



Research paper

Perceptions of German patients consulting a general practitioner or a gynaecologist on conventional medicine, naturopathy and holistic/alternative medicine



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ABSTRACT

Introduction: Patients' perceptions regarding the relationship between conventional medicine, naturopathy and other types of medicine (for example homoeopathy or holistic medicine) have not been studied in depth.

Methods: Patients visiting a general physician or a gynaecologist in two private practices in Germany were asked to complete a survey while waiting for their physician's appointment. They were asked to rate efficacy, side effects, comprehensiveness, personal preferences and cost effectiveness of various types of medicine (conventional medicine, naturopathy, homeopathy and alternative/holistic medicine). The survey was anonymous.

Results: A total of 862 patients returned the assessment forms (91% response rate) which were then evaluated. Most patients trusted in conventional medicine, however, patients were also interested in other types of medicine, to some degree. Patients associated naturopathy with homoeopathy and holistic medicine, despite the fact that classical naturopathy can be considered as a part of conventional medicine in Germany and is taught at universities. Furthermore German naturopathic societies have developed a clear association with medical societies of conventional medicine.

Conclusions: In order to have a common background when communicating with the patient it seems very important to clearly define terms associated with complementary, alternative and integrative medicine. Allowing patients to differentiate between reasonable, integrative approaches according to the definition of the National Center of Complementary and Integrative Health (NCCIH; USA) on one hand and questionable treatment concepts on the other could facilitate communication between physicians and patients so that patients are able to make better treatment decisions.

1. Introduction

The prevalence and relevance of complementary and alternative medicine (CAM) has been increasing worldwide [1,2]. A study which compared Complementary and Alternative (CAM) use in various European countries found that 25.9% of the general population had used CAM during the last 12 months [3]. There has also been an initiative to develop a strategic research agenda starting by systematically evaluating the state of CAM in the EU – CAMbrella [4]. However, there were great differences between the countries ranging from 10% in Hungary to almost 40% in Germany. Several studies have also identified factors which lead to a higher probability of CAM use: difficulty in diagnosing

health conditions, beliefs related to control and participation, perceptions of illness, beliefs in holism, natural treatments, and general philosophies of life, female gender and higher education. Higher income is associated with the use of manual therapies, alternative medicinal systems and traditional Asian medical systems whereas lower income is associated with mind-body therapies [4,5]. Along with its prevalence, CAM has become more relevant. Patients have a desire to discuss and be counselled about CAM perhaps because of direct risks, problems associated with a delay of effective treatments, potential interactions with conventional medicine treatments, and in many cases having run out of options, among other things.

CAM use is largely patient driven. Accordingly, it is important to

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understand the patients' perspective [6]. The aim of our study was to assess the patients' perceptions relating to the efficacy, side effects, comprehensiveness, personal preferences and cost effectiveness of CAM therapies.

2. Patients and methods

2.1. Assessment form

Participants were asked to assess their beliefs and complete a questionnaire in the German language. This form had three parts:

- demographic data
- trust in the medical recommendations of various occupational groups involved in the German health system
- convictions relating to the efficacy, side effects, comprehensiveness, personal preferences and cost effectiveness (Patients were asked to rate the referred aspects regarding conventional medicine, naturopathy, homeopathy and alternative/holistic medicine on a 10-point scale from 1 (none, very unlikely) to 10 (very much, very likely).) Patients were not provided with a definition of what they had to consider as naturopathy or any other type of medicine.

2.2. Patients

The questionnaire was distributed in a paper form in a private gynaecological practice in Weilburg, Germany to a consecutive group of patients ($n = 450$) from July 2017 until August 2017. A second set of questionnaires was collected from patients ($n = 500$) in a practice for general medicine in Kehl, Germany between July 2017 and December 2017. All patients were free to complete the questionnaire while waiting for the physician or take it home and return it later. The samples must be considered as convenience samples as the results of this study were intended to be the basis for future investigations. All patients were informed that participation in the study was welcomed but that they would not face any problems if they chose not to participate. The survey was anonymous.

2.3. Ethical approval

The survey was approved by the ethical review committee of the University Hospital Jena, Germany (reference number 5373-12/17).

2.4. Statistical analysis

SPSS software was used for data management and statistical analyses. Descriptive statistics, Spearman's bivariate correlation (two-sided), cross-tabulation and Pearson's χ^2 test were used for statistical analysis and a probability of error less than 5% was regarded as significant.

3. Results

A total of 862 patients returned the assessment form (862/950; return rate 90.7%). Return rates were 85.1% in Weilburg (383/450) and 95.8% (479/500) in Kehl. 853 assessment form were returned at the appointment, 9 were returned later. Table 1 describes the demographic data of the patients who returned their form. Due to the fact that nearly half of the surveys were completed by patients in a gynaecological practice the majority of participants were women.

With respect to trusting in recommendations concerning their own health, the majority of the patients considered the family doctor as well as the medical specialist as the most important sources of medical information compared to other sources (Fig. 1). For example, the percentage of patients who considered family doctors and medical specialists to be the most important sources of medical information was

Table 1
Characteristics of patients in this study ($n = 862$).

Characteristic of participants	
Age	
Mean (SD)	39.7 (15.0)
(Range)	(15–84)
Gender (%)	
Women	620 (71.9)
Men	242 (28.1)
Type of patient (%)	
Patient with acute disease	211 (25.1)
Patient with chronic disease	100 (11.9)
Healthy person for routine checkup	344 (41.0)
Patient for follow up visit	61 (7.3)
Cancer patient	12 (1.4)
Others	111 (13.2)
School leaving certificate (%)	
None	4 (0.5)
Elementary school	10 (1.1)
Secondary modern school (years 5–9)	198 (23.1)
Secondary modern school (years 5–10)	384 (44.8)
Vocational diploma	102 (11.9)
University-entrance diploma	81 (9.5)
University degree	69 (8.1)
Others	9 (1.1)

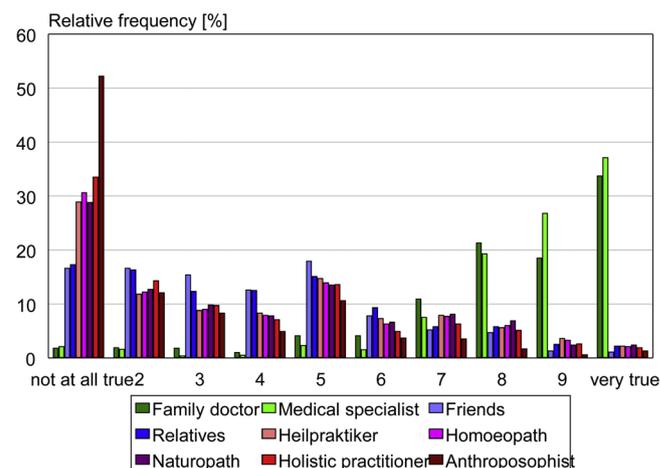


Fig. 1. Patients' responses on who they considered to be the most important sources of medical information.

33.8% and 37.2% in comparison to all other possible sources who received less than 3%. The differences were highly statistically significant ($p < 0.001$). Recommendations of friends and relatives were trusted more than those of 'heilpraktiker', homoeopaths, naturopaths, holistic practitioners and anthroposophists. (Note: It is unique in Germany that there are 'heilpraktiker' ("healing practitioners") who represent an alternative and complementary health care profession by German law. They have to have some knowledge of medical sciences but not necessarily a formal education or training and are allowed to practise as non-medical practitioners using any unconventional therapy. Homoeopaths, holistic practitioners and anthroposophists are physicians with an additional qualification in homoeopathy, anthroposophy, etc. Furthermore, there seems to be a difference in the understanding of naturopathy. In Germany, classical naturopathy comprises only of hydrotherapy, exercise therapy, phytotherapy, nutrition and a balanced lifestyle.

Trust in the family doctor strongly correlated with trust in medical specialists (Table 2). Trust in friends correlated highly with trust in relatives and to some degree with trust in 'heilpraktiker', homoeopaths, naturopaths, holistic practitioners and anthroposophists. There was a strong correlation between trust in any group of 'heilpraktiker', homoeopaths, naturopaths, holistic practitioners and anthroposophists

Table 2
Correlations of trust between various groups of people who provide medical recommendations.

		Medical specialist	Friends	Relatives	Heil-praktiker	Homoe-opath	Naturopath	Holistic practitioner	Anthropo-sophist
General practitioner	Correlation to Pearson	0.718(**)	0.038	0.029	-0.084(*)	-0.096(**)	-0.045	-0.065	-0.117(**)
	Significance (2-sided)	0.000	0.286	0.425	0.021	0.008	0.215	0.078	0.002
Medical specialist	Correlation to Pearson		-0.016	-0.001	-0.026	-0.049	-0.018	-0.037	-0.123(**)
	Significance (2-sided)		0.656	0.978	0.470	0.175	0.617	0.310	0.001
Friends	Correlation to Pearson			0.826(**)	0.214(**)	0.211(**)	0.190(**)	0.183(**)	0.232(**)
	Significance (2-sided)			0.000	0.000	0.000	0.000	0.000	0.000
Relatives	Correlation to Pearson				0.243(**)	0.228(**)	0.227(**)	0.191(**)	0.226(**)
	Significance (2-sided)				0.000	0.000	0.000	0.000	0.000
Health practitioner	Correlation to Pearson					0.853(**)	0.793(**)	0.647(**)	0.598(**)
	Significance (2-sided)					0.000	0.000	0.000	0.000
Homoeopathy	Correlation to Pearson						0.803(**)	0.666(**)	0.614(**)
	Significance (2-sided)						0.000	0.000	0.000
Naturopath	Correlation to Pearson							0.733(**)	0.611(**)
	Significance (2-sided)							0.000	0.000
Holistic practitioner	Correlation to Pearson								0.722(**)
	Significance (2-sided)								0.000

** The correlation is significant at the level of 0.01 (2-sided).

* The correlation is significant at the level of 0.05 (2-sided).

and any other of these professions as well as a weaker inverse correlation between trust in ‘heilpraktiker’, homoeopaths, naturopaths, holistic practitioners and anthroposophists and trust in family and medical specialists (Table 2).

With respect to the perceived efficacy, side effects, personal importance, intelligibility of the concept behind the method and cost effectiveness, the results of the patients’ ratings are shown in Figs. 2–7. Conventional medicine was also considered the first choice by the majority of the patients. It was rated better with respect to efficacy, personal importance, and cost effectiveness. However, homoeopathy and naturopathy were rated better with respect to side effects. No differences were found with respect to intelligibility, which means that patients believed to understand the treatment concepts for all 4 medical concepts equally well.

Patients who considered conventional medicine effective did not consider homeopathy, naturopathy and holistic medicine efficacious, whereas patients who considered homoeopathy, naturopathy or holistic medicine efficacious also considered the other alternative systems as efficacious ($r_{\text{hom/nat}} = 0.591$; $p < 0.001$; $r_{\text{hol/nat}} = 0.423$; $p < 0.001$; $r_{\text{hom/hol}} = 0.433$; $p < 0.001$).

Similar results were found regarding side effects. Low correlation coefficients were found between conventional medicine and naturopathy as well as holistic medicine ($r_{\text{con/nat}} = 0.102$; $p = 0.005$; $r_{\text{con/hol}} = 0.121$; $p = 0.001$). However, strong correlations were found

Side effects

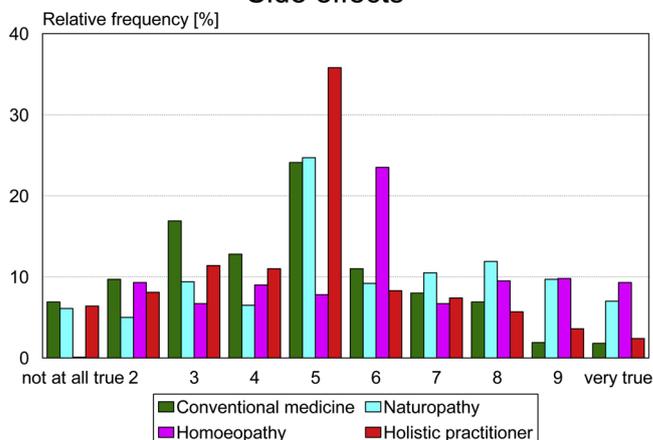


Fig. 3. Patients ratings on conventional medicine, naturopathy, homoeopathy and holistic medicine with respect to side effects.

Personally important

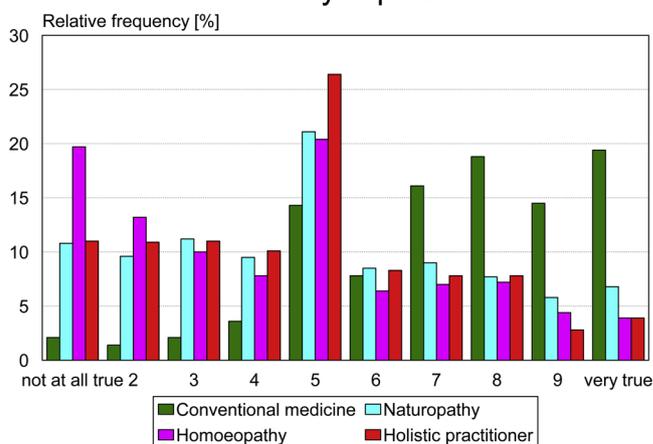


Fig. 4. Patients ratings on conventional medicine, naturopathy, homoeopathy and holistic medicine with respect to their importance to the patients.

Efficacy

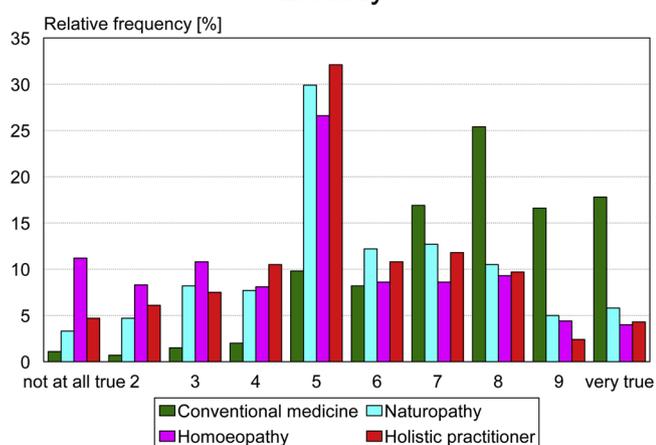


Fig. 2. Patients ratings on conventional medicine, naturopathy, homoeopathy and holistic medicine with respect to efficacy.

between the 3 other types of medicine ($r_{\text{hom/nat}} = 0.623$; $p < 0.001$; $r_{\text{hol/nat}} = 0.465$; $p < 0.001$; $r_{\text{hom/hol}} = 0.475$; $p < 0.001$). Patients who considered conventional medicine personally important denied this aspect with regard to homeopathy and vice versa ($r = -0.117$;

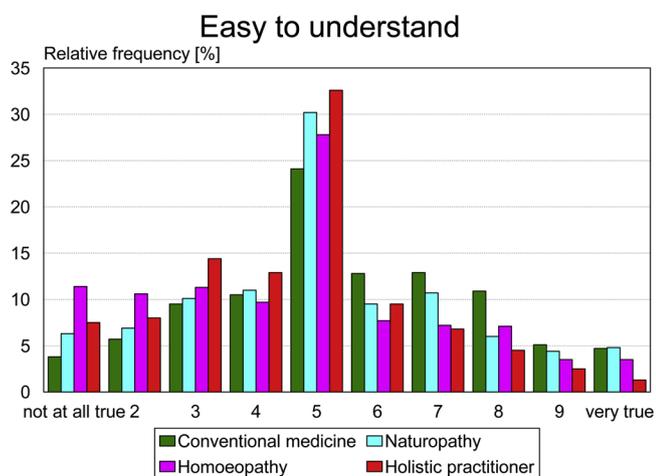


Fig. 5. Patients ratings on conventional medicine, naturopathy, homoeopathy and holistic medicine with respect to patients understanding of the underlying principles.

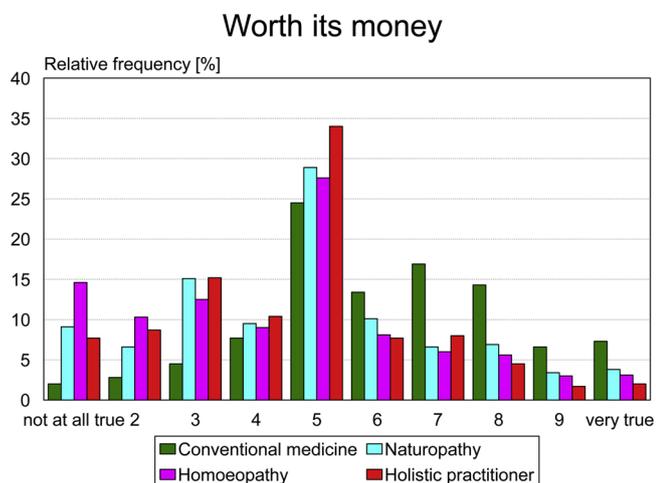


Fig. 6. Patients ratings on conventional medicine, naturopathy, homoeopathy and holistic medicine with respect to cost efficacy.

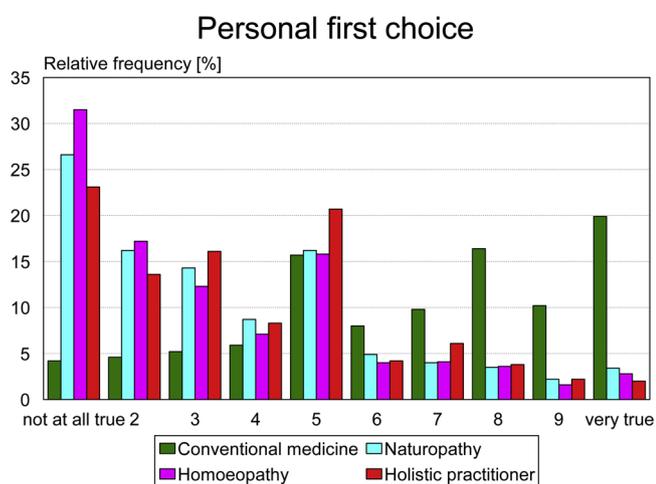


Fig. 7. Patients ratings on conventional medicine, naturopathy, homoeopathy and holistic medicine with respect to patients' preferences.

p = 0.001). Strong correlations were found between the other 3 types of medicine ($r_{\text{hom}/\text{nat}} = 0.689$; $p < 0.001$; $r_{\text{hol}/\text{nat}} = 0.475$; $p < 0.001$; $r_{\text{hom}/\text{hol}} = 0.496$; $p < 0.001$).

Concerning intelligibility of the concept behind the method significant correlations existed between all types of medicine. However, the coefficients of correlations were clearly lower between conventional medicine and the other 3 types of medicine ($r_{\text{con}/\text{nat}} = 0.197$; $p < 0.001$; $r_{\text{con}/\text{hol}} = 0.125$; $p = 0.001$; $r_{\text{con}/\text{hom}} = 0.192$; $p < 0.001$) in comparison to the 3 types of medicine amongst each other ($r_{\text{hom}/\text{nat}} = 0.593$; $p < 0.001$; $r_{\text{hol}/\text{nat}} = 0.444$; $p < 0.001$; $r_{\text{hom}/\text{hol}} = 0.520$; $p < 0.001$). Likewise, patients who considered conventional medicine worth the money did not do so with regard to the other 3 types of medicine and vice versa. Again, there were strong correlations between the 3 other types of medicine ($r_{\text{hom}/\text{nat}} = 0.679$; $p < 0.001$; $r_{\text{hol}/\text{nat}} = 0.539$; $p < 0.001$; $r_{\text{hom}/\text{hol}} = 0.542$; $p < 0.001$). With regard to the patients' first treatment choice we found that patients who considered conventional medicine as their first treatment choice disliked the 3 other types of medicine and vice versa. Here, we found inverse correlations ($r_{\text{con}/\text{nat}} = -0.285$; $p < 0.001$; $r_{\text{con}/\text{hol}} = -0.173$; $p = 0.001$; $r_{\text{con}/\text{hom}} = -0.269$; $p < 0.001$). Again, high coefficients of correlation were found between the 3 other types of medicine ($r_{\text{hom}/\text{nat}} = 0.791$; $p < 0.001$; $r_{\text{hol}/\text{nat}} = 0.577$; $p < 0.001$; $r_{\text{hom}/\text{hol}} = 0.582$; $p < 0.001$).

There were differences in the perception of the various types of medicine with respect to gender. Men trusted significantly more in medical specialists ($F = 4.5$; $p = 0.034$) whereas women preferably relied on the 'heilpraktiker' ($F = 11.5$; $p = 0.001$), homoeopaths ($F = 16.3$; $p < 0.001$), naturopaths ($F = 11.7$; $p = 0.001$), and holistic practitioners ($F = 5.2$; $p = 0.023$).

Younger patients relied more on the medical advice of relatives ($F = 14.1$; $p < 0.001$), 'heilpraktiker' ($F = 5.3$; $p = 0.021$) and homoeopaths ($F = 7.0$; $p = 0.008$). Combining age and gender showed that especially younger women (< 38 years of age; split half) had the greater trust in 'heilpraktiker' ($F = 5.8$; $p = 0.001$) and homoeopaths ($F = 8.0$; $p < 0.001$).

Also education was found to have a strong influence in the perception of the various types of medicine. Based on the coefficients of correlation it was found that patients with higher education considered naturopathy to be the most important type of medicine ($r = 0.174$; $p < 0.001$) followed by conventional medicine ($r = 0.105$; $p = 0.003$), homoeopathy ($r = 0.088$; $p = 0.015$) and alternative medicine (n.s.). The same sequence was found regarding efficacy. Only with regard to side effects was homoeopathy regarded to be superior to naturopathy ($r_{\text{hom}} = 0.207$, $p < 0.001$; $r_{\text{nat}} = 0.184$, $p < 0.001$; $r_{\text{hol}} = 0.137$, $p < 0.001$; $r_{\text{con}} = 0.207$, $p = -0.025$). Overall, highly educated patients favoured naturopathy most. Interestingly, the therapeutic situation of the patients did not influence patients' views on the various types of medicine.

4. Discussion

To the best of our knowledge, there have been no earlier studies which have analysed patients' views on the various types of medicine in comparison to each other.

The study shows that even though patients were approached in practices of physicians with a clear focus on conventional medicine, there were several patients who were convinced of the usefulness of other types of medicine. We found that patients who trusted in a more or less evidence-based conventional medicine tended to distrust the other types of medicine and vice versa. The fact that naturopathy was more associated with homoeopathy and alternative medicine means that patients are not aware of the fact that classical naturopathy is a part of conventional medicine. This statement is based on the fact that conventional medicine is defined as medicine taught at the universities. Classical naturopathy has been taught since the 1990s at German universities. As stated in the results section the definitions between classical naturopathy in Germany and other countries might differ. It also has to be acknowledged that some protagonists try to move their unconventional methods into the proximity of classical naturopathy. As shown in earlier studies patients prefer therapeutic material originating

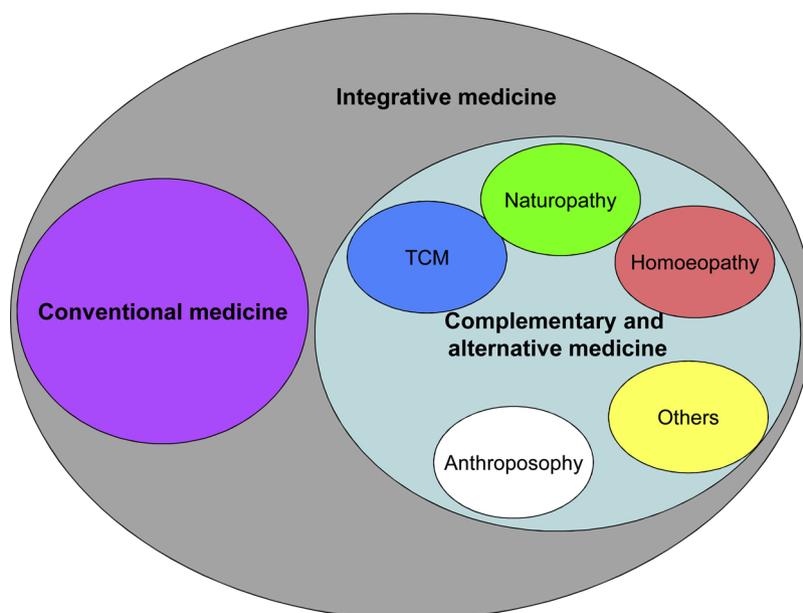


Fig. 8. Concept of the relationship between the different types of medicine as perceived by the patients in this study.

directly from nature [7].

As indicated in Fig. 8 patients distinguish between conventional medicine and other types of alternative medicine as well as naturopathy, but do not clearly distinguish between the various types of alternative medicine and naturopathy. There is no scientific work on the subject but it is discussed on some websites that homoeopathy attempts to present itself as a part of naturopathy, which is not justified based on the definition of classical naturopathy (e. g. <https://www.netzwerk-homoeopathie.eu/kurz-erklart/145-argument-die-homoeopathie-ist-doch-naturheilkunde>; accessed May 6th, 2018).

It should be noted that the concepts of naturopathy are in accordance with the laws of nature and some concepts have been proven on a high scientific basis which cannot be said for many types of alternative medicine. Examples are St John's Wort which was found to have comparable efficacy and safety to selective serotonin reuptake inhibitors (SSRIs) [8] and extracts of *Trifolium pratense* were found to improve hot flushes in menopausal women [9]. Thus, the perception as shown in Fig. 8 does not seem appropriate. Interestingly, education seems to be a very interesting factor. It was shown that higher educated people distinguish between the various types of medicine revealing a clear preference for naturopathy as opposed to other types of non-conventional medicine. Therefore it appears necessary that future research should not just combine the different types of non-conventional medicines but look at them separately because people who have received a higher education will have different views on different types of medicine.

This study reveals a dilemma in the communication with patients on integrative, complementary and alternative medicine – almost all terms are poorly defined. Often there are many different definitions. For example, there are 5 different definitions of integrative medicine [10]. Thus confusion seems inevitable. In order to be able to communicate with patients and counsel them it is important that both parties have a common background. The false association of classical naturopathy with homoeopathy and holistic medicine may have contributed to a higher esteem of the latter by patients. This calls for a stringent definition of all types of medicine throughout the world. The National Center of Complementary and Integrative Health (NCCIH; USA) describes that people often use “alternative” and “complementary” interchangeably. In fact, the two terms refer to different concepts (<https://nccih.nih.gov/health/integrative-health#term>; accessed May 6th, 2018):

- “Complementary medicine” – if a non-mainstream practice is used together with conventional medicine
- “Alternative medicine” – if a non-mainstream practice is used in place of conventional medicine.
- “Integrative medicine” – incorporating complementary approaches into mainstream health care through rigorous scientific investigation.

The fact that many providers label their offerings as integrative medicine although no such rigorous scientific investigations have been performed may also lead to confusion (<https://www.damid.de/position-beziehen/integrative-medizin.html>; accessed May 6th, 2018). In Germany, homoeopathy and anthroposophical medicine label themselves as integrative medicine because they are often used in combination with conventional medicine. However, there have not been any rigorous scientific investigations and the NCCIH or other authorities have not labelled them as integrative.

The fact that patients have a dichotomized perception of medicine with conventional medicine being considered as unnatural, chemically based and symptom-orientated on the one side and the other types of medicine being considered as natural and holistic on the other, shows that the protagonists of holistic medicine have been quite successful in promoting their ideas. Although the concepts of homoeopathy and anthroposophy are not in accordance with the laws of nature, they are regarded as natural. In contrast, conventional medicine, which uses many naturally occurring substances, which are only produced in factories in order to produce them more efficiently and without greater destruction of nature in case of the production of paclitaxel for the example, is considered to be chemically based and unnatural [11]. These and other misunderstandings between physicians and patients may hinder their communication. Similar to the Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs, there should be a clearer definition on what is integrative and/or natural (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISUM%3A121118>; accessed May 6th, 2018).

Use of the terms “alternative”, “complementary” and “integrative” should follow definitions, otherwise the terms are not helpful. Following the NCCIH definition of integrative medicine, integrative approaches should also prove that the combination of conventional and other types of medicine shows a better efficacy and/or lower toxicity as

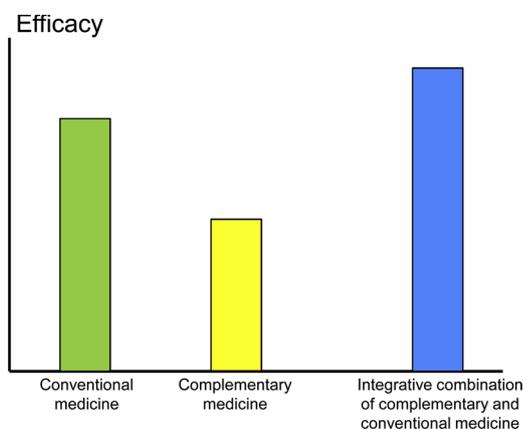


Fig. 9. Ideal concept of an integrative approach in comparison to conventional medicine and complementary medicine with respect to efficacy.

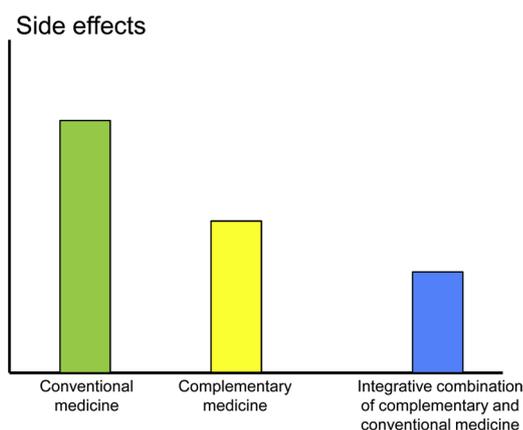


Fig. 10. Ideal concept of an integrative approach in comparison to conventional medicine and complementary medicine with respect to side effects.

indicated in Figs. 9 and 10. An example of such an integrative approach could be vitamin D in combination with monoclonal antibodies in the treatment of cancer. It has been shown that vitamin D increased the efficacy of rituximab and trastuzumab and reduced skin toxicity in combination with chemotherapy [12–14].

The importance of a common understanding of medicine is underlined by the experience with immigrant patients in Norway. A study showed that differences in belief systems, values, perceptions, expectations and style of expression and behaviour resulted in distrust and othering [15]. As implicated by Popper-Giveon et al. [16] it facilitates communication if health care providers are familiar with patients' perspectives. Since patients do not clearly differentiate between reasonable and unreasonable offerings there is a possibility that they have a poorer outcome or delays until they receive adequate therapy if they choose alternative medicine. Examples of studies showing poorer outcomes come from the oncology and reproductive medicine [17–19], examples of studies showing treatment delays have been reported from rheumatology and oncology [19–21]; not to mention the possibility of interactions between conventional and complementary treatments [22]. Clearly, only a small proportion of patients seem to rely only on alternative medicine.

As shown in this study, especially young, highly educated women have adapted to the concept shown in Fig. 8. This may also explain why women use CAM medicine more often than men do [23,24]. Although many earlier studies describe the preference of CAM medicine by women and describe demographic factors associated with CAM use, there have been too few studies which have investigated the underlying psychological background. Recent data show that women may benefit from CAM use for their mental distress [25]. The question is whether

this is a gender specific factor or related to women's greater activities regarding health and disease. As shown earlier, it seems to be a non-linear, complex, dynamic process which is influenced by the patients' unique needs during the different phases of the disease [26]. A recent systematic review showed that psychological factors could play an important role. The trait openness to experience, absorption and various types of coping and intuitive thinking were found to be positively associated with CAM use. Absorption, various types of coping, intuitive thinking and ontological confusions were positively associated with CAM belief [27]. Further work like this will help to better understand patients' motivation.

Since concepts of medicine differ between physicians and patients it is important to understand patients' views. In order to improve communication, it seems important to know that patients do not automatically differentiate between scientifically proven naturopathic treatments and esoteric, unsound medicine which may be harmful. If patient autonomy and shared decision making are supposed to be more than empty words, it has to be made sure that the patient has sufficient knowledge and enough unbiased information to make a proper decision. The fact that all our patients went to a physician and reported great trust in him, but show great interest in other types of medicine unlocks great potential for the physician. Patients could be motivated to turn to evidence-based natural methods [28]. This is in line with the finding that patients prefer to be counselled on complementary, alternative and integrative medicine by their physician [29]. Patient education seems to be one of the key issues and this must not be left to the protagonists of alternative medicine. As shown, patients are likely to find unsound information on the internet especially on websites with a profit-based interest [30]. However, some rethinking also seems to be necessary on the side of conventional physicians. Like complementary therapists, they should learn to understand the placebo effect and other non-specific effects to support the patient's self-healing power, resulting from establishing trust and belief in the treatment process [31]. Empathy and patient empowerment can also be learned from complementary medicine.

4.1. Strengths and limitations of the study

This study comprised of a group of patients who visited physicians who practised conventional medicine. The results of the survey can not be generalized to reflect the patient population in Germany, but it provides an insight into the views of the patients who consulted with the two different medical practices. It must be assumed that patients with even stronger disrespect for conventional medicine will not visit a physician providing conventional medicine. We also assessed more women, which are known to have a more positive attitude towards CAM. All factors which could have created biases. However, because methods from complementary and alternative medicine are mostly not covered by German insurance companies and because alternative therapists do not issue sick leave passes, it can be assumed that we reached patients who would turn to alternative medicine as well. The high response rates and the reactions of the patients in both private practices prove that patients were not averse to being asked about their opinion on this topic. It would be interesting to assess the same data in a group of patients visiting alternative therapists and repeat the study assuring that a representative sample is reached. It would also be very interesting to repeat the study in people with long term conditions, for example cancer patients and compare perhaps different perceptions.

5. Conclusion

This study shows that a considerable percentage of patients believe in the usefulness of methods outside conventional medicine and that the more educated patients seem to understand the background of the various methods. It appears to be important to inform patients that

classical naturopathy is a part of conventional medicine. Thus, it would be interesting to repeat this study after the introduction of patient education and this could be a focus for future studies.

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Conflict of interest

None of the authors have any conflicts of interest to declare.

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