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Generational differences in complementary medicine use in young Australian women: Repeated cross-sectional dataset analysis from the Australian longitudinal study on women's health

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ABSTRACT

Objective: Examine the generational differences in complementary medicine (CM) utilisation between young women from the X and Millennial generations.
Design: Secondary analysis of two cross-sectional surveys from the Australian Longitudinal Study on Women's Health (ALSWH).
Setting: Australia.
Main outcome measures: Differences between young Generation X women (surveyed 1996; aged 18–23 years), and Millennial women (surveyed 2014; aged 19–24 years) regarding consultations with CM practitioners, sociodemographic characteristics, and health. Predictors for CM consultations were analysed via logistic regression analyses.
Results: Of the 14,247 Generation X women, 19.4% reported consulting CM, compared to 26.8% of the 11,344 Millennial women. CM consultations was predicted in both cohorts by higher age, education beyond primary school, non-urban (vs. urban) residence, and frequent back pain or headaches. Obesity and regular smoking predicted non-use in both. Significant cohort differences were found in physical activity levels (moderate/high levels associated with increased CM consultations in Millennial, but not Generation X women), and health status (Generation X women reporting fair-poor health were more likely to consult CM practitioners, while Millennial women reporting good health were less likely to do so, compared to women with very good/excellent health).
Conclusions: The increase in CM utilization among young Australian women from Generation X compared to the Millennial generation could indicate different health consumer patterns for future middle-aged and older adult Australian women. Further increases in CM usage may be observed as current young women age into characteristics traditionally linked with higher CM use such as worsening health status and increased disposable income.

1. Introduction

Trends in both health and increased use of health care associated with chronic and multimorbidities are more prevalent as people age and can have generationally-related patterns.[1] Although practices falling within the currently accepted definition of complementary medicine (CM) (e.g., herbal medicines, chiropractic, massage therapy, acupuncture, etc.) have a long history of use, there has been a purported rise in use of CM alongside, or in addition to, mainstream healthcare.[2,3] Increased CM use over recent decades is perhaps likely due in part to generationally-related changes and differences such as increased media and research attention directed towards CM (those in younger generations not seeing such practices as "new") and the increased ability of people who are older having more access to CM through disposable income or private insurance.[3,4] Generational differences with regards to health care utilisation can be considered in multiple ways including: 1) between different age groups at a single point in time (cross-sectional design; e.g., people in their 20 s compared

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to those in the 40 s), 2) within a single cohort over multiple points in time (longitudinal study design), and 3) between different birth cohorts at the same point in their lives (repeated, cross-sectional design; e.g. people born in the 1920s at 65 compared to those born in the 1950s at 65).

One US study examined generational differences in CM use between older adults from different birth generations ('Silent', born prior to 1946 and 'Baby Boomer', born 1946–1964) using the first, cross-sectional approach and established a precedent for increased CM utilization in a subsequent, younger generation.[5] To date, CM generational differences between younger generations has not been undertaken, nor have CM usage studies utilizing the third research approach outlined above; comparing different birth cohorts at the same point in their lives. Using a birth cohort comparison approach provides a unique general framework to examine generational differences[6] as participants from each cohort having similar exposure to general social experiences, norms, expectations, and events that influence characteristics such as decision-making, behaviour choices, and health beliefs. For example, being in one's 20 s in the late 1990's is inherently different than those in their 20 s in the second decade of the 21st century due to technological developments and societal changes even though developmental and life stage experiences such as completion of physical and cognitive development, secondary education completion, emerging adulthood, entry level career and independent life experiences (financial responsibility, adult relationships, finding "one's self") are similar.

Data collected from women in distinct and currently relevant birth cohort generations since 1996 as part of the Australian Longitudinal Study on Women's Health (ALSWH) provides an excellent opportunity to analyse generational differences from each of the approaches described above; cross-sectional, longitudinal, or repeated, cross-sectional. The current study is the first to analyse generational differences in CM services use between young women from different birth cohorts at the same points in their lives.

2. Methods

2.1. Participants

The analyses reported here were conducted using data from the ALSWH which was designed to assess health and wellbeing and associated factors in Australian women. Women in three different age groups were randomly selected from the national Medicare database in 1996,[7] with respondents shown to be broadly representative of the national population of women in the respective age cohorts.[8] Data was collected from participants approximately every three years. The three age groups sampled in the ALSWH (women born between 1921–1926; 1946–1951; 1973–1978) happen to align with established birth generation cohorts recognized throughout the world: 'Silent Generation' (current older adults born in 1945 and earlier), 'Baby Boomers' (people born 1946–1964), and 'Generation X' (people born 1965–1980).[5] In 2012 another sample of women, the 1989–1995 cohort was introduced into the study and provided a sampling of women from the 'Millennial Generation' (current young adults born ˜1980–2000). Comparisons between two cross-sectional studies are reported here with data for the first analysis deriving from the Generation X cohort's 1996 data collection (aged 18–23 years at data collection) and data from the second deriving from the 2014 collection from Millennials (aged 19–24 years at data collection). Data were combined to create a repeated cross-sectional data set for between cohort comparisons.

2.2. Complementary medicine consultations

Young women from Generation X were queried in 1996 how often they had consulted *"Alternative" health practitioners (e.g., chiropractor, naturopath, acupuncturist, herbalist etc.)* in the past 12 months for their health; and the item was recoded into a binary variable (not consulted vs. consulted).

Young Millennial women were queried in 2014 whether they had consulted i) *a chiropractor*, ii) *an acupuncturist*, iii) *a naturopath/herbalist* or iv) *another alternative health practitioner (e.g., aromatherapist, homeopath, reflexologist, iridologist)* for their health. To ensure comparability a new variable was derived from those data which indicated consultations with any of the practitioners named in the 1996 collection within the past 12 months. Questions on whether they also had consulted osteopaths or massage therapists were not considered because the query was only included in the 2014 collection. Again, a binary variable was created (not consulted vs. consulted).

2.3. Independent variables

Participants in both cohorts were queried about their socio-demographics (e.g. marital status, highest qualifications, managing life with current income, residence area), health behaviours (smoking, alcohol consumption, physical activity) and health including frequency of back pain, headaches, period pain, and self-rated health status. Those variables were used as potential predictors for CM consultations.

2.4. Statistical analyses

Chi-squared tests and Student t-tests were used for the combined data set to compare socio-demographic and health status characteristics between those women who had consulted CM in the past 12 months versus those who had not. Adjusted odds ratios with 95% confidence intervals were computed for all predictor variables within each cohort's data set using forward stepwise logistical regression. To determine if there were differences between the cohort's Odds ratios in terms of the socio-demographic and health status characteristic, cohort interaction effects were modelled using logistic regression where cohort interaction terms were created with each independent variable. All analyses were conducted using IBM SPSS ® software (IBM SPSS Statistics for Windows, release 24.0. Armonk, NY: IBM Corp.). Statistical significance was set at $p < 0.05$ for all analyses.

3. Results

3.1. Description of the Generation X and Millennial cohorts

The distribution of sociodemographic and health status characteristics across young Generation X (n = 14.247) and Millennial (n = 11.344) women are presented in Table 1. Significant differences were found for the majority of sociodemographic and health status characteristics. A significantly greater proportion of Millennial women indicated they had consulted a CM practitioner (26.8%) compared to Generation X women (19.4%) ($p < 0.001$).

3.2. Consulting CM in Generation X and Millennial cohorts

Significant differences between the two generations of young Australian women were also found for those who consulted CM. Table 2 shows comparisons of CM consultation status within and between the X and Millennial generations of young Australian women across sociodemographic and health status characteristics. Higher proportions of single Generation X young women consulted a CM practitioner whereas non-single Millennial young women had higher proportions of CM consultations. Millennial young women had higher proportions of those with some or sever financial struggles consulting CM practitioners compared to Generation X young women who had higher proportions of those with no financial struggles consulting CM practitioners. Significantly higher proportions of Generation X young women who consulted CM practitioners indicated only primary school education (66.8%) compared to Millennials (37.1%) and Millennial young women from urban residents (77.2%) made up a greater proportion of those

Table 1
The distribution of sociodemographic and health status characteristics across both generations.

	Generation X n = 14,247 *n (%)*	Millennials n = 11,344 *n (%)*	p-value
Consulted CM	2,749 (19.4)	3,033 (26.8)	< 0.001
Age, years (Mean ± SD)	20.7 ± 1.5	21.4 ± 1.8	
Marital status			< 0.001
Single	10,983 (77.5)	7,702 (69.1)	
Married/de facto	3,193 (22.5)	3,438 (30.9)	
Income status			< 0.001
Not struggling	6,865 (48.4)	4,642 (41.7)	
Some struggle	4,706 (33.2)	4,031 (36.2)	
Severe struggle	2,624 (18.5)	2,467 (22.2)	
Highest qualification			< 0.001
School only/no formal	10,027 (70.8)	4,746 (42.6)	
Trade/apprentice/ diploma	2,563 (18.1)	3,069 (27.5)	
University/higher degree	1,576 (11.1)	3,331 (29.9)	
Area of residence			< 0.001
Urban	7,869 (55.2)	8,953 (79.9)	
Rural/remote	6,378 (44.8)	2,258 (20.1)	
Health status			< 0.001
Excellent/very good	7,242 (51.1)	4,947 (43.6)	
Good	5,208 (36.8)	4,561 (40.2)	
Fair/poor	1,716 (12.1)	1,835 (16.2)	
BMI			< 0.001
Normal	9,669 (77.9)	7,062 (65.9)	
Overweight	1,934 (15.6)	2,141 (20.0)	
Obese	812 (6.5)	1,508 (14.1)	
Smoking status			< 0.001
Not smoking	9,208 (67.6)	9,179 (81.4)	
Irregular smoking	1,620 (11.9)	1,673 (14.8)	
Regular smoking	2,801 (20.6)	429 (3.8)	
Alcohol consumption			< 0.001
No drinking/low risk	13,306 (94.5)	10,945 (97.1)	
Risky/high risk drinking	782 (5.6)	327 (2.9)	
Physical activity level			< 0.001
Sedentary/low	5,973 (42.0)	3,485 (31.3)	
Moderate	3,261 (22.9)	2,369 (21.2)	
High	4,987 (35.1)	5,299 (47.5)	
Diagnoses and Conditions			
Back Pain			< 0.001
Never/rarely	8,718 (61.4)	5,284 (46.6)	
Sometimes	3,752 (26.4)	3,887 (34.3)	
Often	1,724 (12.2)	2,161 (19.1)	
Headaches			< 0.001
Never/rarely	6,005 (42.3)	4,424 (39.0)	
Sometimes	5,530 (39.0)	4,639 (40.9)	
Often	2,655 (18.7)	2,269 (20.0)	
Period Pain			< 0.001
Never/rarely	8,516 (60.1)	6,203 (54.8)	
Sometimes	3,297 (23.3)	2,913 (25.7)	
Often	2,367 (16.7)	2,201 (19.5)	

who consulted CM practitioners compared to Generation X (50.6%). Among those who consulted CM practitioners, a higher proportion of Generation X young women reported very good to excellent health (47% vs. 43.8%) and higher proportions of Millennial young women reported fair/poor health (15.7% vs. 18%). Higher proportions of Millennial young women reporting CM practitioner consultation were obese (4.7% vs. 13.4%) and overweight (15.3% vs. 20%) compared to Generation X young women. Of those who consulted CM practitioners, Generation X young women had higher proportions of risky alcohol (4.9% vs. 2.5%) and smoking (18.8% vs. 3.2%) behaviours along with sedentary physical activity levels (41% vs. 27.6).

3.3. Predictors of consultation with a CM practitioner

The significant predictors of consultation with a CM practitioner for Generation X and Millennials were identified with forward stepwise logistical regression and are presented in Tables 3 and 4, respectively. Women from the Generation X cohort were more likely to consult CM if they reported higher age (OR 1.14 per year), vocational tertiary education compared to school only (OR 1.21), living in a non-urban location compared to urban (OR 1.34), fair or poor health status compared to excellent or very good health status (OR 1.28), reporting back pain sometimes (OR 2.19) or often (OR 3.72) compared to no pain or frequent headaches compared to no headaches (OR 1.29), while they were less likely to consult CM if they were married or de facto compared to being single (OR 0.84), reported regular smoking compared to no smoking (OR 0.80), high risk drinking compared to no or low risk drinking (OR 0.74) or reported an obese BMI compared to a normal BMI (OR 0.51) (all $p < 0.01$).

Women from the Millennial cohort (Table 4) were more likely to consult CM if they reported higher age (OR 1.06 per year), vocational tertiary (OR 1.40) or university education (OR 1.17) compared to school only, living in a non-urban location compared to urban (OR 1.18), moderate (OR 1.28) or high physical activity (OR 1.38) compared to sedentary levels, reporting back pain sometimes (OR 1.74) or often (OR 2.64) compared to no back pain or frequent headaches compared to no headaches (OR 1.49), while they were less likely to consult CM if they reported a good compared to an excellent or very good health status (OR 0.88), were reported regular smoking compared to no smoking (OR 0.63), or reported an obese BMI compared to a normal BMI (OR 0.78) (all $p \leq 0.01$).

An examination of cohort interaction effects found significant differences between the two cohorts for a number of variables. While detrimental lifestyle behaviours were found to predict consultations with CM practitioners among women from both cohorts, the specific behaviours varied. Millennial women with moderate (OR = 1.28) or higher (OR = 1.38) physical activity levels were more likely to report to consult CM compared to sedentary women, no such association was found for Generation X women ($p = 0.007$). As for health status, a fair or poor health status increased the likelihood to consult CM in Generation X women compared to an excellent or very good health status (OR 1.28) while in the Millennial cohort, a good health status decreases the likelihood to consult CM compared to an excellent or very good health status (OR 0.88; cohort interaction $p = 0.039$). Lastly, the significant Odd's ratios for the BMI ($p = 0.008$) and back pain ($p < 0.001$) were less pronounced in the Millennial cohort compared to the Generation X cohort.

4. Discussion

The ALSWH study provides an excellent opportunity to explore generational differences from the standpoint of within birth cohort change over time (longitudinal), between birth cohorts at the same point in time (cross-sectional), and between different birth cohorts at the same point in their lives (repeated, cross-sectional comparisons). Using ALSWH data collected in 1996 and 2014 from Australian women, the analyses reported here were able to compare young women from Generation X in 1996 (aged 18–23) with those from the Millennial Generation in 2014 (aged 19–24). This is the first examination of CM services use among young women between two distinct birth cohorts. Our analysis highlights several differences and similarities in CM use between young Australian women from the X and Millennial generations. Of particular note is the increased prevalence of CM use in young women between 1996 and 2014 which may reflect increased CM acceptance and availability in the general population.[9] The consistency in characteristics between these two cohorts emphasises the degree to which CM use is an entrenched aspect of health care in Australia. The women appear to be actively utilising CM despite it not being included in the publicly-funded (and subsidised) healthcare system, integration generally not being encouraged by government policy, and most CM practice falling outside of government regulatory purview.[10] The generational influence of this patient-driven characteristic of CM may be

Table 2
Comparisons of the Generation X and Millennials consultations with a CM practitioner, across sociodemographic and health status characteristics.

	Generation X			Millennial			Cohort comparison: Consulted CM
	Consulted CM n = 2,749 *n (%)*	Did not consult CM n = 11,421 *n (%)*	p-value	Consulted CM n = 3,033 *n (%)*	Did not consult CM n = 8,268 *n (%)*	p-value	p-value
Marital status			0.701			0.075	< 0.001
Single	2,128 (77.8)	8,803 (77.4)		2,032 (67.9)	5,667 (69.6)		
Married/de facto	608 (22.2)	2,566 (22.6)		963 (32.2)	2,474 (30.4)		
Income status			0.006			0.047	< 0.001
Not struggling	1,256 (45.8)	5,577 (49.0)		1,192 (39.8)	3,447 (42.3)		
Some struggle	938 (34.2)	3,745 (32.9)		1,109 (37.0)	2,922 (35.9)		
Severe struggle	548 (20.0)	2,059 (18.1)		694 (23.2)	1,772 (21.8)		
Highest qualification			< 0.001			< 0.001	< 0.001
School only/no formal	1,826 (66.8)	8,151 (71.8)		1,112 (37.1)	3,633 (44.6)		
Trade/apprentice/diploma	599 (21.9)	1,951 (17.2)		961 (32.1)	2,108 (25.9)		
University/higher degree	310 (11.3)	1,255 (11.1)		923 (30.8)	2,405 (29.5)		
Area of residence			< 0.001			< 0.001	< 0.001
Urban	1,392 (50.6)	6,432 (56.3)		2,310 (77.2)	6,609 (80.8)		
Rural/remote	1,357 (49.4)	4,989 (43.7)		681 (22.8)	1,568 (19.2)		
Health status			< 0.001			0.002	0.019
Excellent/very good	1,284 (47.0)	5,920 (52.1)		1,327 (43.8)	3,607 (43.6)		
Good	1,018 (37.3)	4,162 (36.6)		1,161 (38.3)	3,379 (40.9)		
Fair/poor	430 (15.7)	1,277 (11.2)		545 (18.0)	1,281 (15.5)		
BMI			< 0.001			0.428	< 0.001
Normal	1,973 (80.0)	7,651 (77.4)		1,918 (66.6)	5,142 (65.7)		
Overweight	377 (15.3)	1,542 (15.6)		576 (20.0)	1,563 (20.0)		
Obese	116 (4.7)	691 (7.0)		385 (13.4)	1,123 (14.3)		
Smoking status			0.012			0.114	< 0.001
Not smoking	1,792 (68.0)	7,375 (67.5)		2,489 (82.2)	6,687 (81.1)		
Irregular smoking	346 (13.1)	1,266 (11.6)		444 (14.7)	1,228 (14.9)		
Regular smoking	496 (18.8)	2,285 (20.9)		97 (3.2)	332 (4.0)		
Alcohol consumption			0.086			0.147	< 0.001
No drinking/low risk	2,585 (95.1)	10,653 (94.3)		2,952 (97.5)	7,990 (97.0)		
Risky/high risk drinking	132 (4.9)	645 (5.7)		76 (2.5)	250 (3.0)		
Physical activity level			0.389			< 0.001	< 0.001
Sedentary/low	1,124 (41.0)	4,816 (42.2)		827 (27.6)	2,657 (32.6)		
Moderate	630 (23.0)	2,613 (22.9)		655 (21.9)	1,712 (21.0)		
High	991 (36.1)	3,972 (34.8)		1,511 (50.5)	3,787 (46.4)		
Diagnoses and Conditions							
Back Pain			< 0.001			< 0.001	< 0.001
Never/rarely	1,158 (42.2)	7,513 (66.0)		1,030 (34.0)	4,243 (51.3)		
Sometimes	949 (34.6)	2,785 (24.5)		1,152 (38.0)	2,723 (32.9)		
Often	636 (23.2)	1,080 (9.5)		851 (28.1)	1,302 (15.7)		
Headaches			< 0.001			< 0.001	0.264
Never/rarely	995 (36.3)	4,981 (43.8)		1,039 (34.3)	3,374 (40.8)		
Sometimes	1,040 (37.9)	4,455 (39.2)		1,193 (39.3)	3,428 (41.5)		
Often	706 (25.8)	1,940 (17.1)		801 (26.4)	1,466 (17.7)		
Period Pain			0.003			0.051	0.003
Never/rarely	1,568 (57.2)	6,905 (60.8)		1,613 (53.2)	4,580 (55.4)		
Sometimes	688 (25.1)	2,595 (22.8)		789 (26.00)	2,120 (25.6)		
Often	485 (17.7)	1,866 (16.4)		631 (20.8)	1,568 (19.0)		

further amplified by an increased consumer access to informal health information through the internet and other related channels in more recent years.[11]

The use of CM by young women was consistently linked with positive health behaviours such as lower smoking or alcohol consumption and higher levels of physical activity in our analysis. The direction of this relationship is not clear, The use of CM by young women was consistently linked with positive health behaviours such as lower smoking or alcohol consumption and higher levels of physical activity in our analysis. The direction of this relationship is not clear.[12] Equally, individuals who choose CM often also hold stronger beliefs related to the importance of self-participation in achieving wellness[13] and tend to have a higher internal health locus of control.[14] Given CM users are more likely to have positive health behaviours,[15] our findings may also reflect the success of health promotion initiatives regarding smoking and alcohol consumption as detrimental health behaviours. In Australia, smoking rates among women have reduced significantly in recent years.[16] Diverse tobacco control initiatives have been implemented in Australia over the last 40 years including price increases, smoke-free legislation, advertising and marketing prohibitions, and plain packaging alongside graphical health warnings.[17] Alongside such initiatives, a notable shift in Australian cultural and societal norms and values have also been reported.[17] Women's alcohol consumption, particularly risky drinking behaviours such as binge drinking, has also reduced in the Australian population but to a much lesser degree.[16] While these trends can be observed across the Australian population, they were more prevalent in our study among CM users. It is unclear the degree to which the perceptions motivating young women's decisions to engage in positive health behaviours are also influencing their choice to use CM, or whether it is through CM use that women are directed towards other healthy lifestyle choices. On the other hand, some CM practices might be associated with increased drug use, as one study found a link between yoga use and the use of marijuana and illicit drugs,[18] however since the use of such substances has not been examined in both cohorts, they were not examined in our analyses.

Our analysis indicated that rural residence was a predictor for CM consultation for both Generation X and Millennial young women. Previous Australian research reports a greater number of CM clinicians

Table 3
Significant predictors of consultation with a CM practitioner for Generation X.

	Generation X	
Characteristics	Odds Ratio (95% CI)	p-value
Age (in increments of 1)	1.14 (1.07; 1.16)	< 0.001
Marital status		
Not married	Reference	
Married/de facto	0.84 (0.74, 0.95)	0.005
Highest qualification		
School only/no formal	Reference	
Trade/apprentice/diploma	1.21 (1.07; 1.37)	0.002
University/higher degree	0.98 (0.83; 1.15)	0.798
Area of residence		
Urban	Reference	
Rural/Remote	1.34 (1.22; 1.48)	< 0.001
Alcohol consumption		
No drinking/low risk	Reference	
Risky/high risk drinking	0.74 (0.59; 0.93)	0.009
Smoking status		
Not smoking/no longer smoking	Reference	
Irregular smoking	1.08 (0.93; 1.24)	0.325
Regular smoking (≥1x/week)	0.80 (0.70; 0.91)	0.001
Health status*		
Excellent/very good	Reference	
Good	1.03 (0.93; 1.15)	0.584
Fair/poor	1.28 (1.10; 1.49)	0.001
BMI*		
< 25 kg/m^2	Reference	
Overweight	0.91 (0.79; 1.03)	0.143
Obese	0.51 (0.41; 0.63)	< 0.001
Diagnoses and Conditions		
Back Pain*		
Never/rarely	Reference	
Sometimes	2.19 (1.97; 2.44)	< 0.001
Often	3.72 (3.25; 4.27)	< 0.001
Headaches		
Never/rarely	Reference	
Sometimes	1.01 (0.90; 1.12)	0.909
Often	1.29 (1.13; 1.47)	< 0.001

* Cohort differences in odds ratios determined by an interaction effect between the variable and cohort described in the text.

Table 4
Significant predictors of consultation with a CM practitioner for Millennials.

	Millennial	
Characteristics	Odds Ratio (95% CI)	p-value
Age (in increments of 1)	1.06 (1.03; 1.09)	< 0.001
Highest qualification		
School only/no formal	Reference	
Trade/apprentice/diploma	1.40 (1.26; 1.57)	< 0.001
University/higher degree	1.17 (1.03; 1.31)	0.013
Area of residence		
Urban	Reference	
Rural/Remote	1.18 (1.06; 1.32)	0.002
Physical activity level*		
Sedentary/low activity level	Reference	
Moderate physical activity level	1.28 (1.13; 1.45)	< 0.001
High physical activity level	1.38 (1.24; 1.54)	< 0.001
Smoking status		
Not smoking/no longer smoking	Reference	
Irregular smoking	0.99 (0.87; 1.24)	0.876
Regular smoking (≥1x/week)	0.63 (0.48; 0.82)	0.001
Health status*		
Excellent/very good	Reference	
Good	0.88 (0.79; 0.97)	0.011
Fair/poor	1.00 (0.87; 1.15)	0.994
BMI*		
< 25 kg/m^2	Reference	
Overweight	0.93 (0.83; 1.04)	0.209
Obese	0.78 (0.68; 0.90)	< 0.001
Diagnoses and Conditions		
Back Pain*		
Never/rarely	Reference	
Sometimes	1.74 (1.57; 1.93)	< 0.001
Often	2.64 (2.34; 2.98)	< 0.001
Headaches		
Never/rarely	Reference	
Sometimes	1.02 (0.92; 1.13)	0.715
Often	1.49 (1.32; 1.69)	< 0.001

* Cohort differences in odds ratios determined by an interaction effect between the variable and cohort described in the text.

practice in rural areas compared to urban locations, and that there are more CM compared with conventional health providers in some rural localities.[9] However, additional research from the 1946-51 ALSWH cohort (Baby Boomer generation) suggests lack of access to and/or patient dissatisfaction with conventional health practitioners are less influential in women's decision to use CM in these areas,[19] suggesting the number of CM clinicians practicing in rural areas may have grown in response to marked demand. Alternatively, CM clinicians may be more established as members of the local community in rural locations.[20] The importance of long-standing community participation has been found to characterise social dynamics in rural communities[21] and also to be lacking in conventional health care delivery in these areas in many instances.[22] Equally, the social fabric of rural communities adds value to word-of-mouth referrals for services,[23] which is a common source of informal referral for CM irrespective of the locality.[24]

The occurrence of some specific health conditions is linked with CM use across both cohorts included in our analysis. There is a growing, and in some cases substantial level of evidence underpinning the clinical effectiveness of CM for pain conditions such as back pain[25,26] or headaches.[27,28] As such, the consistent use of CM by women who report having these conditions may be reflective of clinical benefit they experience from their chosen treatments. Equally, dissatisfaction with the available conventional treatments for these conditions or perception that their treatment priorities are not being addressed by conventional health providers[29–31] may also be driving the higher rates of CM use for these women.[32]

It is interesting that from the predictors considered in the analysis, young women from Generation X were more likely to report CM use if they were in poor health compared to excellent health. This was not the case for young Millennial women in that those who reported good health were significantly less likely to utilize CM compared to those with excellent health. This finding may suggest a change in the way CM is used between generations. Young Millennial women, for example, may be accessing CM as a part of their wellness strategy and for health maintenance or enhancement rather than to address a specific health concern as may have been the case for Generation X women. This premise is supported by research within business and organisational psychology which emphasises the value placed on wellness by Millennials.[33,34] These potential difference in motivation and use of CM between young X and Millennial women becomes somewhat concerning when coupled with the significant increase in women from the Millennial cohort reporting poor health and obesity – also a trend reported elsewhere.[35] If CM use has reduced among those with poor health or shifted away from use as a way to address specific health conditions, it is possible that those who may benefit most from CM practices in the Millennial cohort are either not utilizing the approaches by choice or have less access to potentially beneficial treatment. If so, these patterns have wider implications beyond CM use to population health behaviours more generally.

A final key point from our analyses is the potential for continued increases in CM use among future Australian women in middle age and older adulthood as Millennials progress through these life stages. Research from Western culture points to higher proportions of CM use among women in general[4] but also among those who are Baby Boomers.[2,5,36] Individuals born within the Boomer delineation are in a generational "sweet spot" for CM use in terms of having had more time to develop single or multiple morbidities and/or chronic conditions,

being at a life stage in which there is a higher likelihood of disposable income availability and coming of age in a time when such practices were developing in prominence and acceptance. The pronounced increases in CM use in the 1990s[2] and early 2000s[37] are mainly attributed to higher prevalence of use by individuals in their middle-aged adulthood (current Baby Boomers). The general Baby Boomer openness to, and acceptance of, CM practices[2] has set the precedent for even higher trends in CM use in following generations; in part because they made health and access decisions for their children (Generation X) and potentially their grandchildren (Millennials). Indeed, the increased CM use among Baby Boomers likely fuelled increases in CM utilisation among those in younger age groups in the 1990s and early 2000s (Generation X) including paediatric populations[38] that are now today's young adults (Millennials). Potential generational influence is demonstrated in research from 2001[39] that indicated children who used CM were more likely to have a parent who also used such approaches. Children in 2001 fall into the Millennial age group range surveyed in the ALSWH's 2014 data collection of young women; the increased CM use in this study's Millennial cohort may reflect the influence to use such practices from earlier generations of women. The potential for unprecedented proportions of Australia women accessing CM in the future is set if current young Millennial women follow CM utilization trends that increase with advancing age. These predicted future increases in CM utilization among middle-aged and older Australian women should be prepared for in urban and rural settings as well as accounted for in Australian health care access and policy planning.

4.1. Strengths and limitations

The ALSWH is a comprehensive and well-respected source for epidemiological data and the large number of participants as well as the inclusion of the most important confounders within the analyses provides strength to the results reported here. There are however some limitations. Not all CM practices were included and/or collected consistently during the 1996 and 2014 time points. Specifically, it is unknown the extent to which those from the 1996 collection reported using CM based on their visits to practitioners not specifically named in the list of examples such as osteopathic treatment or massage therapy. Although consultations with osteopaths and massage therapists were included in the 2014 survey, responses to these queries were excluded in the analysis which may have artificially deflated CM use numbers for the Millennial sample. Future research should attempt to draw on the increasingly sophisticated understanding of CM within contemporary research to undertake a more detailed analysis of patterns of CM use across current and successive generations.

There is also a slight difference in the age ranges between the two cohorts with those from Generation X being 18–23 while Millennials were 19–24. The motivation for younger people to use CM may stem from health concerns accompanied with (or not) increased disposable income or the acquisition of private insurance; all of which become more likely the older people get. Although the age range is only off by only 1 year in both directions, the consideration of these factors between 18-year-old young women and 25-year-old women could be pronounced. Those who are older will have had much more time than one who is 18 to become exposed to CM practices in general and also to have developed a motivating condition or acquired private insurance or enough disposable income to access such treatment. However, the final logistical regression analyses comparing odds ratios between cohorts controlled for age and still highlighted CM usage differences for young women from Generation X and the Millennials.

5. Conclusion

The analysis presented here demonstrates increased CM utilization prevalence in young Australian women from 1996 to 2014. Several predictors of CM usage are similar across X and Millennial generations including non-urban residence, back pain, and frequent headaches. Obese young women or those who reported regular smoking were less likely to use CM practices. The higher levels of CM utilization in young Millennial Australian women along with a potential change in usage motivation from poor health to excellent health could point to different health consumer patterns for future middle-aged and older adults. Increased CM usage for Millennials may also be expected as these current young adults age into higher potentials for usual CM usage motivators such as health condition acquirement and increases in disposable income. Increased CM across subsequent generations is somewhat intuitive if a rational to support usage includes influence from earlier generations, especially when considering adult influence on minors and health behaviours regarding CM usage for children or adolescents. The ALSWH is well poised to provide data to explore such trends and projections as current participants continue to age.

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Conflict of interest

The authors declare they have no conflict of interest.

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