

Australian adults use complementary and alternative medicine in the treatment of chronic illness: a national study

Abstract

Objectives: The objectives of this study were to identify the prevalence of the use of vitamin/mineral supplements or natural/herbal remedies, concurrent use of pharmaceutical medication, and to profile those most likely to use these complementary and alternative medicines (CAM) in the treatment of five chronic conditions identified as national health priorities (asthma, diabetes, arthritis, osteoporosis, heart or circulatory condition) within the Australian adult population.

Methods: Analysis of the Australian National Health Survey database, 2004-05.

Results: Approximately 24% (1.3 million) of Australian adults with a chronic condition regularly applied CAM to treatment. CAM was most often used exclusively or in combination with pharmaceutical medicine in the treatment of arthritis and osteoporosis. Fewer than 10% of adults with asthma, diabetes or a heart or circulatory condition used CAM, most preferring pharmaceutical medicine. Regular CAM users were more likely to be aged ≥ 60 , female, have a secondary school education and live in households with lower incomes than non-users. Non-users were more likely to be 30-59 years old and tertiary educated.

Conclusion and implications: Arthritis, osteoporosis and, to a lesser extent, heart or circulatory conditions are illnesses for which doctors should advise, and patients need to be most aware about the full effects of CAM and possible interactive effects with prescribed medicine. They are also conditions for which research into the interactive effects of CAM and pharmaceutical medication would seem of most immediate benefit.

Key words: Complementary medicine, chronic illness, national study

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The use of complementary and alternative medicines (CAM) is now commonplace in Australian society.

In a given year, two in every three Australian adults are estimated to use at least one CAM product (e.g. vitamin or mineral supplements and natural or herbal remedies) and one in four are estimated to use a CAM service (e.g. acupuncture, massage, chiropractic therapy).¹

While these broad figures are known, administrative data concerning CAM product usage patterns is limited because CAMs are not funded routinely through the Pharmaceutical Benefits Scheme. For instance, the extent to which CAM products are used to treat specific chronic illnesses is unknown. The extent to which CAM products are used as a substitute for or complement to prescribed medicines is also unknown. This information has significant implications for health professionals and their clients. Knowledge of the extent of CAM product use, their effects and interaction with conventional pharmacological treatments is vital to consumer safety.²⁻⁴ However, many consumers perceive no danger in CAM use, and do not think to disclose their consumption

to their doctors.^{2,5-8} Moreover, it is not common practice for doctors to ask.⁸⁻¹⁰ For these reasons, it is important that research identifies the prevalence of use, concurrent use of medication types, and profiles of those most likely to use CAM, particularly among more vulnerable populations.

In this paper, we investigate: 1) the prevalence of regular CAM product use to treat five chronic conditions (asthma, diabetes, arthritis, osteoporosis, heart or circulatory condition) identified as National Health Priority Areas by the Australian Government; 2) the extent to which CAM and pharmaceutical medications are used independently or in combination to treat these conditions; and 3) the sociodemographic characteristics of those who use CAM in relation to these disorders, and compare them with those who do not.

The term 'CAM' is taken to mean vitamin/mineral supplements or natural/herbal treatments whether they are prescribed or bought over the counter. The Australian National Institute of Complementary Medicine (NICM) states that there is no universally agreed definition of complementary

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medicine.¹¹ The NICM uses the term ‘complementary medicine’ to include the concept of complementary medicine as practices and products not currently recognised as a conventional or mainstream western medicine practiced by medical doctors, nurses and allied health professionals, and ‘alternative medicine’ as complementary medicine used in place of mainstream western medicine. Many vitamin/mineral supplements or natural/herbal treatments such as calcium, vitamin D, fish oil or glucosamine are seen now as legitimate therapies for many conditions and are being recommended in mainstream medicine by doctors or allied health professionals. The NICM recognises that some healthcare providers integrate both complementary and conventional medicine and that there is a growing intersection between conventional and complementary medicine practices. One of the four domains of complementary medicine articulated by the US National Centre for Complementary and Alternative Medicine and adopted by the NICM is ‘biologically-based practices’. These practices use substances found in nature, such as herbs, foods and vitamins.¹¹ This reflects what the Australian Therapeutic Goods Administration defines and regulates as complementary medicines, namely, medicinal products containing herbs, vitamins, minerals and nutritional supplements, while homoeopathic medicines and certain aromatherapy products are referred to as ‘complementary medicines’.¹²

Methods

Survey

This research is based on analyses of data drawn from the Confidential Unit Records File (CURF) of the 2004-05 Australian National Health Survey (NHS).¹¹ The NHS was conducted by the Australian Bureau of Statistics (ABS) using a stratified multi-stage area sample of private dwellings, resulting in a final interview sample of 25,906 persons (of all ages) living in 19,501 private dwellings, covering urban and rural areas across all States and Territories of Australia, thus representing the total Australian population.

Prevalence data were examined for five long-term or chronic (defined as lasting ≥ 6 months) conditions (asthma, diabetes, arthritis, osteoporosis, heart or circulatory condition), and whether actions taken to manage these conditions included the use of conventional pharmaceutical medications and/or vitamin/mineral supplements or natural/herbal remedies (i.e. use of CAM) in the two weeks preceding the survey (usage in this period is considered by the ABS to better distinguish regular use from singular applications). In the NHS, pharmaceutical medications are classified by their generic drug type and while most are prescribed medicines they could include over-the-counter medications. When respondents were asked about the pharmaceutical medications that they may have used or taken for their chronic health condition in the previous two weeks, they were specifically instructed not to include vitamin and mineral supplements as well as natural or herbal medications in this answer as information on these would be collected in later questions. Thus, any prescribed vitamin and mineral supplements such as calcium or Vitamin D are included in the CAM count. Data were extracted on respondents’ age, sex, education, gross weekly

equivalised household cash income, and geographic region to compare the socio-demographic profiles of those who used CAM to treat their conditions with those who did not.

The current study sample was made up of CURF records of 7,805 adults (aged ≥ 20 years) in the NHS 2004-05 sample who:

- had been told by a doctor that they had one or more of the five condition types (i.e. responded ‘Yes’ to the statement, ‘Have you been told by a doctor or nurse you have [chronic condition]);
- reported that the condition was current (‘Do you still get [chronic condition]);
- the condition was long term (current age in months was > 6 months since diagnosis); and
- had no missing socio-demographic data relevant to the study.

Statistical analyses

Following data processing and validation, ABS-established person weights were attached to the 7,805 adult records to generate survey estimates representative of the total Australian adult population (for detailed information concerning ABS NHS weighting procedures see explanatory notes).¹³ The 7,805 adults subsequently represented the conditions experienced by, medication used and socio-demographic profiles of 5,334,908 individuals or 42.66% of the Australian adult population. These data were classified into three simple age groups to purposefully delineate the younger and older populations: 20-29, 30-59 and ≥ 60 years. Education levels were classified into three groups: secondary school only, trade/diploma or tertiary qualification. Gross weekly equivalised household cash incomes were partitioned into five quintiles: 1st quintile being the 20% of households with the lowest income and 5th quintile with the highest income. Places of residence were classified into three geographic regional levels: major cities, inner regional, outer regional and remote.

Cross-tabulations were performed to establish the prevalence of conditions among the population, and prevalence of CAM and pharmaceutical medication use in the treatment of each condition. Chi-square tests were performed to compare the socio-demographic characteristics of those who used CAM to treat their conditions with those who did not. The NHS replicate weights were used to calculate 95% confidence intervals for the chronic disease and CAM use prevalence rates. SAS v9.1¹⁴ and Stata v11¹⁵ were used to conduct the analyses.

Results

Prevalence of chronic conditions

Estimates of the age-sex prevalence rates of Australian adults diagnosed with one or more of the five chronic conditions investigated are shown in Table 1. The 95% confidence intervals are shown in parenthesis. Unweighted sample size and weighted population figures by for each age-sex group are provided. A total of 7,805 cases, representing 5,334,908 individuals or 42.66% of the Australian adult population were found to have one or more chronic condition.

As seen in Table 1, almost half of the Australian adult population in 2004-05 had lived for at least six months with one or more of

the five conditions. The proportion affected increased with age, with approximately one-in-five adults aged 20-29 years reporting a chronic condition, compared to one in three aged 30-59 years and four in five aged ≥ 60 years. Four of the five chronic conditions were more common among women, particularly osteoporosis, whereas more men reported diagnoses of diabetes.

Asthma was most common among the youngest age group, with a marginal decline in the proportion of adults affected in the two older age groups. Heart and circulatory conditions, followed by arthritis, overtook asthma as the most prevalent conditions in the middle age group, and the dominance of these two conditions further increased in the oldest age group. While not as prevalent as the latter two, the proportions of adults affected by osteoporosis and diabetes exhibited

the sharpest increase between the middle and oldest age group, with proportions more than quadrupling.

Table 2 shows the prevalence of Australian adults who treated their chronic condition with CAM.

The data indicate that around one-quarter of Australian adults affected by one or more of the five conditions studied regularly used a CAM product. The proportion of usage differed considerably across age, sex and condition. Fewer than one in 20 adults in the youngest age group treated a condition with CAM, this despite almost 20% reporting a chronic illness. In contrast, one third of affected adults aged ≥ 60 years used CAM in this way, as did one-fifth of adults aged 30-59 years.

Table 1: Prevalence of Australian adults with one or more chronic health conditions by age and sex.

Chronic condition ^a	Age group (years)							
	20-29		30-59		≥ 60		Total	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Asthma								
Male	8.61	(6.66-11.07)	7.44	(6.64-8.34)	8.33	(7.00-9.88)	7.87	(7.13-8.69)
Female	14.84	(12.65-17.35)	11.70	(10.70-12.78)	11.24	(9.66-13.04)	12.19	(11.40-13.04)
Total	11.68	(10.28-13.24)	9.53	(8.88-10.22)	9.85	(8.83-10.98)	10.02	(9.49-10.58)
Diabetes								
Male	0.41 ^b	(0.15-1.14)	3.60	(2.98-4.33)	15.51	(13.39-17.89)	5.60	(4.95-6.32)
Female	0.69	(0.28-1.66)	2.49	(2.07-2.98)	11.44	(9.81-13.29)	4.32	(3.84-4.85)
Total	0.55	(0.28-1.06)	3.05	(2.64-3.52)	13.38	(11.97-14.93)	4.96	(4.54-5.42)
Arthritis								
Male	1.08	(0.66-1.76)	10.09	(9.09-11.19)	30.79	(28.12-33.60)	12.88	(12.08-13.73)
Female	2.26	(1.51-3.36)	14.92	(13.74-16.18)	45.99	(43.88-48.12)	20.05	(19.22-20.90)
Total	1.66	(1.19-2.32)	12.46	(11.72-13.23)	38.73	(36.88-40.61)	16.45	(15.86-17.05)
Osteoporosis								
Male	0.21	(0.03-1.59)	0.79	(0.51-1.23)	3.77	(2.75-5.16)	1.34	(1.04-1.71)
Female	0.17	(0.03-0.79)	3.29	(2.81-3.85)	19.93	(17.84-22.20)	6.74	(6.15-7.38)
Total	0.19	(0.05-0.72)	2.01	(1.73-2.34)	12.21	(10.95-13.60)	4.03	(3.69-4.39)
Heart and circulation								
Male	4.92	(3.53-6.83)	19.13	(18.04-20.26)	56.81	(53.86-59.71)	24.64	(23.77-25.53)
Female	8.02	(6.47-9.90)	23.59	(21.86-25.41)	60.26	(57.57-62.88)	29.51	(28.17-30.89)
Total	6.44	(5.39-7.68)	21.31	(20.44-22.22)	58.61	(56.61-60.58)	27.07	(26.32-27.83)
One or more chronic conditions								
Male	14.75	(12.15-17.78)	32.50	(31.01-34.03)	73.54	(70.63-76.26)	38.05	(36.76-39.36)
Female	23.50	(20.97-26.24)	40.72	(39.05-42.42)	81.42	(79.35-83.32)	47.31	(46.18-48.44)
Total	19.05	(17.39-20.83)	36.53	(35.42-37.66)	77.65	(76.06-79.17)	42.66	(41.86-43.47)
n^c								
Male	1,198		4,613		1,947		7,758	
Female	1,382		4,991		2,597		8,970	
N^d (million)								
Male	1.243		3.650		1.387		6.280	
Female	1.202		3.506		1.516		6.225	

Notes:

a. Multiple chronic conditions allowed.

b. Italic is unweighted cell frequency <10.

c. Unweighted cell frequency (number of records).

d. Weighted cell frequency (population number).

CAM use was particularly high among sufferers of arthritis and osteoporosis, with approximately four in 10 adults in the middle and oldest age groups using CAM to treat their condition. Notably, the high usage within both these conditions was driven by women, whose proportions of usage were around 30% higher than that of men for arthritis and double that of men for osteoporosis. This was not the case for those suffering a heart or circulatory illness, where CAM usage rates for both sexes in the middle and eldest age groups were relatively equal, at around one in 10. CAM use by adults with the remaining conditions, asthma and diabetes, was very small, with around 2% and 4% of those affected seeking treatment through vitamins, minerals and herbal supplements.

Use of CAM, pharmaceutical medication and their combination

Table 3 shows a further breakdown in the treatment modalities used for the various conditions, in terms of the number and proportion of Australian adults who treated their chronic condition with CAM only, pharmaceutical medication (PHARM) only, a

combination of CAM and PHARM, or neither medicine type.

Underlying cell frequencies were too small to establish an age-by-sex matrix at the level of treatment modality. The data, nevertheless, paint a unique and valuable picture of medication use by condition in 2004-05. It appears that Australian adults with asthma, diabetes, or a heart or circulatory condition generally treated their illness with conventional pharmaceutical medication or no medicine at all. A small proportion regularly used a combination of CAM and pharmaceutical medication, while even fewer used CAM exclusively. Many persons with arthritis or osteoporosis did not use prescribed or CAM medication for their condition either. However, more than one in five used CAM or pharmaceutical medication exclusively, and similar though somewhat smaller numbers used a combination of both medicine types.

Demographic characteristics of CAM users and non-users

In Table 4, the sociodemographic characteristics of those adults who used CAM to treat an existing chronic condition were

Table 2: Prevalence of CAM use by Australian adults to treat chronic health conditions by age and sex.

Chronic condition ^a	Age group (years)						Total	
	20-29		30-59		≥60		%	95% CI
	%	95% CI	%	95% CI	%	95% CI		
Asthma								
Male	2.00 ^b	(0.46-8.30)	0.94	(0.25-3.45)	- ^c		0.95	(0.36-2.48)
Female	1.17	(0.33-4.08)	2.91	(1.35-6.16)	2.22	(0.75-6.39)	2.35	(1.33-4.11)
Total	1.48	(0.59-3.67)	2.13	(1.12-4.01)	1.32	(0.45-3.84)	1.80	(1.12-2.88)
Diabetes								
Male	37.21	(1.67-95.40)	6.65	(3.45-12.44)	2.54	(1.06-5.96)	4.58	(2.80-7.40)
Female	- ^c	- ^c	7.07	(3.26-14.68)	1.75	(0.55-5.46)	3.42	(1.61-7.13)
Total	14.24	(1.34-66.97)	6.82	(4.18-10.94)	2.18	(1.15-4.12)	4.08	(2.71-6.09)
Arthritis								
Male	8.39	(1.81-31.26)	31.31	(26.17-36.96)	32.81	(28.35-37.60)	31.73	(28.05-35.64)
Female	21.29	(8.73-43.34)	41.20	(36.12-46.47)	44.55	(41.44-47.70)	42.64	(39.90-45.42)
Total	17.03	(7.86-33.06)	37.11	(33.29-41.11)	40.09	(37.29-42.95)	38.35	(36.03-40.71)
Osteoporosis								
Male	- ^c	- ^c	20.91	(7.50-46.29)	22.83	(13.44-36.04)	24.61	(15.88-36.09)
Female	24.40	(0.01-99.92)	45.39	(36.00-55.13)	43.02	(38.05-48.14)	43.58	(39.28-47.99)
Total	67.49	(1.53-99.64)	40.48	(31.85-49.74)	40.04	(35.42-44.85)	40.42	(36.34-44.63)
Heart and circulation								
Male	- ^c	- ^c	9.15	(7.06-11.78)	12.66	(10.35-15.40)	10.58	(8.81-12.65)
Female	6.76	(3.17-13.84)	6.81	(5.30-8.73)	12.91	(10.97-15.13)	9.84	(8.63-11.20)
Total	4.14	(1.95-8.55)	7.88	(6.46-9.59)	12.79	(11.29-14.47)	10.18	(9.11-11.35)
One or more chronic conditions								
Male	4.27	(1.71-10.29)	15.70	(13.54-18.13)	24.75	(22.05-27.67)	18.69	(16.86-20.66)
Female	5.09	(3.09-8.28)	23.12	(21.08-25.30)	40.22	(37.54-42.95)	28.56	(27.01-30.16)
Total	4.77	(3.15-7.15)	19.75	(18.10-21.52)	33.22	(31.09-35.42)	24.14	(22.76-25.57)

Notes:

a. Multiple chronic conditions allowed.

b. *Italic* = unweighted cell frequency <10.

c. - is no cell counts.

d. CAM use is defined as treating condition with vitamin/mineral supplements or natural/herbal supplements in the previous two weeks.

compared with those who did not. Percentages sum down columns by characteristic.

Regular CAM users were more likely to have been aged ≥ 60 years and be female than non-users. As well, CAM users were more likely to live in households with lower incomes than non-users, which is consistent with their age and gender distribution and a tendency to have secondary school as their highest level of education. Relatively fewer CAM users compared with non-CAM users lived in outer regional and remote areas of Australia, with slightly more living in inner regional areas (the ABS defines inner regional as areas with an Accessibility/Remoteness Index of Australia, ARIA, value greater than 0.2 and less than or equal to 2.4).

Discussion

This study details the prevalence of complementary and alternative medicine use defined in terms of the use of vitamin/mineral supplements or natural/herbal remedies by Australian adults to treat common long-term health problems. It is the first Australian study to do so with a large nationally representative sample of men and women with chronic disease, and to contrast the use of CAM with pharmaceutical medication in the treatment of specific conditions.

Survey estimates indicated that around 42% of Australian adults (~5.3 million) in 2004-05 were living with one or more of the five conditions investigated, and around one-quarter (~1.3 million) were using CAM specifically to treat their illness. Having assessed usage within the two weeks before survey, rather than within a timeframe of one year (as previous studies have more frequently done),^{6,8,16-18} the data suggest according to the ABS that this subpopulation use CAM regularly in this way.

While this was so at the overall population level, the data indicated that particular subsets of the chronically ill population were more likely to treat their conditions with CAM products than others. Those most likely included adults with osteoporosis or arthritis, persons over 60 years of age, women and those in the lower household income brackets. Those least likely included adults with asthma, diabetes, or a heart or circulatory condition, persons aged 20 to 29 years, males and those in the highest household income brackets.

The sex profile reported here is similar to results reported in other studies of general CAM use, both in Australia and internationally. However, the age, income and education profiles are quite different. Previous Australian studies of the CAM-using population have typically reported greater use among younger^{6,8,16,18} or middle-aged groups^{16,19} rather than older groups, and among those with higher rather than lower income and education.^{6,8,16-18,20} The differences

Table 3: Proportion of Australian adults using CAM only, pharmaceutical medicine only, their combination, or no medicine, in the treatment of each chronic condition.

	Treatment modality				Total
	CAM ^a only	PHARM ^b only	CAM and PHARM	Neither CAM or PHARM	
Asthma^c					
n ^d	3,200 ^e	718,200	19,400	512,700	1,253,400
%	0.25	57.30	1.54	40.90	100
95% CI	(0.11-0.59)	(55.00-59.57)	(0.90-2.63)	(38.59-43.26)	
Diabetes					
n	6,000	399,700	19,300	195,400	620,400
%	0.97	64.43	3.11	31.50	100
95% CI	(0.34-2.73)	(60.06-68.57)	(2.04-4.72)	(27.68-35.58)	
Arthritis					
n	458,500	454,500	330,200	813,600	2,056,800
%	22.29	22.10	16.05	39.56	100
95% CI	(20.41-24.30)	(20.29-24.01)	(14.43-17.82)	(37.30-41.85)	
Osteoporosis					
n	106,900	121,100	96,600	178,900	503,500
%	21.23	24.05	19.19	35.53	100
95% CI	(17.33-25.73)	(20.16-28.42)	(15.82-23.08)	(31.57-39.70)	
Heart and circulation					
n	67,300	2,029,400	277,200	1,010,700	3,384,700
%	1.99	59.96	8.19	29.86	100
95% CI	(1.51-2.61)	(58.33-61.57)	(7.30-9.18)	(28.22-31.56)	

Notes:

a. CAM use is defined as treating condition with vitamin/mineral supplements or natural/herbal supplements in the previous two weeks.

b. PHARM use is defined as treating condition with conventional pharmaceutical medication.

c. Multiple chronic conditions allowed.

d. N is weighted frequency (population) rounded to nearest 100.

e. *Italic* = unweighted cell frequency <10.

in this study are most likely explained by the focus on the use of CAM to treat chronic disease, rather than CAM use per se, as has been the focus of Australian research to date. Osteoporosis and arthritis, the conditions to which CAM was most often applied, have much higher prevalence among the aged population, a generation for whom higher education levels were much less of an emphasis and whose household income often reflected a reliance on the age pension, superannuation or limited returns from investments rather than paid work.²¹

Past Australian studies have shown that CAM is used in conjunction with orthodox treatment in somewhere between 30–50% of cases^{6,8,16–18} and that CAM users are typically larger consumers of pharmaceutical medications than non-CAM users.¹⁷ In this study, a more detailed picture of the conditions for which the two broad treatment modalities are applied concurrently or exclusively has been provided. It was found that more than one in five adults with osteoporosis or arthritis did not use pharmaceutical medication

to treat their condition. Rather, many used complementary and alternative medicines exclusively. Interestingly, similar proportions reported using pharmaceutical medication only. Somewhat smaller proportions reported concurrent use of both medication types. In direct contrast, pharmaceutical medication was used exclusively by around 60% of sufferers to treat asthma, diabetes or a heart or circulatory condition. Fewer than 10% of persons within each of these three condition categories opted to integrate CAM into their treatment program and fewer than 2% treated their condition solely with CAM.

These findings clearly indicate that persons with different condition types elect to medicate using very different treatment modalities. For most individuals with asthma, diabetes, or heart or circulatory conditions, CAM is not considered complementary to orthodox treatment. On the other hand, many sufferers of osteoporosis and arthritis consider CAM as complementary or as an alternative to contemporary pharmaceutical medicine. This perhaps is not so surprising a finding, since the latter conditions are those where the evidence for CAM efficacy is more convincing²² and application of CAM more obvious (supplementation of identifiable vitamin and mineral deficiencies).

Of course, with higher rates of CAM use comes the potential for adverse drug interactions with pharmaceutical medicines.²⁴ This is of particular import because many consumers do not disclose their CAM use to their medical practitioner^{2,5–8} and many doctors do not ask their patients.^{8–10} Numerous studies have raised the issue of patient safety, but few have identified where research into synergetic effects needs to be prioritised. This study suggests that osteoporosis, arthritis and, to a lesser extent, heart and circulatory conditions, are where research of this nature would be of most immediate benefit. This knowledge could be augmented with further investigations of the extent to which CAM and/or pharmaceutical medicine use differs in relation to disease severity, the side effects of pharmaceutical treatment and reasons for use, e.g. health enhancement rather than symptom treatment, managing pain or mental wellbeing. Demographic consumer profiling to predict the use of particular treatment modalities and combinations would be helpful in assisting doctors to integrate CAM safely into the treatment of their patients.

Several study limitations should be noted. The definition of CAM applied in this study is consistent with what is commonly understood to be 'complementary medicine'. However, this stretches from vitamins commonly applied to chronic conditions and now frequently recommended or prescribed by doctors or allied health professionals working in mainstream medicine, to less known herbal treatments or homeopathic remedies. Response rates reflect respondents' knowledge and recall, with prompt cards listing particular vitamin and mineral supplements and natural/herbal medications being used only for arthritis and osteoporosis. This included the use of calcium and Vitamin D supplements. These evidence-based supplements are often medically prescribed or advocated and thus may not be seen by many to come under the umbrella definition of CAMs as applied here.

Inaccurate self-reporting by respondents may have affected data

Table 4: Socio-demographic characteristics of CAM users and non-CAM users.

	CAM users ^a		Non-CAM users		χ^2 p-value ^c
	n ^b	% ^e	n	% ^e	
Age group (years)					<0.0001
20–29	22,200	1.72	443,500	10.96	
30–59	516,500	40.11	2,098,000	51.84	
≥60	749,000	58.17	1,505,700	37.20	
Sex					<0.0001
Male	446,500	34.68	1,943,200	48.01	
Female	841,100	65.32	2,104,100	51.99	
Education					0.0933
Secondary School only	707,200	54.92	2,094,700	51.76	
Trade/diploma	296,300	23.01	897,900	22.19	
Tertiary	284,200	22.07	1,054,600	26.06	
Income quintiled					< 0.0001
1st (poorest)	321,100	24.94	771,600	19.06	
2nd	468,500	36.39	1,110,000	27.43	
3rd	204,900	15.91	763,600	18.87	
4th	131,200	10.19	67,700	16.75	
5th (richest)	161,900	12.57	724,300	17.90	
Geographic region					0.0474
Major cities	822,700	63.89	2,603,100	64.32	
Inner regional	323,700	25.14	912,600	22.55	
Outer regional and remote	41,200	10.97	531,500	13.13	

Notes:

a. CAM use is defined as treating condition with vitamin/mineral supplements or natural/herbal supplements in the previous two weeks.

b. N is weighted frequency (population) rounded to nearest 100.

c. χ^2 level of statistical significance of difference between CAM users and non-users.

d. Gross equivalised weekly household cash income.

e. Percentages in columns for each sociodemographic characteristic sum to 100%.

pertaining to recall of doctors' diagnoses, date of diagnoses and use of medications. The NHS is not a biomedical survey and thus confirmation of the diagnosis of the five chronic conditions via independent biomedical testing is out of scope. Prevalence rates will reflect inaccuracies in patient recall of having been told by a doctor or nurse that they had the condition, but there is no evidence to indicate that there is any bias in response rates across the patient groups examined.

The weighted population estimates derived from the Australian adult population sample may be different from figures obtained from an enumeration of the entire population. Persons with more severe manifestations of conditions are potentially under-represented in this study because residents of hospitals, nursing or convalescent homes, residential aged-care facilities and similar non-private accommodation were not sampled. Finally, our analyses suggest that there may be important geographical differences in the prevalence of CAM use, with a slightly higher proportion of CAM users living in inner regional areas and relatively fewer in outer rural and remote Australia. CAM use by individuals with chronic health conditions is integrally related to their knowledge of, access to and use of both conventional pharmaceutical medications and CAM products. Potential differences in treatment modalities for each of the chronic conditions between urban and rural populations certainly warrant further investigation.

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