

# Trust in Conventional Healthcare and Utilization of Complementary and Alternative Medicine in South Tyrol, Italy: A Population-Based Cross-Sectional Survey

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## Abstract

**Background.** This study explored the link between trust in conventional healthcare and consultations with complementary and alternative medicine (CAM) providers in South Tyrol, Italy's linguistically diverse region.

**Methods.** A representative cross-sectional survey of 1,388 South Tyrolean adults assessed trust in conventional healthcare, general practitioners, and complementary and alternative medicine consultation frequencies and their determinants using chi-square tests and Kendall-Tau-b correlations.

**Results.** Seventy percent trusted the traditional healthcare system, with general practitioners as the primary trusted professionals. Trust is correlated with higher education and linguistic compatibility. A 5% subgroup, mostly women and multilinguals with lower education levels, showed uncertain trust. Over 80% had seen a general practitioner in the last year, while distrust was correlated with complementary and alternative medicine consultations. German and Ladin speakers, with higher education levels, were notably inclined towards complementary and alternative medicine consultations.

**Conclusions.** Trust in South Tyrolean healthcare varied according to education level and language. While general practitioners remain central, there is a marked shift towards complementary and alternative medicine among specific groups.

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## Introduction

Trust in healthcare influences patient decisions and compliance, but has declined pre- and post-pandemic (1-5). It serves as a metric for healthcare effectiveness (6) and is affected by demographic factors such as language and education (7-9). Mistrust can lead to the overuse or underuse of services (10-12) and has contributed to an increase in Complementary and Alternative Medicine (CAM) use (13, 14). The popularity of CAM, particularly in the Western World, remains a subject of debate (15-22) and is partly driven by mistrust in conventional medicine (23-25).

Italy's CAM regulations are complex and vary by region (26, 27). South Tyrol has a unique CAM integration model, but lacks comprehensive usage data (28, 29). Vaccine hesitancy is high among the German-speaking population and is linked to lower education levels and distrust in conventional healthcare (30, 31).

This study aims to examine variations in trust in South Tyrol's bilingual context, focusing on demographic factors such as language and education, assessing which healthcare providers and institutions in South Tyrol are the most and least trusted, investigating regional CAM usage patterns and their relation to trust in conventional healthcare, and examining perceptions of healthcare professionals and their influence on health choices, including CAM inclination. Based on these findings, informed and evidence-based strategies may be proposed to improve trust in the South Tyrolean healthcare system.

## Methods

### 1. Study participants sampling and recruitment

The survey was conducted by the Provincial Statistical Office (ASTAT) in scientific collaboration with the Institute of General Practice and Public Health of the College of Health Professions Claudiana in Bolzano, Italy. According to Italian law, approval by the ethics committee and written informed consent are not required for non-clinical questionnaire-based or register-based population studies (Legislative Decree No. 121 of May 5, 2001). This study was conducted in accordance with the principles of the Declaration of Helsinki. The provision of information about the survey, its purpose, and voluntary participation in the interview constituted implicit consensus. This study was conducted in compliance with the European

Union's General Data Protection Regulation (GDPR), which supersedes the Italian Personal Data Protection Law (Legislative Decree No. 196 of June 30, 2003). Informed consent was obtained from all subjects involved in the study.

The administration of the questionnaires to participants was conducted through a structured approach. Each participant received a personalized invitation letter, which included the specified date for participation. The letter contained a link to an online questionnaire, designed to gather a comprehensive range of demographic, clinical, and socio-behavioral data relevant to our study. To ensure the privacy and confidentiality of participant's responses, a personalized password was provided with each invitation. This password served as a pseudonymization code, allowing participants to securely access and complete the questionnaire online. Additionally, to accommodate participants who might face challenges with the online format or have any queries regarding the questionnaire, telephone support was made available.

A total of 1,388 questionnaires were completed. The estimated response rate, which is the ratio of the number of units responding to the number of eligible units, is 39%. The average time taken to complete the questionnaire was 26 minutes. The dropout rate ("people who started to fill in the questionnaire but did not finish") was 5%.

### 1.1. Questionnaire

The questionnaire assessing trust was an adapted version of the COSMO questionnaire (32) using a 6-point Likert scale (1= no trust...6=big trust) with a seventh option for "I don't know." Trust in local institutions (regional free emergency numbers, civil protection, local Government), national medical institutions (national Ministry of healthcare, "Istituto Superiore di Sanità"), regional medical institutions (healthcare professionals colleges, leaders of the regional sanitary system) and in the WHO was asked as well as trust in specific healthcare professionals (pharmacists, vaccine staff, nursing staff, general practitioners (GPs), pediatricians, private specialists, specialists in hospitals, physiotherapists, nutrition consultants, director of the local sanitary system).

The International Questionnaire (I-CAM-Q) was used to measure CAM use. It is a widely recognized instrument designed to capture detailed data on CAM consumption patterns. To ensure accuracy and inclusivity in the bilingual context of South Tyrol, the survey employed both its German and Italian versions (15, 33).

Demographic variables were asked in accordance with the COSMO questionnaire (32), and a question to assess the local mother tongue was added with the options “German, Italian, Ladin, other language/more than one language according to the local mother tongues.

As primary outcome variable “trust in health care professionals” was analyzed, and “trust in the national healthcare system” as secondary outcome variable.

## 1.2. Statistics

The total study population included an adult population residing in South Tyrol. Individuals permanently residing in nursing homes or other community institutions were excluded from this study. The statistical unit, which is the same as the survey unit, is the individual unit. This study used a stratified probability-sample survey. A total of 3,800 names were randomly selected from the population registers of the South Tyrolean municipalities using Statistical Analysis System (SAS) software (SAS Institute, Cary, NC). Stratification was based on the following variables: municipality of residence, age, and gender. Estimates were obtained using calibration estimators. For this purpose, post-stratification was carried out on the known totals according to the following variables: nationality, geographical area (three zones), municipality size (two classes), age, and sex. The weights were calibrated using the software “R Functions for Calibrated Weighting and Complex Variance Estimation in Survey Data Analysis” (ReGenesees; Italian National Institute of Statistics, Rome, Italy). The estimated percentages were rounded to the nearest total number. Therefore, the sum of the percentage distributions may differ from 100 (99 or 101).

To assess trust, the 6-point Likert scale was redefined as dichotomous (1–3: low trust; 4–6: high trust) (34, 35). The responses were analyzed separately.

Nominal and ordinal data were presented as absolute and relative frequencies, and age was presented as mean (M)  $\pm$  standard deviation (SD). Significant differences between groups were assessed using chi-square tests, and correlations were calculated using Kendall’s tau-b. Significance levels were defined as  $p < 0.05$  (\*),  $p < 0.01$  (\*\*), and  $p < 0.001$  (\*\*\*)

## Results

### 1.1. Demographics

A total of 1,388 participants completed the questionnaire, and their demographic patterns are presented in Table 1. The mean age was 50.3 years and

51% were female. Household income increased in the last three months for 5% of the participants, remained the same for 66.9%, decreased for 25.2%, and 2.9% did not know whether it had increased or decreased. Education level was reported by 18.1% of the participants as primary school, 28.7% as vocational school, 31.3% as high school, and 21.8% as university. German was the mother tongue of 63.1% of the participants, Italian 27.1%, and Ladin 3.7%, whereas 6.1% declared that they had another mother tongue. Of the participants, 40.5% reported living in an urban area, 90.2% reported having Italian nationality, and 18.2% reported having a chronic disease.

### 1.2. Trust in healthcare professionals and institutions

Table 1 shows demographic and health characteristics of the 1,388 participants, categorized by their trust in healthcare professionals: low trust (28.5%), high trust (66.5%), and “don’t know” (5%). No significant differences were found in sex, age, residence, or chronic diseases between the groups. Trust levels are linked to household income, education, native language, and nationality. Stable income was correlated with higher trust, whereas low education, multiple mother tongues, and non-Italian citizenship were associated with uncertainty in trust.

Variances were observed in the percentage of participants who were unfamiliar with the different health professionals. The rates of unfamiliarity were as follows: GPs, 4.1%; vaccination professionals, 4.5%; pharmacists, 4.6%; care professionals, 7.6%; hospital specialists, 11.3%; general directors of the regional health system, 20.7%; private sector specialists, 21.8%; pediatricians, 35.1%; physiotherapists, 29.1%; and nutrition specialists, 36.1%.

Figure 1 provides a detailed breakdown of trust in various healthcare professionals and institutions, reflecting responses from participants familiar with each entity. Trust is measured on a 1 to 6 scale, with 1 indicating no trust and 6 indicating high trust. General Practitioners (GPs) and hospital specialists garner the highest trust at 78.6%, closely followed by specialists in the private sector at 79.4%, and pediatricians at 76.1%. The overall trust in healthcare professionals stands at 70%, akin to trust in nursing staff (71.8%) and pharmacists (70.8%). Vaccination specialists command a trust level of 67.7%. On the lower end, physiotherapists are trusted by 61.4% of respondents, while the general directors of the provincial health system and nutrition specialists see lower trust levels at 49.2% and 48.4%, respectively.

Table 1. Basic characteristics of the participants based on their trust in health care professionals.

	Total (N=1388)	Low trust in health care professionals (N=396)	High trust in health care professionals (N=923)	Don't know (N=69)	p-value
Women (%)	51	50.5	50.6	59.4	n.s.
18–34 years (%)	23.8	22.9	23.6	30.9	n.s.
35–49 years (%)	24.1	29.0	21.9	25.0	
50–64	29.8	28.7	30.8	23.5	
65+	22.3	19.4	23.7	20.6	
Household Income within the last 3 months					
Better	5.0	3.8	5.4	5.8	<0.001
Equal	66.9	61.0	70.5	52.2	
Lower	25.2	31.6	22.0	31.9	
Don't know	2.9	3.5	2.2	10.1	
Years of Education					
Primary school	18.1	17.9	17.2	31.9	0.003
Vocational school	28.7	28.3	28.7	31.9	
Secondary school	31.3	34.3	30.1	29.0	
College/university	21.8	19.2	23.9	7.2	
Mother tongue					
German	63.1	64.6	63.0	55.9	<0.001
Italian	27.2	26.0	28.4	17.6	
Ladin	3.7	3.8	3.7	2.9	
More than one/ other	6.1	5.5	5.0	23.6	
Urban residency	40.5	41.9	40.0	39.1	n.s.
Italian nationality	90.2	94.2	89.9	72.5	<0.001
Chronic disease	18.2	16.4	19.0	18.8	n.s.

Figure 1 also presents the trust levels in national and regional institutions as well as in the WHO on a scale of 1 (no trust) to 6 (high trust). Trust in both national and international entities was relatively consistent, at approximately 60%. This was evident in institutions such as the Italian National Health System, the “Istituto Superiore di Sanità,” the WHO, regional free emergency numbers, and the directory of the regional health system. Among these, civil protection recorded the highest trust at 69.2%, whereas regional government registered the lowest at 45.5%. Regarding unfamiliarity with certain institutions, 17.8% of respondents were unfamiliar with regional free emergency numbers and 17.2% were unaware of the “Istituto Superiore di Sanità.” For the remaining institutions, between 5% to 8% of participants opted for the “I don't know” response.

### 1.3. CAM Usage Patterns

#### 1.3.1. Consultations with CAM Providers within the last 12 months

Table 2 provides a breakdown of patients' consultations with various health practitioners in the past year, the perceived efficacy of these consultations, and the primary reasons for seeking such services. Overall, the table illustrates the preferences and experiences of participants regarding various health practitioners, emphasizing the importance of GPs in healthcare consultations and underscoring the role of both conventional and alternative health practices in addressing acute and chronic conditions as well as the pursuit of holistic well-being.

A substantial percentage (81.7%) of the participants reported consulting a GP in the past year. Among

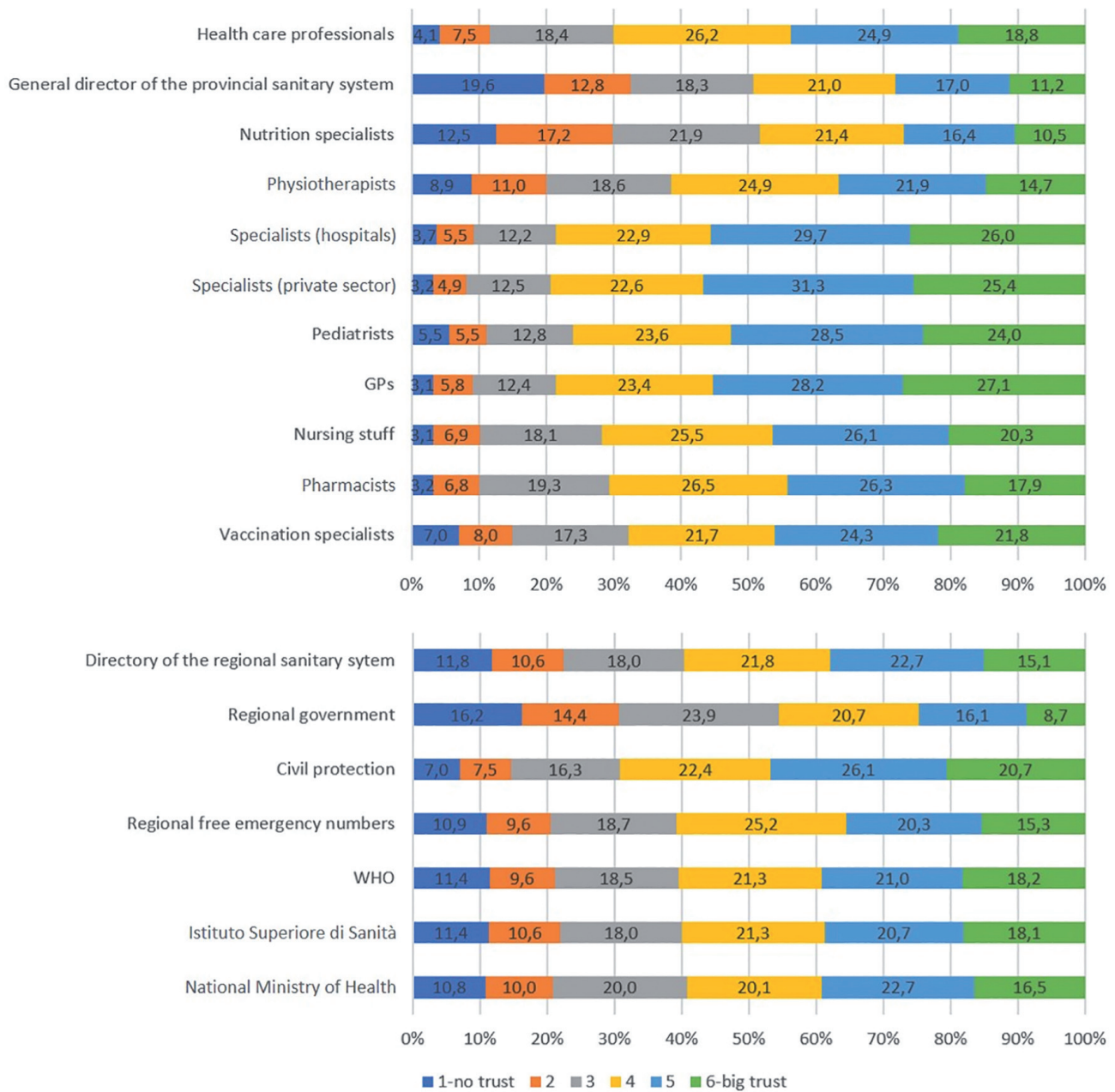


Figure 1. Trust spectrum in healthcare professionals and institutions. This figure visualizes the spectrum of trust in various healthcare professionals and national and regional institutions, rated on a scale from 1 (no trust) to 6 (high trust). The graph categorizes trust levels into six segments, illustrating the percentage of respondents within each trust bracket. The x-axis represents the percentage of responses, while the y-axis lists the professional groups and institutions. Responses of ‘I don’t know’ are excluded for visual clarity but are discussed in the manuscript text.

Table 2. Consultation Rates, Efficacy, and Reasons for Seeking Different Health Practitioners in the Past Year

Health practitioner	Consulted within the last year (%)	Consultations very/ rather helpful (%)	Reason for consultation (%)		
			Acute illness	Chronic disease	Improve wellbeing
GP	81.7	86.1	43.0	19.7	37.4
Osteopath	9.9	75.1	24.0	24.9	51.1
Homeopath	8.7	65.4	15.0	27.2	57.8
Medical CAM specialist	4.8	74.5	9.7	29.1	61.5
Non-medial CAM specialist	4.5	69.1	11.5	26.7	61.8
Other	4.4	66.3	10.7	28.1	61.8
Acupuncturist	3.8	65.7	11.9	36.3	51.7
Chiropractor	3.4	69.0	23.0	25.7	51.4

those who consulted GPs, 86.1% found consultations helpful. The main reasons for consulting GPs included acute illness (43%), chronic diseases (19.7%), and desire to improve overall well-being (37.4%).

Osteopaths were consulted by 9.9% of participants, with 75.1% receiving beneficial consultations. Reasons for seeking osteopathic care varied as follows: 24% for acute illness, 24.9% for chronic diseases, and 51.1% for well-being. Homeopathy services were sought by 8.7% of participants, with 65.4% perceiving consultations as very helpful. The reasons for consultation were acute illness (15%), chronic disease (27.2%), and the goal of improving well-being (57.8%). Medical CAM

specialists were consulted by 4.8% of the participants and 74.5% deemed the sessions beneficial. These specialists were primarily approached for chronic conditions (29.1%) and with the purpose of enhancing well-being (61.5%). Consultations with non-medical CAM specialists were reported by 4.5% of the participants, with 69.1% finding them useful. Sessions were sought for acute illness (11.5%), chronic diseases (26.7%), and pursuit of better well-being (61.8%). The “Other” category of practitioners was consulted by 4.4% of participants, with 66.3% appreciating the efficacy of the sessions. The consultations were primarily for acute health concerns (10.7%), chronic conditions (28.1%),

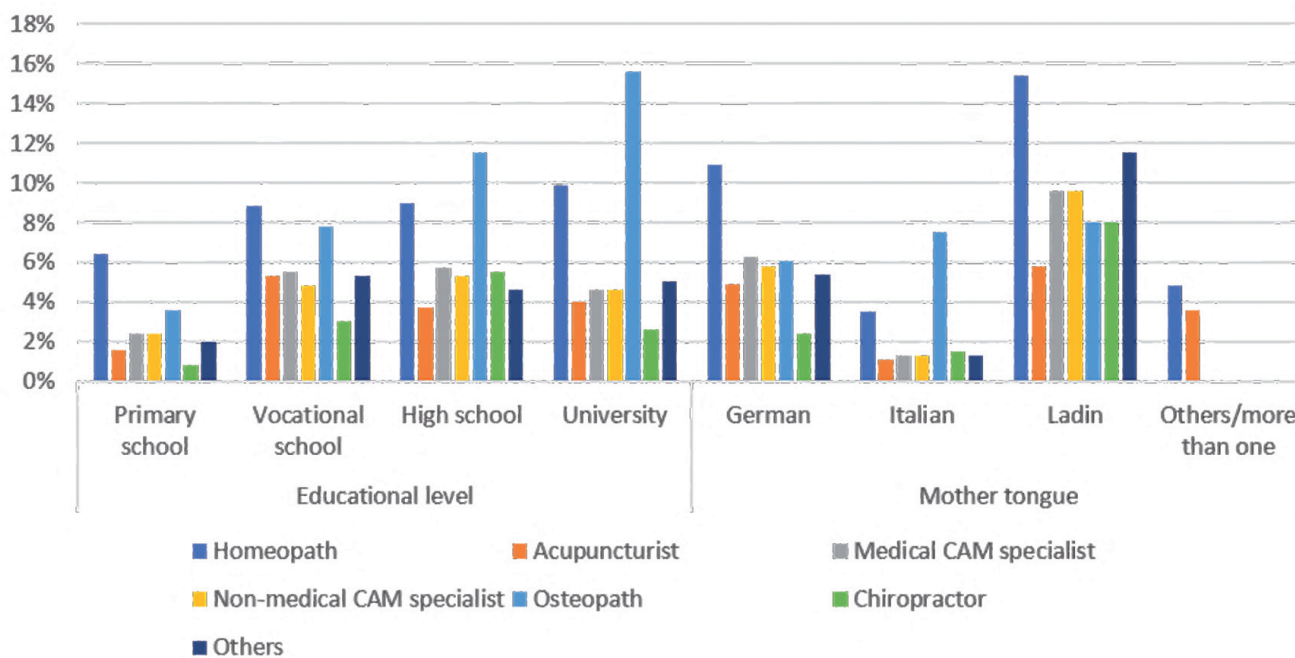


Figure 2. Consultation of CAM-providers within the last 12 months per educational level and mother tongue.

and general well-being (61.8%). Acupuncturists were seen by 3.8% of respondents, with 65.7% deeming their sessions beneficial. The reasons were spread among acute illnesses (11.9%), chronic ailments (36.3%), and enhanced wellbeing (51.7%). Finally, 3.4% of participants consulted chiropractors. Of these, 69% found their care very helpful. Consultations were predominantly for acute health issues (23%), chronic conditions (25.7%), and the enhancement of overall well-being (51.3%).

Most participants found the treatment beneficial (over 65%, Table 2). GPs were consulted mainly for acute conditions (43%), whereas CAM providers were consulted mainly for improving well-being (over 50% each) and for chronic conditions (over 20%). Acupuncturists were consulted for chronic conditions in 36.3% of cases, followed by medical CAM specialists (29.1%).

Women consulted GPs (85.6% vs. 77.5%,  $p<0.001$ ), homeopaths (11.7% vs. 5.4%,  $p<0.001$ ), acupuncturists

(4.9% vs. 2.6%;  $p=0.026$ ), medical CAM specialists (6.1% vs. 3.5%;  $p=0.027$ ), non-medical CAM specialists (5.9% vs. 2.9%;  $p=0.007$ ), and osteopaths (13.1% vs. 6.5%;  $p<0.001$ ) more often than men within the last 12 months, whereas no significant sex difference was found for chiropractors and others.

The 35–49 years age group consulted CAM providers significantly more often than the 65+ ( $p<0.001$ ) and 50–64 years age groups ( $p<0.001$ ). Among the individual CAM providers, a significant difference between age groups was only found for osteopaths ( $p=0.009$ ): 18–34 years old participants: 8.5%; 35–49: 13.2%; 50–54: 12.4%, and 65+: 5.8%.

### 1.3.2. Influences of Education and Linguistic Backgrounds on differences in CAM consultations

The influence of education and linguistic background is shown in Fig. 3. Participants with different levels of education considered CAM providers

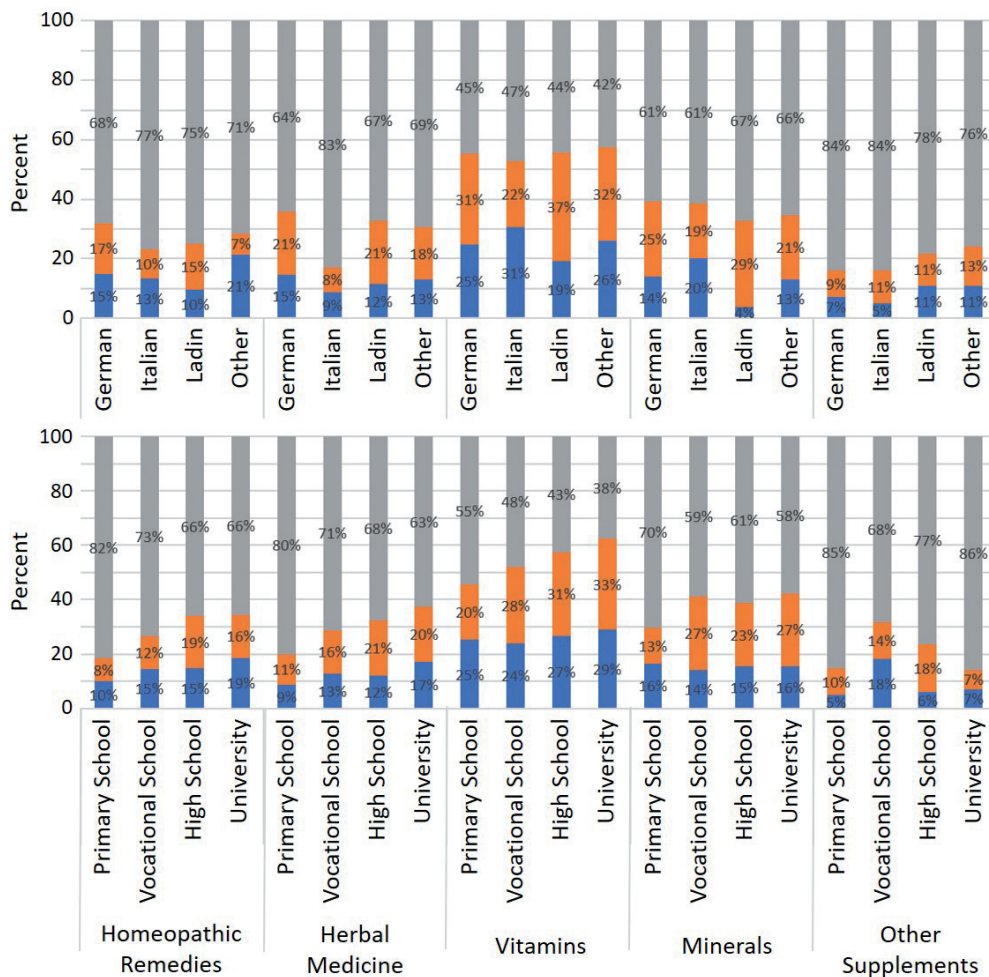


Figure 3. Use of herbal remedies per mother tongue and educational level. (Blue - Yes, by prescription; Orange - Yes, without prescription; Grey - No)

significantly different ( $p < 0.001$ ). Participants with primary education consulted CAM providers in 4.9% of cases, those with vocational education in 10.1% of cases, those with secondary education in 12.6% of cases, and those with university degrees in 13.2% of cases. Significant differences were found between primary education and all other educational levels ( $p < 0.001$  for both).

Regarding consultations with individual CAM providers, significant differences were found between the educational levels for osteopaths and chiropractors. Osteopaths were consulted by 3.6% of the participants with primary education, 7.8% with vocational education, 11.5% with high school education, and 15.6% with university education. Significant differences were found between participants with primary education and those with other levels of education (vocational school,  $p = 0.031$ ; high school and university,  $p < 0.001$  each). The difference in osteopath consultations between participants with vocational school and university education was significant ( $p = 0.001$ ). Chiropractors were consulted by 0.8% of primary school participants, by 3.0% of vocational school participants, by 5.5% of high school participants, and by 2.6% of university participants. The only significant difference was found between the participants with primary and high school education ( $p = 0.002$ ).

Differences between German, Italian, Ladin, and more than one native tongue were also investigated. No significant differences were found between participants with German and Ladin mother tongues in total consultations with CAM providers, consultations with GPs, or individual consultations with CAM providers. Significant differences were found between the German (12.3%) and Italian (6.8%) language groups ( $p < 0.001$ ), the Italian and Ladin (12.8%) language groups ( $p = 0.027$ ), and the German language group and the group of participants who reported having more than one native tongue (6.8%,  $p = 0.026$ ).

There was also a significant difference in the number of consultations with the GPs between the German and Italian groups (80.1% vs. 85.9%,  $p = 0.014$ ). For individual CAM providers, a significant difference between the German and Italian groups was found for homeopaths (10.9% vs. 3.5%;  $p < 0.001$ ), acupuncturists (4.9% vs. 1.1%,  $p = 0.001$ ), medical CAM specialists (6.3% vs. 1.3%;  $p = 0.001$ ), non-medical CAM specialists (5.8% vs. 1.3%;  $p < 0.001$ ), and other CAM providers (5.4% vs. 1.3%,  $p = 0.001$ ). No significant differences were found between the osteopaths and chiropractors. Significant differences between the Italian and Ladin groups were found for homeopaths

(3.5% vs. 15.4%,  $p < 0.001$ ), acupuncturists (1.1% vs. 5.8%,  $p = 0.012$ ), medical CAM providers (1.3% vs. 9.6%,  $p < 0.001$ ), non-medical CAM providers (1.3% vs. 9.6%,  $p < 0.001$ ), and others (1.3% vs. 11.5%,  $p < 0.001$ ).

### 1.3.3. Self-help Practices

Approximately 78% of the participants reported using at least one self-help technique in the past 12 months. The most popular treatment modalities were prayer (29.1%), relaxation (21.4%), yoga (14.7%) and meditation (13.4%). Self-help practices were mainly used to improve well-being (usually more than 80%), followed by chronic conditions (approximately 10%) and less often acute conditions (less than 10%). Most participants considered all modalities to be very helpful. Painting/music-making was very helpful in 90.6% of the cases, yoga in 85.8%, and meditation in 82.9%. QiGong (64.9%) and Prayer (68.6%) were the least effective techniques.

In general, females used self-help techniques more than males (77.6% vs. 57.8%;  $p < 0.001$ ), with only ThaiChi and prayer for personal health showing no significant gender differences. Differences between language groups were found only for yoga (German, 18.1%; Italian, 8.7%; Ladin, 15.4%; other/more than one language, 7.2%;  $p = 0.002$ ), praying for personal health (German, 32.2%; Italian, 22.6%; Ladin, 32.7%; more than one/other, 21.5%;  $p < 0.001$ ), and other self-help techniques (German, 13.0%; Italian, 7.7%; Ladin, 1.5%; more than one/other, 15.1%).

Educational level significantly influenced the use of self-help techniques (primary school: 46%; vocational school: 54%; high school: 50%; university: 57%;  $p < 0.001$ ). While no significant difference was found in painting/music-making, there was a significant decrease in praying for personal health with increasing educational level (primary school, 38%; vocational school, 31%; high school, 26%; university, 23%,  $p < 0.001$ ). For ThaiChi and participation in ritual healing, there were small significant differences between levels of education. For all other techniques such as meditation, yoga, QiGong, relaxation, and visualization, there was a significant increase in their use with increasing levels of education.

### 1.3.4. Use of Natural Remedies

Nearly 68% of the participants used natural remedies, most commonly vitamins (54.8%), and minerals (38.5%). Females were more likely to use them than were males (59.9% vs. 43.7%,  $p < 0.001$ ). Use increased with education as follows: 55.4%



(primary), 64.2% (vocational), 73.2% (high school), and 75.9% (university) ( $p < 0.001$ ) (Fig. 3). Language also influenced use: German (68.9%), Italian (67.2%), Ladin (59.6%), and multilingual (65.5%) ( $p < 0.001$ ). Germans favored herbal and homeopathic remedies, Italians preferred dietary supplements, and multilinguals mainly used vitamins.

For all single natural remedies, a significant association was found between increasing age and increasing use of natural remedies (homeopathic remedies,  $p = 0.003$ ; herbal remedies,  $p < 0.001$ ; vitamins,  $p = 0.04$ ; minerals,  $p = 0.01$ ; others,  $p < 0.001$ ).

## 2. Trust in Health Care System Components and CAM Use

### 2.1. Healthcare Professionals

Kendall's tau-b correlation coefficient was calculated for trust in healthcare professionals and the CAM parameters. There was a significant negative correlation between trust in healthcare professionals

and CAM consultations ( $\rho = -0.084^{**}$ ), and a slightly positive correlation between trust and GP consultation ( $\rho = 0.063^*$ ). There was also a significant positive correlation between the GP and CAM consultations ( $\rho = 0.109^{**}$ ). The highest correlations were found between CAM consultation and the use of natural remedies ( $\rho = 0.227^{**}$ ) and between CAM consultation and the use of self-help techniques ( $\rho = 0.249^{**}$ ). The use of self-help techniques and natural remedies were positively correlated ( $\rho = 0.266^{**}$ ).

While trust in healthcare professionals seems to deter CAM consultations, it encourages GP consultations. Moreover, those engaged in CAM consultations were particularly inclined to use natural remedies and self-help techniques. The overall percentage of CAM consultations in the last 12 months was approximately 21.2%, GP consultations were 81.7%, use of natural remedies (prescribed or not) was about 67.9%, and use of self-help techniques was about 78.1%. These four subgroups were analyzed in detail (Fig. 4).

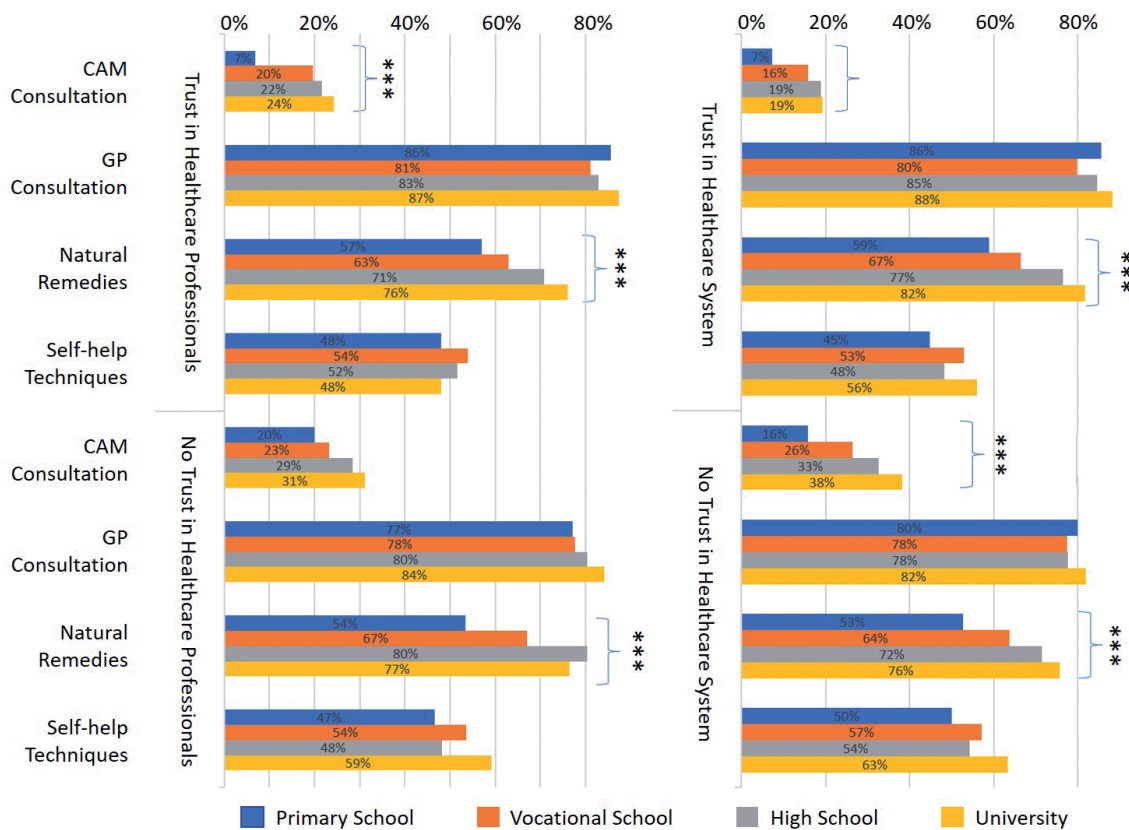


Figure 4. Consultation of CAM-specialists and GPs, use of natural remedies and self-help techniques per educational level for subgroups of persons trusting and non-trusting in health care professionals and the health care system.

*CAM practitioner consultation:* People with low or no trust in health professionals consulted CAM practitioners significantly more often (26.3% vs. 19.2%,  $p=0.004$ ) than those with high or high trust. No significant differences were observed in consultations with GPs, use of natural remedies, or self-help techniques. The following individual CAM practitioners were consulted significantly more often by participants with low or no trust in healthcare providers than by those with high or low trust: homeopaths (14.1% vs. 6.4%;  $p<0.001$ ), medical CAM practitioners (8.6% vs. 3%;  $p<0.001$ ), non-medical CAM practitioners (8.3% vs. 2.9%;  $p<0.001$ ), and others (8.3% vs. 2.7%,  $p=0.001$ ). No significant differences were found among acupuncturists, osteopaths, and chiropractors.

In both the trust and mistrust subgroups, language significantly affected CAM consultations. Among the trusters, Italians consulted CAM specialists the least (12.6%), followed by Ladins (20.6%), Germans (21.8%), and multilinguals (22.2%), with  $p=0.004$ . Among the distrusters, Germans (30.5%) and Ladins (46.7%) consulted CAM specialists more than Italians (15.5%) and multilinguals (13.6%) did.

*GP consultation, use of natural remedies, and self-help techniques* for the groups of participants who had consulted a GP in the last 12 months, who had used natural remedies, and who had used self-help techniques, showed no significant difference between the language groups.

There was a clear significant increase with an increasing level of education in CAM consultation ( $p<0.001$ ), use of natural remedies ( $p<0.001$ ), and use of self-help techniques ( $p<0.001$ ) in the group of people who trusted health professionals. In the mistrust group, only a significant increase in the use of natural remedies was observed ( $P<0.001$ ) (Fig. 4). Regarding individual CAM providers, homeopaths were consulted significantly more often by mistrusting participants than by trusting participants (14.1% vs. 6.4%,  $p<0.001$ ) as well as by medical CAM providers (8.6% vs. 3.0%;  $p<0.001$ ), non-medical CAM providers (8.3% vs. 2.9%;  $p<0.001$ ), and other CAM providers (8.3% vs. 2.7%). No significant differences were found among acupuncturists, osteopaths, and chiropractors.

Individuals with little or no trust in healthcare professionals were significantly more likely to use homeopathic (35.5% vs. 26.9%;  $p=0.002$ ) and herbal remedies (37.1% vs. 28.0%;  $p=0.004$ ). No significant differences were found in vitamin, mineral, or other dietary supplements.

## 2.2. National Ministry of Health

Those with little or no trust in the Ministry of Health were significantly more likely to consult CAM specialists (28.4% vs. 16.3%,  $p<0.001$ ) and significantly less likely to consult GPs (78.8% vs. 84.6%,  $p=0.007$ ) than were those with high trust. The following CAM specialists were consulted significantly more often by participants with no or low trust in the Ministry of Health: homeopaths (14.6% vs. 4.8%), acupuncturists (5.5% vs. 2.7%,  $p=0.011$ ), medical CAM providers (8.1% vs. 2.5%;  $p<0.001$ ), non-medical CAM providers (6.6% vs. 3.1%;  $p=0.003$ ), chiropractors (5.6% vs. 1.9%;  $p<0.001$ ), others (7.0% vs. 2.7%;  $p=0.001$ ). No significant differences were observed between the osteopaths.

No significant differences in trust were found in the use of natural remedies or among the native speakers towards the Ministry of Health. However, trust varied by educational level, with university graduates showing the highest level of trust at 67.8%. While education did not affect trust in GP consultations or self-help use, it significantly increased CAM consultation and natural remedy use in both the trusting and mistrusting subgroups (Fig. 4).

## Discussion

This study investigated trust in healthcare and CAM consultation patterns among adults in Northern Italy. Most participants (70%) trusted healthcare providers, particularly the GPs. Higher education and linguistic compatibility were positively associated with trust, whereas the geographic location within the region had no impact. A vulnerable 5% subset—primarily women, multilinguals, those with low education, or non-Italians—expressed uncertainty in their healthcare trust, indicating a need for targeted information interventions.

Over 80% of the participants consulted a GP in the last year, indicating a high utilization rate of GP services. This rate of consultation does not directly equate to trust, as evidenced by the fact that 30% of our sample expressed mistrust in healthcare professionals, particularly among German speakers and the highly educated, which led to increased CAM use. Trust did not affect GP visits, but influenced the choice of CAM providers. Distrust in health authorities has pushed people towards CAM and away from GPs. Higher education increased CAM and natural remedy use regardless of trust, underlining the role of trust in

steering patients between mainstream and alternative healthcare (6).

While a preference for CAM can suggest some level of skepticism towards conventional treatments, it does not invariably imply a complete rejection of conventional healthcare. In many instances, individuals may choose CAM due to personal health beliefs, cultural influences, or as a complement to conventional medical treatments, rather than as an outright alternative. Individuals with higher education levels may exhibit a more cautious and informed approach to using certain medications, such as antibiotics, and may favor natural remedies not necessarily as a manifestation of mistrust but as part of a broader, “informed” healthcare strategy from their part.

Economic stability was a crucial determinant of trust in healthcare professionals in this study. Those with stable incomes expressed higher trust, aligning with the notion that personal financial well-being shapes perceptions of healthcare system reliability (36). Importantly, trust correlates not only with perceptions but also with better health outcomes (37). These findings underline the role of socioeconomic factors in healthcare disparities and trust, offering actionable insights into areas that require targeted intervention.

Contrary to the expectations, conventional demographics such as age and gender did not significantly impact trust levels, possibly due to the uniform quality of care in Italy’s National Health Service. Larger influences, such as healthcare policies or tools for measuring trust, may explain this (38). More nuanced sociocultural factors, such as education and language, affect trust (39). Linguistic diversity, notably among multilinguals, indicates uncertainty in trust and potentially signals communication barriers in healthcare (40). Higher education levels often lead to better-informed opinions and varied trust levels, highlighting the role of information access in shaping trust.

In South Tyrol (Alto Adige in Italian), a Region with German-speaking people as a majority and where there is a kind of autonomous regional government, healthcare policies allow to search for specialized services in Germany and Austria. This option may inadvertently influence trust, particularly among German-speaking residents who frequently use these foreign services. This suggests that linguistic factors can create disparities in trust in healthcare.

High trust in GPs and hospital specialists underscores their pivotal role in healthcare (41, 42). Most participants had consulted a GP in the past year, primarily for acute illnesses. While CAM providers

are consulted less often, they often address overall well-being or chronic conditions, indicating their role in holistic or long-term care (23, 43).

Education level was correlated with CAM consultation frequency and herbal remedy use, suggesting increased openness to alternative healthcare among the more educated (43). Linguistic background significantly influenced CAM consultations; Italian speaking people were less inclined towards CAM than their German or Ladin counterparts. Those distrusting the Ministry of Health notably favored CAM specialists. Trust varied across educational levels but was not significantly influenced by language. The data show that women tend to consult a more diverse range of healthcare providers, particularly in the CAM sector. This trend suggests that females may have unique health care needs and preferences that differ from males, possibly due to biological, psychological or social factors (23). In order to develop more effective gender-specific health strategies, it is essential to recognize these differences. Such strategies should take into account women’s different health-seeking behavior and ensure that health services, whether conventional or CAM, are tailored to their specific needs. This approach aims to provide more personalized healthcare and improve outcomes and patient satisfaction for females.

High trust levels correlate with frequent GP consultations, whereas lower trust is associated with CAM consultations and natural remedy use (44). Understanding trust factors in Italian and German communities is vital for aligning healthcare practices with evidence-based medicine in southern Tyrol. Higher education levels were correlated with increased use of natural remedies and self-help techniques, except for prayer. Linguistic groups displayed different preferences for these practices (23).

Among all the providers, GPs were rated as the most beneficial, followed by osteopaths and medical CAM specialists. Osteopathy and chiropractic pain are perceived as more manual and structural and require specialized training, unlike homeopathy and acupuncture, which are more holistically perceived and culturally rooted (45). Immediate relief from osteopathic or chiropractic treatments may explain their “tangible” benefit perception.

In light of WHO’s encouragement for integrative healthcare practices (46), it is recommended that South Tyrol’s CAM center seek to establish a collaborative relationship with conventional healthcare, especially with GPs. This integration should not be

unidirectional but rather a mutual effort, recognizing the need for open-mindedness and cooperation from both conventional healthcare providers and CAM practitioners. Tailoring treatments for South Tyrol's linguistic and cultural diversities are crucial. Cultural sensitivity training of CAM practitioners can improve the relationship with the patient. A synchronized approach incorporating empirical methods and community involvement will address South Tyrol's diverse needs.

Distrust in healthcare is correlated with more CAM consultations (23). Among German and Ladin speakers in South Tyrol, this trend does not extend to self-help or natural remedy. The impact of educational level on CAM use was independent of trust. The drive towards CAM may stem from a desire for personalized care, which self-guided remedies do not offer. The skeptics of conventional healthcare may seek reassurance from CAM professionals, instead of self-management.

This study revealed that trust in South Tyrol's healthcare system is influenced by language, education, and income. The GPs were exceptionally trusted, with a 78% trust rating, indicating a focal point for enhancing overall trust. Lower trust in mainstream healthcare is linked to higher CAM use, which is influenced by linguistic and educational factors. This suggests that CAM could serve as an alternative to conventional healthcare.

In South Tyrol, efforts to increase trust in conventional healthcare should not only target healthcare professionals, who are instrumental in creating patient's trust, but also address the complex healthcare preferences of the better educated. While this group tends to have higher levels of trust in the healthcare system, their increased inclination towards CAM providers suggests a desire for diverse healthcare options. Healthcare strategies should therefore aim to build trust in conventional medicine while recognizing and accommodating the educated group's preference for CAM. The GP-patient relationship is crucial and should be reinforced through clear and understandable communication. The unique linguistic landscape of South Tyrol, especially the needs of Italian and German speakers, should be prioritized in these communication strategies. A specific subset of the population, mainly consisting of females, multilinguals, and those with lower education or non-Italian ethnicity, has an information gap. Targeted outreach and communication programs can bridge this gap effectively. Investment in strengthening the GP-patient relationship is further justified by the high consultation rates within this segment.

## Limitations

This study has some limitations, including its focus on South Tyrol's unique sociocultural dynamics, which may not be generalizable to other regions. There is ambiguity in responses like "I don't know" when questioned about trust's complicate interpretation. The study only looked at consultations with CAM specialists, natural remedies, and self-help practices, without a comprehensive CAM-Use score. Additionally, the study relied on older research, potentially making the findings less relevant to the current healthcare landscape (38).

## Conclusions

In South Tyrol, trust in healthcare is influenced by education, language, and nationality. GPs are the primary trust figures, but there has been a shift towards CAM, especially among specific language groups and the educated. Addressing language barriers and strengthening GP relationships could improve public healthcare outcomes.

Strengthening the relationship between GPs and patients is crucial, with a particular emphasis on linguistic compatibility to cater to South Tyrol's diverse language groups. Specialized communication and outreach programs should be developed to target vulnerable subgroups such as females, multilingual individuals, and those with lower education levels. To bridge the existing trust gap, it is advisable to better integrate complementary and alternative medicine services with conventional healthcare, especially since German and Ladin speakers in South Tyrol are more inclined to consult CAM providers. Finally, enhancing social support mechanisms that focus on economic stability could significantly boost trust in healthcare given the correlation between financial security and better health outcomes.

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## CRedit authorship contribution statement

Verena Barbieri: Conceptualization, methodology, data curation, data analysis, writing, and editing of the manuscript. Stefano Lombardo: Conceptualization, methodology, data curation, and data analysis. Adolf Engl: Supervision and editing of the manuscript. Giuliano Piccoliori: Edited manuscript. Timon Gärtner: Supervision and editing of the manuscript. Christian J. Wiedermann: Conceptualization, writing, and editing of the manuscript.

## Declaration of Competing Interest

None.

## Riassunto

### *Fiducia nella Sanità Tradizionale e Utilizzo della Medicina Complementare ed Alternativa in Alto Adige, Italia: Un'Indagine Trasversale su Base di Popolazione*

**Premessa.** Questo studio ha esplorato il legame tra la fiducia nei servizi sanitari e le consulenze con fornitori di medicina complementare e alternativa in Alto Adige, regione d'Italia di lingua diversa (tedesco).

**Metodi.** Un'indagine trasversale rappresentativa su 1.388 adulti altoatesini ha valutato la loro fiducia nei servizi sanitari, le frequenze di consultazione con medici di medicina generale e con i fornitori di medicine complementari ed alternative ed i determinanti di questi comportamenti, utilizzando test del chi quadrato e le correlazioni di Kendall-Tau-b.

**Risultati.** Il 70% dei partecipanti ha fiducia nel sistema sanitario, con i Medici di medicina generale come professionisti più fidati. La fiducia è correlata con un più alto livello di istruzione e con la compatibilità linguistica. Un sottogruppo del 5%, prevalentemente donne e multilingue con livelli di istruzione inferiori, ha mostrato una fiducia incerta. Oltre l'80% ha consultato un Medico di Medicina Generale nell'ultimo anno, mentre la sfiducia era correlata con le consultazioni con i fornitori di medicine complementari ed alternative. I parlanti tedesco e ladino con livelli di istruzione più elevati erano particolarmente inclini verso le medicine complementari ed alternative.

**Conclusioni.** La fiducia nei servizi sanitari altoatesini variava secondo l'istruzione e la lingua. Benchè i Medici di Medicina Generale rimangono centrali, si nota un marcato spostamento verso le medicine complementari ed alternative in gruppi specifici.

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