

ORIGINAL RESEARCH

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Use of complementary and alternative medicine in a pediatric population in southern Turkey

Abstract

Purpose: The use of complementary and alternative medicine (CAM) in children is becoming increasingly acceptable and popular. The aim of this questionnaire-based study was to determine the prevalence, patterns of use, types, perceived effectiveness and associated factors of CAM in children.

Methods: Parents of children (n= 268) who attended the Pediatric Outpatient Department of the Faculty of Medicine at Gaziantep University in June and July 2008 were asked to complete a questionnaire.

Results: The prevalence of CAM use, at least once in the previous year, was 58.6%. The most commonly used CAM modality was herbal preparations (82.7%), which were used to treat cough (42.0%), diarrhea (30.0%) and gas (colic) pains (34.4%). These products were recommended by the respondents' mother/mother-in-law (52.5%), neighbors (20.0%), friends (14.7%) and doctors (12.8%). Only 31.6% (61) of these parents informed their doctor about their use of CAM to treat their children. Thirty-eight percent (n=102) of the participants stated that they preferred to use CAM modalities rather than referring to a doctor when their child was sick. While most of the families (57.7 %) stated that the method they used was "slightly" useful, 18.6% of them stated the method to be "fairly" useful. The parental use of CAM and the educational level of the parents were among the factors of affecting the use of CAM in children. No correlation was found between the use of CAM and the sex, social security status, income level and other sociodemographic properties of the respondents.

Conclusion: This study showed that a great majority of parents of children in this population used CAM modalities and that herbal products were preferred. Most parents did not inform their physicians of their use of CAM. In the light of these findings, pediatricians should be prepared to discuss alternative therapies with parents, since talking about CAM may be helpful in minimizing associated risks.

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Complementary and alternative medicine (CAM) can be defined as any traditional, philosophical, spiritual or meditational approach adopted for therapeutic purposes and used alone or with a conventional medicine [1,2]. In recent years, interest in and publications concerning the use of CAM for a range of medical conditions has gradually increased. For many families and their children, CAM is an accepted alternative for conventional medical care, particularly in chronic, recurrent or incurable conditions, and the literature clearly shows that the use of such modalities is widespread [2-4]. The American Academy of Pediatrics (AAP) reports that 20-40% of healthy children and 50% of children with chronic diseases use CAM [5]. In recent years, CAM modalities have become increasingly attractive also in Turkey [4]. In Turkey, almost all previous CAM studies focused on cancer patients. There are very limited data on the use of CAM in healthy children and adults, or in patients other than cancer patients. CAM modalities present a wide range of practices, including use of herbs, vitamins, massage, acupuncture, homeopathy, naturopathy, aromatherapy and reflexology, and may be used in different ways and for different reasons [6-9]. Due to wide-range of CAM options, different definitions can be offered for CAM. Such different definitions as well as the chosen therapies may affect the reported prevalence of CAM use.

Although the natural products are generally harmless, the possibility of adverse reactions, insufficient quality control, contamination and interactions with conventional medications are often ignored. Also, missed diagnosis and delaying more effective treatments are indirect detrimental effects of CAM use [2, 10-12].

Health professionals are frequently asked questions about CAM; however, due to lack of information and experience, they are likely to respond to patients' inquiries negatively and to feel uncomfortable when discussing these treatments with their patients. Such tendency of the health professional underscores the fact that pediatricians should be aware of the necessity to establish an open and respectful relationship and a clear communication with families.

The aim of this questionnaire-based study was to determine the prevalence, patterns of use, types of therapies employed, perceived effectiveness, and other factors associated with the use of CAM for children in Southern Turkey.

Methods

Study sample was comprised of 268 children who attended the Pediatric Outpatient Department of the Faculty of Medicine, Gaziantep University in June and July 2008. The study was approved by the Local Ethical Committee. First, participants

were informed on the aim of the study and, then each parent was interviewed face-to-face by a pediatrician in the waiting room of the outpatient clinic. CAM was defined as "practices and ideas, which are outside the conventional treatment methods for preventing or treating illness, or promoting health". Parents were asked both open- and close-ended questions: the questionnaire consisted of three open-ended questions, 34 multiple-choice questions and 20 true/false statements. The questionnaire was prepared with the cooperation of two centers (Kirikkale University and Gaziantep University), based on a review of published subject-related data. A pilot study was carried out to test the comprehensibility of the questions [2, 13-16]. These data were then used to develop the final version of the questionnaire. Of note, no previous CAM study on children has provided data on the validity of their data collection tool.

The questionnaire used in the present study was divided into three parts: the first part was related to the sociodemographic characteristics of children and their parents (such as age, sex, marital status, educational background, economic statuses and health insurance status). The second part of the questionnaire addressed the parents' knowledge of CAM. The third part focused on the behaviors and approaches of parents towards CAM. In this third section of the questionnaire, parents were asked whether they had previously used any type of CAM for their children. Participants were then asked to explain the type of CAM they used for their child and the disease for which they used it. In addition, they were asked the source from which they received information on CAM therapies.

Statistical Analysis: All statistical data were analyzed using the Statistical Package for the Social Science Program, SPSS 11.0 for Windows (SPSS Inc., Chicago IL, USA). Continuous values were expressed in terms of mean $\pm$ standard deviation. Prevalence of use, CAM knowledge of parents and other outcomes were compared on the basis of demographic characteristics (such as sex, marital status, educational background, economic status, health insurance status) using chi-square tests; and continuous variables were tested with Student's t-test. Statistical significance was determined as $p < 0.05$.

Results

A total of 350 families were asked to fill in the questionnaire form; however, 82 families declined this request on the grounds that "they had no time to fill in the questionnaire form". Thus, a total of 268 parents (73.7%) were interviewed. Study parents were predominantly female (72.8%, $n = 195$). The age of the child of the participating families ranged from 1 month to 17 years (mean age 3.52 ± 3.70 years, median age 3

TABLE 1. Sociodemographic characteristics of the participants

Characteristics of participants	N (%)
Sex	
Female	195 (72.8%)
Male	73 (27.2%)
Marital Status	
Married, living with my spouse	257 (95.9%)
Married /divorced living apart	9 (3.4%)
My spouse passed away	2 (0.7%)
Educational background	
Illiterate	14 (5.2%)
Primary school	152 (56.7%)
High school	55 (20.5%)
University	47 (17.5%)
Employment Status	
Not working	182 (67.9%)
Retired	4 (1.5%)
Teacher	12 (4.5%)
Military personnel	4 (1.5%)
Health care personnel	15 (5.6%)
Other	51 (19.0%)
Financial Status	
We can easily meet our daily needs	50 (18.7%)
We can meet our daily needs	121 (45.1%)
We can meet only our vital needs	40 (14.9%)
We are unable to meet even our vital needs	57 (21.3%)
Health Insurance	
None	32 (11.9%)
Retirement fund	55 (20.5%)
Self-Employed Fund	18 (6.7%)
Social Insurance Institution	129 (48.1%)
Green Card*	34 (12.7%)

*The system established for the poor by the Turkish Ministry of Health

years). Mean age of mothers and fathers was calculated to be 31.25 ± 6.50 years (18-50 years) and 35.32 ± 6.83 years (23-50 years), respectively. The number of children per participating family ranged from 1 - 12 (mean 2.51 ± 1.55) and the total number of people per household ranged from 3 - 14 people (mean 4.60 ± 1.56 people). Other sociodemographic characteristics of the parents' are summarized in Table 1.

The percentage of the participants who considered natural products beneficial for health was 64.4% (n=172, CI 95%=58.44-69.92). Among all participants, 73.9% (n=198, CI 95%=68.62-79.14) had some opinion about possible adverse effects of herbal therapies. These adverse effects were listed as

gastric problems (55.5% (n=27, CI 95%=6.47-13.67), poisoning (22.2% (n=6, CI 95%=0.47-4.01) and disruption of body balance (22.2 % (n=6, CI 95%=0.47-4.01). Parents' CAM knowledge is summarized in Table 2.

When the usage patterns of participants who mentioned treatment methods as an alternative to medical drugs and advice (44%, n=119, CI 95%=38.45-50.35) were analyzed, it was found that the most frequently selected options were herbal therapy (82.7%, n=98, CI 95%=30.8-42.34), bone settling (8.9%, n=10, CI 95%=1.46-6) and massage therapy (3.8%, n=4, CI 95%=0.04-2.94). Parents who thought that natural products were beneficial for health were asked which natural products they were aware of. Their responses were as follows: linden (32.8% (n=58, CI 95%=16.71-26.57), green tea (17.9% (n=31, CI 95%=7.74-15.4), mint-lemon (12% (n=21, CI 95%=4.62-11.06), chamomile (7.2% (n=13, CI 95%=2.28-7.42) and stinging nettle (7.2% (n=13, CI 95%=2.28-7.42).

Seventy-two percent of the participants (n=193, CI 95%=66.63-77.39) acknowledged using natural/herbal products for themselves and 58.6% (n=157, CI 95%=52.68-64.48) for their children at least once in the previous year. These modalities were commonly used to treat coughing (42.0%, n=66, CI 95%=19.47-29.79) in children and were generally recommended by the participants' mother/mother-in-law (52.5%, n=82, CI 95%=25.08-36.12) (Table 3). Only 31.6% (n=61, CI 95%=17.74-27.78) of these parents had informed their doctor about their use of CAM, while 68.4% (n=207, CI 95%=72.22-82.26) had not informed their doctor.

Thirty-eight percent of the participants (n=102, CI 95%=32.25-43.87) stated that they had preferred the use of CAM rather than referring to a doctor when their child was sick. Among these individuals, religious therapy was most commonly used (65.7%, n=67, CI 95%=19.82-30.18), as shown in Table 4. When the families were asked which alternative methods they would use when their child had diarrhea, 47.0% (n=126, CI 95%=41.03-52.99) of the families stated they would feed the child with breast milk, 38.0% (n=102, CI 95%=32.25-43.87) with yoghurt, 25.4% (n=68, CI 95%=20.16-30.58) with fruit juice and 16.0% (n=43, CI 95%=11.65-20.43) with a mixture of Turkish coffee and lemon. In cases of a child's fall or trauma, 10.8% (n=29, CI 95%=7.1-14.54) of families would apply chewed bread or raw meat to the harmed area and 20.0% (n=54, CI 95%=15.35-24.95) would apply olive oil to the inflamed area.

Eighty-six percent (n=230, CI 95%=81.64-90) of families were recorded to use some kind of vitamin preparations in addition to vitamin D; 19.8% (n=53, CI 95%=15.01-24.55) to

TABLE 2. The personal knowledge level of the parents about CAM modalities

Opinions about alternative medicine	True		False	
	n (%)	CI 95%	n (%)	CI 95%
Herbal products are better than medical drugs for health	117 (43.7%)	37.72-49.6	151 (56.3%)	50.4-62.28
Supernatural power may affect human health	131 (48.9%)	42.9-54.86	137 (51.1%)	45.14-57.1
Colostrum is not suitable for newborns	43 (16.0%)	11.65-20.43	225 (84.0%)	79.57-88.35
Sand can be placed in diaper	14 (5.2%)	2.56-7.88	254 (94.8%)	92.12-97.44
Baby must be swaddled	96 (35.8%)	30.08-41.56	172 (64.2%)	58.44-69.92
Three calls to prayer after delivery is necessary for breast feeding	12 (4.5%)	2-6.96	256 (95.5%)	93.04-98
Evil eye causes abrupt cessation of breast milk	124 (46.3%)	40.3-52.24	144 (53.7%)	47.76-59.7

TABLE 3. Characteristics of the use of natural/herbal products as CAM

	Use of CAM status			
	For her/himself		For his/her child	
	n (%)	CI 95%	n (%)	CI 95%
Use of natural/herbal products at least once	193 (72.0%)	66.63-77.39	157 (58.6%)	52.68-64.48
These products are used for				
Coughing	70 (36.3%)	20.86-31.38	66 (42.03%)	19.47-29.79
Diarrhea	46 (23.9%)	12.65-21.67	47 (30.0%)	12.99-22.09
Constipation	44 (22.8%)	11.98-20.86	20 (12.7%)	4.31-10.61
Gas pain	38 (19.7%)	10-18.36	54 (34.4%)	15.35-24.95
Stomach ache	17 (8.8%)	3.42-9.26	31 (19.7%)	7.74-15.4
Hair and face care	15 (7.8%)	2.85-8.35	0 (0.0%)	
Weight loss	13 (6.7%)	2.28-7.42	0 (0.0%)	
Headache	10 (0.5%)	1.46-6	4 (2.5%)	0.04-2.94
Rash, pruritus	9 (4.7%)	1.2-5.52	10 (6.3%)	1.46-6
Fever	7 (3.6%)	0.7-4.52	18 (11.4%)	3.72-9.72
Uncomfortable sleep	4 (2.0%)	0.04-2.94	12 (7.6%)	2-6.96
Recommendation status				
Mother/Mother-in-law	83 (43.2%)	25.43-36.51	82 (52.5%)	25.08-36.12
Neighbor	40 (20.8%)	10.66-19.2	31 (20.0%)	7.74-15.4
Friend	48 (25.0%)	13.32-22.5	23 (14.7%)	5.23-11.93
Nurse	16 (8.3%)	3.13-8.81	7 (4.5%)	0.7-4.52
Doctor	19 (9.9%)	4.02-10.16	20 (12.8%)	4.31-10.61
Chemist	16 (8.3%)	3.13-8.81	9 (5.7%)	1.2-5.52
Newspaper/journal	11 (5.7%)	1.73-6.47	10 (6.4%)	1.46-6
TV/radio	16 (8.3%)	3.13-8.81	5 (3.20%)	0.25-3.49
Internet	16 (8.3%)	3.13-8.81	9 (5.7%)	1.2-5.52
Have you experienced benefits of the CAM you have used?				
No benefit	32 (16.7%)	8.06-15.82	23 (14.1%)	5.23-11.93
It has been slightly useful	112 (58.3%)	35.88-47.7	90 (57.7 %)	27.93-39.23
It has been fairly useful	33 (17.2%)	8.38-16.24	29 (18.6%)	7.1-14.54
I have just started	11 (5.7%)	1.73-6.47	8 (5.1%)	0.95-5.03
It has been harmful	4 (1.5%)	0.04-2.94	6 (3.8%)	0.47-4.01

TABLE 4. CAMs preferred to a doctor visit when child is sick (n=102)

	n (%)	CI 95%
Methods preferred to a doctor visit when child is sick		
Religious therapy	67 (65.7%)	19.82-30.18
Prayer of a religious man	50 (49.0%)	14-23.32
Amulet	11 (10.7%)	1.73-6.47
Tomb visit	6 (8.8%)	0.47-4.01
Melting lead	27 (26.5%)	6.47-13.67
Kohl for eyelids	8 (7.8%)	0.95-5.03
Bonesetter	9 (9.0%)	1.2-5.52
Have you experienced benefits of the CAM you have used?		
No benefit	29 (365.8%)	10.99-19.61
It has been slightly useful	50 (44.0%)	14-23.32
It has been fairly useful	17 (15.0%)	3.42-9.26
I have just started	3 (2.6%)	-0.14-2.38
It has been harmful	3 (2.6%)	-0.14-2.38

use a probiotic formula or yoghurt; and 11.6% (n=31, CI 95%=7.74-15.4) to use omega-3 fatty acids. Doctors (63.8%, 171, CI 95%=58.06-69.56), newspapers/journals (13.8%, 37, CI 95%=9.68-17.94) and friends (7.8%, 21, CI 95%=4.62-11.06) served as the main source of such knowledge.

The most common used CAM therapy was thermal spring (72.8%, 195, CI 95%=67.43-78.09). Only 6.3% of participants used color therapy (6.3%, 17, 95%=3.42-9.26). Colour therapy, or chromotherapy, involves the stimulation of brain structures via retinal receptors using light of varying wavelengths. Leech therapy (8.2%, 22, CI 95%=4.92-11.5) (*Hirudo medicinalis* application) was used as a traditional treatment modality. Of all the participants, 84.3% (n=226, CI 95%=79.98-88.68) had never used anti-aging products; however, 7.5 % (n=20, CI 95%=4.31-10.61) had taken vitamins (Table 5).

With regards to educational background; the highest proportion of the university-graduates gave positive answer to the question "Are there traditional alternatives to medical drugs in the treatment of diseases?" (illiterate: 7/14, 50.0%; primary school: 53/152, 34.9%; high school: 31/55, 56.4%; university: 28/47, 59.6%; χ^2 : 13.344, p= 0.004). Parents who admitted to have used CAM themselves were found to be more likely to use these modalities for their children (CAM users: 131/173, 75.7%; Non-users: 26/95, 27.4%; χ^2 : 59.095; p<0.001; OR: 8.277, 95% CI 95%: 4.684-14.628). Not surprisingly, participants who used CAM for their child had less knowledge about potential harmful effects of CAM in comparison with non-CAM users (CAM users: 107/157, 68.2%; non-users: 91/111,

82.0%; χ^2 : 6.444; p= 0.011, OR: 2.126; 95% CI 95%: 1.180-3.832).

Discussion

In recent years, there has been growing interest in the use of CAM modalities. This study shows that natural/herbal therapies were used (58.6%) in this pediatric population at least once in the previous year. Given the usage pattern of CAM therapies, herbal therapies were the most common used CAM modalities (82.7%). Findings of the present study are consistent with those of the AAP, which reported that 75% of adolescents using CAM preferred herbal products or other dietary supplements [5]. A study on 1230 pediatric subjects conducted in south-west England also revealed herbal tea as the most-preferred CAM modality (24%) [17]. Different studies on pediatric cancer patients in Turkey showed that herbal products were used by 71.4 - 90.7% of patients [14, 15]. A South Australian study reported that 33.5% of children received herbal products [6]. Lanski *et al.* reported that in the USA, herbal product use during childhood was 53% for a single product and 27% for more than three products [12]. According to recent World Health Organization (WHO) data, herbal product usage reached 60% in Nigeria, Ghana, Mali and Zambia.¹⁸ In the present study, the use of herbal products as one of the CAM modalities was very common. This may result from the fact that herbal combinations are a vital part of conventional Turkish medicine. For example, stinging nettle is found in most areas of Turkey and is commonly used in cancer treatment [14, 15]. CAM modalities used in different coun-

Table 5. Used/known CAM methods of the parents (n=268)

	n (%)	CI 95%
Widely-used modalities (known)		
Thermal spring	195 (72.8%)	67.43-78.09
Herbal tea	191 (71.3%)	65.85-76.69
Massage	92 (34.3%)	28.65-40.01
Acupuncture	77 (28.7%)	23.31-34.15
Yoga/meditation	56 (20.9%)	16.03-25.77
Hypnosis	37 (13.8%)	9.68-17.94
Aromatherapy	25 (9.3%)	5.85-12.81
Breath therapy	21 (7.8%)	4.62-11.06
Bioenergy	19 (7.1%)	4.02-10.16
Color therapy	17 (6.3%)	3.42-9.26
Traditional treatment methods		
To apply almond or olive oil to hair	156 (58.2%)	52.3-64.12
To drink herbal tea for weight loss	57 (21.2%)	16.37-26.17
To drink senna for constipation	53 (19.7%)	15.01-24.55
To drink stinging nettle tea	39 (14.5%)	10.33-18.77
To apply plaster/ cupping glass to body	38 (14.2%)	10-18.36
To drink milk with honey for stomach pain	29 (10.8%)	7.1-14.54
To drink herbal tea for dysmenorrhea	28 (10.4%)	6.79-14.11
Leech therapy	22 (8.2%)	4.92-11.5
To drink kephir for health	20 (7.4%)	4.31-10.61
Modalities for anti-aging		
Vitamin	20 (7.5%)	4.31-10.61
Linseed (flax seed)	13 (5.0%)	2.28-7.42
Grape seed	13 (5.0%)	2.28-7.42
Omega-3 fatty acids	9 (3.3%)	1.2-5.52
Zinc, magnesium, selenium	8 (3.0%)	0.95-5.03
Calcium	8 (3.0%)	0.95-5.03
Bee pollen	8 (3.0%)	0.95-5.03
Kephir	7 (2.6%)	0.7-4.52

tries may be partially explained by cultural habits as well as availability, low cost and the belief that “natural is safe”.

The present study showed that CAM modalities were common in this pediatric population, with nearly half of the respondents using CAM when their child was sick (38%). Several studies reported this rate to be in 18.4-49% range in healthy children [6, 7, 11]. The American Academy of Pediatrics reported that 20-40% of healthy children and 50% of children with chronic, recurrent or incurable diseases used CAM [5]. The pediatric population in this study group consisted of generally healthy children with no chronic disease; thus, our data are consistent with the literature results.

The most common indication for CAM in the present study population was coughing (42.0%), gas pain or infantile colic (34.4%), diarrhea (30.0%) and abdominal pain (19.7%). Common indications for CAM in the literature were listed as self-limited diseases like upper respiratory tract infections (50%) in a southwest England study [17], the common cold (31%) in an American study [12]; and for upper airway complaints (20%) and dermatologic problems (18%) in a south Australian study [6]. Pediatricians should take into consideration the possibility that CAM modalities may be applied in children presenting with these complaints. Therefore, health care professionals must be aware of the effectiveness, dosages,

side-effects, toxicities and potential drug interactions of CAM modalities.

Vitamin use in children is reported to vary between 13% and 24% [7, 16]. Ball *et al.* reported that vitamin use in children with a chronic disease (such as leukemia, asthma, cystic fibrosis, seizure disorder) varied between 42-100% [19]. In the present study, this rate was found to be 86%. This high rate of vitamin use was attributed to the fact that vitamins are sold without prescription in Turkey and families can buy them freely from pharmacies.

Social, cultural, and religious beliefs may play significant roles in the choice and use of CAM modalities. Studies have suggested that spiritual healing has limited adverse effects, does not interact with conventional therapies, reduces stress, raise the spirit of the family and strengthens the immune system [14, 20]. Several studies have reported that two-thirds of families pray for their children [8, 21]. Loman reported praying to be a CAM modality in 47% of subjects [7]. In previous studies made in Turkey, Gözümlü *et al.* and Karadeniz *et al.* reported the use of spiritual healing to be 18.9% and 40.8%, respectively, among children with cancer [14, 15]. According to the AAP, 73% of Americans accept praying as a CAM modality [5]. In this study, 65.7% of individuals that preferred CAM to having their child see a doctor, used religious therapy, consistent with rates reported in the literature.

The present study identified several therapies that are not reported in previous literature studies. These include remedies such as mixing Turkish coffee with lemon for diarrhea, placing chewed bread or raw meat on painful areas following a fall/trauma, and applying olive oil on burns of the child. These are traditional and folkloric methods that are also commonly used in southern Turkey. Due to geographical, cultural and historical differences, the family structure of southeastern Turkey is more traditional than other parts of Turkey and thus traditional folkloric treatments continue, albeit at a low rate.

While acupuncture, homeopathy, naturopathy, aromatherapy, reflexology [7-9] are the most common CAM methods used and reported in the literature, the most common method in Turkey was found to be "a visit to a thermal spring". This results from the fact that Turkey has many thermal springs which are used commonly by people.

A study made by Gözümlü *et al.* on a pediatric oncology population revealed that most parents using CAM methods for their child learning of these methods from friends and relatives (79.1%) or other children's parents (14.0%) [14]. In this study, CAM was recommended by a family member (52.5%), neighbors (20.0%), friends (14.7%) and mass media (15.4%), whereas recommendation by doctors was less common

(12.8%). This result can be attributed to limited CAM knowledge and experience of doctors and to doctors' feeling of discomfort in discussing these methods with their patients. Similarly, Lanski reported that in the USA 80% of families obtained information about CAM mostly from friends and relatives [12]. A study undertaken in South Korea showed that family members and other relatives served as the main source of information for 66% of patients [16]. Shakeel reported that in the UK, friends and family were the main source of information for 68% of families, compared with 36% who consulted healthcare staff and 26% who consulted mass media [22]. Thus, relatives, friends and neighbors were the most common information sources for CAM modalities.

Shin reported that 24% of study participants experienced some negative effects of CAM therapies [16]. The low reporting rate of side effects in the present study was attributed to the use of prayer rather than herbal products as the most commonly used CAM method in children.

The majority of parents in this study (68.4%) had not informed their children's doctor about the use of CAM for their children's ailments. In similar studies, Lanski *et al.* [12] reported that 55% of families in the USA and Gözümlü *et al.* [14] reported that 72.1% of families (in eastern Turkey) did not inform their doctors about the use of herbal therapies. A study from Nigeria reported that none of the families of children with chronic conditions (such as epilepsy, asthma, sickle cell anemia) informed their doctors about CAM use, although 85% of the families considered sharing this information with their doctor, but they were not asked about CAM use [23]. It is probable that parents do not mention about CAM use to health care providers because of fear of possible negative feedback. Therefore, doctors are advised to encourage parents to discuss with them the use of CAM for their children. This is particularly important as many people are unaware of interactions between CAM modalities and other medications; therefore, health professionals can promote patient safety by informing their patients about potential dangers.

The present study showed that belief in alternative therapeutic approaches increased in parallel with educational background. Use of natural or herbal products for children was a more common practice among parents who used these products for themselves in comparison with those who did not use such products themselves. Higher level of maternal education and familial CAM applications were two factors effecting the use of CAM for the child [24]. Shakel *et al.* also reported more frequent use of CAM in families with higher educational level [22]. Similarly, Hurvitz *et al.* reported that CAM usage among children with cerebral palsy was more prevalent when the

mother was a college graduate [25]. Higher-educated parents have greater exposure to numerous sources of information and families who have previously used CAM would have more information and less prejudice against alternative therapies.

This study has some limitations. The sample group of the present study reflects only one region of Turkey. Therefore, findings of the study are limited to this population and cannot be generalized to whole Turkish and European pediatric populations. The study is also limited as the sample may be biased toward those families that apply to conventional (modern) health care since the study data were collected in the waiting rooms of pediatric offices. Moreover, adolescents may desire not to share information about their use of different products and thus their parents' reports may not accurately reflect their behavior. These findings indicate the importance of further research on these therapies with larger populations; therefore, future studies should be made on the patients from a more diverse geographic region.

Conclusions

The study showed that a great majority of parents in this population used CAM therapies and herbal products. Most parents did not inform their physicians about their use of CAM. The parental use of CAM and educational level of the parents were among the factors of affecting the use of CAM in children. Study findings highlighted the importance of realization by doctors of the fact that that CAM modalities are widely used by parents and that they should also consider that these products can cause adverse effects. Doctors should also determine which CAM modality their patients use and provide evidence-based information on the efficacy and side effects of CAM to both patients and their families. Therefore pediatricians should discuss alternative therapies with parents, since talking about CAM may help to minimize potential risks and to restrain parental misconceptions and doubts.

Further studies should analyze the medical practice, effectiveness, safety and side effects of frequently preferred CAM therapies.

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