

COMPLEMENTARY AND ALTERNATIVE MEDICINE USE AMONG AMISH AND NON-AMISH RESIDENTS OF OHIO APPALACHIA

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ABSTRACT

The use of complementary and alternative medicine (CAM) is common among many rural residents but little is known about its use among the Amish. The aim of this study was to determine the prevalence of CAM therapy use among an Amish community and compare it to a rural non-Amish population. Data were taken from a cancer-related lifestyle cross-sectional individual interview survey conducted among Amish and non-Amish residents of Ohio Appalachia. Amish adults (62 males, 72 females) were compared to non-Amish adults (64 males, 90 females) in terms of CAM therapy use and utilization of mainstream healthcare services. Prior use of any CAM therapy was highly prevalent among both Amish (males: 98%, female: 100%) and non-Amish (males: 89%, females: 98%) participants. CAM therapies for which the prevalence was significantly higher among Amish participants for both genders included chiropractic therapy (males: 84% vs. 61%, $p=0.005$; females: 90% vs. 57%, $p<0.001$) and reflexology (males: 35% vs. 5%, $p<0.001$; females: 53% vs. 13%, $p<0.001$). Few differences in the use of mainstream healthcare services were found between Amish and non-Amish participants. While CAM therapy use was widespread among both Amish and non-Amish participants, the Amish generally reported higher levels of prior use. These findings underscore the importance of physicians and nurses collecting information on CAM therapies when treating patients in this region, particularly Amish patients.

INTRODUCTION

Complementary and alternative medicine (CAM) is defined as “a group of diverse medical and healthcare systems, practices, and products that are not presently considered to be part of conventional medicine” (National Center for Complementary and Alternative Medicine, 2008). While many types of CAM therapy exist, some of the more commonly used therapies include chiropractic therapy, meditation, and massage therapy (Barnes et al., 2004). In the United States (U.S.), use of CAM therapy is prevalent and increasing in popularity, with 34% to 62% of people reporting use within the last year (Barnes et al., 2004; Eisenberg et al., 1993;

Eisenberg et al., 1998; Wolsko et al., 2002). Use of CAM therapies tends to be higher among individuals who are female, have higher education levels, higher socioeconomic status, and those in poorer health (Astin, 1998; Bishop & Lewith, 2008; Eisenberg et al., 1993; Wolsko et al., 2002).

Some CAM therapies, such as chiropractic therapy, have a history of use among residents of rural communities (Gesler, 1988), and recent estimates of CAM therapy use among rural populations have ranged from 47% to 79% (Arcury et al., 2004; Barish & Snyder, 2008; del Mundo, Shepherd, & Marose, 2002). While these studies varied in the CAM therapies examined, results still indicate that CAM therapy use among individuals living in rural areas is likely higher than the national rate. The increase may be due to many social determinants of health, including having less access to mainstream healthcare providers, having lower incomes, and having specific cultural attitudes toward health.

A unique rural population that has not been examined extensively in terms of CAM therapy use is the Amish. The Amish are a conservative religious group who have strong communal values and try to separate themselves from modern American life. In terms of healthcare, the Amish utilize a wide variety of non-mainstream therapies but also remain dependent on the American culture for professionally educated healthcare providers (Brewer & Bonalumi, 1995). The Amish tend not to have commercial health insurance but instead rely on self-pay and community funds for larger healthcare bills (Brewer & Bonalumi, 1995).

The largest Amish community in the world is located in the Holmes County Region of Ohio Appalachia (Donnermeyer, Kreps, & Kreps, 1999; Hostetler, 1995). Similar to many parts of Appalachia, Ohio Appalachia lacks healthcare providers and has high rates of residents without health insurance (Dorsky, Ramsini, & Holtzhauer, 2000; Halverson, Ma, & Harner, 2004). Because of these conditions, it becomes of interest to examine the use of CAM therapies among the residents of this geographic region.

The purpose of this study was to determine the prevalence of CAM therapy use within the Holmes County Amish community and compare it with that of rural, non-Amish residents of Ohio Appalachia. To the best of our knowledge, this is the most extensive examination of CAM therapy use among the Amish and is the first time Amish and non-Amish individuals living in the same geographic location have been compared regarding CAM therapy. The results of this study will provide insight into the use of CAM therapy among two distinct rural populations in the U.S. This information may be used in future education interventions aimed at improving the health and health behaviors of Amish and rural non-Amish populations, and it will be especially useful to physicians and nurses practicing in these rural communities.

METHODS

Study Design

We utilized data collected as part of a cancer-related lifestyle cross-sectional individual interview study conducted among Amish and non-Amish adults living in Ohio Appalachia. All participants for this study were residents of either Holmes County (2005 population=41,567) or Tuscarawas County (2005 population=91,944) (U.S. Census Bureau, 2006a; U.S. Census Bureau, 2006b). We interviewed Amish adults during 2004 and non-Amish adults during 2005.

Amish households used for this behavioral lifestyle study had previously been randomly selected from the Holmes County, Ohio Amish Directory for a study focusing on cancer

incidence among the Amish (Ohio Amish Directory, 2000). To recruit participants for the current study, we first mailed a letter explaining the study to each of these Amish households. A co-investigator then visited each household to further explain the study and ask each male and female head of household to participate in a face-to-face interview. If individuals in the sampled households had died or moved out of the state, we recruited the current residents, provided they were Amish. An attempt was made to locate individuals who had moved within Ohio. For households that were no longer Amish or refused to participate, we randomly sampled replacement households from within the same Amish church district listed in the Amish Directory to maintain the target sample size.

Non-Amish households were randomly selected from Holmes County and Tuscarawas County using the publicly available county auditors' databases. Many of the households were located close to the Amish, making for an ideal comparison group. The recruitment methods used for non-Amish adults were identical to those used for Amish adults. After mailing an introduction letter, a co-investigator visited each selected household to further explain the study and recruit each male and female head of household to participate in a face-to-face interview. We only included individuals who were not raised in Amish households in the non-Amish sample.

For individuals who agreed to participate, research staff conducted face-to-face interviews (1.5 to 2 hours on average) in the participants' homes. If both the male and female head of household agreed to participate, they were usually interviewed at the same time by different interviewers in separate rooms. Most of the men were interviewed by male interviewers and women by female interviewers. We provided a \$25 gift card to each participant after their interview in appreciation of their time. The study was approved by the Institutional Review Board at The Ohio State University.

Measures

We addressed four major domains of CAM therapy, as described by the National Center for Complementary and Alternative Medicine (NCCAM), in this study: (1) Manipulative and body-based practices: the manipulation or movement of one or more body parts (chiropractic therapy, massage therapy, and reflexology), (2) Energy medicine: the use of energy fields (Reiki, polarity therapy, and acupuncture), (3) Mind-body medicine: a variety of techniques designed to enhance the mind's ability to affect bodily function and symptoms (meditation, yoga, pow-wow, and prayer for healing purposes), and (4) Biologically-based practices: the use of substances found in nature (dietary supplements) (National Center for Complementary and Alternative Medicine, 2008). Dietary supplements included vitamins, minerals, proteins/amino acids, fatty acids, fiber, botanicals, enzymes, and any other supplements mentioned by participants.

We provided participants with a brief definition of each therapy examined and then asked about prior use (if they had ever used it or were currently using it in the case of dietary supplements). Response options for each CAM therapy included yes, no, or don't know. Since dietary supplement use by these participants has been described in detail elsewhere (Carter, 2008), we will only briefly address it in this report.

We also documented each participant's utilization of mainstream healthcare services by collecting information on history of ever seeing mainstream healthcare providers (any healthcare provider, doctor, nurse practitioner, and physician assistant; yes or no for each), type of healthcare professional seen most often (doctor, chiropractor, or other), and hospital care within

the last three years (yes or no). Participants provided a self-assessment of their general health by rating their health compared to people of the same age and gender (poor, fair, good, very good, or excellent). Lastly, participants indicated if they had any medical conditions requiring them to see a healthcare provider regularly (yes or no).

Demographic information collected included age, marital status (married, never married, and other), education level (less than high school, high school graduate, and more than high school), and household income (less than county median and equal to or greater than county median). County median household incomes were from the year prior to the interview and were based on the U.S. Census Bureau Small Area Income and Poverty Estimates (U.S. Census Bureau, 2008). If both a husband and wife reported a household income estimate and they differed, we assigned the husband's estimate to both individuals and compared it to the appropriate county median.

Statistical Analyses

We used chi-square tests to assess associations between group (Amish versus non-Amish) and each categorical variable and the Mann-Whitney test to compare the two groups on age. For CAM therapies, if a participant responded "don't know" for a particular therapy, he or she was excluded from that comparison but included in all others for which data were provided. We stratified all analyses by gender since data were clustered in instances where we interviewed both the male and female head of household. Statistical tests were two-sided, and the p-values for chi-square tests were from Fisher's exact test. We used SPSS 16.0 (Chicago, IL) to conduct all analyses.

RESULTS

Demographic Characteristics

Overall, we interviewed 134 Amish adults from 75 households (62 males, 72 females) and 154 non-Amish adults from 98 households (64 males, 90 females). Response rates for the Amish and non-Amish were 67% and 23%, respectively. When only households that had an adult available during contact attempts were considered for the non-Amish (63% of sampled households), the response rate was 37%.

Amish males tended to be younger ($p=0.02$), currently married ($p=0.009$), less educated ($p<0.001$), and have lower incomes ($p=0.02$) compared to non-Amish males (see table 1). Among females, the Amish were more likely to be currently married ($p=0.004$) and less educated ($p<0.001$) than the non-Amish females.

CAM Therapy

CAM therapy use was highly prevalent among both genders with 94% (118/126) of males and 99% (160/162) of females reporting prior use of at least one type of CAM therapy (see tables 2 and 3). When prayer was excluded from the CAM definition, as has been done elsewhere (del Mundo, Shepherd, & Marose, 2002; Eisenberg et al., 1993; Wolsko et al., 2002), these percentages fell slightly to 91% for males and 98% for females. In addition to current dietary

Table 1
Demographic Characteristics of Amish and Non-Amish Participants by Gender; Ohio
Appalachia, 2004-2005

	<u>Males</u>		p-value	<u>Females</u>		p-value
	Amish (n=62)	Non-Amish (n=64)		Amish (n=72)	Non-Amish (n=90)	
Age (years)			0.02			0.07
Mean \pm SD	52.4 \pm 13.8	58.8 \pm 15.9		52.9 \pm 15.1	56.8 \pm 15.3	
Range	22-84	24-92		21-89	22-90	
Marital Status			0.009			0.004
Married	59 (95)	53 (83)		67 (93)	67 (74)	
Never married	2 (3)	1 (2)		0 (0)	2 (2)	
Other	1 (2)	10 (16)		5 (7)	21 (23)	
Education			<0.001			<0.001
< High school	61 (98)	8 (13)		72 (100)	11 (12)	
High school graduate	1 (2)	30 (47)		0 (0)	47 (52)	
> High school	0 (0)	26 (41)		0 (0)	32 (36)	
Household Income			0.02			0.06
\geq County median	20 (34)	34 (58)		21 (36)	42 (52)	
< County median	38 (66)	25 (42)		38 (64)	39 (48)	

Note: Table reports n (%) for categorical variables. Totals may be less than stated numbers due to missing data. Percents may not sum to 100% due to rounding. SD: standard deviation.

supplement use, prior use of chiropractic therapy (males=72%, females=72%), prayer for healing purposes (males=63%, females=71%), and massage therapy (males=24%, females=33%) were the most commonly reported CAM therapies. Few participants reported using Reiki therapy, polarity therapy, and pow-wow.

Compared to non-Amish males, a higher percentage of Amish males reported prior chiropractic therapy (84% vs. 61%, $p=0.005$), reflexology (35% vs. 5%, $p<0.001$), and prayer for healing purposes (77% vs. 48%, $p=0.001$). Current dietary supplement use was also higher among Amish males (82% vs. 64%, $p=0.03$). A higher percentage of Amish females reported previous chiropractic therapy (90% vs. 57%, $p<0.001$), massage therapy (44% vs. 23%, $p=0.007$), and reflexology (53% vs. 13%, $p<0.001$) compared to non-Amish females. Amish females also had a higher prevalence of current dietary supplement use, though the difference only reached borderline statistical significance (90% vs. 79%, $p=0.06$).

Mainstream Healthcare and General Health

Almost all participants (males=98%, females=100%) reported having seen a healthcare professional in the past (see table 4). A higher percentage of non-Amish females reported having ever seen a nurse practitioner (27% vs. 6%, $p<0.001$) and going to the hospital for care within the last three years (51% vs. 31%, $p=0.02$) compared to Amish females. Non-Amish males did not differ from Amish males in terms of these mainstream healthcare services. However, compared

Table 2
Use of Complementary and Alternative Medicine (CAM) among Male Participants, Amish vs. Non-Amish; Ohio Appalachia, 2004-2005

	Amish (n=62)	Non-Amish (n=64)	p-value
Any CAM Ever ^a			0.06
Yes	61 (98)	57 (89)	
No	1 (2)	7 (11)	
Any CAM Excluding Prayer Ever ^a			0.009
Yes	61 (98)	54 (84)	
No	1 (2)	10 (16)	
Manipulative and Body-based Practices			
Chiropractic Therapy Ever			0.005
Yes	52 (84)	39 (61)	
No	10 (16)	25 (39)	
Massage Therapy Ever			0.10
Yes	19 (31)	11 (17)	
No	43 (69)	53 (83)	
Reflexology Ever			<0.001
Yes	22 (35)	3 (5)	
No	40 (65)	61 (95)	
Energy Medicine			
Reiki Therapy Ever			0.06
Yes	0 (0)	5 (8)	
No	62 (100)	59 (92)	
Polarity Therapy Ever			0.99
Yes	1 (2)	1 (2)	
No	61 (98)	63 (98)	
Acupuncture Therapy Ever			0.62
Yes	2 (3)	1 (2)	
No	60 (97)	63 (98)	
Mind-body Medicine			
Meditation Ever			0.99
Yes	4 (6)	5 (8)	
No	58 (94)	59 (92)	
Yoga Ever			0.99
Yes	0 (0)	1 (2)	
No	62 (100)	63 (98)	
Pow-wow-ing Ever			0.49
Yes	1 (2)	0 (0)	
No	61 (98)	64 (100)	
Prayer For Healing Purposes Ever			0.001
Yes	48 (77)	31 (48)	
No	14 (23)	33 (52)	
Biologically-based Practices			
Current Use of Dietary Supplements			0.03
Yes	51 (82)	41 (64)	
No	11 (18)	23 (36)	

Note: Table reports n (%) for all variables. Totals may be less than stated numbers due to missing data. Percents may not sum to 100% due to rounding.

^aIncludes current use of dietary supplements

Table 3
Use of Complementary and Alternative Medicine (CAM) among Female Participants, Amish vs. Non-Amish; Ohio Appalachia, 2004-2005

	Amish (n=72)	Non-Amish (n=90)	p-value
Any CAM Ever ^a			0.50
Yes	72 (100)	88 (98)	
No	0 (0)	2 (2)	
Any CAM Excluding Prayer Ever ^a			0.13
Yes	72 (100)	86 (96)	
No	0 (0)	4 (4)	
Manipulative and Body-based Practices			
Chiropractic Therapy Ever			<0.001
Yes	65 (90)	51 (57)	
No	7 (10)	39 (43)	
Massage Therapy Ever			0.007
Yes	32 (44)	21 (23)	
No	40 (56)	69 (77)	
Reflexology Ever			<0.001
Yes	38 (53)	12 (13)	
No	34 (47)	78 (87)	
Energy Medicine			
Reiki Therapy Ever			0.73
Yes	3 (4)	5 (6)	
No	69 (96)	85 (94)	
Polarity Therapy Ever			0.17
Yes	4 (6)	1 (1)	
No	68 (94)	89 (99)	
Acupuncture Therapy Ever			0.22
Yes	7 (10)	4 (4)	
No	65 (90)	86 (96)	
Mind-body Medicine			
Meditation Ever			0.53
Yes	10 (14)	16 (18)	
No	62 (86)	74 (82)	
Yoga Ever			0.99
Yes	4 (6)	5 (6)	
No	67 (94)	85 (94)	
Pow-wowing Ever			0.19
Yes	2 (3)	0 (0)	
No	69 (97)	90 (100)	
Prayer For Healing Purposes Ever			0.30
Yes	53 (76)	61 (68)	
No	17 (24)	29 (32)	
Biologically-based Practices			
Current Use of Dietary Supplements			0.06
Yes	65 (90)	71 (79)	
No	7 (10)	19 (21)	

Note: Table reports n (%) for all variables. Totals may be less than stated numbers due to missing data. Percents may not sum to 100% due to rounding.

^aIncludes current use of dietary supplements

to the non-Amish, higher percentages of both Amish males (35% vs. 11%, $p=0.002$) and females (38% vs. 7%, $p<0.001$) reported a chiropractor was the healthcare professional they visited most often.

The perceived health of Amish males did not differ from that of non-Amish males, but more non-Amish males reported having a medical condition requiring regular visits to a healthcare provider (50% vs. 27%, $p=0.02$). Among females, Amish participants perceived themselves to be in poorer general health ($p=0.02$), but more non-Amish women reported having a medical condition requiring regular visits to a healthcare provider (57% vs. 29%, $p<0.001$).

Table 4
Use of Mainstream Healthcare Services and General Health among Amish and Non-Amish Participants by Gender; Ohio Appalachia, 2004-2005

	<u>Males</u>			<u>Females</u>		
	Amish (n=62)	Non-Amish (n=64)	p-value	Amish (n=72)	Non-Amish (n=90)	p-value
Ever Seen a Healthcare Professional			0.99			N/A
Yes	61 (98)	62 (97)		72 (100)	90 (100)	
No	1 (2)	2 (3)		0 (0)	0 (0)	
Ever Seen a Doctor			0.99			0.44
Yes	61 (100)	61 (98)		71 (99)	90 (100)	
No	0 (0)	1 (2)		1 (1)	0 (0)	
Ever Seen a Nurse Practitioner			0.48			<0.001
Yes	9 (15)	13 (21)		4 (6)	24 (27)	
No	52 (85)	49 (79)		68 (94)	66 (73)	
Ever Seen a Physician Assistant			0.83			0.15
Yes	12 (20)	14 (23)		3 (4)	10 (11)	
No	49 (80)	48 (77)		69 (96)	80 (89)	
Healthcare Professional Seen Most Often			0.002			<0.001
Doctor	39 (65)	53 (85)		40 (56)	83 (92)	
Chiropractor	21 (35)	7 (11)		27 (38)	6 (7)	
Other Healthcare Professional	0 (0)	2 (3)		5 (7)	1 (1)	
Gone to the Hospital for Care in Last Three Years			0.57			0.02
Yes	17 (28)	21 (33)		22 (31)	45 (51)	
No	44 (72)	43 (67)		50 (69)	44 (49)	
General Health			0.67			0.02
Poor	1 (2)	0 (0.0)		0 (0)	3 (3)	
Fair	9 (15)	11 (17)		20 (28)	12 (13)	
Good	26 (42)	30 (47)		33 (46)	33 (37)	
Very Good	17 (27)	18 (28)		15 (21)	30 (34)	
Excellent	9 (15)	5 (8)		4 (6)	11 (12)	
Any Medical Conditions That Require Regular Visits to a Healthcare Provider			0.02			<0.001
Yes	17 (27)	31 (50)		21 (29)	51 (57)	
No	45 (73)	31 (50)		51 (71)	39 (43)	

Note: Table reports n (%) for all variables. Totals may be less than stated numbers due to missing data. Percents may not sum to 100% due to rounding. N/A: not applicable, p-value could not be calculated due to multiple cells containing a zero.

DISCUSSION

We aimed to determine the prevalence of CAM therapy use among an Ohio Appalachian Amish community and compare it to that of non-Amish residents of the same geographical region. To the best of our knowledge, the results provide the first comparison of CAM therapy use between the Amish and non-Amish rural communities. Overall, the use of CAM therapy was found to be highly prevalent among both groups with many similarities between the two groups. Amish males and females did, however, report a higher prevalence of prior use of specific CAM therapies, mostly involving manipulative and body-based practices, compared to their non-Amish counterparts.

The observed levels of CAM use observed in this study were noticeably higher than previous studies examining lifetime use of CAM therapy (52%-75%) (Barnes et al., 2004; Oldendick et al., 2000). The discrepancy may be attributable to our study focusing on one rural area within Ohio Appalachia, a region shown to have a shortage of healthcare providers and high percentages of residents without health insurance (Dorsky, Ramsini, & Holtzhauer, 2000; Halverson, Ma, & Harner 2004). These conditions are extremely important to consider when interpreting our findings since individuals who self-pay for medical care or perceive inadequate access to mainstream healthcare services are more apt to seek non-mainstream healthcare providers (Martin & Long, 2007; Ritchie, Gohmann, & McKinney, 2005). CAM therapy may be used by many residents of Ohio Appalachia if it is perceived as a less costly and more easily accessible form of healthcare.

Only one identified study has addressed CAM therapy use among the Amish community, and it found that 36% of Amish women reported prior use of CAM therapy (von Gruenigen et al., 2001). Our results indicate that CAM therapy use among the Amish is much higher. Since the previous study recruited consecutive women, most of whom were young, from one obstetric/gynecology clinic, it may have underestimated the use of CAM therapy among this population. We believe our results, using a random selection of participants, may provide a more valid estimate of CAM therapy use among the Amish.

While the Amish have been noted to frequently use home remedies and a folk healthcare system (Brewer & Bonalumi, 1995), they also seem to be utilizing CAM therapies requiring a provider, particularly those offering manipulative and body-based practices. Past use of reflexology, chiropractic therapy, and massage therapy were widespread among the Amish, with reported usage levels much higher compared to the non-Amish. Furthermore, over one-third of Amish participants indicated a chiropractor was the type of healthcare provider seen most often. Thus, the Amish appear to be using the services of CAM providers frequently, in addition to any home remedies.

For the most part, Amish and non-Amish participants did not differ in terms of their use of mainstream healthcare providers. These results suggest that Amish residents of this Ohio Appalachian region are using CAM therapy in conjunction with mainstream healthcare services, as found in other national surveys (Barnes et al., 2004; Eisenberg et al., 1998). Since it has been shown that patients do not frequently mention CAM therapy use to mainstream healthcare providers (Eisenberg et al., 1993), it is extremely important for mainstream healthcare providers (e.g., physicians and nurses) in rural areas to inquire about CAM therapy when treating patients, particularly Amish patients, to avoid possible negative therapeutic interactions.

This study has several strengths. It provides an improvement over previous research concerning CAM therapy use in the Amish community due to its larger sample size, inclusion of

male participants, and the presence of a non-Amish comparison group from the same geographic region. Furthermore, the participants for this study were randomly selected, face-to-face interviews were conducted, a wide range of CAM therapies were examined, and descriptions of each CAM therapy were provided to increase respondents' accuracy.

In addition to the cross-sectional study design, there were a few limitations to this study. The response rates, particularly among the non-Amish, were lower than desired, which is becoming more common in survey research (Steeh et al., 2001). Reasons for declining response rates to survey studies are numerous and include but are not limited to lack of time, concerns about privacy, and reduced civic participation (Groves, Cialdini, & Couper, 1992). Limited study resources allowed for a maximum of only three attempts to contact each household. While the Holmes County Amish community is the largest Amish community in the U.S. (Donnermeyer, Kreps, & Kreps, 1999; Hostetler, 1995), the results still may not generalize to all Amish communities, and one strict Amish order in the region was excluded because its members were not listed in the Holmes County Amish Directory. Comparisons were not adjusted for possible confounders (demographic factors and health status) since some CAM therapies had very small numbers of participants who reported use. It is believed, however, that adjusting for these variables would not qualitatively change our findings. Fewer non-Amish participants reported prior CAM therapy use despite having more education, higher incomes, and medical conditions that require regular visits to a healthcare provider, which are all characteristics previously associated with increased use of CAM therapy (Bishop & Lewith, 2008).

In this study, prior CAM therapy use was highly prevalent among both the Amish and non-Amish, with Amish tending to report higher levels of prior use for almost all of the CAM therapies examined. The Amish also reported using mainstream healthcare services and therefore may be using CAM more as complementary therapy. Physicians and nurses need to be diligent about collecting information about CAM therapy when treating patients in this geographic region, particularly Amish patients, to avoid negative therapeutic interactions. The results are also important for future education interventions aimed at improving the health and health behaviors of Amish and rural non-Amish populations. Future research is needed to explore CAM therapy use among other Amish and non-Amish rural communities and confirm these findings.

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