapies.

Additional logistic regression analyses for single therapists showed that association patterns differ to some extent for single

CAM therapies (Table 5). As could be expected both for medical reasons and based on the descriptive analyses, frequent use of CAM therapies with a focus on the musculoskeletal system (chirotherapy, acupuncture and osteopathy) was very strongly associated with being an orthopaedist. However, male gender was associated only with chirotherapy use. High values on the time–relationship scale were significantly associated only with frequent use of vitamins/micronutrients and herbal medicine.

## Discussion

The results of our survey show that many physicians working in private practice in Germany use CAM treatments frequently and

**Table 3.** Frequent use (at least once per week) of CAM therapies for treating patients

Therapy (missing observations)	Family physicians ( <i>n</i> = 319)	Internists ( <i>n</i> = 305)	Orthopaedists ( <i>n</i> = 311)	Total ( <i>n</i> = 935)	<i>P</i> value, three groups (pairwise)
Homeopathy (21)	101 (32%)	26 (9%)	71 (23%)	198 (21%)	<0.001 (**/**/**)
Vitamins/supplements (6)	130 (41%)	74 (25%)	97 (31%)	301 (33%)	<0.001 (**/**/**)
Herbal remedies (11)	245 (77%)	103 (34%)	94 (31%)	442 (47%)	<0.001 (**/**/**)
Other classical NHP (38)	92 (29%)	18 (7%)	44 (16%)	154 (17%)	<0.001 (**/**/**)
Acupuncture (9)	67 (21%)	25 (9%)	206 (77%)	298 (33%)	<0.001 (**/**/**)
Chiropractic (13)	89 (29%)	19 (8%)	281 (91%)	389 (42%)	<0.001 (**/**/**)
Osteopathy (18)	24 (8%)	7 (2%)	105 (35%)	136 (15%)	<0.001 (**/**/**)

For legend see Table 1. Values are absolute frequencies (percentages). *P* values are from Kruskal–Wallis test (three-group comparisons) and Mann–Whitney *U*-tests (two-group comparisons). For full data (absolute frequencies of single answers) per answer option see online [supplementary data](#). NHP, Natural Healing Procedure.

**Table 4.** Factors associated with the pattern of the CAM use in multivariate multinomial regression (reference category no CAM therapy used more often than 4x/month; *n* = 194, 104 missing)

	1 CAM therapy >4x/month, <i>n</i> = 162	2 to 3 CAM therapies >4x/month, <i>n</i> = 322	4 to 7 CAM therapies >4x/month, <i>n</i> = 155
Age (per year)	1.00 (0.97–1.03)	1.00 (0.97–1.03)	1.00 (0.96–1.05)
Sex female	1.11 (0.62–1.98)	1.30 (0.72–2.35)	0.74 (0.36–1.55)
Urban practice	0.80 (0.50–1.29)	0.54 (0.33–0.91)	0.52 (0.28–0.96)
Patients average high income	1.11 (0.70–1.49)	1.30 (0.77–1.77)	1.31 (0.78–2.21)
Family physician	1.38 (0.79–2.39)	5.81 (3.25–10.4)	6.29 (2.79–14.1)
Orthopaedist	4.61 (2.09–10.1)	52.6 (23.8–125)	76.9 (28.6–200)
Orthodox views	0.50 (0.29–0.85)	0.31 (0.18–0.54)	0.17 (0.09–0.34)
Heterodox views	1.33 (0.83–2.12)	1.95 (1.20–3.18)	2.64 (1.46–4.76)
Time and relationship	1.47 (0.94–2.03)	2.20 (1.34–3.61)	3.30 (1.78–6.13)
Harnessing placebo effects	0.99 (0.74–1.33)	1.07 (0.78–1.47)	1.03 (0.71–1.51)
CAM belief	2.13 (1.48–3.05)	4.46 (2.96–6.70)	19.1 (11.2–32.7)

$r^2 = 0.55$  (Nagelkerke).

believe in their efficacy. The belief in specific effects and the use of CAM treatments are highly variable within and between disciplines. Contrary to our initial expectations orthopaedists use CAM treatments more frequently than family physicians and much more often than internists. While believing in the specific effects of a CAM treatment is strongly associated with its use, a minority of skeptic physicians use such treatments, too. Physicians agreeing to orthodox scientific views use CAM treatments less often.

When interpreting our findings some limitations must be taken into account. Slightly more than half of the physicians did not send back the questionnaire. Age and gender of respondents were similar to that of all registered physicians in the three specialties. As the primary focus of the survey and the information letter was on placebo use it does not seem very likely that our questionnaire was particularly attractive to physicians favouring CAM. Yet, our findings might over- or underestimate the true use of and believe in CAM therapies by German physicians. However, as the response rate was very similar in all three physician groups it is very likely that the differences observed between specialties are true phenomena.

We considered chiropractic as a CAM treatment although the curriculum for obtaining the additional qualification manual medicine/chiropractic in Germany includes manual techniques which might be considered ‘conventional’. However, we only used the term chiropractic and the courses for the qualification include many chiropractic and osteopathic techniques whose evidence base is weak. Neither in the pre-test nor in the main phase of the survey, we received comments from participants criticizing the inclusion of

chiropractic as a CAM treatment. Our ‘measurement’ of basic professional attitudes can be considered only a first attempt and should not be considered a properly validated instrument. The cognitive interviews performed during the development phase made clear that the issues addressed are very difficult to grasp quantitatively in a standardized questionnaire (13). Obviously, our survey describes and reflects the German situation. As attitudes and use of CAM therapies as well as their legal status and regulation differ strongly between countries, our findings cannot be generalized easily.

However, our survey has specific aspects which make it interesting on an international level. A basic assumption of our approach was that physicians need strategies to deal with situations in which patients wish to receive a treatment but evidence-based effective options are not available, have not been successful, are not acceptable to patients or a treatment is medically not needed. The professionally correct strategy would be to explain the situation adequately respecting the patient’s autonomy while keeping professional integrity (17). Another option would be to provide placebo treatments and non-specific treatments (14). This option is clearly professionally and often ethically problematic (18,19). A third option is the use of CAM treatments. A physician considering the treatment he uses effective probably feels in full compliance with the basic professional principle of patient welfare (20). Current statements on medical professionalism typically also include a commitment to scientific knowledge (20). Therefore, a physician using CAM might perceive some conflict if he highly values the commitment to scientific knowledge. But for some CAM treatments there is evidence of effectiveness (e.g.

**Table 5.** Factors associated significantly with the frequent use (more often than 4x/month) of single CAM modalities in multivariate logistic regression (Wald forward selection)

	Orthopaedist	Family physicians	Orthodox views	Heterodox views	Time	Gender female	Belief	r <sup>2</sup> (Nagelkerke)
Homeopathy	2.00 (1.17–3.41)	2.69 (1.58–4.57)	0.62 (0.41–0.93)	1.92 (1.36–2.72)	–	–	1.94 (1.66–2.27)	0.289
Vitamins/micronutrients	–	–	0.66 (0.45–0.95)	1.35 (1.00–1.83)	2.65 (2.24–3.13)	–	2.65 (2.24–3.13)	0.287
Herbal medicine	0.60 (0.40–0.91)	4.47 (2.91–6.85)	0.44 (0.30–0.65)	1.40 (1.01–1.94)	1.75 (1.23–2.45)	–	3.02 (2.44–3.74)	0.435
Other classical NHP	2.49 (1.29–4.81)	5.07 (2.71–9.49)	–	1.98 (1.35–2.92)	–	–	4.14 (3.11–5.51)	0.378
Acupuncture	13.1 (8.75–19.6)	–	0.46 (0.31–0.72)	2.68 (1.87–3.83)	–	–	2.49 (2.02–3.08)	0.534
Chirotherapy	132 (68.1–258)	5.64 (3.17–10.0)	–	–	–	0.29 (0.18–0.49)	3.79 (2.74–5.23)	0.686
Osteopathy	9.04 (5.58–14.7)	–	–	1.66 (1.12–2.48)	–	–	2.68 (2.03–3.55)	0.362

Values are odds ratios (95% confidence intervals). NHP, Natural Healing Procedure.

acupuncture for chronic pain (21)), others like chirotherapy seem to be well accepted in the orthopaedic profession in Germany without being researched systematically, and homeopaths interpret the available evidence from clinical trials much more positive than the academic mainstream (22). There are clearly ways for physicians to rationalize the use of CAM as professionally adequate.

The clear negative association of CAM use and orthodox views in our quantitative survey fits to the findings of qualitative studies showing that physicians not using CAM therapies emphasize their lack of plausibility and trial evidence (6–8). Similarly, the positive associations between heterodox views and the items stressing time and the patient–provider relationship with CAM use fit to statements of CAM users in qualitative studies stressing improved communication and limitations of the scientific worldview (6,7).

In our study the influence of medical specialties was as least as pronounced than that of professional attitudes. Based on the considerations presented in the introduction the differences found between family physicians and internists were expected and seem plausible, but the findings on orthopaedists surprised us to some extent. We had included this group because it seemed of considerable interest. German orthopaedists are mainly trained in hospitals where they typically treat selected patients with surgical procedures. If they later provide ambulatory care in private practice they very often see patients suffering from chronic pain or functional musculoskeletal disorders for which their training should have provided only few specific solutions. As we expected, orthopaedists agreed less than family physicians and internists to the statement that their postgraduate medical training prepared them well for their work in private practice. But orthopaedists reported the by far lowest use of placebos and non-specific treatments while family physicians use these treatments to a considerable extent (14). Instead orthopaedists strongly believe and often use CAM modalities—in particular, chirotherapy, acupuncture and osteopathy. We assume that the differences mainly reflect diverse challenges in daily work but also to some extent differences in the cultures between the medical specialties.

Compared to other countries the use of CAM therapies by German physicians working in private practice seems high (4,5,23). At German medical schools CAM therapies are taught only to a very limited extent (24). With few exceptions such therapies are usually not reimbursed by the statutory health insurance system which covers 90% of the population. However, this latter fact might make some CAM therapies such as chirotherapy or osteopathy financially attractive to physicians as they can charge patients directly (which is not allowed for interventions covered by the statutory health insurance). The availability of additional postgraduate CAM qualifications certified by the German Medical Association gives these therapies credit. However, it warrants that they are provided by conventionally trained physicians who should know when conventional treatment is mandatory. We would expect that while CAM use might be lower in other countries differences between medical disciplines and associations with professional attitudes could be similar.

In conclusion, many physicians working in private practice in Germany have integrated CAM treatments into their daily work. The great differences between medical specialties suggest that CAM use is influenced strongly by field-specific professional socialization processes and work experiences. The great differences regarding belief in the specific activity and use of CAM treatments within specialties show that individual attitudes and choices vary strongly. There is disagreement among physicians. Future quantitative research should investigate whether similar inter- and intra-disciplinary differences exist in other countries. Further qualitative studies are needed to

understand better the reasons why physicians hold different views and make different choices. At least some of these studies should not only interview physicians but directly observe what they actually do. Given their widespread use CAM treatments should be addressed in undergraduate education and postgraduate training. We believe that a critical but constructive discussion of the (lack of) plausibility and clinical evidence of these treatments on the one hand, and their appeal to many patients and health care providers on the other could even strengthen scientific and professional attitudes in medical students and physicians.

### Supplementary material

Supplementary material is available at *Family Practice* online.

### Declaration

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