



Research Article

Medical Students' Attitudes, Experiences and Future Perspectives on Complementary Medicine - an Exploratory Study

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Abstract

Since 2003 Complementary Medicine (CM) is a mandatory subject in the medical licensure act in Germany. However, undergraduate training in CM is implemented in various ways. Although generally interested in learning about CM, medical students often do not feel to have sufficient competencies to advise patients on CM or to provide CM themselves. The study aimed to survey medical students' attitudes towards CM and underlying influential factors, the level of interest in CM as well as which CM techniques were known and expected to be used in the future. Based on selective literature research a questionnaire was developed, piloted and distributed to medical students during lectures. Using IBM SPSS Statistics version 25.0 (SPSS Inc. IBM) data was analyzed descriptively. Additionally, a binary logistical regression model was calculated to predict factors for a positive attitude towards CM. A response rate of 93 % (542/580) was observed, 524 student responses (90 %) were included in the analysis. The majority of participating students had a positive (61 %, n=318) or neutral (22 %, n= 114) attitude towards CM. Main reasons for the students' interest in CM were considering conventional therapies as not enough for a holistic understanding of human beings (58 %, n=302) and the wish for advising patients in CM (56 %, n=292). Expected future usage of homeopathy (OR=6.9, CI=1.9-24.7) and positive, personal experiences (OR=6.7, CI=1.6-28.2) were identified as strongest predictors for the students' positive attitudes towards CM. To conclude, universities should react to the

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medical students' needs by extending their CM curriculum allowing for positive, personal experiences. Nutrition therapy, manual medicine and relaxation techniques should be included in medical education since most students imagined to use these CM therapies as physicians. Critical appraisal of and training in homeopathy and manual medicine might positively influence students' attitudes towards CM.

Keywords: Complementary medicine; Homeopathy; Manual medicine; Undergraduate medical education

Introduction

The rising demand in complementary therapies [1,2] spotlights the need for a holistic treatment approach of patients by health care providers. The World Health Organization (WHO) promotes to integrate CM into the national health care system [3]. This will only be possible if the health care professional is properly trained in CM.

The German medical licensure act of 2002 obliges medical schools to train medical students in CM during their studies [4]. Recommendations for the implementation of appropriate learning objectives are included in the German national competence-based catalogue of learning objectives for undergraduate medical education of July 2015 [5].

Studies have shown that there is distinct heterogeneity in the way and extent to which CM is being trained at German universities [6,7]. The existence of a link between the level of knowledge about CM and having an open mind and positive attitude towards it is documented [8,9]. It must be concluded that because of the varied extent of CM training, there are differences in knowledge about CM that can negatively influence students' attitudes towards CM.

However, the students' desire for learning about CM has been attributed to considering conventional medicine as insufficient in treating patients [10]. Furthermore, medical students consider it necessary to be able to answer their patients' questions about CM and to recommend suitable treatments to the benefits of their patients [11]. Students have shown to consider it important to be able to warn patients of treatments that are not evidence-based or have not been tested properly for harmlessness [12]. Hence, it seems to be of importance for the students to reach a level of competency in CM that allows them to critically evaluate possible complementary treatments options for their patients in the future.

This study aimed to evaluate the attitudes of medical students towards CM, influencing factors and their valued future perspectives in CM for the professions they were currently trained in.

Methods

A cross-sectional study was performed using paper questionnaires.

Recruitment

About 1,500 medical students are enrolled at the University of Lübeck, Germany. Next to being a medical student at the University of Lübeck, inclusion criteria for recruitment were a minimum age of 18 years and sufficient German language skills to fill out the questionnaire.

Medical students were approached at the end of lectures or courses in the winter semester 2017/2018 upon prior obtained approval by the lecturers. Mandatory or very important lectures or courses with a high participation number were chosen in order to invite a high number of medical students in every year of study. This study was presented to the students with a following invitation to fill out and return the questionnaire directly after presentation. Five to ten minutes from the lecture or course time were used.

Measurement

The questionnaire development underwent several stages based on a selective literature research on CM therapies and education [1,13-15]. First drafts were discussed and commented by researchers of the Institute of Family Medicine and the Nursing Research Unit of the Institute of Social Medicine and Epidemiology of the University of Lübeck as well as the Division Physiotherapy Research of the Department of Orthopaedics and Trauma Surgery at the University Hospital Schleswig-Holstein, Campus Lübeck. For pilot testing, the consented questionnaire was filled out using a think-aloud approach by a group of 20 students currently enrolled at the University of Lübeck. The students' feedback was incorporated by adding definitions of CM, phytotherapy, nutrition therapy and aromatherapy. The adjusted draft was finalized in a final consensus round of the researchers.

Students were asked which CM therapies they were able to describe, which CM therapies they were using with frequencies from 'at least once a week' to 'never' and which CM therapies they considered important for their profession. Additionally, the questionnaire surveyed the reasons for the students' general interest in CM as well as their interest in and expectations of CM training. On an interval scale from 0 (not at all important/interested) to 10 (absolutely important/interested) the students indicated the perceived future importance of and their general interest in CM. Sociodemographic data comprised year of birth, sex, study programme, study semester and prior health care training.

Data analysis

The data was analyzed using IBM SPSS Statistics version 25.0 (SPSS Inc. IBM). Firstly, a descriptive analysis of sociodemographic characteristics and responses was performed. Additionally, a binary logistic regression analysis was calculated with "positive attitude towards CM" being the binary outcome variable. It was split so that the categories '-1 to -5' were interpreted as negative attitude and the categories '1 to 5' were interpreted as positive attitude towards CM. Sociodemographic characteristics, CM therapies that participating students were able to describe, that were used by the participants and that the students expected to use in the future as well as the reasons for the students' interest in CM were defined as explanatory variables. Subsequently, the forward conditional procedure was applied. The suitability of the logistic regression model was evaluated with the Hosmer-Lemeshow test and the variance of the model was explained by the Nagelkerke R-squared [16,17]. For statistical significance an alpha level of $p < 0.05$ was used.

Ethical approval

This study was approved by the ethics committee of the University of Lübeck on July 13th, 2017 with an approved amendment on June 4th, 2018 (reference number 17-200).

Results

The response rate was 93 % (542/580). In total, 524 responses (90 %) could be included in the analysis since participants explicitly stated to be medical students. On average, participants were 24 years old and in their third year of studies. About two thirds were female. Out of all participating medical students, 61 % (n=318) indicated having a positive attitude towards CM, whereas 22 % (n=114) considered their attitude neutral and 17 % (n=87) negative. Further details are displayed in table 1.

Characteristics*		
Gender, n (%)	Male	165 (31.5)
	Female	352 (67.2)
Age, mean (SD)		24.3 (3.6)
Semester of study, mean (SD)		4.7 (3.3)
On a scale from 0 to 10: How important do you perceive CM therapies for the profession you are currently trained in?, mean (SD)		6.0 (2.5)
On a scale from 0 to 10: How would you describe your general interest in CM?, mean (SD)		5.7 (2.6)
General attitude towards CM	Positive, n (%)	318 (60.7)
	Neutral, n (%)	114 (21.8)
	Negative, n (%)	87 (16.6)

Table 1: Characteristics of the study population (n=524).

*n varies due to missing; SD = standard deviation

Acupuncture was the CM therapy most participants (80 %, n=418) were able to describe, followed by nutrition therapy/dietetics (74 %, n=388) and relaxation techniques (74 %, n=387) such as meditation and autogenous training. On the contrary, the lowest number of participants was able to describe aromatherapy (28 %, n=147), followed by drainage therapies (e.g. cupping, leech therapy, 28 %, n=148) and hydro-/balneotherapy (33 %, n=172). Most participants (87 %, n=458) imagined to use nutrition therapy in the future, followed by manual medicine (83 %, n=437) and relaxation techniques (77 %, n=403) table 2 shows more details.

Complementary procedure	Description, n (%)	Future usage, n (%)
herbal medicine / phytotherapy	301 (57.4)	335 (63.9)
nutrition therapy / dietetics	388 (74.0)	458 (87.4)
treatments with water / hydro-/balneotherapy (e.g. baths, water treading, compresses)	172 (32.8)	258 (49.2)
homeopathy	381 (72.7)	226 (43.1)
acupuncture	418 (79.8)	321 (61.3)
aromatherapy	147 (28.1)	120 (22.9)
drainage therapies (e.g. cupping, leech therapy)	148 (28.2)	115 (21.9)
maunual medicine / manual therapy (e.g. osteopathy, massages)	360 (68.7)	437 (83.4)
relaxation techniques (e.g. meditation, autogenic training)	387 (73.9)	403 (76.9)

Table 2: Responses to "Which CM therapies are you able to describe?" and "Which CM therapies can you imagine to use in the future?"

Most used CM therapies by the participants were manual medicine (53 %, n=278), relaxation techniques (52 %, n=270) and phytotherapy (35 %, n=185). Relaxation techniques (7 %, n=35), nutrition therapy (6 %, n=30) and phytotherapy (3 %, n=15) were most frequently used at least once a week. See table 3 for more detailed information.

The main reason for the participants' interest in CM therapies was that conventional medicine was considered not enough for a holistic understanding of human beings (58 %, n=302), followed by the wish for advising patients in complementary medicine (56 %, n=292). Least frequently stated reason was complementary medicine as source of financial income (7 %, n=38). More details are displayed in table 4.

A proportion of 56 % (n= 292) stated that they would like to learn more about CM by means of an elective course, 27 % (n= 240) in a compulsory course, and 14 % (n=74) would not like to learn more about CM in their medical studies.

The binary regression model regarding the positive attitude towards CM showed six factors with a Nagelkerke R-squared of 0.723 (Hosmer-Lemeshow Test p= 0.680); foremost, the expected future use of homeopathy (OR=6.85, CI=1.89-24.74), the students' positive, personal experiences with CM (OR=6.72, CI=1.60-28.22) and the expected use of manual medicine (OR=4.95, CI=1.36-18.05). Further details are displayed in table 5.

	At least once a week, n (%)	At least once every three months, n (%)	At least once every twelve months, n (%)	Less than every twelve months, n (%)	Never, n (%)
herbal medicine / phytotherapy	15 (2.9)	60 (11.5)	61 (11.6)	49 (9.4)	311 (61.5)
nutrition therapy / dietetics	30 (5.7)	39 (7.4)	50 (9.5)	57 (10.9)	329 (62.8)
treatments with water / hydro-/balneotherapy (e.g. baths, water treading, compresses)	4 (0.8)	9 (1.7)	25 (4.8)	52 (9.9)	411 (78.4)
homeopathy	8 (1.5)	41 (7.8)	59 (11.3)	61 (11.6)	346 (66.0)
acupuncture	2 (0.4)	3 (0.6)	7 (1.3)	34 (6.5)	457 (87.2)
aromatherapy	4 (0.8)	6 (1.1)	8 (.59)	21 (4.0)	462 (88.2)
drainage therapies (e.g. cupping, leech therapy)	0 (0.0)	0 (0.0)	7 (1.3)	15 (2.9)	480 (91.6)
maunual medicine / manual therapy (e.g. osteopathy, massages)	13 (2.5)	72 (13.7)	83 (15.8)	110 (21.0)	231 (44.1)
relaxation techniques (e.g. mediation, autogenic training)	35 (6.7)	82 (15.6)	83 (15.8)	70 (13.4)	241 (46.0)

Table 3: How often have you been using complementary therapies?

Reasons	n (%)
conventional therapies are not enough for a holistic understanding of human beings	302 (57.6)
wish for advising patients in complementary medicine	292 (55.7)
positive experiences in my personal environment	258 (49.2)
positive, personal experiences	221 (42.2)
wish for using therapies in patient care	188 (35.9)
wish for using therapies on my own body	127 (24.2)
family imprint	89 (17.9)
complementary therapies as a trend	63 (12.0)
complementary medicine as source of financial income	38 (7.3)

Table 4: Reasons for the students' interest in CM therapies (multiple answers possible).

Variables	β	OR (95% CI)	p-value
How important do you perceive CM therapies for the profession you are currently trained in?	0.89	2.44 (1.74-3.42)	< 0.01
Future use: homeopathy	1.92	6.85 (1.89-24.74)	< 0.01
Future use: manual medicine / manual therapy	1.60	4.95 (1.36-18.05)	0.02
Reasons: conventional therapies are not enough for a holistic understanding of human beings	1.29	3.62 (1.20-10.89)	0.02
Reasons: positive, personal experiences	1.91	6.72 (1.60-28.22)	0.01
Would you like to learn more about complementary therapies in your medical studies?	0.99	2.69 (1.31-5.53)	0.01

Table 5: Prediction of factors for a positive attitude towards complementary medicine - a binary logistical regression model (forward conditional).

OR = odds ratio; CI = confidence interval

Discussion

This study investigated medical students' attitudes on CM therapies and underlying influencing factors, the personal use of CM by medical students, their interest in CM and underlying reasons as well as expectations regarding CM training. With only 17 % of the students stating to have a negative attitude towards CM and even less (14 %) not wanting to learn about it through compulsory or elective courses there is potential for a more extensive and creative curriculum on CM therapies.

The rating for the general interest in CM and the perceived importance of CM showed that students also have a personal interest and motivation to learn about this topic. Lecturers in all medical areas should adapt their teaching content to these reported needs and use different levels of competencies. The students should at least be able to critically appraise CM therapies in order to be able to advise their patients. That corresponds with level two of the framework for clinical assessment by Miller [18]. The future medical professional knows about CM therapies (level one) and how they work (level two). In order to fulfill the WHO's goals to combine CM and conventional medicine reaching level two should be the basic requirement for medical professionals. However, being able to show how or to perform CM therapies might be useful for certain treatment approaches.

Most students were able to describe acupuncture, nutrition therapy and relaxation techniques. This could be due to the fact that the basic principles for these three therapies are relatively easy to describe without any deeper knowledge about the way how the procedures actually work. Nutrition therapy, manual medicine and relaxation techniques were most frequently imagined as used in the future. Especially manual medicine and relaxation techniques offer the possibility for self-awareness. A recently published study showed that education with an aspect of self-experience positively influenced the students' ability to critically evaluate CM therapies [19].

Although acupuncture can be described by a large group of students it was ranked as one of the least used procedures. The German Physician Association for Acupuncture lists only thirteen physicians that would provide acupuncture in the city of Lübeck, a town with about 200,000 inhabitants [20]. Furthermore, acupuncture is a procedure that most health insurances will only pay for if it is administered by a licensed physician for the conditions of chronic pain of the lumbar spine or arthrosis of the knee lasting more than six months [21]. With an average age of the participating medical students of 24 years, the aforementioned conditions are not very likely. So, they would have to pay themselves which is a hurdle that can prevent people of making use of this CM therapy.

CM therapies often have to be paid extra when prescribed or offered by a medical professional. Even though it creates an additional source of income, this was the least frequently stated reason for the students' interest in CM. The main reasons for interest were the wish to provide holistic treatment for the patients and to have a advisory competence, which is in line with the WHO goals concerning CM [2,22]. This study showed that students themselves had already realized that modern medicine has to offer more than just conventional therapies and treatments.

The three strongest predictors for a positive attitude towards CM were the students' positive personal experiences as well as

the expected future usage of homeopathy and manual medicine. The fact that personal positive experiences positively influences the attitude towards CM can be used for the conceptualization and improvement of a CM curriculum. Students could get more hands-on training to experience CM themselves, therefore using not only their knowledge, but also their experiences as a resource for advice. Positive experiences might be conveyed through role models, „explicit curricula and changes to educational environments“ [23] in addition to self-awareness and hands-on training. The outstanding position of homeopathy in the binary regression analysis is in line with its peculiarities. As individualisation of treatment is required in homeopathy, research approaches fail to prove specific effects of homeopathic treatment [24]. Since some homeopathic dilutions are free from active components, the potential mechanisms of action remain unknown [25]. Nevertheless, positive impacts of homeopathy have been described, e.g. it would reduce costs in health care [26]. Since homeopathy is described as increasingly used or remarkably popular, medical students have to be prepared for this demand of their patients in order to support informed decision making [24,27]. Addressing and discussing these conflictive aspects of homeopathy in student lectures or courses might enhance positive attitudes towards CM with regards to the results of the binary regression analysis.

Conclusion

Medical students generally have a positive attitude towards CM therapies and are interested in a holistic treatment approach combining conventional and complementary medicine. Universities should react to that need by extending their CM curriculum allowing for positive, personal experiences. Especially nutrition therapy, manual medicine and relaxation techniques should be included in medical education since most students imagined to use these CM therapies as physicians. Critical appraisal of and training in homeopathy and manual medicine might positively influence students' attitudes towards CM.

Author Disclosure Statement

No competing financial interests or potential conflicts exist for this study.

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