VIA MEDICA

Original article

NOWOTWORY Journal of Oncology
2021, volume 71, number 6, 357–372
DOI: 10.5603/NJO.a2021.0068

ISSN 0029–540X, e-ISSN: 2300-2115
www.nowotwory.edu.pl

The scope of complementary and alternative medicine in Poland

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Introduction. Complementary and alternative medicine (CAM) is widely used by patients. The most frequent CAM users are patients with cancer, but patients with other chronic diseases also utilize these methods.

Materials and methods. Data on the use of CAM were obtained from Google searches. For each specific search term, the first three Google pages were analyzed.

Results. The analysis included 91 CAM institutions matching the inclusion criteria. The most common anticancer services were intravenous vitamin C infusion, saltwater, intravenous infusion of glutathione, colon irrigation, an anticancer diet, bio-resonance, and intravenous ozone infusions. The most common non-cancer entities treated were rheumatic diseases, chronic fatigue syndrome, arterial hypertension, allergies, borreliosis, diabetes, atherosclerosis, and depression. Anticancer therapies were more expensive than those used for non-malignant diseases (medians 250 PLN and 170 PLN, respectively; $p = 0.041$).

Conclusions. This study provides a comprehensive overview of CAM methods used in Poland. These data may facilitate social education and the development of preventive measures.

Key words: complementary medicine, alternative medicine, cancer, chronic diseases

Introduction

Complementary and alternative medicine (CAM) includes complementary medicine, which claims to reinforce standard medical treatments, and alternative medicine, which refers to methods intended to replace standard medical treatments. CAM methods are widely used all over the world [1]. The most frequent CAM users are cancer patients, but patients with other chronic diseases (e.g., type 2 diabetes, arterial hypertension, depression, obesity, chronic pain, and allergies) also practice these methods [2–6]. Despite its potential harmful effects and the lack of evidence-based benefits, the usage of CAM has significantly increased in recent years [7]. In Western countries, up to 40–90% of cancer patients admit to using CAM methods, and consistent growth has also been observed among patients with other chronic diseases [8]. Recent reports show that more than 70% of United States inhabitants have used CAM at least once in their lives [9]. In 2007, the total annual expenditure on CAM services in the United States was 34 billion USD – a 25% increase compared to 1997 [10]. In 2016, the reported yearly out-of-pocket spending on CAM services in the United States reached 58.5 billion USD [11, 12].

How to cite:
Perdyan A, Wasiukiewicz M, Szastok P, Jassem J. ***The scope of complementary and alternative medicine in Poland.*** *NOWOTWORY J Oncol* 2021; 71: 357–372.

Meta-analyses and systematic reviews assessing the efficacy of CAM provide conflicting results [13]. Due to their low-quality methodology, most CAM studies do not allow for meaningful conclusions [14]. CAM phase III clinical trials are less likely than non-CAM clinical trials to report disease-related outcomes, be supported by pre-trial results, and meet their endpoints [15]. Notably, the anticancer treatment mechanisms of CAM methods are often attributed to a single, specific pathophysiological effect rather than multiple regulatory pathways or influences on different effectors. CAM compounds may also have several active components whose effects may be cell-determined or epigenetically determined. Consequently, CAM methods are largely scientifically unproven. Even though some preclinical studies and preliminary clinical studies have postulated anticancer effects, the clinical relevance of these findings is highly questionable [16].

Data on types of CAM methods and their applications are scarce. The purpose of this study was to assess the scope of CAM practices offered to patients in Poland, with a particular focus on anticancer therapies.

Material and methods

In August 2020, we performed an Internet search using the Google Search web facility. The first three pages of search results were analyzed for each of the following search terms: "cancer treatment", "alternative medicine", "complementary medicine", "intravenous vitamin infusions in cancer treatment", "vitamin C in cancer treatment", "bioresonance therapy in cancer treatment", "whole-body hyperthermia in cancer treatment", "hyperthermia in cancer treatment", "saltwater in cancer treatment" and "colon irrigation in cancer treatment." Method specific search queries were selected based on their frequent use in CAM institutions found by general search terms. We only included articles that provided an institution with contact information given on its website, a list of methods used, and indications for their use.

All institutions were categorized as follows, according to the CAM methods used:

- anticancer therapies,
- supportive cancer therapies,
- anticancer and supportive cancer therapies,
- therapies for non-malignant diseases.

This subdivision into categories was performed independently by three individuals (AP, PS, and MW), and the final group assignment was based on their collective opinion. Additionally, all services were divided into those using drug substances (any substances that were ingested or injected into the body) or those using other methods. The following data were abstracted from website pages and included in the Excel database: name of the institution, city, type of institution, voivodeship, city population, contact information, website page, diseases treated, methods used, methods used for the treatment of cancer and other diseases, number of physicians employed and their medical specializations, type of service, service fees, and reference to E-published literature. Institutions without information about fees of CAM services available on the website (n = 30) were contacted by phone. For institutions that provided ranges of fees for consultations and procedures, the mean values were calculated. Institutions that set their consultation and procedure fees individually were not included in the analysis. A non-parametric (Mann-Whitney U) test for independent variables was used to compare treatment and consultation fees.

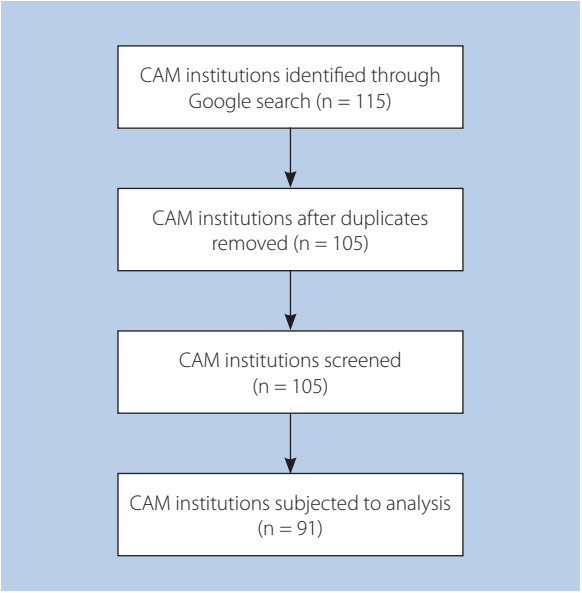

Figure 1. Flow chart of the inclusion of CAM institutions

Table I. Clinical entities treated in all CAM institutions (n = 91)

Disease	n	%
cancer	52	57%
anticancer therapy	37	41%
supportive cancer therapy	42	46%
rheumatic diseases	53	58%
chronic fatigue syndrome	51	56%
arterial hypertension	45	50%
allergies	45	49%
borreliosis	44	48%
atherosclerosis	43	47%
diabetes	43	47%
depression	42	46%
chronic infections	42	46%
migraine	40	44%
pain from various origins	39	43%
obesity	39	43%
hepatic diseases	37	41%
atopic dermatitis, psoriasis	36	40%

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Table I. cont. Clinical entities treated in all CAM institutions (n = 91)

Disease	n	%
asthma	35	39%
addictions	33	36%
immunity deficiency	31	34%
acne	31	34%
ulcerative colitis, Crohn disease	31	34%
candidiasis	30	33%
heavy metals or mushroom intoxication	30	33%
neurological disorders	29	32%
oxidative stress	29	32%
parasitic diseases	26	29%
hangover	25	28%
coronary artery disease	23	25%
multiple sclerosis	22	24%
autoimmune diseases	22	24%
bedsores, burns, ulcers	22	24%
ischemic stroke	21	23%
impotence	20	22%
cardiovascular diseases	19	21%
irritable bowel syndrome	19	21%
heart diseases	18	20%
gastric and duodenal ulcers	18	20%
Alzheimer's disease	16	18%
myocardial infarction	16	18%
pneumonia, bronchitis	15	17%
thyroid diseases	14	15%
chronic inflammation of the urethra and prostate	14	15%
intermittent claudication	13	14%
gout	13	14%
Parkinson's disease	13	14%
osteoporosis	12	13%
Hashimoto's disease	12	13%
sciatica	12	13%
chronic gastritis	11	12%
eye diseases	11	12%
pancreatic function disorders	11	12%
fibromyalgia	10	11%
thromboembolism	10	11%
autism	9	10%
endocrine disorders	9	10%
kidney diseases	9	10%
digestive system diseases	9	10%
herpes	8	8.8%
anemia	8	8.8%
tinnitus	8	8.8%
varicose veins	8	8.8%
food intolerances	7	7.7%
cataract	7	7.7%
viral hepatitis	7	7.7%
paralysis	6	6.6%
heart arrhythmia	6	6.6%
hemorrhoids	6	6.6%
colon dysfunction	6	6.6%
respiratory system diseases	6	6.6%
other	5	5.5%
deafness, hearing loss	5	5.5%
infertility	5	5.5%
inflammation of women reproductive organs	5	5.5%
chickenpox	4	4.4%
sterility	4	4.4%
human immunodeficiency virus infection/ acquired immune deficiency HIV/AIDS	4	4.4%
cerebral palsy	4	4.4%
chronic diseases	4	4.4%
neuropathies	3	3.3%
bedwetting	3	3.3%
bile ducts and gall bladder inflammation	3	3.3%
posture defects	2	2.2%
heart defects	2	2.2%
endometriosis	2	2.2%
cellulite, stretch marks, scars	2	2.2%
neuritis	2	2.2%
schizophrenia	2	2.2%
viral diseases	2	2.2%
sepsis	2	2.2%
chronic obstructive pulmonary disease	2	2.2%
attention deficit hyperactivity disorder	2	2.2%
acute and chronic inflammation of reproductive organs	2	2.2%
all diseases (bioresonance therapy)	2	2.2%
stupor	1	1.1%
anorexia	1	1.1%
bulimia	1	1.1%
blindness	1	1.1%
infectious myocarditis	1	1.1%
tooth decay	1	1.1%
hair loss	1	1.1%
seasickness	1	1.1%

Table I. cont. Clinical entities treated in all CAM institutions (n = 91)

Disease	n	%
tetanus	1	1.1%
retinopathy	1	1.1%
acidosis	1	1.1%
post-infection paralysis	1	1.1%
absorption disorders	1	1.1%
Huntington's disease	1	1.1%
age-related macular degeneration	1	1.1%
hypercholesterolemia	1	1.1%
polycystic ovary syndrome	1	1.1%
Down's syndrome	1	1.1%
shingles	1	1.1%
fungal sepsis	1	1.1%

Results

The screening identified a total of 115 institutions providing CAM services, 91 of which met the study's inclusion criteria and were further analyzed (fig. 1). 91% of CAM institutions were located in cities inhabited by over 100,000 people. Of the 109 entities treated, the most common were rheumatic diseases (58%), cancer (57%), chronic fatigue syndrome (56%), arterial hypertension (50%), allergies (49%), borreliosis (48%), type 2 diabetes (47%), atherosclerosis (47%), depression (46%), and chronic infections (46%) – table I. There were 61 and 73 institutions offering drug- and non-drug-based methods, respectively. A total of 70 methods were offered (18 drug-

Table II. Practices used across all CAM institutions (n = 91)

Method	n	%
vitamin C intravenous infusion	47	52%
bioresonance	44	48%
vitamin intravenous infusion (other than vitamin C)	42	46%
ozone therapy – autotransfusion	32	35%
intravenous infusion of alpha-lipoic acid	24	26%
diet	19	21%
colon irrigation	19	21%
herbal medicine	13	14%
intravenous infusion of glutathione	13	14%
acupuncture	10	11%
massage	10	11%
ear candling	10	11%
chelation	9	10%
hyperthermia	7	7.7%
oxygen therapy	6	6.6%
medicinal leeches	6	6.6%
homeopathy	5	5.5%
iridology	5	5.5%
reflexology	5	5.5%
laser therapy	5	5.5%
energy medicine, chakra therapy	5	5.5%
quantum therapy	4	4.4%
ion detox – feet soaking in saltwater	4	4.4%
electrotherapy	4	4.4%
bubbles	3	3.3%
magnetotherapy	3	3.3%
hyperbaric chamber	3	3.3%
plasmotherapy – Rife's generator	3	3.3%
hypnosis	2	2.2%
psychotherapy	2	2.2%
reiki	2	2.2%
moxibustion	2	2.2%
electromagnetic waves	2	2.2%
naturopathy	2	2.2%
matrix regenerating therapy	2	2.2%
coenzyme Q10 intravenous infusion	2	2.2%
essential oils	1	1.1%
physical therapy	1	1.1%
ganotherapy	1	1.1%
cryotherapy	1	1.1%
aromatherapy	1	1.1%
clairvoyance	1	1.1%
su jok	1	1.1%
collagen water	1	1.1%
choline intravenous infusion	1	1.1%
curcumin	1	1.1%
immunotherapy (*thymostimulinum*)	1	1.1%
dimethyl sulfoxide	1	1.1%
peptide therapy	1	1.1%
artesunate	1	1.1%
oligonucleotide therapy	1	1.1%
dowsing	1	1.1%
acupressure	1	1.1%
taping	1	1.1%
bipolar bioresonance therapy	1	1.1%
revolutionary scanning regulatory thermography	1	1.1%
viofor magnetic field therapy	1	1.1%
kangen water	1	1.1%
aloes and propolis	1	1.1%
mistletoe	1	1.1%
vibroacoustic therapy	1	1.1%
hippotherapy (horse therapy)	1	1.1%

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Table II. cont. Practices used across all CAM institutions (n = 91)

Method	n	%
Zenni's electrostimulation	1	1.1%
geopathic test	1	1.1%
Bach's therapy	1	1.1%
Schumann's platform	1	1.1%

Method	n	%
bioelectronics – beta examination	1	1.1%
fotostimulation	1	1.1%
biofeedback	1	1.1%
gemmotherapy	1	1.1%

and 52 non-drug-based), the most common of which were intravenous vitamin C infusion (IVCI; 11.5%) and bioresonance (10.7%) – table II; supplementary tables I–XI. The mean number of methods used per individual CAM institution was 4.6 (range: 1–15), and the mean number of diseases or groups of diseases treated per individual CAM institution was 18.5 (range: 1–51). 41% of institutions offered anticancer treatment; 46% offered supportive cancer treatment; 32% offered anticancer and cancer-supportive treatment; and 42% offered non-cancer treatment. Drug-based and non-drug-based methods to treat cancer were used by 73% and 78% (p = 0.52) of institutions, respectively. Anticancer therapy was used by 72% of institutions offering drug-based methods and 64% of institutions offering non-drug-based methods (p = 0.33). Oxidative stress and hangover after alcohol use were more frequently treated with drug-based methods than with non-drug-based methods (46% *vs.* 26%; p = 0.02 and 41% *vs.* 15%; p < 0.01, respectively), whereas the opposite was true for addiction (23% *vs.* 43%; p = 0.02), sciatica (3.3% *vs.* 16%; p = 0.01), allergies (38% *vs.* 59%; p = 0.01), and parasitic diseases (18% *vs.* 36%; p = 0.02) – supplementary table XII. The number of anticancer or supportive cancer therapies provided by particular institutions varied between 1 and 13, with 48% of institutions providing only 1 method (tab. III). The most common anticancer therapy was IVCI (19%), followed by intravenous infusion of glutathione and intravenous infusions of ozone (6.0% each), colon irrigation and an anticancer diet (5.3% each), and bioresonance therapy (4.6%) – table IV. Only 35% of institutions reported the names (93 total) and specialties (36 total) of their employed physicians. There were no significant differences between cancer- and non-cancer-treating institutions regarding the employment of physicians (37% *vs.* 25%, p = 0.27) or the frequency of drug-

Table III. Number of cancer services offered by CAM institutions

Number of cancer services	Number of institutions	All institutions (n = 91)	Institutions providing cancer services (n = 52)
1	25	28%	48%
2	6	6.6%	12%
3	6	6.6%	12%
4	1	1.1%	1.9%
5	6	6.6%	12%
6	3	3.3%	5.8%
7	3	3.3%	5.8%
9	1	1.1%	1.9%
13	1	1.1%	1.9%

Table IV. Services offered by CAM institutions for cancer patients

Service	n = 52	%	Median fee per procedure (PLN)*
vitamin C intravenous infusion	28	19%	225
ozone therapy – autohemotransfusion	9	6.0%	173
infusion intravenous glutathione	9	6.0%	190
colon irrigation	8	5.3%	180
diet	8	5.3%	–
bioresonance	7	4.6%	243
ozone salt intravenous infusion	7	4.6%	175
whole-body hyperthermia	6	4.0%	1450

Service	n = 52	%	Median fee per procedure (PLN)*
alpha-lipoic acid intravenous infusion	6	4.0%	188
local hyperthermia	5	3.3%	550
superficial ozone therapy	5	3.3%	150
hyperbaric chamber	3	2.0%	170
vitamin B complex intravenous infusion	3	2.0%	235
bioenergotherapy	3	2.0%	–
aromatherapy	2	1.3%	–

→

Table IV. cont. Services offered by CAM institutions for cancer patients

Service	n = 52	%	Median fee per procedure (PLN)*
cryotherapy	2	1.3%	–
folic acid intravenous infusion	2	1.3%	–
ozone inhalation	2	1.3%	–
vitamin B_{17} intravenous infusion	2	1.3%	–
oxygen therapy	2	1.3%	430
ozone therapy – nonspecific	2	1.3%	–
microbeam radiation therapy	2	1.3%	–
coenzyme Q10 intravenous infusion	2	1.3%	75
gonotherapy	1	0.7%	–
reiki	1	0.7%	–
reflexology	1	0.7%	–
vitamin intravenous infusions	1	0.7%	–
magnesium intravenous infusion	1	0.7%	–
choline	1	0.7%	–
cobalamin intravenous infusion	1	0.7%	–
vitamin A intravenous infusion	1	0.7%	–
vitamin D intravenous infusion	1	0.7%	–
curcumin	1	0.7%	–
chelation	1	0.7%	160
peptide therapy	1	0.7%	475
artesunate	1	0.7%	–
oligonucleotide therapy	1	0.7%	–
intravenous infusion of unknown composition	1	0.7%	–
feet reflexology	1	0.7%	100
head and neck reflexology	1	0.7%	100
kangen water	1	0.7%	–
mistletoe therapy	1	0.7%	–
herbal medicine	1	0.7%	–
vibroacoustic therapy	1	0.7%	–
plasmotherapy (Rifle's generator)	1	0.7%	–
larvae therapy	1	0.7%	350
rectal ozone therapy	1	0.7%	–
bioelectronics	1	0.7%	–
Zapper's biofeedback	1	0.7%	305

*1PLN ≈ 0.22 EUR

Table V. Medical specialties of physicians working in CAM institutions

Medical specialty (n = 84)	n	%
general surgery	10	12%
internal medicine	10	12%
family medicine	6	7%
cardiology	5	6%
radiology	4	5%
oncological surgery	3	4%
gynecology	3	4%
plastic surgery	3	4%
dermatology	3	4%
orthopaedics	3	4%
neurology	3	4%
ophthalmology	2	2%
pediatrics	2	2%
oncology	2	2%
esthetic medicine	2	2%
homeopathy	2	2%
emergency medicine	2	2%
urology	2	2%
vascular surgery	1	1%
palliative medicine	1	1%
nuclear medicine	1	1%
infectious diseases	1	1%
osteopathy	1	1%
phlebology	1	1%
anesthesiology and intensive care	1	1%
hyperbaric medicine	1	1%
rheumatology	1	1%
andrology	1	1%
proctology	1	1%
Chinese medicine	1	1%
oncological radiotherapy	1	1%
environmental engineering	1	1%
geriatrics	1	1%
psychiatry	1	1%
endocrinology	1	1%

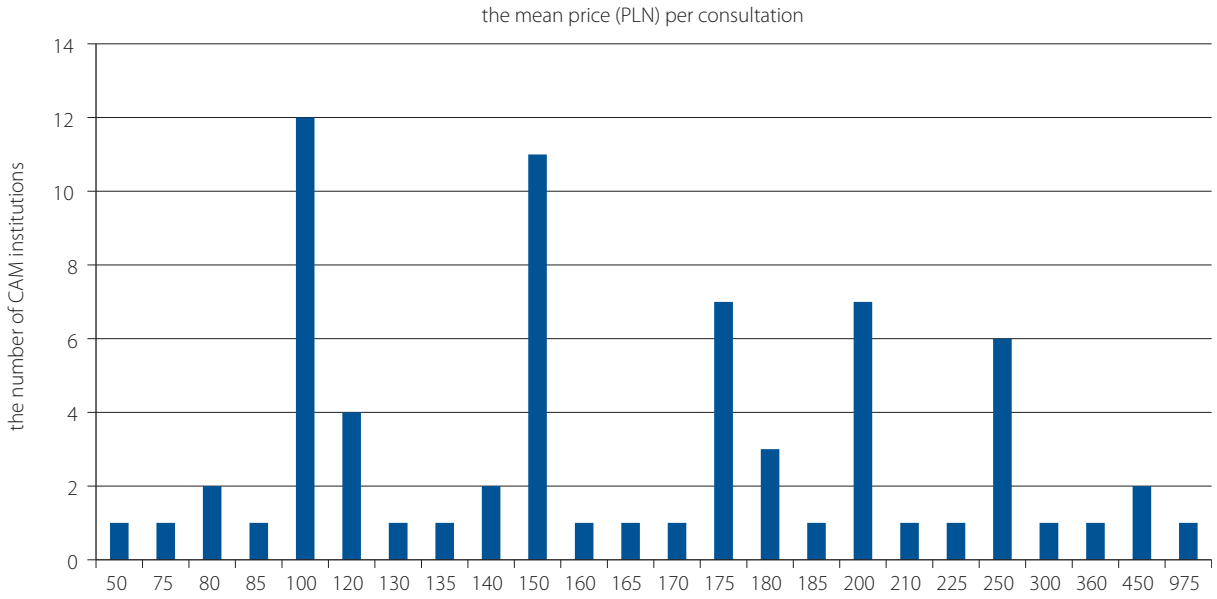

Figure 2. The mean price (PLN) per consultation in CAM institutions (n = 70)

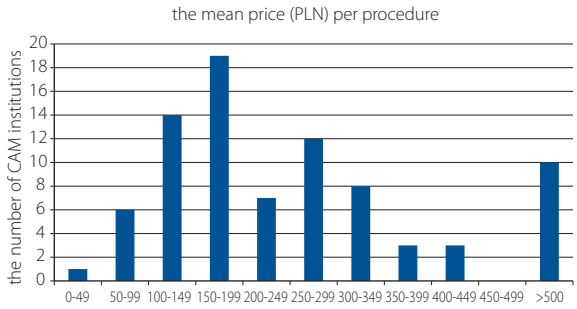

Figure 3. The mean price (PLN) per procedure in CAM institutions (n = 83)

-based and non-drug-based therapies (38% *vs.* 32%, p = 0.45). The most common physician specialties were general surgery, internal medicine, family medicine, cardiology, and radiology (tab. V). The fees for consultations and procedures were provided by 77% and 90% of institutions, respectively. The mean prices for consultations and procedures were 179.43 PLN (standard deviation 122 PLN) and 313 PLN (standard deviation 312 PLN), respectively (fig. 2 and 3). The median fees for cancer and non-cancer consultations were 150 PLN each (ranges: 50–975 PLN and 75–450 PLN, respectively; p = 0.95), whereas the median fee for anticancer therapies was higher than that for non-anticancer therapies (medians: 250 PLN and 170 PLN, respectively, p = 0.041; ranges: 90–1235 PLN and 45–1625 PLN, respectively). Only 15% of CAM institutions provided references to published articles when recommending particular services.

Discussion

To the best of our knowledge, this is the first study to investigate the scope of CAM in Poland. Our analysis demonstrated a wide variety of methods for treating cancer and other chronic diseases. Both the number of methods (18 drug-based and 52 non-drug-based) and the number of treated entities (109) identified in our study are impressive. The vast majority of CAM institutions in Poland are located in large cities, making them easily accessible. Since there is no public funding for CAM services in Poland, all institutions subjected to this analysis were private.

The legal status of CAM in Poland is unregulated, and data on its prevalence are scarce. In the Public Opinion Research Center survey in 2011, 24% of people admitted that they or a close family member had used the CAM Public Opinion Research Center 2011 [17].

The popularity of CAM among cancer patients in Poland may have several reasons. One of them is the poor general assessment of public cancer care. A study conducted in 2011 on a representative sample of 1000 Poles revealed that only 18% of responders believed that the available cancer treatment in Poland was of a standard comparable to that of other EU countries [18]. The use of CAM may also result from anxiety and a lack of emotional and psychological support during treatment. Patients often feel alone in coping with the psychological impact of a cancer diagnosis. As opposed to conventional treatment, they view CAM as an effective, safe, and holistic approach. Furthermore, many patients view conventional medicine as an aggressive and isolated treatment (cancer disease similarly to depression in Poland is often stigmatized. In result patients end up alone with the disease) and are afraid of its toxicity [19]. Hence, despite a lack of evidence, alternative methods are frequently used in line to supplement standard treatment to increase overall efficacy and alleviate side effects. Interestingly, until recently, there was a relatively high level of CAM acceptance among Polish physicians. In a survey undertaken in 2008, 42% of physicians working in oncology departments had recommended at least one CAM method to their patients [20]. However, a more recent study

showed a higher level of skepticism about the value of CAM, particularly among junior physicians [21].

The primary target of CAM is malignant diseases. A global survey of 61 studies indicated that the prevalence of CAM usage among cancer patients in the second decade of the 21st century varied from 16.5% to 93% (mean 51%) [22]. Cancer patients demonstrate an increased desire to use CAM, primarily due to their motivation to alleviate treatment--related side effects, boost immunity, and cure the disease [14, 22, 23]. In our study, 41% of CAM institutions offered anticancer treatment, 46% provided supportive cancer treatment, and 32% offered both anticancer and supportive cancer treatment. The high proportion of institutions providing cancer services in this study may bedue to Internet search criteria focused on cancer treatment. In contrast, other CAM--managed diseases were identified unintentionally and may be underreported.

The most common CAM service across all diseases (offered by more than half of institutions) was IVCI. This method was popular among cancer patients. A recent Polish study indicated that the most frequent indications for IVCI therapy were its perceived effectiveness in acting as a potent anticancer agent, enhancing the chemosensitivity of cancer cells, and reducing the intensity of chemotherapy-related toxicities [24]. The widespread use of this method may also be attributed to its ease of access, efficient marketing, as well as common belief that vitamins are generally safe and non-toxic. Other relatively common methods used by cancer patients were saltwater, intravenous infusions of glutathione, colon irrigation, diet, and bioresonance. The most frequent methods used for non-cancer chronic diseases, depending on the diagnosis, included saltwater, bioresonance, IVCI, intravenous infusions of alpha-lipoic acid, intravenous infusion of vitamins other than vitamin C, and colon irrigation.

Several demographic predictors associated with CAM usage were previously identified, (e.g., young age/female sex, higher education, higher income, and history of CAM use). However, since the incidences of cancer and other chronic diseases increase with age, older populations are also frequent CAM users [22, 23].

To the best of our knowledge, our study is the first to analyze the costs of CAM services in Poland. The money spent on CAM services often deplete patients' finances; this is especially true for the elderly. The median costs per consultation and procedure were 150 PLN (33 EUR) and 175–245 PLN (39–54 EUR), respectively, which constitute 7.7% and 16% of the national average and retirement pension in Poland, respectively [25, 26]. Notably, most CAM treatments involve repeat visits, which significantly increases the cost of the service. In 2007, the costs of nutrition-based CAM for the top five causes of cancer-related death in the US per month ranged from 4.33 USD to 263 USD (median 27 USD) [27]. CAM-related expenses for cancer patients vary significantly across the world (e.g., Europe, US, Australia, New Zealand, Turkey), from 4 EUR up to 123 EUR per month [28].

In our study, only 35% of institutions reported the names and specialties of employed doctors. This may be due to the lack of relevant scientific evidence proving the beneficial effects of their practices or fear of possible legal consequences of CAM practices. The most common medical specialties of CAM practitioners were general surgery and internal medicine. Only 15% of CAM institutions supported their services with specific references to published articles on their websites, and these articles were often of low quality or reported only preclinical data.

Our study aimed to assess the general scope of the CAM phenomenon in Poland, including the methods and diseases managed by CAM, physicians' involvement in these practices, and the related costs. We recognize that this study has several limitations. Firstly, our analysis was based on an Internet search, which is not fully representative, as some CAM providers may not advertise their services. Secondly, we used a few specific search queries which could misrepresent the prevalence of certain methods. Thirdly, our study provides only a snapshot of the CAM market in Poland. This may likely be a subject with considerable fluctuation (e.g., related to the current COVID-19 pandemic). Due to its design, our study did not address factors associated with patients' willingness to use CAM in Poland and did not attempt to perform a profound and quantitative analysis of the topic or its social, demographic, or psychological background. We also did not measure patients' preferences or their level of satisfaction related to CAM usage. Finally, we did not address the clinical value of particular CAM methods, as this was beyond the scope of our investigation.

Conclusions

Our study confirms the popularity of CAM in Poland and demonstrates the astonishing number of treated entities and the various CAM practices available to Polish patients. For the first time, we have also provided the cost of these services. These data may prompt future analyses of the medical and economic aspects of this phenomenon. Patients often conceal CAM use from their physicians. Health care professionals should discuss possible CAM use with every patient. It should be an open and nonjudgmental conversation so as to gain trust and encourage patients to share their experiences on CAM use. Patients should be counseled and redirected to evidence-based treatment options and life-style changes which are effective and will not interfere with conventional medicine. Oncologists, but also other medical specialists, should be aware of these recommendations, especially since the widespread use of CAM is prevalent among patients suffering from other chronic diseases.

Acknowledgements

The study was conducted under the patronage of the Polish Cancer League.

We thank Agastya Patel for proofreading this article.

Conflict of interest: none declared

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Received: 16 Aug 2021
Accepted: 2 Nov 2021

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Supplementary table I. Practices used in the treatment of rheumatic diseases

Method	n	%
ozone therapy	21	21%
bioresonance	20	20%
vitamin C intravenous infusion	15	15%
systemic hyperthermia	6	6.1%
colon irrigation	5	5.1%
alpha-lipoic acid intravenous infusion	4	4.1%
hyperbaric chamber	3	3.1%
acupuncture	3	3.1%
vitamin intravenous infusion (other than vitamin C)	2	2.0%
intravenous infusion of glutathione	2	2.0%
medical leeches	2	2.0%
electromagnetic waves	2	2.0%
energy therapy	1	1.0%
diet	1	1.0%
reflexology	1	1.0%
chelation	1	1.0%
vibroacoustic therapy	1	1.0%
matrix regenerating therapy	1	1.0%
physiotherapy	1	1.0%
moxibustion	1	1.0%
massage	1	1.0%
viofor magnetic field therapy	1	1.0%
naturopathy	1	1.0%
ion detox – feet soaking in saltwater	1	1.0%
biofeedback	1	1.0%

Supplementary table II. Methods used in the treatment of chronic fatigue syndrome

Method	n	%
ozone therapy	14	23%
bioresonance	9	15%
vitamin intravenous infusion (other than vitamin C)	8	13%
intravenous infusion of glutathione	6	10%
colon irrigation	6	10%
alpha-lipoic acid intravenous infusion	3	5.0%
moxibustion	3	5.0%
systemic hyperthermia	2	3.3%
electromagnetic waves	2	3.3%
vitamin C intravenous infusion	1	1.7%
diet	1	1.7%
oxygen therapy	1	1.7%
herbal medicine	1	1.7%
biofeedback	1	1.7%
naturopathy	1	1.7%
ion detox – feet soaking in saltwater	1	1.7%

Supplementary table III. Methods used in the treatment of diabetes

Method	n	%
ozone therapy	21	24%
alpha-lipoic acid intravenous infusion	17	20%
vitamin C intravenous infusion	11	13%
bioresonance	11	13%
intravenous infusion of coenzyme Q10	5	5.8%
hyperbaric chamber	3	3.5%
chelation	3	3.5%
systemic hyperthermia	2	2.3%
vitamin intravenous infusion (other than vitamin C)	2	2.3%
oxygen therapy	2	2.3%
intravenous infusion of glutathione	1	1.2%
vibroacoustic therapy	1	1.2%
medical leeches	1	1.2%
physiotherapy	1	1.2%
fotostimulation	1	1.2%
massage	1	1.2%
viofor magnetic field therapy	1	1.2%
naturotherapy	1	1.2%
electromagnetic waves	1	1.2%

Supplementary table IV. Methods used in the treatment of allergies

Method	n	%
bioresonance	24	38%
ozone therapy	12	19%
vitamin C intravenous infusion	6	9.5%
colon irrigation	6	9.5%
vitamin intravenous infusion (other than vitamin C)	2	3.2%
matrix regenerating therapy	2	3.2%
systemic hyperthermia	1	1.6%
reflexology	1	1.6%
chelation	1	1.6%
oxygen therapy	1	1.6%
kangen water	1	1.6%
herbal medicine	1	1.6%
medical leeches	1	1.6%
biofeedback	1	1.6%
naturopathy	1	1.6%
ion detox – feet soaking in saltwater	1	1.6%
electromagnetic waves	1	1.6%

Supplementary table V. Methods used in the treatment of borreliosis

Method	n	%
bioresonance	25	29%
ozone therapy	21	25%
vitamin C intravenous infusion	11	13%
systemic hyperthermia	4	4.7%
vitamin intravenous infusion (other than vitamin C)	4	4.7%
herbal medicine	4	4.7%
diet	3	3.5%
hyperbaric chamber	3	3.5%
alpha-lipoic acid intravenous infusion	2	2.4%
intravenous infusion of glutathione	1	1.2%
homeopathy	1	1.2%
physiotherapy	1	1.2%
fotostimulation	1	1.2%
massage	1	1.2%
viofor magnetic field therapy	1	1.2%
naturopathy	1	1.2%
electromagnetic waves	1	1.2%

Supplementary table VI. Methods used in the treatment of arterial hypertension

Method	n	%
vitamin C intravenous infusion	13	19%
ozone therapy	10	15%
colon irrigation	6	8.8%
bioresonance	4	5.9%
alpha-lipoic acid intravenous infusion	4	5.9%
systemic hyperthermia	3	4.4%
vitamin intravenous infusion (other than vitamin C)	3	4.4%
hyperbaric chamber	3	4.4%
medical leeches	3	4.4%
intravenous infusion of coenzyme Q10	3	4.4%
acupuncture	3	4.4%
chelation	2	2.9%
reflexology	1	1.5%
herbal medicine	1	1.5%
vibroacoustic therapy	1	1.5%
biofeedback	1	1.5%
hypnosis	1	1.5%
physiotherapy	1	1.5%
fotostimulation	1	1.5%
massage	1	1.5%
viofor magnetic field therapy	1	1.5%
naturopathy	1	1.5%
electromagnetic waves	1	1.5%

Supplementary table VII. Methods used in the treatment of depression

Method	n	%
bioresonance	16	23%
vitamin C intravenous infusion	10	15%
vitamin intravenous infusions (other than vitamin C)	7	10%
colon irrigation	7	10%
hyperbaric chamber	4	5.8%
diet	2	2.9%
ozone therapy	2	2.9%
alpha-lipoic acid intravenous infusion	2	2.9%
matrix regenerating therapy	2	2.9%
homeopathy	2	2.9%
electromagnetic waves	2	2.9%
systemic hyperthermia	1	1.4%
energy medicine	1	1.4%
reflexology	1	1.4%
intravenous infusion of glutathione	1	1.4%
chelation	1	1.4%
oxygen therapy	1	1.4%
medical leeches	1	1.4%
acupuncture	1	1.4%
hypnosis	1	1.4%
physiotherapy	1	1.4%
moxibustion	1	1.4%
massage	1	1.4%
naturopathy	1	1.4%

Supplementary table VIII. Methods used in the treatment of chronic infections

Method	n	%
vitamin C intravenous infusion	16	21%
bioresonance	16	21%
ozone therapy	15	19%
colon irrigation	7	9.0%
alpha-lipoic acid intravenous infusion	5	6.4%
intravenous infusion of glutathione	4	5.1%
vitamin intravenous infusion (other than vitamin C)	3	3.8%
oxygen therapy	2	2.6%
systemic hyperthermia	1	1.3%
diet	1	1.3%
reflexology	1	1.3%
herbal medicine	1	1.3%
matrix regenerating therapy	1	1.3%
intravenous infusion of coenzyme Q10	1	1.3%
acupuncture	1	1.3%
naturopathy	1	1.3%
ion detox – feet soaking in saltwater	1	1.3%
electromagnetic waves	1	1.3%

Supplementary table IX. Methods used in the treatment of atherosclerosis

Method	n	%
ozone therapy	17	22%
vitamin C	13	17%
alpha-lipoic acid intravenous infusion	11	14%
chelation	8	10%
bioresonance	6	7.8%
hyperbaric chamber	3	3.9%
intravenous infusion of glutathione	3	3.9%
colon irrigation	3	3.9%
intravenous infusion of coenzyme Q10	3	3.9%
medical leeches	2	2.6%
electromagnetic waves	2	2.6%
vitamin intravenous infusions (other than vitamin C)	2	2.6%
systemic hyperthermia	1	1.3%
oxygen therapy	1	1.3%
dimethyl sulfoxide	1	1.3%
naturopathy	1	1.3%

Supplementary table X. Diseases treated by intravenous vitamin C infusion

Diseases	n	%
anticancer therapy	28	11%
chronic infections	24	9.5%
supportive cancer therapy	18	7.1%
oxidative stress	18	7.1%
arterial hypertension	15	5.9%
heart diseases	14	5.5%
rheumatic diseases	13	5.1%
chronic fatigue syndrome	10	4.0%
diabetes	9	3.6%
immunity deficiency	9	3.6%
allergies	7	2.8%
borreliosis	6	2.4%
depression	6	2.4%
candidiasis	6	2.4%
atherosclerosis	5	2.0%
parasitic diseases	5	2.0%
viral hepatitis	5	2.0%
cardiovascular diseases	5	2.0%
pain from various origins	4	1.6%
cataract	4	1.6%
heavy metals or mushroom intoxication	4	1.6%
myocardial infarction	4	1.6%
heart arrhythmia	4	1.6%
chronic diseases	4	1.6%
asthma	3	1.2%
atopic dermatitis, psoriasis	3	1.2%
hepatic diseases	2	0.8%
multiple sclerosis	2	0.8%
autoimmune diseases	2	0.8%
viral diseases	2	0.8%
Alzheimer's disease	2	0.8%
intermittent claudication	1	0.4%
migraine	1	0.4%
osteoporosis	1	0.4%
neuropathies	1	0.4%
sciatica	1	0.4%
impotence	1	0.4%
ulcerative colitis, Crohn disease	1	0.4%
thyroid diseases	1	0.4%
Parkinson's disease	1	0.4%
absorption disorders	1	0.4%

Supplementary table XI. Diseases treated by bioresonance

Diseases	n	%
allergies	25	6.9%
borreliosis	22	6.0%
addiction treatment	22	6.0%
pain from various origins	21	5.8%
chronic infections	21	5.8%
candidiasis	20	5.5%
parasitic diseases	15	4.1%
rheumatic diseases	13	3.6%
depression	12	3.3%
obesity	12	3.3%
migraine	11	3.0%
heavy metals or mushroom intoxication	11	3.0%
chronic fatigue syndrome	9	2.5%
diabetes	8	2.2%
asthma	7	1.9%
immunity deficiency	7	1.9%
ulcerative colitis, Crohn disease	7	1.9%
atopic dermatitis, psoriasis	7	1.9%
autoimmune diseases	6	1.6%
neurological disorders	6	1.6%
arterial hypertension	5	1.4%
hormonal diseases	5	1.4%
hepatic diseases	4	1.1%
sciatica	4	1.1%
multiple sclerosis	4	1.1%
gastric and duodenal ulcers	4	1.1%
anticancer therapy	4	1.1%
chronic diseases	4	1.1%
atherosclerosis	3	0.8%

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Supplementary table XI. cont. Diseases treated by bioresonance Services offered by CAM institutions for cancer patients

Diseases	n	%
osteoporosis	3	0.8%
ischemic stroke	3	0.8%
chronic inflammation of the urethra and prostate	3	0.8%
thyroid diseases	3	0.8%
cardiovascular diseases	3	0.8%
other (everything)	3	0.8%
supportive cancer therapy	3	0.8%
intermittent claudication	2	0.5%
acne	2	0.5%
irritable bowel syndrome	2	0.5%
infertility	2	0.5%
heart diseases	2	0.5%
eye diseases	2	0.5%
pancreatic function disorders	2	0.5%
bedsores, burns, ulcers	2	0.5%
viral hepatitis	2	0.5%
digestive system diseases	2	0.5%
viral diseases	2	0.5%
chronic obstructive pulmonary disease	2	0.5%

Diseases	n	%
attention deficit hyperactivity disorder	2	0.5%
coronary artery disease	1	0.3%
neuropathies	1	0.3%
chronic gastritis	1	0.3%
herpetic lesions	1	0.3%
anemia	1	0.3%
pneumonia, bronchitis	1	0.3%
autism	1	0.3%
chickenpox, shingles	1	0.3%
myocardial infarction	1	0.3%
thromboembolism	1	0.3%
kidney diseases	1	0.3%
Parkinson's disease	1	0.3%
absorption disorders	1	0.3%
inflammation of the reproductive organs	1	0.3%
hemorrhoids	1	0.3%
infertility	1	0.3%
respiratory system diseases	1	0.3%
bile ducts and gall bladder inflammation	1	0.3%

Supplementary table XII. Frequency of drug-based and non-drug based methods in the treatment of non-cancer diseases

		Drug-based (n = 61)		Non-drug based (n = 73)		z-test	
	n	n	%	n	%	statistic	p
rheumatic diseases	53	37	61%	47	64%	0.444	0.6599
chronic fatigue syndrome	51	39	64%	42	58%	0.755	0.4533
arterial hypertension	45	33	54%	38	52%	0.236	0.8103
allergies	45	23	38%	43	59%	2.444	0.0147
borreliosis	44	28	46%	43	59%	1.502	0.1336
diabetes	43	35	57%	35	48%	1.089	0.2757
atherosclerosis	43	35	57%	37	51%	0.774	0.4413
depression	42	29	48%	37	51%	0.363	0.7188
chronic infections	42	27	44%	36	49%	0.584	0.5619
migraine	40	25	41%	37	51%	1.122	0.2627
obesity	39	24	39%	34	47%	0.841	0.4009
pain from various origins	39	23	38%	37	51%	1.505	0.1336
hepatic diseases	37	28	46%	30	41%	0.559	0.5755
atopic dermatitis, psoriasis	36	25	41%	33	45%	0.491	0.6214
asthma	35	24	39%	30	41%	0.206	0.8337
addiction	33	14	23%	31	43%	2.382	0.0173
acne	31	25	41%	26	36%	0.637	0.5222
immunity deficiency	31	17	28%	28	38%	1.28	0.2005
ulcerative colitis, Crohn disease	31	22	36%	28	38%	0.273	0.7872
candidiasis	30	15	25%	29	40%	1.858	0.0629
heavy metals or mushroom intoxication	30	21	34%	25	34%	0.022	0.984

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Supplementary table XII. cont. Frequency of drug-based and non-drug based methods in the treatment of non-cancer diseases

		Drug-based (n = 61)		Non-drug based (n = 73)		z-test	
	n	n	%	n	%	statistic	p
oxidative stress	29	28	46%	19	26%	2.401	0.0164
neurological disorders	29	18	30%	29	40%	1.234	0.2187
parasitic diseases	26	11	18%	26	36%	2.267	0.0232
hangover	25	25	41%	11	15%	3.37	0.0008
coronary artery disease	23	19	31%	19	26%	0.655	0.5157
multiple sclerosis	22	18	30%	20	27%	0.27	0.7872
autoimmune diseases	22	17	28%	19	26%	0.24	0.8103
bedsores, burns, ulcers	22	15	25%	20	27%	0.368	0.7114
ischemic stroke	21	18	30%	19	26%	0.449	0.6527
impotence	20	16	26%	16	22%	0.583	0.5619
irritable bowel syndrome	19	8	13%	17	23%	1.505	0.131
cardiovascular diseases	19	13	21%	17	23%	0.273	0.7872
heart diseases	18	15	25%	14	19%	0.758	0.4473
gastric and duodenal ulcers	18	10	16%	17	23%	0.991	0.3222
Alzheimer's disease	16	15	25%	13	18%	0.962	0.3371
myocardial infarction	16	15	25%	12	16%	1.172	0.242
pneumonia, bronchitis	15	10	16%	15	21%	0.615	0.5419
chronic inflammation of the urethra and prostate	14	8	13%	14	19%	0.944	0.3472
thyroid diseases	14	9	15%	12	16%	0.267	0.7872
intermittent claudication	13	8	13%	10	14%	0.099	0.9203
gout	13	11	18%	13	18%	0.034	0.9761
Parkinson's disease	13	12	20%	12	16%	0.486	0.6241
osteoporosis	12	12	20%	9	12%	1.165	0.246
Hashimoto's disease	12	10	16%	11	15%	0.21	0.8337
sciatica	12	2	3.3%	12	16%	2.48	0.0131
chronic gastritis	11	6	9.8%	11	15%	0.906	0.3628
eye diseases	11	4	6.6%	11	15%	1.556	0.1188
pancreatic function disorders	11	8	13%	10	14%	0.099	0.9203
fibromyalgia	10	9	15%	9	12%	0.41	0.6818
thromboembolism	10	7	12%	9	12%	0.152	0.8808
autism	9	7	12%	8	11%	0.094	0.9283
endocrine disorders	9	3	4.9%	8	11%	1.269	0.2041
kidney diseases	9	6	9.8%	8	11%	0.212	0.8337
digestive system diseases	9	5	8.2%	9	12%	0.779	0.4354
herpes	8	5	8.2%	8	11%	0.538	0.5892
anemia	8	6	9.8%	7	9.6%	1.427	0.1527
varicose veins	8	5	8.2%	8	11%	0.538	0.5892
food intolerances	7	5	8.2%	7	9.6%	0.281	0.7795
cataract	7	7	12%	6	8.2%	0.634	0.5287
tinnitus	7	7	12%	6	8.2%	0.634	0.5287
viral hepatitis	7	5	8.2%	7	9.6%	0.281	0.7795
paralysis	6	1	1.6%	6	8.2%	1.705	0.0891

Supplementary table XII. cont. Frequency of drug-based and non-drug based methods in the treatment of non-cancer diseases

		Drug-based (n = 61)		Non-drug based (n = 73)		z-test	
	n	n	%	n	%	statistic	p
heart arrhythmia	6	5	8.2%	4	5.5%	0.626	0.5287
hemorrhoids	6	3	4.9%	6	8.2%	0.76	0.4473
colon dysfunction	6	1	1.6%	6	8.2%	1.705	0.0891
respiratory system diseases	6	4	6.6%	6	8.2%	0.365	0.7188
deafness, hearing loss	5	5	8.2%	5	6.0%	0.296	0.7642
inflammation of female reproductive organs	5	3	4.90%	5	6.8%	0.47	0.6384
infertility	5	2	3.3%	5	6.8%	0.925	0.3524
sterility	4	2	3.3%	3	4.1%	0.253	0.8026
chickenpox	4	2	3.3%	4	5.5%	0.613	0.5419
human immunodeficiency virus infection/ AIDS	4	3	4.9%	3	4.1%	0.225	0.8181
cerebral palsy	4	4	6.6%	4	5.5%	0.262	0.7949
chronic diseases	4	2	3.3%	3	4.1%	0.253	0.8026
neuropathies	3	2	3.3%	3	4.1%	0.253	0.8026
bedwetting	3	0	0.0%	3	4.1%	1.601	0.1096
bile ducts and gall bladder inflammation	3	2	3.3%	3	4.1%	0.253	0.8026
posture defects	2	1	1.6%	2	2.7%	0.429	0.6672
heart defects	2	1	1.6%	2	2.7%	0.429	0.6672
endometriosis	2	1	1.6%	2	2.7%	0.429	0.6672
cellulite, stretch marks, scars	2	2	3.3%	1	1.4%	0.744	0.4593
acute and chronic inflammation of reproductive organs	2	2	3.3%	2	2.7%	0.183	0.8572
neuritis	2	2	3.3%	1	1.4%	0.744	0.4593
schizophrenia	2	2	3.3%	1	1.4%	0.744	0.4593
viral diseases	2	2	3.3%	2	2.7%	0.183	0.8572
sepsis	2	1	1.6%	2	2.7%	0.429	0.6672
all diseases (bioresonance therapy)	2	1	1.6%	2	2.7%	0.429	0.6672
chronic obstructive pulmonary disease	2	1	1.6%	2	2.7%	0.429	0.6672
attention deficit hyperactivity disorder	2	0	0.0%	2	2.7%		
stupor	1	1	1.6%	0	0.0%	1.098	0.2713
anorexia	1	0	0.0%	1	1.4%	0.744	0.4593
bulimia	1	0	0.0%	1	1.4%	0.744	0.4593
blindness	1	0	0.0%	1	1.4%	0.744	0.4593
fungal sepsis	1	1	1.6%	1	1.4%	0.128	0.8966
infectious myocarditis	1	1	1.6%	1	1.4%	0.128	0.8966
tooth decay	1	1	1.6%	1	1.4%	0.128	0.8966
hair loss	1	1	1.6%	1	1.4%	0.128	0.8966
shingles	1	1	1.6%	0	0.0%	1.098	0.2713
seasickness	1	1	1.6%	0	0.0%	1.098	0.2713
tetanus	1	1	1.6%	0	0.0%	1.098	0.2713
retinopathy	1	1	1.6%	1	1.4%	0.128	0.8966
acidosis	1	1	1.6%	1	1.4%	0.128	0.8966
post-infection paralysis	1	1	1.6%	0	0.0%	1.098	0.2713

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Supplementary table XII. cont. Frequency of drug-based and non-drug based methods in the treatment of non-cancer diseases

		Drug-based (n = 61)		Non-drug based (n = 73)		z-test	
	n	n	%	n	%	statistic	p
absorption disorders	1	1	1.6%	1	1.4%	0.128	0.8966
Huntington's disease	1	1	1.6%	1	1.4%	0.128	0.8966
age-related macular degeneration	1	1	1.6%	1	1.4%	0.128	0.8966
hypercholesterolemia	1	1	1.6%	1	1.4%	0.128	0.8966
polycystic ovary syndrome	1	1	1.6%	1	1.4%	0.128	0.8966
Down's syndrome	1	0	0.0%	1	1.4%	0.744	0.4593