European Journal of Public Health, Vol. 20, No. 2, 227–230

doi:10.1093/eurpub/ckp104 Advance Access published on 8 July 2009

Belief in complementary and alternative medicine is related to age and paranormal beliefs in adults

Jan Van den Bulck, Kathleen Custers

Background: The use of complementary and alternative medicine (CAM) is widespread, even among people who use conventional medicine. Positive beliefs about CAM are common among physicians and medical students. Little is known about the beliefs regarding CAM among the general public. Among science students, belief in CAM was predicted by belief in the paranormal. **Methods:** In a cross-sectional study, 712 randomly selected adults (>18 years old) responded to the CAM Health Belief Questionnaire (CHBQ) and a paranormal beliefs scale. **Results:** CAM beliefs were very prevalent in this sample of adult Flemish men and women. Zero-order correlations indicated that belief in CAM was associated with age ($r = 0.173$ $P < 0.001$) level of education ($r = -0.079$ $P = 0.039$) social desirability ($r = -0.119$ $P = 0.002$) and paranormal belief ($r = 0.365$ $P < 0.001$). In a multivariate model, two variables predicted CAM beliefs. Support for CAM increased with age (regression coefficient: 0.01; 95% confidence interval (CI): 0.006 to 0.014), but the strongest relationship existed between support for CAM and beliefs in the paranormal. Paranormal beliefs accounted for 14% of the variance of the CAM beliefs (regression coefficient: 0.376; 95%: CI 0.30–0.44). The level of education (regression coefficient: 0.06; 95% CI: −0.014–0.129) and social desirability (regression coefficient: −0.023; 95% CI: −0.048–0.026) did not make a significant contribution to the explained variance (<0.1%, $P = 0.867$). **Conclusion:** Support of CAM was very prevalent in this Flemish adult population. CAM beliefs were strongly associated with paranormal beliefs.

Keywords: complementary and alternative medicine, cross-sectional study, paranormal beliefs.

Introduction

Complementary and alternative medicine (CAM) has been defined as 'a group of therapeutic and diagnostic disciplines that exist largely outside the institutions where conventional health care is taught and provided'.[1] Whereas CAM elicits many comments from sceptics and from advocates of evidence-based medicine, it is evident that many people turn to its therapies.[2] Recent studies show that more than half of the patients presenting at an Accidents and Emergency department were using or had used some form of CAM.[3] In paediatric patients presenting at the emergency room, a similar proportion were found to have used CAM, and a quarter of the parents reported that their children were using CAM for the illness for which they were seeking medical attention.[4] A cross-sectional study of adult women in the United States suggested that between one-third and half of the women had used CAM at least once a year.[5] Overall, about 35% of American adults reported the use of CAM.[6] CAM appeared to be particularly popular among cancer patients.[7] Similar trends could be found in numerous countries.[8]

The use of CAM, however, only paints half of the picture. There is a lot of evidence that many physicians have positive attitudes towards CAM as well. A recent study in *BMJ* showed that student doctors had a very positive attitude towards the use of CAM therapies, were willing to use them themselves and were considering training in some of the CAM disciplines.[9] While it would appear that students were more positive during the earlier stages of their training, there appeared to be support for CAM well beyond graduation.[10] In a study of emergency physicians, 40% stated that they were using or had used CAM.[3] The phenomenon is therefore not limited to medical students. Even senior hospital doctors have been shown to have positive attitudes towards CAM.[11]

The use of the adjectives such as 'complementary' and 'alternative' may suggest that CAM exists as a simple additional choice over and above what physicians are trained to do. It is, however, important to note that CAM reflects a very different understanding of biological processes. A survey of a sample of adults in the United States showed that people who held a 'holistic' view of health were much more likely to turn to CAM.[12] A study of health sciences students found that 24% of the variance in attitudes towards CAM was predicted by indicators of a worldview which opposed scientific explanation. Demographical variables, in contrast, only explained 2% of the variance. The best predictor of attitudes towards CAM was paranormal belief.[13]

The current study attempts to chart the prevalence of beliefs supporting CAM and the extent to which these beliefs are associated with demographical variables and with beliefs about science and the paranormal.

Methods

Participants and procedure

Interviews were conducted by 73 undergraduate students of a social science methodology class who were carefully trained as interviewers using documented and established techniques, the quality of which has been documented.[14] The study received ethical clearance at the Katholieke Universiteit Leuven, and informed consent was obtained from all participants. Participants had to be 18 years old or older to take part in the study. A two-step protocol was used for selecting participants. First, a city or village was selected randomly from the list of cities and villages in Flanders, Belgium. Next, 20 addresses were selected from the

Leuven School for Mass Communication Research, Katholieke Universiteit Leuven, Parkstraat 45, Box 3603, 3000 Leuven, Belgium
Correspondence: Jan Van den Bulck, Leuven School for Mass Communication Research, Katholieke Universiteit Leuven, Parkstraat 45, Box 3603, 3000 Leuven, Belgium, tel: +32-16-323294, fax: +32-16-323312, e-mail: jan.vandenbulck@soc.kuleuven.be

telephone directory of each city or village following a random selection protocol. Interviewers were instructed to go to the addresses in the order in which they had been selected, and a random walk protocol was used to select houses: the interviewers were instructed to proceed to the first building to the left of the building on the address list. There they had to ask to interview the member of the household who was first in line to celebrate his or her birthday. They had to try to initiate contact three times before they were allowed to use a replacement address. This procedure was designed to avoid oversampling of people listed in telephone directories and undersampling of those with an active lifestyle. Interviewers followed this procedure until they had 10 successful interviews.

After careful examination of the data for coding errors or other abnormalities, 712 questionnaires were retained for analysis.

Measures

CAM

The Complementary and Alternative Medicine Health Belief Questionnaire (CHBQ) was used to measure beliefs about CAM.[15] The scale consists of 10 items that were measured on a 7-point scale. A principal component factor analysis showed the 10 items loaded on a single factor (eigenvalues: 3.542; explained variance: 35.4%; Cronbach's α: 0.78).

Paranormal beliefs

A 20-item scale was used to assess respondents' paranormal beliefs.[16] The respondents indicated the extent of their agreement or disagreement on a 5-point scale. A principal component factor analysis showed the 20 items loaded on a single factor (eigenvalues: 7.564; explained variance: 37.8%; Cronbach's α: 0.91).

Attitudes towards science and technology

Questions were taken from the Science and Engineering Indicators 2006.[17] Respondents were asked to indicate on a 5-point scale the extent to which they agreed with six items that measured attitudes towards science and technology. A principal component factor analysis showed the 20 items loaded on a single factor (eigenvalues: 2.580; explained variance: 43%; Cronbach's α: 0.713).

Confounding variables

The study controlled for the potentially confounding effects of gender, age, level of education and social desirability. The level of education consisted of five categories: no formal education; finished ninth grade or less; finished twelfth grade or less; 3-year college education or less; 4 years or more of college education or university. To adjust for social desirability effects, we used the short, homogeneous version of the Marlow-Crowe social desirability scale.[18] The scale consisted of 10 items and was measured as a binary variable. Response items were 'true' or 'false'. A principal component factor analysis showed the 10 items loaded on a single factor (eigenvalues: 2.270; explained variance: 22.7%; Cronbach's α: 0.62).

Statistical analyses

SPSS® 16.0 for windows was used to analyse the data. We used means and standard deviations to express descriptive results. To explore the prevalence of belief in CAM, frequency tables of the responses to the CAM belief items were constructed. To gain information about the correlates of CAM beliefs, zero-order correlations and regression analyses were conducted and $P < 0.05$ was considered as significant.

Results

Description of the sample

The sample consisted of 43% men. The average age was 44.9 years (SD = 17.4) ranging from 18 to 93. Of the respondents, 21.1% finished 9th grade or less and 33.4% only finished 12th grade. 24.5% finished 2 or 3 years of college and 21.1% finished 4 years or more of college or university.

Prevalence of CAM beliefs

To summarize the prevalence of belief in CAM in a table, we divided the answers into three categories (agree, undecided, disagree), but all response categories were used in the statistical analyses. Table 1 shows that belief in CAM was very common among the respondents. For example, almost 70% of the respondents believed that the body is self-healing. About 60% of the study's respondents believed that physical and mental health are maintained by an underlying energy or a vital force. Over 70% of the participants believed that complementary therapies are not a threat to public health.

Table 1 Prevalence of attitudes towards CAM ($N = 712$)

	Mean	SD	Agree (%)	Undecided (%)	Disagree (%)
The physical and mental health are maintained by an underlying energy or a vital force	4.54	1.560	57.8	17.4	24.8
Health and disease are a reflection of balance between positive life-enhancing forces and negative destructive forces	4.31	1.545	50.2	21.4	28.4
The body is essentially self-healing and the task of a health care provider is to assist in the healing process	4.76	1.444	65.7	13.1	21.2
A patient's symptoms should be regarded as a manifestation of a general imbalance or dysfunction affecting the whole body	4.56	1.407	57.4	21.4	21.2
A patient's expectations, health beliefs and values should be integrated into the patient care process	5.27	1.194	78.8	14.2	7.0
Complementary therapies are a threat to public health	2.79	1.382	10.0	16.6	73.4
Treatments not tested in a scientifically recognized manner should be discouraged	4.34	1.675	47.4	20.5	32.1
Effects of complementary therapies are usually the result of a placebo effect	3.84	1.436	32.1	29.8	38.1
Complementary therapies include ideas and methods from which conventional medicine could benefit	4.54	1.295	52.1	29.4	18.5
Most complementary therapies stimulate the body's natural therapeutic powers	4.64	1.180	53.7	35.1	11.2

Table 2 Correlates of belief in CAM

	CAM	Paranormal belief	Attitudes towards science	Social desirability	Gender	Age	Level of education
CAM	1.00	0.365**	−0.069	−0.119**	0.068	0.173**	−0.079*
Paranormal belief		1.00	−0.260**	−0.052	0.064	0.020	−0.169*
Attitudes towards science			1.00	0.003	−0.097**	0.075*	0.144**
Social desirability				1.00	−0.065	−0.479**	0.232**
Gender					1.00	−0.032	−0.075*
Age						1.00	−0.392**
Level of education							1.00

**$P < 0.01$, *$P < 0.05$

Correlates of CAM beliefs

Table 2 shows the zero-order correlations between CAM beliefs and paranormal beliefs, attitudes towards science and technology, social desirability, gender, age and level of education. Belief in CAM was not associated with gender, but support for CAM increased with age and decreased somewhat with the level of education. Participants who scored high on the social desirability scale tended to score somewhat lower on the CAM scale. Belief in CAM was not associated with attitudes towards science. Finally, the correlation between paranormal beliefs and belief in CAM was higher than the other correlations.

All variables were entered into a hierarchical regression analysis. Paranormal beliefs were the strongest predictor of CAM beliefs. They accounted for 14% of the variance of the CAM beliefs [regression coefficient: 0.37; 95% confidence interval (CI): 0.30–0.44]. Age accounted for a further 3% of the variance (regression coefficient: 0.01; 95% CI: 0.006–0.014). Neither level of education (regression coefficient: 0.06; 95% CI: −0.014–0.129), gender (regression coefficient: 0.023; 95% CI: −0.096–0.190), social desirability (regression coefficient: −0.023; 95% CI: −0.048–0.026), nor attitudes towards science (regression coefficient: −0.006; 95% CI: −0.079–0.067) made a significant contribution to the explained variance.

Discussion

Belief in CAM appeared to be widespread in this sample of adult Flemish men and women. A majority of respondents agreed with the statements of the CHBQ. In a multivariate model, only two variables were significant predictors of CAM beliefs. Support for CAM appeared to increase somewhat with age, but the strongest relationship existed between support for CAM and beliefs in the paranormal. This relationship was fairly robust: it did not disappear even when social desirability and attitudes towards science and demographic variables were taken into account. These results reflect those of a much narrower study of health science students in which similar effects sizes were found for paranormal beliefs and demographic variables.[13]

Limitations

This study had obvious limitations. First, it relied on self-reports. It is possible that the respondents under- or overestimated their belief in CAM. Support for CAM appears to be widespread. If and to the extent that people were aware of this they may have felt a certain social pressure to agree. On the other hand, people may have assumed that support for CAM is not something one should express too openly. This may have led to under-reporting of support for CAM beliefs. Our study used a social desirability scale to correct for such bias. Our results suggest that expressing support for CAM beliefs was not or only weakly related to the tendency to give socially desirable answers. The correlation between CAM beliefs and a social desirability scale was very small and disappeared when age was entered as a confounder. Nevertheless, if socially desirable answers were given, the belief in CAM was probably underestimated (as the relationship with social desirability was negative) and the actual beliefs may be even more prevalent.

Second, our study looked at beliefs about CAM and not the actual use of CAM. Beliefs may offer a bigger threat to the legitimacy of a conventional medicine than the use of CAM. The use of CAM does not necessarily imply that the user has doubts about the validity of the claims of conventional medicine.[19] Because many conventional physicians, either in family practice or in the hospital setting, talk to patients about complements of and alternatives to conventional treatments, some patients may use CAM without realizing the extent to which CAM challenges the scientific world view of conventional medicine.

Finally, this study used a scale developed to measure beliefs about CAM among medical students and applied mainly to students, physicians and other healthcare providers. While the scale had acceptable internal consistency (as expressed by Cronbach's α), it is unclear whether members of the general public interpret the items of the scale the same way as a medical professional would. Given the broad acceptance of the use of CAM and the support for the beliefs supporting CAM, it would be advisable to develop measurement tools geared towards measuring CAM beliefs among the general population.

Conclusion

It has been argued that physicians have to be knowledgeable about CAM because their patients will expect guidance and advice regarding their use.[7] It would appear that cancer patients in particular are looking for anything that might complement conventional treatments.[7] Our study suggests that physicians need to be aware of the fact that belief in the basic tenets of CAM is widespread. It is not just about the question whether particular treatments might alleviate pain, speed up recovery or improve resistance. Belief in CAM refers to an alternative view of the physical world, a world in which symptoms are signs of a general imbalance of the body and where uncharted vital forces steer physical and mental health. They need to be aware of the fact that whether people have such beliefs about health and illness is not predicted by gender or education, but by whether they also believe in extra-sensory perception, astrology, ghosts, astral projection and even 'flying saucers'.

Conflicts of interest: None declared.

Key points

- A large proportion of people adhere to beliefs that challenge the foundations of current thinking in conventional, evidence-based medicine.
- There was little or no difference according to gender, age or level of education. Belief in the paranormal was the strongest predictor of belief in the CAM in this sample of adults.
- Policy makers have to realize that conventional medical reasoning when explaining policy choices may no longer sound convincing to many people.
- Information or prevention campaigns may need to target fundamental perceptions of science as well as behaviours.

References

1 Zollman C, Vickers A. ABC of complementary medicine: what is complementary medicine? *BMJ* 1999;319:693–6.

2 Owen DK, Lewith G, Stephens GR. Can doctors respond to patients' increasing interest in complementary and alternative medicine? *BMJ* 2001;322:154–8.

3 Waterbrook AL. The knowledge and usage of complementary and alternative medicine in emergency department patients and physicians. *J Emerg Med* 30 August 2008, doi:10.1016/j.jemermed.2008.01.007 [Epub ahead of print].

4 Zuzak TJ, Zuzak-Siegrist I, Simões-Wüst AP, et al. Use of complementary and alternative medicine by patients presenting to a paediatric emergency department. *Eur J Pediatr* 2009;168:431–7.

5 Chao MT, Wade CM. Socioeconomic factors and women's use of complementary and alternative medicine in four racial/ethnic groups. *Ethn Dis* 2008;18:65–71.

6 Tindle HA, Davis RB, Phillips RS, Eisenberg DM. Trends in use of complementary and alternative medicine by US adults. *Altern Ther Health Med* 2005;11:42–9.

7 Balneaves LG, Weeks L, Seely D. Patient decision-making about complementary and alternative medicine in cancer management: context and process. *Curr Oncol* 2008;15:s94–100.

8 Tascilar M, De Jong FA, Verweij J, Mathijssen RHJ. Complementary and alternative medicine during cancer treatment: beyond innocence. *Oncologist* 2006;11:732–41.

9 Reilly DT. Young doctors' views on alternative medicine. *BMJ* 1983;287:337–9.

10 Riccard CP, Skelton M. Comparative analysis of 1st, 2nd, and 4th year MD students' attitudes toward complementary alternative medicine (CAM). *BMC Res Notes* 2008;1:84.

11 Fadlon J, Granek-Catarivas M, Roziner I, Weingarten MA. Familiarity breeds discontent: senior hospital doctors' attitudes towards complementary/alternative medicine. *Complement Ther Med* 2008;16:212–9.

12 Astin JA. Why patients use alternative medicine: results of a national study. *JAMA* 1998;279:1548–53.

13 Pettersen S, Olsen RV. Exploring predictors of health sciences students' attitudes towards complementary-alternative medicine. *Adv Health Sci Educ Theory Pract* 2007;12:35–53.

14 Billiet J, Loosveldt G. Improvement of the quality of responses to factual survey questions by interviewer training. *Public Opin Q* 1988;52:190–211.

15 Lie D, Boker J. Development and validation of the CAM Health Belief Questionnaire (CHBQ) and CAM use and attitudes amongst medical students. *BMC Med Educ* 2004;4:2.

16 Sparks GG, Nelson CL, Campbell RG. The relationship between exposure to televised messages about paranormal phenomena and paranormal beliefs. *J Broadcast Electron* 1997;41:345–59.

17 National Science Board. *Science and Engineering Indicators 2006*. Arlington, VA: National Science Foundation, 2006.

18 Strahan R, Gerbasi KC. Short, homogeneous versions of the Marlow-Crowne social desirability scale. *J Clin Psychol* 1972;28:191–3.

19 Moore J, Phipps K, Marcer D. Why do people seek treatment by alternative medicine? *BMJ* 1985;290:28–9.

Received 4 May 2009, accepted 11 June 2009