

Original Article

Prevalence and Determinants of Traditional, Complementary and Alternative Medicine Provider Use among Adults from 32 Countries

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ABSTRACT **Objective:** To estimate recent prevalence data (2011–2013) on traditional, complementary and alternative medicine (TCAM) provider use and sociodemographic and health related correlates in nationally representative population samples from 32 countries from all world regions. **Methods:** This secondary analysis was based on the International Social Survey Program (ISSP), 2011–2013, Health and Health Care Module. In a cross-sectional population-based survey (N=52,801), simple or multi-stage stratified random sampling was used, resulting in representative samples of the adult population of respective countries. **Results:** Overall, the 12-month TCAM provider use prevalence was 26.4%, ranging from under 10% in Bulgaria, Poland and Slovenia to over 50% in China mainland, the Philippines and Republic of Korea. Over 80% TCAM treatment satisfaction was found in Europe in Denmark, Slovenia, Spain and Switzerland, in Asia in Taiwan (China) and USA. Multivariate logistic regression found sociodemographic variables (middle age, female sex, lower educational status, not having a religious affiliation, and lower economic indicators) and health variables (perceived poor or fair health status, being unhappy and depressed, having a chronic condition or disability, and having positive attitudes towards TCAM) were associated with TCAM provider use. **Conclusions:** A high prevalence TCAM provider use was found in all world regions and several sociodemographic and health related factors of its use were identified.

KEYWORDS utilization, traditional, complementary medicine, Africa, Asia, America, Australia, Europe

In the most recent review of national studies of traditional, alternative and complementary medicine provider (TCAM) use in the past 12 months, Harris, et al⁽¹⁾ found from national surveys in 9 countries a 12-month TCAM provider use of averaged 21.1%, ranging from 5.8% to 48.7%, e.g., in Australia 44.1% in 2005, in the UK 12.1% in 2005 and in the USA 16.2% in 2007.⁽¹⁾ In a more recent study in Norway TCAM provider use was 9.8% in 2012.⁽²⁾ Some non-specific national surveys (not specific TCAM surveys) found a 12-month TCAM provider use of, e.g., in the Philippines 6.3%, Cambodia 5.4%, Vietnam 3.5%, Thailand 2.6%, Indonesia 2.0%⁽³⁾ and South Africa (0.1%).⁽⁴⁾ In more recent national population surveys on overall TCAM use (including TCAM provider use, over-the-counter use and self-help) found a 12-month TCAM use estimate of 29.9% in 2015 in Lebanon,⁽⁵⁾ 33.2% in 2012 in USA,⁽⁶⁾ 25.0% in 2012 in Switzerland,⁽⁷⁾ and in a review of 11 studies in Republic of Korea the prevalence of TCAM use ranged from 29% to 83%.⁽⁸⁾

Determinants of TCAM use or TCAM provider use have been broadly defined as sociodemographic and health related factors.⁽⁹⁾ Sociodemographic factors

include female gender,^(7,9) middle age,^(5,7,9,10) higher education,^(7,9,11) lower education,^(2,11) higher income,^(4,12) urban residence,⁽¹³⁾ rural residence,⁽¹¹⁾ needing health care but not receiving it.^(5,10) Health related factors include more than one health condition,⁽⁹⁾ having a chronic disease,^(5,7,14,15) inconsistent results on poor physical health,^(7,9) inconsistent associations with poor psychological health,⁽⁹⁾ poor mental health,⁽¹⁴⁾ and positive attitudes toward TCAM.⁽¹⁶⁾ There is a lack of data on the TCAM provider use from large multi-country studies using uniform assessment measures.

The aim of this study was to estimate the prevalence of TCAM provider use and sociodemographic and health related correlates in

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nationally representative population samples from 32 countries and areas from all world regions.

METHOD

Data

This secondary analysis is based on the International Social Survey Program (ISSP), 2011–2013, Health and Health Care Module, which is publicly available.⁽¹⁷⁾ The Health and Health Care Module provides data for individuals' evaluation of the health care system, health status and health insurance coverage.⁽¹⁷⁾ Information from respondents from 32 countries from all world regions was included in this analysis. The ISSP data set included 55,081 adults. Participants that had missing data on TCAM provider variables ($n=2,280$) were excluded from this analysis, leaving a final sample size of 52,801.

Sampling and Procedure

Sampling procedures differed for the individual countries either simple or multi-stage stratified random sampling, yielding representative samples of the adult population of respective countries.⁽¹⁷⁾ The cross-sectional survey included persons aging 18 years and older, and in some countries 15 years (Finland) and 16 years (Italy, Japan, South Africa) and older.⁽¹⁷⁾ The mode of interview differed for the participating countries: "partly face-to-face interviews (partly computer-assisted personal interviewing) with standardized questionnaire, partly paper and pencil and postal survey and partly web survey."⁽¹⁷⁾ Informed consents were obtained from participants.⁽¹⁷⁾

Measure

Questions for the survey of TCAM are listed in Table 1.⁽¹⁷⁾

Data Analysis

Data analysis was conducted using STATA software version 13.0 (Stata Corporation, College Station, Texas, USA). Descriptive statistics were used to calculate frequencies, percentages and means. Using a sampling weight, weighted percentages and confidence intervals were reported. Multivariate logistic regression analysis was used to identify associations between sociodemographic and health related independent variables and 12-month TCAM provider use as the dependent variable. Independent variables found to be significant in relation to the outcome variables in univariate analysis were included in the final multivariable regression model. *P*-value

Table 1. Questions for TCAM Survey

Item	Question	Response option
TCAM provider use	During the past 12 months, how often did you visit or were visited by...an A/T/F* health care practitioner?	Please use the term most appropriate for your country
TCAM provider treatment satisfaction	How satisfied or dissatisfied were you with the treatment you received when you last visited an A/T/F health care practitioner?	1=completely satisfied 7=completely dissatisfied
Demography	Sex, age, education, number of household members, religious affiliation or denomination, place of living: urban – rural	
Self-rated overall health	In general, would you say your health is...?	4=excellent, 3=very good, 2=good, 1=fair, 0=poor
Psychological health	How often in the past four weeks did you feel unhappy and depressed.	0=never, 1=seldom, 2=sometimes, 3=often, 4=very often
Satisfaction with health care system	In general, how satisfied or dissatisfied are you with the health care system in [country]?	1=completely satisfied 7=completely dissatisfied
Attitudes towards TCAM	How much do you agree or disagree with the following statements? (1) A/T/F provides better solutions for health problems than [mainstream/Western conventional] medicine. (2) A/T/F promises more than it is able to deliver. (3) Each country should choose the term that most appropriately refers to medical and health care practices and products, which are not currently part of mainstream Western medicine. (4) Each country should choose the term that most appropriately refers to allopathic mainstream western medicine.	1=strongly agree 5=strongly disagree 8=can't choose

Notes: A/T/F: alternative/traditional/folk medicine. *By A/T/F health care practitioners, we mean someone who was not trained in Western, mainstream medicine or does not practice it.

of less than 5% was used to indicate statistical significance. Those with missing values for age (0.4%), sex (0.2%), education (1.0%), religion (2.6%), household size (1.0%), health status (2.9%), health care system satisfaction (1.4%) and TCAM attitudes (0.8%) were excluded from all analyses.

RESULTS

Sample Characteristics

The total sample included 52,801 adults from 32 countries and areas, ranging from 899 in the UK to 5,548 in China mainland. Response rates ranged from 30.2% in Belgium to 85.9% in South Africa.⁽¹⁷⁾ Overall, for all 32 countries the 12-month TCAM provider use prevalence was 26.4%. There were large country differences in the prevalence of TCAM provider use, in Australia 34.7%, in Europe ranging from under 10% in Bulgaria, Poland and Slovenia to 35.4% in France,

in Asia from 16.7% in Russia to over 50% in China mainland, the Philippines and Republic of Korea, and over 20% in the USA, Chile and South Africa. Respondents rated their TCAM satisfaction (defined as fairly or very or completely satisfied) with 80% or more were from Australia, in Europe in Denmark, Slovenia, Spain and Switzerland, in Asia, in Taiwan (China) and USA, while lower than 60% TCAM satisfaction was found in Europe in Bulgaria, Croatia, and Poland, in Asia in Russia and Japan, and in Chile (Table 2).

Associations with 12-Month TCAM Provider Use

Multivariate logistic regression found regarding sociodemographic variables that middle age, female sex, lower educational status, not having a religious affiliation, larger household size, not having a health insurance, could not pay for medical treatment when needed it were associated with TCAM provider use. In terms of health variables, perceived poor or fair health status, being unhappy and depressed, having a chronic condition or disability, and having positive attitudes towards TCAM (TCAM being better than mainstream medicine and TCAM does not promise more than it can deliver) significantly increased the odds of TCAM provider use (Table 3).

DISCUSSION

This study provides from a single study recent national prevalence estimates of TCAM provider use and its correlates in 32 countries and areas in all major world regions. The study found an overall prevalence of 12-month TCAM provider use of 26.4%, which seems a little higher (averaged 21.1%) than in the most recent reviewed 9 national TCAM provider use surveys (Australia, Canada, Denmark, Germany, Israel, Norway, Saudi Arabia, United Kingdom, USA).⁽¹⁾ In agreement with the previous review,⁽¹⁾ this study found the highest prevalence of TCAM provider use (over 50.0%) in East Asian countries (China, the Philippines, Republic of Korea). This result may compare with 74.8% prevalence of TCAM use in the past 12 months in Republic of Korea in 2006,⁽¹⁹⁾ possibly with 6.3% past month TCAM provider use in a previous survey in the Philippines in 2006,⁽²⁰⁾ 16.3% TCAM use in middle or older aged persons in China mainland,⁽¹⁵⁾ and 6.8% past month TCAM use prevalence in Taiwan (China) in 2005.⁽¹⁰⁾ TCAM provider use was 30.4% in Japan, which compares to the only study assessing TCAM provider use among rural family medicine clinic

Table 2. Sample Size, TCAM Provider Use and TCAM Satisfaction by Country and Area

Country	Sample	TCAM provider use OR (95% CI) ¹	TCAM satisfaction OR (95% CI) ¹	TCAM policy ²
Australia	1,841	34.7 (31.8–37.7)	80.0 (75.4–83.8)	Yes
Europe				
Belgium	2,868	25.5 (23.9–27.1)	78.5 (75.6–81.1)	Yes
Bulgaria	973	7.2 (5.3–9.5)	59.6 (48.6–69.6)	Yes
Croatia	1,145	16.9 (14.8–19.1)	52.8 (46.8–58.7)	–
Czech Republic	1,700	20.1 (18.1–22.2)	68.8 (63.9–73.3)	Yes
Denmark	1,364	23.5 (21.4–25.9)	80.8 (76.8–84.3)	No
Finland	1,311	15.7 (13.8–17.8)	75.5 (70.4–80.0)	–
France	3,059	35.4 (33.6–37.3)	77.1 (74.5–79.4)	No
Germany	1,634	19.7 (17.8–21.7)	72.0 (67.9–75.7)	Yes
Italy	1,094	15.8 (12.5–19.6)	61.1 (51.8–69.7)	–
Lithuania	1,106	13.2 (11.4–15.3)	60.3 (53.1–67.0)	No
Netherlands	1,404	16.1 (13.9–18.5)	77.9 (71.2–83.5)	No
Norway	1,789	18.2 (16.5–20.1)	71.1 (67.2–74.7)	Yes
Poland	1,082	6.1 (4.8–7.7)	59.4 (49.9–68.4)	–
Portugal	978	14.6 (12.3–17.2)	76.7 (69.7–82.1)	No
Slovak Republic	1,111	13.5 (11.1–16.3)	73.0 (63.9–80.5)	No
Slovenia	1,062	6.5 (5.2–8.1)	83.1 (75.8–88.5)	No
Spain	2,622	15.7 (14.3–17.2)	85.2 (81.5–88.3)	No
Sweden	1,087	19.3 (17.1–21.8)	75.8 (69.6–81.1)	No
Switzerland	1,192	22.0 (19.7–24.4)	87.8 (84.5–90.5)	No
United Kingdom	899	23.6 (20.6–26.9)	77.2 (72.1–81.7)	No
Asia				
China mainland	5,548	53.0 (50.0–55.1)	70.4 (67.6–73.0)	Yes
Israel	1,093	24.9 (22.4–27.5)	71.4 (66.4–76.0)	Yes
Republic of Korea	1,535	50.3 (47.8–52.8)	63.7 (60.5–66.7)	Yes
Japan	1,287	30.4 (27.9–33.8)	57.7 (51.9–63.4)	No
The Philippines	1,170	53.7 (50.6–56.8)	66.2 (62.7–69.5)	Yes
Russia	1,466	16.7 (14.6–19.0)	56.1 (49.6–62.4)	Yes
Taiwan, China	2,197	34.6 (32.6–36.7)	81.6 (79.5–83.6)	–
Turkey	1,410	22.3 (20.2–24.6)	64.3 (60.5–68.0)	Yes
Other				
USA	1,535	21.0 (18.8–23.4)	84.8 (80.8–88.0)	–
Chile	1,440	22.1 (19.2–25.2)	49.4 (42.2–56.6)	Yes
South Africa	2,798	24.0 (21.9–26.2)	65.0 (61.1–68.7)	Yes
All	52,801	26.4 (25.9–26.9)	71.9 (71.0–72.7)	–

Notes: CI=confidence interval; ¹weighted % and CI; ²National policy on traditional medicine and complementary/alternative medicine in place or planned, including "definition, provision for the creation of laws and regulations, and consideration of intellectual property issues."⁽¹⁸⁾

out-patients in Japan (21.4%)⁽²¹⁾ and TCAM use (mainly over-the-counter, 76%) in 2001 in Japan.⁽²²⁾ The high prevalence of TCAM provider use in East Asian areas may be attributed to a high institutional acceptance of TCAM.⁽²³⁾ Further, Shim⁽²³⁾ proposed

Table 3. Associations with 12-Month TCAM Provider Use

Index	N (%)	Unadjusted odds ratio (95% CI) ²	Adjusted odds ratio (95% CI) ²
Socio-demographic variables			
Age (Year)			
15–30	11,687 (22.2)	1.00	1.00
31–50	19,981 (37.2)	1.20 (1.12–1.28)*	1.22 (1.11–1.34)*
>50	21,324 (40.5)	1.03 (0.96–1.11)	1.03 (0.93–1.15)
Sex			
Female	27,543 (52.3)	1.00	1.00
Male	25,160 (47.7)	0.76 (0.72–0.80)*	0.90 (0.84–0.97)*
Residential status			
Rural	17,956 (34.2)	1.00	–
Urban	34,593 (65.8)	0.96 (0.91–1.01)	
Educational status			
≤Primary	7,736 (15.3)	1.00	1.00
Secondary	25,277 (48.6)	0.67 (0.62–0.72)*	0.79 (0.72–0.87)*
Post-secondary	19,284 (36.2)	0.66 (0.61–0.71)*	0.81 (0.74–0.90)*
Religious affiliation			
None	15,880 (30.9)	1.00	1.00
Catholic	15,509 (30.2)	0.56 (0.53–0.60)*	0.51 (0.46–0.56)*
Protestant	9,063 (17.6)	0.59 (0.55–0.63)*	0.60 (0.55–0.67)*
Other	10,956 (21.3)	0.78 (0.74–0.84)*	0.67 (0.61–0.73)*
Household size			
1–2	22,115 (42.3)	1.00	1.00
3–4	20,967 (40.1)	1.20 (1.14–1.26)*	1.22 (1.13–1.32)*
5 or more	9,185 (17.6)	1.44 (1.33–1.56)*	1.29 (1.16–1.44)*
Has health insurance	45,648 (94.6)	0.64 (0.58–0.71)*	0.84 (0.74–0.95)*
Could not pay for medical treatment when needed it	3,890 (10.1) ¹	1.98 (1.82–2.14)*	1.38 (1.24–1.54)*
Health variables			
Perceived health status			
Poor/fair	14,714 (28.7)	1.00	1.00
Good	19,706 (38.4)	0.71 (0.67–0.75)*	0.89 (0.81–0.97)*
Very good/excellent	16,852 (32.9)	0.66 (0.62–0.70)*	0.94 (0.85–1.05)
Unhappy and depressed			
Never	18,841 (37.6)	1.00	1.00
Seldom	13,676 (27.3)	1.87 (1.75–2.00)*	1.60 (1.46–1.75)*
Sometimes	12,488 (24.9)	2.29 (2.14–2.45)*	1.76 (1.60–1.94)*
Often/very often	5,151 (10.3)	2.34 (2.16–2.54)*	1.63 (1.45–1.84)*
Chronic condition/disability	15,682 (30.1)	1.32 (1.26–1.40)*	1.13 (1.04–1.22)*
Health care system satisfaction			
Dissatisfied or neither	19,849 (38.1)	1.00	1.00
Fairly satisfied	22,582 (43.4)	1.01 (0.95–1.07)	1.08 (0.99–1.16)
Very/completely satisfied	9,647 (18.5)	0.87 (0.82–0.93)*	1.03 (0.93–1.14)
TCAM is better than mainstream medicine			
Not agree	19,370 (36.9)	1.00	1.00
Neither/can't choose	22,306 (42.5)	2.40 (2.15–2.55)*	2.19 (2.01–2.38)*
Agree	10,767 (20.5)	5.28 (4.94–5.65)*	4.84 (4.44–5.28)*
TCAM promises more than can deliver			
Not agree	9,398 (17.9)	1.00	1.00
Neither/can't choose	20,828 (39.4)	0.79 (0.74–0.84)*	0.78 (0.71–0.85)*
Agree	22,137 (42.3)	0.49 (0.46–0.52)*	0.62 (0.58–0.67)*

Notes: CI=confidence interval; * $P < 0.01$. ¹Not included in all countries/areas. ²The regression models were weighted

that East Asian countries have different ways of institutionalizing TCAM (e.g., "unification in China, equalization in Korea, and subjugation in Japan"), and TCAM use may be "more obvious under the Chinese and the Korean system than the Japanese system."⁽²³⁾

Further, the study found a relatively low prevalence of TCAM provider use in a number of Eastern European countries, including Russia, e.g., below 10.0% in Bulgaria, Poland and Slovenia, and below 20.0% in Lithuania, Slovak Republic and Russia. It is possible that the use of TCAM in Eastern European countries has not always been accepted, but may have become increasingly acceptable.⁽¹²⁾ In a 2001 survey, Stickley, et al⁽¹²⁾ found a prevalence of usual treatment by a TCAM provider among those that had "experienced at least one of 10 common symptoms" of 5.8% in Russia.⁽¹²⁾

Comparing the prevalence of TCAM provider use in this study with previous national country surveys, an increase or a higher prevalence of TCAM provider use was observed in several countries, e.g., in Norway from 9.8% in 2012⁽²⁾ to 18.2% in 2012 in this survey, in the UK from 10.0% in 2004⁽²⁴⁾ to 23.6% in 2011 in this survey, in Israel, from 5.8% in 2004⁽²⁵⁾ to 24.9% in 2011/12 in this survey, in South Africa from 0.1% in 2008⁽⁴⁾ to 24.0% in 2011 in this survey, and in USA from 16.2% TCAM provider use in 2007⁽²⁶⁾ to 21% TCAM provider use in 2012 in the current study. On the other hand, it seems, the prevalence of TCAM provider use reduced in Australia from 44.1% in 2005⁽²⁷⁾ to 34.7% in 2012 in this survey. The more recent TCAM provider use prevalence (34.7%) corresponds more to the results of the prevalence of TCAM practitioner visits estimated from a 2004 South Australian study (26.5%).⁽²⁸⁾ The increase in TCAM provider use in USA from 2007 to 2012 seem to be accompanied by a slight reduction in the percentage of adults who used any TCAM modality in the past 12 months from 35.5% in 2007 and to 33.2% in 2012.⁽⁶⁾ It is possible that contrary to an earlier survey comparison with the number of visits U.S. adults make to TCAM practitioners, which had dropped by 50% from 1997 to 2007, the number of TCAM provider visits are now increasing again, possibly because of continuous professionalization of TCAM practitioners.⁽²⁹⁾ For most study countries information on the existence of national TCAM policies is available,⁽¹⁸⁾ but it seems the prevalence of TCAM provider use did not differ between countries having

or not having a TCAM policy. For example, Bulgaria has a TCAM policy, but TCAM provider use was only 7.2% and France does not have a TCAM policy but TCAM provider use was 35.4% in this study. It should be noted that country TCAM provider use prevalence estimates are difficult to compare with previous surveys since different measures and methods may have been used.⁽¹⁾

Regarding TCAM satisfaction, the study found overall a good TCAM satisfaction, as found in previous studies.^(5,30) High TCAM satisfaction (defined as fairly or very or completely satisfied, $\geq 80\%$) was found in Australia, in four European countries (Denmark, Slovenia, Spain and Switzerland), in Taiwan (China) and USA. This means that in some of the high TCAM provider utilization East Asian countries like China mainland, the Philippines and Republic of Korea, TCAM satisfaction was not particularly high. This study found a TCAM provider use satisfaction of 63.7% in Republic of Korea, which is similar to a previous study where 56.1% of participants who had visited traditional Korean medicine clinics were generally satisfied with the clinics' effectiveness.⁽³⁰⁾ In this study positive TCAM attitudes were associated with TCAM provider treatment satisfaction (analysis not shown). High TCAM satisfaction may be related to various factors such as positive TCAM attitudes, the perceived competence of the TCAM practitioner, the perceived improvement of the health problems and the time dedicated to them by the TCAM provider.^(16,31)

Regarding socio-demographic factors, this study found agreement with previous studies^(7,9-11) that female gender, middle age, lower educational background and indicators of lower socioeconomic status were associated with TCAM provider use. It is possible that middle aged people take care of health care seeking for their children and/or parents,⁽¹⁰⁾ and women may be more willing than men to access TCAM,⁽¹⁰⁾ as women generally access out-patient health care services more frequently than men.⁽³²⁾ Further, not having a religious affiliation was associated with increased odds of TCAM provider use. It is possible that people without a formal religious affiliation may hold (traditional) beliefs that are congruent with TCAM and are thus more attracted to the use of TCAM.⁽³³⁾ Unlike some previous studies,^(12,13) residency status was not found to be associated with TCAM provider use. In terms of health related factors, this study

found, in agreement with a number of studies,^(5,7,9,14-16) that poor or fair health status, being unhappy and depressed, having a chronic condition or disability, and having positive attitudes towards TCAM was associated with TCAM provider use. The higher TCAM provider use among persons with chronic conditions or disability, including mental conditions and poorer health status, may be explained by an increased health seeking behaviour utilizing a variety of health sources available, in particular alternative to conventional medicine.^(8,34)

This study had several limitations. Firstly, the questionnaire assessed only limited aspects of TCAM provider use and other aspects such as the type of TCAM (provider) use should be included in future surveys. Furthermore, this study was based on data collected in a cross sectional survey, and therefore to causal conclusions can be drawn.

In conclusion, a high prevalence TCAM provider use was found in all world regions and several sociodemographic and health related factors of its use were identified.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Peltzer K and Pengpid S designed the study, analysed the data, wrote the paper and approved the final version.

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International Social Survey Programme: Health and Health Care-ISSP 2011 dataset is publicly available at <http://zacat.gesis.org/webview/index/en/ZACAT/ZACAT.c.ZACAT/ISSP.d.58/by-Year.d.69/International-Social-Survey-Programme-Health-and-Health-Care-ISSP-2011/fStudy/ZA5800>

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