Complementary Therapies in Clinical Practice 30 (2018) 103–108

Contents lists available at ScienceDirect

Complementary Therapies in Clinical Practice

journal homepage: www.elsevier.com/locate/ctcp

Prevalence and pattern of usage of complementary and alternative medicine among south Indian asthma patients in a tertiary care hospital

Sabarathinam Sarvesh [a], Mathivanan Koushik Muthu Raja [b], Muhasaparur Ganesan Rajanandh [a, *], Palanichamy Seenivasan [a]

[a] Department of Pharmacy Practice, Faculty of Pharmacy, Sri Ramachandra Medical College and Research Institute, Deemed to be University, Porur, Chennai 600 116, Tamil Nadu, India
[b] Department of Chest and TB, Sri Ramachandra Medical College and Research Institute, Deemed to be University, Porur, Chennai 600 116, Tamil Nadu, India

ARTICLE INFO

Article history:
Received 6 November 2017
Received in revised form
14 December 2017
Accepted 16 December 2017

Keywords:
Asthma
Complementary and alternative medicine
Herbal medicine
Breathing
Yoga
Fish

ABSTRACT

Objectives: The study aimed to investigate the prevalence of CAM users among asthmatic patients in a tertiary care South Indian hospital.
Methods: Prospective, cross sectional study was conducted in 394 asthmatic patients.
Results: 30.4% of the patients used CAM therapies. The most commonly used CAM treatment was herbal medicine followed by pranayama (controlled breathing exercises). Most of the CAM users were found to be in lower middle class. The baseline characteristics of the CAM users and the non CAM users were found to be similar except for education and socioeconomic status ($p < .008$). Among the CAM users, none of the patients disclosed about their CAM treatment to their pulmonologists.
Conclusion: Patients must be educated about CAM therapies and they must be advised to discuss all their treatment related issues with treating clinicians. Healthcare professionals should be familiar with the merits and demerits of using CAM therapy so that they could provide proper guidance to their patients.
© 2017 Elsevier Ltd. All rights reserved.

1. Introduction

Asthma is a chronic inflammatory disease of the airways. It is characterized by recurrent attacks of breathlessness, chest tightness and wheezing. Asthma is a highly prevalent disease across the world. Latest reports have clearly stated that the prevalence of asthma has increased in many countries in recent decades [1,2].

Pharmacotherapy management of asthma is based on the administration of controller medication such as inhaled or oral corticosteroids, long acting beta agonists, leukotriene modifiers, sustained release theophylline, mast cell stabilizers, immunoglobulin E blockers and other antibiotics for the prevention and management of the disease condition. Reliever medications such as short acting beta agonists and anticholinergics are used to manage the acute exacerbations [3,4].

Majority of the patients fear to use corticosteroids as long term use of it can lead to many side effects such as osteoporosis and stunting of growth in the case of children [5]. Although the above mentioned allopathic medicines provide quick relief to most patients, preventive treatment of asthma is much cost effective and thus nearly 80% of the Indian asthmatics use alternative therapies for the management of their disease condition [6].

Complementary and alternative medicines (CAM) are generally not part of the usual standard medical care. Complementary medicine means the usage of medicines along with the conventional medicines and alternative medicine means the usage of medicines as a substitute for conventional medicine [7]. Though the CAM therapy is widely used, its efficacy from well-designed clinical trials are still limited. Not only the lack of evidence, but also the possibilities of toxicities and potential drug-drug or drug-food interactions in patients using CAM are of big concern among the health care providers [8].

The pattern and prevalence of CAM usage varies to a large extent among people with different cultural practices especially in a

* Corresponding author.
E-mail address: rajanandh.mg@sriramachandra.edu.in (M.G. Rajanandh).

https://doi.org/10.1016/j.ctcp.2017.12.016
1744-3881/© 2017 Elsevier Ltd. All rights reserved.

country like India which has huge culturally diversities. Hence it is important to explore such patterns across various hospital settings. There are many reasons behind the usage of CAM therapy. Many have supported the use of CAM and few have reported adverse effects [9–13]. In the present study, the authors aimed (i) To develop and validate a CAM questionnaire which can be applied to a hospital setting. (ii) To estimate the prevalence of CAM usage among asthmatic patients, (iii) To understand the pattern of CAM usage.

2. Patients and methods

2.1. Study design and criteria

A prospective, cross-sectional study was conducted at the department of Pulmonology in Sri Ramachandra Medical Center (SRMC), Sri Ramachandra University, Chennai, Tamilnadu. Patients who were not less than 18 years of age, both genders, were clinically diagnosed with any type of asthma for more than 3 months were included in the study. Patients with any co-morbidities were excluded. The purpose of the study was explained using patient information brochure and oral informed assent was obtained from the study participants.

2.2. Development of CAM questionnaire

The content of the questionnaire was developed by the research team on this project. After review of literature, the research team decided to include 8 relevant questions to assess the patients' perspectives about CAM usage. The items of the CAM questionnaire was reviewed by a panel of external and internal experts, namely pulmonologists, psychologist, public health experts and clinical pharmacologist. Experts were asked to comment on the lucidity and comprehensiveness of the items. The instrument with the content valid items were converted into a question format (Annexure 1).

2.3. Sample size

The sample size was calculated by using the following formula, where expected prevalence (p) is 0.28, precision (d) is 0.1 and Z-value is 1.96.

$$n = \frac{(Z^2(1-\frac{\alpha}{2})*p(1-p))}{d^2}$$

The calculated sample size was 128.

2.4. Study procedure

Each patient received a questionnaire including information on demographic variables of the patients, such as patients' age, gender, domicile, education, occupation and family monthly income, etc. Socioeconomic class of the patients were calculated with reference to Kuppusamy Socioeconomic classification. The patient's asthma severity was classified as intermittent, mild persistent, moderate persistent and severe persistent, according to the Global Initiative for Asthma (GINA) guidelines. A detailed CAM questionnaire was given to ascertain whether the patient used CAM therapy anytime in his/her life for the treatment of asthma symptoms. Types and details of the CAM therapy used were recorded.

2.5. Statistical analysis

The collected data were analyzed using Statistical Package for the Social Sciences (SPSS), version 16.0, USA. Baseline characteristics were expressed as descriptive statistics. Frequency of CAM usage was expressed as percentages. The influence of age, gender, socioeconomic status, educational status, occupation and the disease conditions in the usage of CAM was assessed using chi square test. *p*-value of less than 0.05 was considered statistically significant.

3. Results

The time required to complete the CAM questionnaire was measured in a subset of participants, and the mean measured runtime was about 9 min (9.0 ± 2.0). The median visit interval between the test and re-test was 10 days. The test-retest reliability was 0.86 which showed a high reliability. With a Cronbach's alpha values of 0.84, all the items had acceptable to excellent consistency. The content validity ratio was 0.76.

A total of 394 persistent asthmatic patients were interviewed. The baseline characteristics of the patients are summarized in Table 1. Most of the CAM users were male (59.1%) and above 51 years of old (47.7%). The majority of the CAM users was residing in rural (62.5%) and in lower middle class (35.8%) in this study.

CAM therapy was used by 30.4% of the patients. Table 2 depicts the data on usage of CAM among the study patients. The most commonly used CAM was herbal medicine (33.3%) in the present study. Tulasi leaves, ginger, mustard oil, honey soaked figs, carom

Table 1
Socio-demographic details of study patients.[a]

Variables	CAM users		Non CAM users	
	N	%	N	%
Gender				
Male	71	59.1	159	58.1
Female	49	40.8	115	41.9
Age in years				
18–21	11	9.1	32	11.8
22–31	18	15	48	17.7
32–41	23	19.1	54	19.7
42–51	11	9.1	46	16.6
>51	57	47.7	94	34.2
Domicile				
Rural	75	62.5	163	59.6
Urban	45	37.5	111	40.4
Educational background				
Profession or Honors	16	13.6	54	19.7
Graduate or postgraduate	11	9.1.	22	8.2
Intermediate or post	20	16.6	74	27
High school diploma				
High school certificate	23	19.1	29	10.6
Middle school certificate	09	7.5	21	7.6
Primary school certificate	12	10	26	9.4
Illiterate	29	24.1	48	17.5
Occupation				
Profession	21	17.5	63	22.9
Semi profession	13	10.8	23	8.3
Clerk/Shop-owner	10	8.3	65	23.7
Skilled worker	11	9.1	22	8
Semi-skilled worker	14	11.6	19	6.9
Unskilled worker	16	13.6	24	8.7
Unemployed	35	29.1	58	21.5
Socioeconomic status				
Class I Upper	13	10.8	23	8.3
Class II Upper Middle	16	13.3	21	7.6
Class III Lower Middle	43	35.8	118	43.4
Class IV Upper Lower	23	19.3	26	9.4
Class V Lower	25	20.8	86	31.3

[a] No statistical significant difference in baseline characteristics between the groups.

Table 2
Type of CAM therapy used by study patients.

Type of CAM	Number of patients (N)	Percentage (%)
Herbal	40	33.3
Ocimum sanctum	6	15
Zingiber officinalis	5	12.5
Brassica nigra	8	20
Apis mellifera	6	15
Trachyspermum ammi	7	17.5
Citrus limon	8	20
Breathing (*Pranayama*)	31	25.8
Yoga	15	12.5
Fish	14	11.8
Steaming with eucalyptus leaves	11	9.1
Aromatherapy	5	4.17
Others	4	3.33

seeds and lemon were the most common herbal medicines. Smoke inhalation from raw turmeric and the reason of religious belief were the least used types of CAM therapy. All the CAM therapies were taken orally and no external or parenteral use was noticed.

Table 3 depicts the data on usage of CAM among the study patients. Information about the CAM treatment was brought to the knowledge of the patient by previously used family members for their ailments (50%). Many patients preferred CAM therapy as they showed no signs of improvement with the current conventional treatment (49.2%). About 47.6% of the patients expected a complete cute from CAM therapy.

The association between baseline characteristics and usage of CAM is shown in Table 4. No statistical significant difference was observed with respect to age, gender, residence and the category of asthma and CAM usage. The findings of this study indicate that lower middle class children preferred CAM usage, which proved to be statistically significant. ($p = .008$ with chi-square value of 13.47).

4. Discussion

The National Center for Complementary and Alternative Medicine (NCCAM) recognizes five main categories of complementary and alternative medicine: (i) Mind-body medicine: It includes treatments that focus on how our mental and emotional status interacts and affects the body's ability to function such as an art and music. (ii) Whole medical systems: This category refers to a complete system of medical theory and practice, many of which go back thousands of years and have roots in non-western cultures such as Chinese medicine and Ayurveda. (iii) Manipulative and body-based practices: It relies on the physical manipulation of the body, this practice is intended to improve specific symptoms and overall health, such as chiropractic and osteopathy. (iv) Energy medicine: This form of alternative medicine uses energy fields to promote healing such as bio electromagnetic-based therapies, such as magnet therapy, involved in the manipulation of electromagnetic fields. (v) Biological based practices: This focus on herbs, nutrition and vitamins, dietary supplements and herbal medicine [14,15].

Among the five main categories of CAM medicine, in the present study, the authors observed the use of two categories such as mind-body medicine and biological based practices. In the present study, the authors observed a high prevalence of usage of herbs. This is in accordance with studies carried out by Adeyeye et al., 2011 [16]; Babayigit 2015 [17].

Many herbal drugs are used to manage asthma. Though most of the herbals are not standardized, they are still used in the formulation of Ayurvedic products. A number of plant products are used as home remedies in the treatment of asthma. In the present study, tulasi leaves, ginger, mustard oil and honey soaked figs were the commonly used herbal medicines.

According to the literatures, ginger produces bronchodilation by modulating intracellular calcium in airway smooth muscle. Tulasi promotes the removal of the catarrhal matter and phlegm from the bronchial tube. Honey thins the accumulated mucus and helps in the elimination of mucus from the respiratory passage. Figs give comfort to the patient by draining off the phlegm. During the asthmatic attack, mustard oil is mixed with a small quantity of camphor and massaged over the chest. This will loosen up the phlegm and ease breathing [18–20].

No harmful effects of CAM are observed by any of the patient in

Table 3
Treatment characteristics of CAM users.

Characteristics	Number of patients (N)	Percentage (%)
Source of inform about CAM		
Recommended by family	60	50
Recommended by friends	30	25
Own feel	11	9.1
Media/magazine	19	15.9
Reason for using CAM		
Not improved with existing one	59	49.2
Repeated hospitalization	28	23.3
Less cost compared to conventional therapy	33	27.5
Expectation of using CAM		
Complete cure	74	57.6
Suppress the progression	27	1.6
Increase the immunity	19	8.4
Effectiveness of CAM		
Don't know	120	100
Harmful effects of CAM		
No	120	100
Reason for not informing the use of CAM to pulmonologist		
Pulmonologist didn't ask	58	48.3
Harmless and it is not a medicine	27	22.5
Afraid that they may discourage	22	18.4
Forgot to tell	13	10.8

Table 4
Association between characteristics and usage of CAM.

Characteristics of patients	CAM users		Non-CAM users		Chi square value	*p*-value
	N	%	N	%		
Age (in years)						
18–21	11	9.1	32	11.8	0.22	0.908
22–31	18	15	48	17.7		
32–41	23	19.1	54	19.7		
42–51	11	9.1	46	16.6		
>51	57	47.7	94	34.2		
Gender						
Male	71	59.1	159	58.1	0.06	0.864
Female	49	40.8	115	41.9		
Domicile						
Village	65	54.1	92	33.5	0.28	0.862
Semi-Urban	32	26.6	80	29.1		
Urban	23	19.3	102	37.4		
Diagnosis of patients						
Mild persistent	11	9.1	168	61.4	1.12	0.754
Moderate persistent	41	34.1	94	34.3		
Severe persistent	68	56.8	12	4.3		
Education of patients						
Profession or Honors	16	13.6	54	19.7	0.97	0.008[a]
Graduate or postgraduate	11	9.1.	22	8.2		
Intermediate or post high school diploma	20	16.6	74	27		
High school certificate	23	19.1	29	10.6		
Middle school certificate	09	7.5	21	7.6		
Primary school certificate	12	10	26	9.4		
Literate	29	24.1	48	17.5		
Socio-economic status						
Class I Upper	13	10.8	23	8.3	13.47	0.008[a]
Class II Upper Middle	16	13.3	21	7.6		
Class III Lower Middle	43	35.8	118	43.4		
Class IV Upper Lower	23	19.3	26	9.4		
Class V Lower	25	20.8	86	31.3		

[a] Represents statistical significance at <0.05 and all other values were not significant.

this study. However, certain herbs may be dangerous to health when combined with modern medicines. Herbal medicines cause toxicity due to the presence of heavy metals or adulterants with undeclared synthetic molecules. In addition to this, there is a possibility of potential herb-drug interactions if CAM is consumed by patients along with the conventional medicines [21,22].

Torres-Llenza V et al. [23] 2010 had observed a high prevalence of usage of vitamins as CAM therapy. However, none of the patients, in the present study, adopted the use of vitamins as a CAM medicine. In the present study, next to herbals, breathing exercise (*Pranayama*) is found to be a the most accepted CAM therapy. This observation is supported by Chen et al., 2013 [24], where the technique of breathing exercises was the most popular CAM usage.

Pranayama is a Sanskrit word which consists of *prana* and *ayama*. *Prana* means self-energizing life forces and *ayama* means extension. *Pranayama* is defined as an expansion and control of *prana* through various yogic techniques. *Pranayama* is not a simple breathing exercise but it is a scientific breathing process where control over *prana* is achieved. *Pranayama* is the connecting link between the physical (*asanas*) and mental (meditation) yogic practices.

Yoga is an ancient Hindu discipline which increases mental and physical control of the body and aims to effect the union of the soul with the universal spirit. Yoga improves strength, flexibility and lung capacity, the three necessary components of overall fitness. It is ideal for the people with exercise induced asthma, in which more rigorous exercises cause asthma to flare. It emphasizes on conscious breathing and includes relaxation [25–27].

Patients in the present study, learnt about CAM therapies from their friends, relatives and media. The reason for using CAM was that the patients were not improved with existing conventional medicine and they wanted to be free from their disease condition by trying the holistic treatment approach. Repeated hospitalization and less cost when compared to conventional therapy were also found to be the reason for the use of CAM in the current study.

Findings on the association between CAM use and sociodemographic factors are generally consistent with published articles. No statistically significant association found with the use of CAM therapy and gender in the present study. This observation is in contradiction with the studies carried out by Blanc PD et al., 2001 [27]. The authors of this study reported a greater possibility of receiving CAM among women with asthma as compared with men. However, in a recent study carried out by Marino LA and Shen J 2015 [20] in US population, reported the same observation as that of the present study.

The present study had observed that highly educated as well as high socioeconomic status patients used CAM therapy more when compared with uneducated, low socioeconomic status patients. This is in accordance with the studies carried out by Maureen G et al. [28] 2006, Bielory L 2002 [29], Bhalerao et al., 2013 [30]. Above studies have also noticed that no association exists between the use of CAM therapy and age of patients. The present study supports the similar findings.

None of the patients, in the present study had disclosed/discussed their usage of CAM therapy with their pulmonologists for several reasons. This observation is not new and it is being

supported by previous studies [31–33]. The present study recommends that health care providers should enquire about CAM usage as a part of their case history and data collection. Patients must be educated about the clinically relevant serious adverse effects associated with herb-drug interactions and they must be encouraged to reveal their complete treatment history to health care professionals.

4.1. Limitations of the study

The results of this study were limited by its sample size and single center location which might show the predominance of one ethnic group. Another limitation of this study is its quantitative approach in assessing the usage of CAM medicine. Thus, the authors could not explore the in-depth information and also could not provide better understanding of the patient's attitude towards the use of CAM therapy.

4.2. Strength of the study

The study is important as there is no study on the prevalence of the use of complementary and alternative medicine therapies by asthma patients in South Indian population. The data in the study will be useful for the healthcare professionals working in the field of pulmonology.

5. Conclusion

In the present study, pharmacists served as a mediator between patients and pulmonologists. The patients were encouraged by pharmacists to talk about the use of CAM to their treating clinicians. This is the first study in South India to report the prevalence of CAM among asthma patients and to make the active role of pharmacists in case finding. Future efforts will be made to determine the safety and efficacy of CAM therapy through rigorous investigation.

Conflicts of interest

Authors have no conflict of Interest.

Funding

No funding received for this project.

Acknowledgement

Sarvesh S thanks Ms. Madhu Madhy, Allied Health Science (AHS), 2014-15 batch, Sri Ramachandra University for her help in data collection.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.ctcp.2017.12.016.

Annexure - 1

Pattern of Complementary and Alternative Medicine Use in Asthma Patients
Study Questionnaire

Date of Interview: Interview done by:

Demographic and clinical characteristics of the patients

Age: _____ Years Gender: Male / Female

Asthma severity: Intermittent / Mild persistent / Moderate persistent / Severe persistent

Co-morbid condition(s), if any:

Allergy, if any:

Contact details:

Education details (According to Kuppusamy's Socio Economic Scale 2017)
a) Profession or honors b) Graduate / P.G c) Intermediate /post high school diploma
d) High school certificate e) Middle school certificate f) Primary school certificate
g) Illiterate

Occupation (According to Kuppusamy's Socio Economic Scale 2017)
a) Profession b) Semi profession c) Clerical / shop-keeper / farmer
d) Skilled worker e) Semi skilled worker f) Unskilled worker g) Unemployed

Monthly family income in Rs (According to Kuppusamy's Socio Economic Scale 2017)
a) ≥ 41430 b) 20715-41427 c) 15536-20714 d) 10357-15535
e) 6214-10356 f) Rs. 2072-6213 g) <2071

Socio Economic Status (According to Kuppusamy's Socio Economic Scale 2017)
a) Upper class b) Upper middle class c) Lower middle class
d) Upper lower class e) Lower class

Residence
a) Village b) Semi Urban c) Urban

Complementary and Alternative Medicine (CAM) Questionnaire

1) Have you ever used or currently using CAM (It includes various therapies such as Chinese herbal medicine, Acupuncture, Siddha, Unani, Ayurveda, Breathing technique, homeopathy, aromatherapy, yoga, hypnosis and others)
Yes / No
If yes, please specify _____

2) Did you use any type of food as a remedy?
Yes / No
If yes, specify _____

3) How did you get information about CAM?
a) Previously used by child or family members for other ailments
b) Recommended by friends c) Your own free will
d) Recommended by other cancer patients e) Internet f) Media or Magazine
If others, specify_____

4) What is the reason for using CAM?
a) Not improved with existing one b) Repeated hospitalization
c) Less cost compared to conventional therapy

5) What did you expect by using CAM?
a) Complete Cure b) Suppress the progression c) Improve the symptoms
d) Complimentary effects of the present medication on efficacy e) Increase appetite
f) Increase the immunity g) Decrease the side effects h) Others
If others, specify_____

6) Did it work?
Yes / No / Don't know
If yes, how effective it was? (According to Likert Scale)
a) Very good b) Good c) Satisfactory d) Poor satisfaction

7) Did you experience any harmful effect of CAM?
Yes / No If yes,
i) Name of the CAM: _____
ii) What effects did your child get? _____

8) Did you inform the use of CAM to pulmonologists / treating clinicians?
Yes / No
If yes, what was the pulmonologist's view on CAM usage?
a) Agree b) Disagree c) Neutral d) Not applicable
If no, reason for not informing to the pulmonologist,
a) Harmless & it is not a medicine b) pulmonologist did not ask c) Forgot to tell
d) Afraid that they may discourage CAM use e) others

References

[1] M.G. Rajanandh, An overview and update on asthma and its management, J. Med. Sci. 15 (2015) 122–129.
[2] M.G. Rajanandh, A.D. Nageswari, G. Prathiksha, Effectiveness of vitamin D_3 in severe persistent asthmatic patients: a double blind, randomized, clinical study, J. Pharmacol. Pharmacother. 6 (2015) 142–146.
[3] A.D. Nageswari, K.G. Uday, M.G. Rajanandh, Comparison between spirometry and BODE index for clinical assessment in chronic obstructive pulmonary disease patients, Trends Med. Res. 10 (2015) 12–18.
[4] M.G. Rajanandh, A.D. Nageswari, K. Ilango, Assessment of Montelukast, Doxofylline and Tiotropium with Budesonide for the treatment of asthma: which is the best among the second-line treatment? A Randomized trial, Clin. Ther. (2015) 418–426.
[5] E.M.P.R.M. Viswanathan, M.G. Rajanandh, A.D. Nageswari, Periostin - a novel systemic biomarker for Eosinophilic airway inflammation: a case control study, J. Clin. Diagn. Res. 10 (2016) OC01–OC04.
[6] M.G. Rajanandh, A.D. Nageswari, K. Ilango, Impact of pharmacist provided patient education on knowledge, attitude, practice and quality of life in asthma patients in a South Indian hospital, J. Med. Sci. 14 (2014) 254–260.
[7] A.D. Nageswari, M.G. Rajanandh, R.K. Priyanka, et al., Effect of Vitamin D_3 on mild to moderate persistent asthmatic patients: a Randomized controlled pilot study, Persp. Clin. Res. 5 (2014) 167–171.
[8] M.G. Rajanandh, A.D. Nageswari, K. Ilango, Assessment of various second-line medications in addition to inhaled corticosteroid in asthmatic patients - a randomized controlled trial, Clin. Exp. Pharmacol. Physiol. 41 (2014) 509–513.
[9] M.G. Rajanandh, A.D. Nageswari, K. Ilango, Influence of demographic status on pulmonary function, quality of life and symptom scores in patients with mild to moderate persistent asthma, J. Exp. Clin. Med. 6 (2014) 102–104.
[10] M.G. Rajanandh, A.D. Nageswari, K. Ilango, Development and validation of knowledge, attitude, practice questionnaire for asthma and assessment of impact of patient education on asthma patients, Int. J. Pharm. Pharmaceut. Sci. 6 (2014) 309–311.
[11] K. Ilango, M.G. Rajanandh, A.D. Nageswari, Roflumilast: an upcoming drug for curing asthma and COPD, Int. J. Pharm. Res. Tech. 5 (2013) 130–135.
[12] M.G. Rajanandh, A.D. Nageswari, K. Ilango, Pulmonary function assessment in mild to moderate persistent asthma patients receiving montelukast, doxofylline, tiotropium with budesonide - a randomized controlled study, Clin. Ther. 36 (2014) 526–533.
[13] R. Anita, M.G. Rajanandh, A. Vivenkanandan, et al., in: Pattern of Complementary and Alternative Medicine Use in Cancer Patients: Prospective Analysis of Medical Oncology Unit, vol. 8, Academic J Can Res, 2015, pp. 40–42.
[14] M.G. Rajanandh, A.D. Nageswari, K. Ilango, Effect of two controller medications with inhaled corticosteroid in mild to moderate persistent asthma patients, J. Med. Sci. 4 (2014) 81–86.
[15] M.G. Rajanandh, A.D. Nageswari, P.P. Irshad, C. Ramasamy, Does dose reduction of an inhaled corticosteroid with the addition of leukotriene antagonist is clinical significance in asthma Patients? A randomized clinical trial, World Appl. Sci. J. 24 (2013) 276–281.
[16] O.O. Adeyeye, B.O. Onadeko, O. Ogunleye, et al., The use of complementary and alternative medicine by asthma patients receiving care in an urban tertiary centre in Nigeria, Int. J. Biol. Med. Res. 2 (2011) 1026–1030.
[17] A.H. Babayigit, High usage of complementary and alternative medicine among Turkish asthmatic children, Iran. J. Allergy, Asthma Immunol. 14 (2015) 410–415.
[18] A. Huntley, E. Ernst, Herbal medicine for Asthma: a systematic review, Thorax 55 (2000) 925–929.
[19] R. Arreola, S. Qunitero-Fabian, R.I. Lopez-Roa, et al., Immunomodulation and Anti-inflammatory effects of garlic compound, J. Immune Res. 2015 (2015), 401630, 1–13.
[20] L.A. Marino, J. Shen, Characteristics of complementary and alternative medicines use among adults with current asthma, J. Asthma 47 (2010) 521–525.
[21] T.P. Ng, M.L. Wong, C.Y. Hong, et al., The use of complementary and alternative medicine by asthma patients, Q J. Med. 96 (2003) 747–754.
[22] M.A. Alshagga, S.A. Al-Dubai, S.S.M. Faiq, et al., Use of complementary and alternative medicine among asthmatic patients in primary care clinics in Malaysia, Ann. Thorac. Med. 6 (2011) 115–119.
[23] V. Torres-Llenza, S. Bhogal, M. Davis, F. Ducharme, Use of complementary and alternative medicine in children with asthma, Canc. Res. J. 17 (2010) 183–187.
[24] W. Chen, J.M. FitzGerald, R. Rousseau, et al., Complementary and alternative asthma treatments and their association with asthma control: a population based study, BMJ Open (2013), e003360.
[25] R. Manocha, G.B. Marks, P. Kenchington, et al., Sahaja yoga in the of management of moderate to severe asthma: a randomized controlled trial, Thorax 57 (2002) 110.
[26] T.J. Manoj, R.R. Vyankatesh, Effects of integrated yoga module on respiratory pressures and pulmonary functions in children, Int. J. Med. Sci. 3 (2015) 3548–3552.
[27] P.D. Blanc, W.G. Kuschner, P.P. Katz, et al., Alternative therapies among adult with a reported diagnosis of asthma or rhinosinusitis: data from a population based survey, Chest 120 (2001) 1461–1467.
[28] G. Maureen, B. Kathleen, J.H. David, et al., Beliefs about asthma and complementary and alternative medicine in low-income inner-City african-american adults, J. Gen. Intern. Med. 21 (2006) 1317–1324.
[29] L. Bielory, Complementary and Alternative Medicine' population based studies: a growing focus on allergy and asthma, Allergy 57 (2002) 655–658.
[30] M.S. Bhalerao, P.M. Bolshete, B.D. Swar, et al., Use of and satisfaction with complementary and alternative medicine in four chronic diseases: a cross-sectional study from India, Natl. Med. J. India 26 (2013) 75–78.
[31] B. Helen, Complementary and alternative medicine and patient choice in primary care, Qual. Prim. Care 15 (2007) 207–212.
[32] T.C. Medici, E. Grebski, J. Wu, et al., Acupuncture and bronchial asthma: a long term randamoized study of the effects of real versus sham acupuncture compared to controls in patients with bronchial asthma, J. Altern. Complement. Med. 8 (2002) 737–750.
[33] S.K. Vemula, P.R. Turapati, R.S.R. Ponugoti, et al., Asthma: alternative management approaches, Asian J. Pharm. Clin. Res. 4 (2011) 1–8.

Pattern of Complementary and Alternative Medicine Use in Asthma Patients

Study Questionnaire

Date of Interview: Interview done by:

Demographic and clinical characteristics of the patients

Age: _____ Years Gender: Male / Female

Asthma severity: Intermittent / Mild persistent / Moderate persistent / Severe persistent

Co-morbid condition(s), if any:

Allergy, if any:

Contact details:

Education details (According to Kuppusamy's Socio Economic Scale 2017)

a) Profession or honors b) Graduate / P.G c) Intermediate /post high school diploma
d) High school certificate e) Middle school certificate f) Primary school certificate
g) Illiterate

Occupation (According to Kuppusamy's Socio Economic Scale 2017)

a) Profession b) Semi profession c) Clerical / shop-keeper / farmer
d) Skilled worker e) Semi skilled worker f) Unskilled worker g) Unemployed

Monthly family income in Rs (According to Kuppusamy's Socio Economic Scale 2017)

a) ≥ 41430 b) 20715-41427 c) 15536-20714 d) 10357-15535
e) 6214-10356 f) Rs. 2072-6213 g) <2071

Socio Economic Status (According to Kuppusamy's Socio Economic Scale 2017)

a) Upper class b) Upper middle class c) Lower middle class
d) Upper lower class e) Lower class

Residence

a) Village b) Semi Urban c) Urban

Complementary and Alternative Medicine (CAM) Questionnaire

1) Have you ever used or currently using CAM (It includes various therapies such as Chinese herbal medicine, Acupuncture, Siddha, Unani, Ayurveda, Breathing technique, homeopathy, aromatherapy, yoga, hypnosis and others)
Yes / No
If yes, please specify _____

2) Did you use any type of food as a remedy?
Yes / No
If yes, specify _____

3) How did you get information about CAM?
a) Previously used by child or family members for other ailments
b) Recommended by friends c) Your own free will
d) Recommended by other cancer patients e) Internet f) Media or Magazine
If others, specify_____

4) What is the reason for using CAM?
a) Not improved with existing one b) Repeated hospitalization
c) Less cost compared to conventional therapy

5) What did you expect by using CAM?
a) Complete Cure b) Suppress the progression c) Improve the symptoms
d) Complimentary effects of the present medication on efficacy e) Increase appetite
f) Increase the immunity g) Decrease the side effects h) Others
If others, specify_____

6) Did it work?
Yes / No / Don't know
If yes, how effective it was? (According to Likert Scale)
a) Very good b) Good c) Satisfactory d) Poor satisfaction

7) Did you experience any harmful effect of CAM?
Yes / No If yes,
i) Name of the CAM: _____
ii) What effects did your child get? _____

8) Did you inform the use of CAM to pulmonologists / treating clinicians?
Yes / No
If yes, what was the pulmonologist's view on CAM usage?
a) Agree b) Disagree c) Neutral d) Not applicable
If no, reason for not informing to the pulmonologist,
a) Harmless & it is not a medicine b) pulmonologist did not ask c) Forgot to tell
d) Afraid that they may discourage CAM use e) others