Original Research Article

How informed are bronchial asthma patients: a questionnaire based study in a tertiary care hospital

Sunil B. Jadhav[1], Philips Antony[2]*

[1]Department of Respiratory Medicine, MGM Medical College, Aurangabad, Maharashtra, India
[2]Department of Respiratory Medicine, Kanachur Institute of Medical Sciences, Mangalore, Karnataka, India

*Correspondence:
Dr. Philips Antony,
E-mail: phil.antony@gmail.com

ABSTRACT

Background: Asthma has been considered as one of the most common chronic diseases worldwide. Asthma due to its effects on bronchial passage compromises the respiration and intern impairs the quality of life. Aim was to evaluate the knowledge of asthma among patients attending our tertiary care hospital.

Methods: The patients were subjected to chest X-ray and spirometry followed by the knowledge on asthma questionnaire which consisted of 28 questions.

Results: Out of 75 patients, aged between 18-80 years, majority were males. Out of 75 patients, 60 (80%) patients had obtained a total score below 10 out of the total of 28 score. The causative factors for asthma, 60 (80%) patients believed that asthma was due to allergy. Only 2-3 patients (3-4%) had knowledge of the underlying pathologic process during an asthma attack. Fifty nine (79%) patients were aware of the symptoms of asthma. However, only 10 (13%) patients knew about the early signs of worsening of asthma and only 14 (19%) patients could judge the severity of asthma. Only 5 (7%) patients knew which drug was for regular use and which was to be used if breathlessness occurred. Merely around 4-10 (5 to 13%) patients knew that asthma could be prevented by avoiding trigger factors and by taking medication regularly.

Conclusions: A good level of knowledge about asthma and better practices are rigorously important to prevent asthma exacerbations. More comprehensive, regular and patient centred counselling programs will be beneficial in improving awareness of asthma.

Keywords: Asthma, Education, Knowledge, Questionnaire

INTRODUCTION

"When you can't breathe, nothing else matters", is the mantra of the American lung Association. Asthma has been considered as one of the most common chronic diseases worldwide.[1] The most common reasons are poor knowledge, non-adherence to treatment and lack of skills in disease management.[2] There is remarkable increase in health care burden due to asthma in several areas of the world.[3] The prevalence may be related to environmental factors, pollutants, exposure to allergens and urbanization. Asthma due to its effects on bronchial passage compromises the respiration and intern impairs the quality of life.

Asthma patients usually claim they lead a normal life or they might mask their restrictions, wanting to "live like others". It greatly affects on their performance either at school or work area. Inadequate asthma control may be due to poor knowledge of the disease and how to take the medications, poor understanding of the use of inhalers and self-management.[3-5] Despite the great availability of

specific drugs and improvement in technology, prevalence of asthma is still increasing. Using a positive family history of asthma we could provide a basis for targeting prevention efforts, which will aim at reducing exposure to environmental risk factors.[6]

Though it is a manageable condition, the suffering of asthma patients is not in control. The reasons may be many, but mainly it is due to lack of patient awareness, inadequate health communication by doctors, no proper teaching of the preventive measures to avoid acute attacks and the measures to be adapted for effective maintenance at home.[7-8] Current level of asthma management and control fall short of international guidelines for asthma management.

Non-adherence and non-compliance to therapeutic regimens are a constant challenge to doctors and other health professionals. If patients can understand the benefits of compliance and the risks for non-compliance, they would believe that the treatment is safe and it will increase their motivation and confidence to improve self-management practices.[9,10] Effective asthma management should include positive control over asthma symptoms and its acute exacerbations and improve the quality of living.

Authors hypothesised that understanding of asthma is poor and we sought to evaluate the knowledge and perceptions of asthma and the medications used to treat the disease amongst patients attending our tertiary care hospital.

METHODS

Information on asthma knowledge was obtained from patients of Bronchial Asthma (above the age of 18 years) presenting to outpatient department for the first time by using a questionnaire (Annexure 1). As there is no "gold standard" for knowledge only content validity is relevant. The questionnaire on Asthma knowledge was based on the content of knowledge a patient is expected to have.

Asthma knowledge questionnaire (Annexure 1)

This was developed in English and in local languages, i.e., Marathi/Hindi and was designed to obtain information about different aspects of the disease that a patient is expected to be given to make him/her an active partner in self-management. The 28 questions were divided into the following six domains:

- Aetiology (3 questions)
- Pathophysiology (3 questions),
- Symptoms and assessment of severity (8 questions)
- Medication (8 questions)
- Prevention (4 questions)
- Natural history (2 questions).

Study staff administered the questionnaire verbally in the participants' choice of language. The questionnaire was designed to assess the knowledge, attitudes and perceptions of asthma among the general public. Subject responses were categorical (yes/no/can't say) and the percentage of subjects with different responses to each question was calculated. Subject responses will be scored on a categorical scale where 0 represented 'no knowledge /no response and 1 represented knowledge of the subject addressed in a particular question. In question number 1 of the aetiology domain, a score of one was given if atleast one of the eight subsets was correctly answered; as even one correct answer represented that the patient had some knowledge regarding the aetiology of bronchial asthma. A final score will be obtained by summing these scores. Maximum possible score is 28. The scores will be expressed as percentage of the maximum possible score. Simple random sampling for one year was done (2016-2017).

Study area

Study was conducted in a tertiary care hospital at Aurangabad in respiratory medicine department.

Study population

All Patients aged ≥18 years who presents to the OPD for the first time with history suggestive of asthma was included. They were evaluated and the diagnosis of bronchial asthma was confirmed based on the symptoms and reversible spirometry.

Study duration

This study was conducted from January 2017- December 2017. This was cross-sectional; observational study.

Sample size

$$N= \frac{z^2 P(1-P)}{D^2}$$

Where, P-incidence=2.88% = 3% (approx)=3/100=0.03
Z=1.96 for 95% C.I.
D = allowable error 5%.

$$N=\frac{1.96\times1.96\times0.03\times0.97}{0.05\times0.05}$$

Statistical Analysis

Statistical analysis was done by using Microsoft Excel and statistical softwares.

Data collection

Patients of bronchial asthma above the age of 18 were subjected to Chest X-ray and spirometry after clinical evaluation. Upon diagnostic confirmation study patients were provided with the questionnaire in their language of

comfort (Marathi/ Hindi/English) and were collected after completion. Collected data was compiled in MS Excel Sheet 2010. Qualitative data were represented in the form of frequencies and percentages.

RESULTS

In my study, out of 75 cases studied, majority of patients were males (46 patients) and females were 29 cases (Table 1).

Table 1: Sex wise distribution.

Sex	No. of cases	% of cases
Male	46	62
Female	29	38

Age wise distribution of the patients enrolled in the study is shown in Figure 1. Majority of the patients presented in the age group 18-27 years which was followed by the age group 28-37 years (Figure 1).
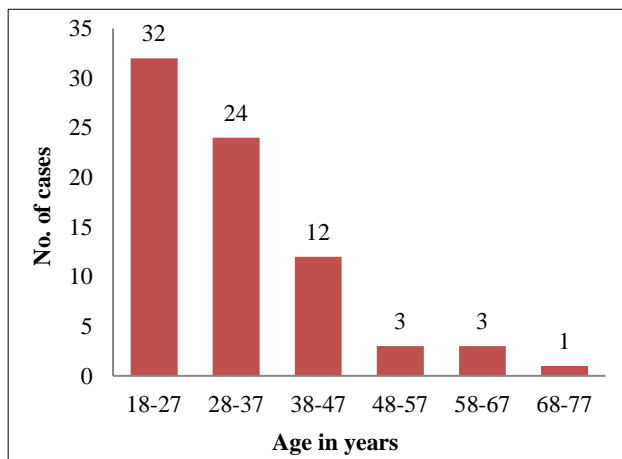

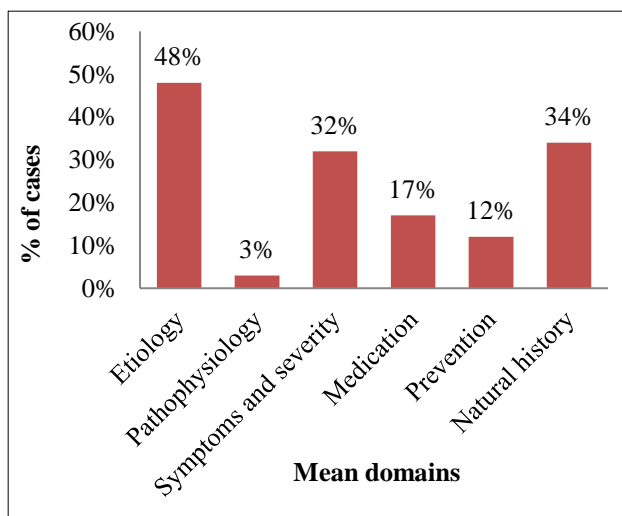### Figure 1: Age wise distribution.

Figure 2: Mean scores of different domains of asthma knowledge questionnaire.

Out of 75 patients, 60 (80%) patients had obtained a total score below 10 out of the total of 28 score. Scores obtained in different domains revealed that a large proportion of patients lacked basic knowledge about asthma and its treatment (Figure 2).

When patients were asked to identify the causative factors for asthma, 60 (80%) patients believed that asthma was due to allergy and up to 39(53%) patients were not aware that drugs could also cause asthma symptoms. Forty seven patients (63%) did not know whether asthma is a contagious disease or not and if it can be contracted by living with another asthma patient; also around 40 patients (53%) of the patients did not know that asthma could be blood related (Figure 3).
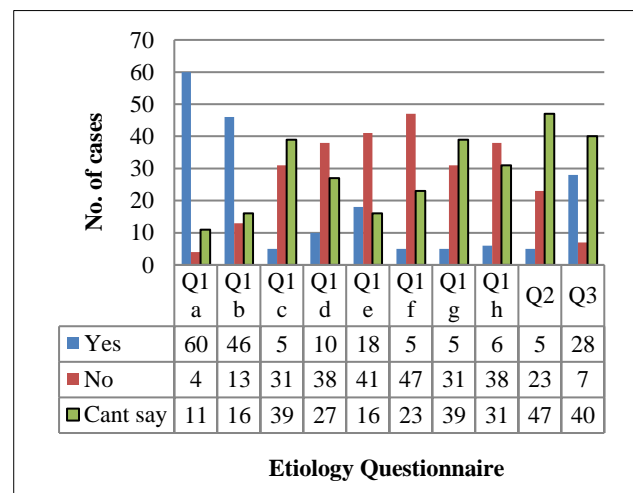

Figure 3: Etiology questionnaire.

Only 2-3 patients (3-4%) had knowledge of the underlying pathologic process during an asthma attack (Figure 4).
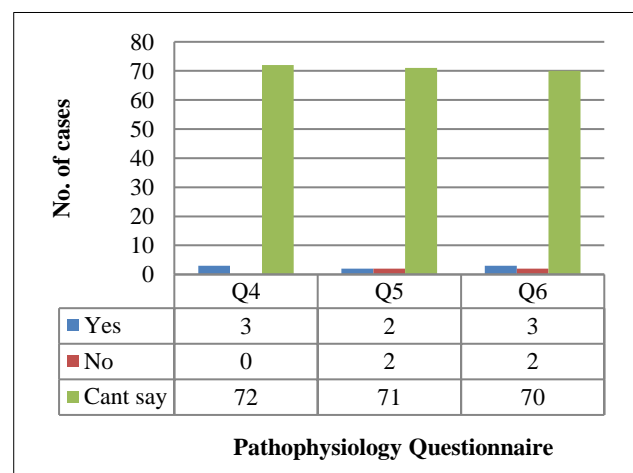

Figure 4: Pathophysiology questionnaire.

Fifty nine (79%) patients were aware of the symptoms of asthma. However, only 10 (13%) patients knew about the early signs of worsening of asthma and only 14 (19%)

patients could judge the severity of asthma. Merely 11-15 (15 to 20%) patients knew that the severity of asthma can be judged by a peak flow meter and that severity could be assessed using the same at home; while around 55-60 (74 to 80%) patients had no understanding of the concept. Fifteen (20%) patients did not think that asthma can be dangerous and can result in death during an attack (Figure 5).
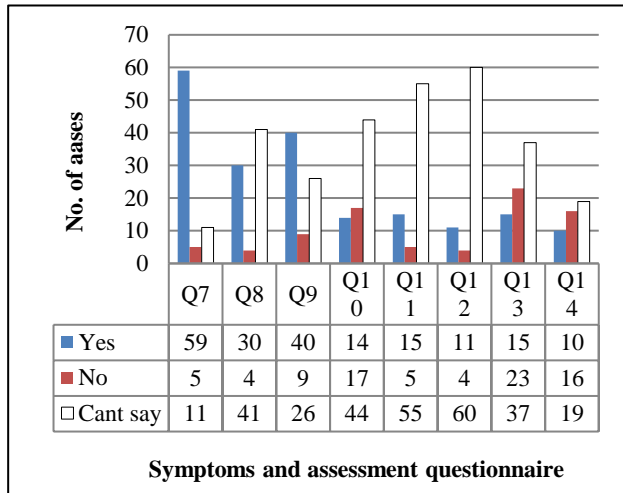

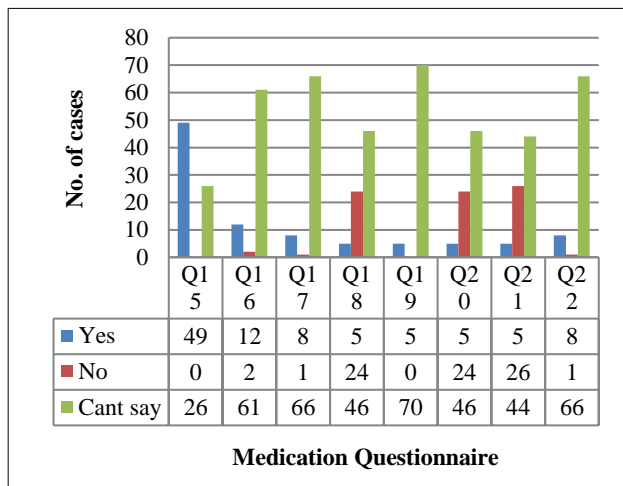**Figure 5: Symptoms and assessment questionnaire.**

Symptoms and assessment questionnaire	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
Yes	59	30	40	14	15	11	15	10
No	5	4	9	17	5	4	23	16
Cant say	11	41	26	44	55	60	37	19

Figure 6: Medication questionnaire.

Medication Questionnaire	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22
Yes	49	12	8	5	5	5	5	8
No	0	2	1	24	0	24	26	1
Cant say	26	61	66	46	70	46	44	66

Forty nine (65%) of the patients agreed that medications can be given as tablets, syrups and as inhalers. Sixty six (88%) patients did not know whether the drug prescribed to them was a "reliever" or "preventer" of asthma symptoms. Only 5 (7%) patients knew which drug was for regular use and which was to be used if breathlessness occurred. Up to 61 (81%) patients did not know that the best way of taking asthma medicines is by inhalation. Seventy (93%) patients did not know that steroids were the most effective drugs for controlling asthma; 24 (32%) believed that steroids are in fact harmful even when given by inhalation route and 46(61%) patients could not say if steroids are harmful or not via inhalation route. Only

twenty six (35%) patients said that medicines have to be taken even after the symptoms persist and only 8 (11%) patients suggested that the medicines have to be taken till the doctor advises to stop (Figure 6).

Merely around 4-10 (5 to 13%) patients knew that asthma could be prevented by avoiding trigger factors and by taking medication regularly. And only 5 (6%) patients knew how to change the medication in case asthma worsened (Figure 7).
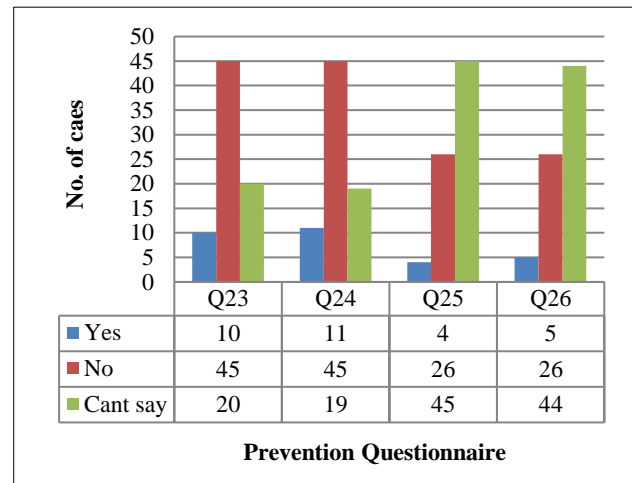

Figure 7: Prevention questionnaire.

Prevention Questionnaire	Q23	Q24	Q25	Q26
Yes	10	11	4	5
No	45	45	26	26
Cant say	20	19	45	44

Twenty three (30%) patients believed that asthma cannot be cured and 44 (59%) patients had no idea if asthma could be cured but 44 (59%) patients mentioned though asthma cannot be cured it can be usually be controlled (Figure 8).
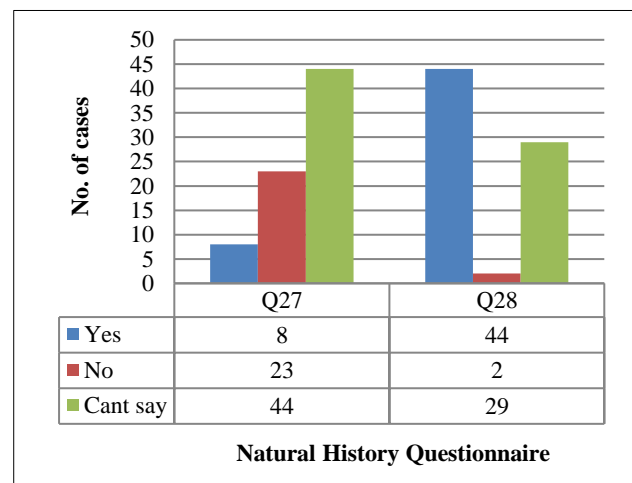
Figure 8: Natural history questionnaire.

Natural History Questionnaire	Q27	Q28
Yes	8	44
No	23	2
Cant say	44	29

DISCUSSION

In our study of 75 asthmatic patients, age group ranged between 18-72 years of age, the most affected age group was seen to be between 18-40 years. In a study done by

Bartosz et al, the age group showed a wide variation ranging from 18-84 years.[11] Majority of our patients (62%) were males and this pattern of sex prediction for asthma was seen in a recent report of ICMR, where nearly 7 million sufferers were males and just over 6 million were women and also in this study the worst affected age group was 15-35 years which was also seen in our study.[12]

Asthma knowledge questionnaire

Aetiology

Out of 75 asthmatic patients, 60 (80%) patients knew allergy as the main symptom for asthma. Patients probably knew enough about the symptoms of asthma because of their own personal experience. Our study was in discordance with the studies done by Khan et al, in which 79% patients showed ignorance to the etiology of asthma and by a study done by Gajanan et al in which 30% considered asthma as just an allergy.[13,14] In our study 53% of the patients were not aware that drugs could also cause asthma symptoms and this was in concordance with the study done by Anjali et al[15] in which up to 74% of patients (37) were not aware of the fact that drugs can also cause asthma symptoms.

Pathophysiology

Only 3-4% patients had knowledge regarding the underlying pathologic process during an asthma attack. This was in discordance with the studies done by Anita et al, in which 36-68% patients had knowledge regarding the pathologic process during an asthma attack and in a study done by Leonardo et al, around 66% knew that wheezing was due to tightening of the muscles and 67.2% stated that it can also be due to swelling of the lining of air passages.[15,16]

Symptoms and severity of asthma

Fifty nine (78%) patients could identify the symptoms of asthma and this was in concordance with a study done by Leonardo et al, in which high percentage of cases could enumerate atleast two out of three symptoms.[16] In this study, 40 patients believed that asthma was more likely to occur at night or early morning. This was in concordance with the study done by Lenardo et al, in which 65% patients knew that asthma usually becomes a problem during night than during the day.[16]

Eleven patients assessed the severity of asthma at home using peak flow meter while in the study done by Gupta PP et al, only one patient out of 1400 patients used peak flow meter at home to monitor the severity of disease.[17] The use of peak flow meter at home should be encouraged as monitoring this way the patients might have a true assessment of the severity of asthma and thus avoid the delay in treatment and this will help in decreasing the morbidity and mortality caused by asthma.

Medication

Forty nine of the patients agreed that medication can be given as tablets, syrups and as inhalers. But only 12 patients agreed that inhalation is the best line of medication. This result was also seen in the study by Gupta PP et al, in which 76% patients believed that inhalers were inferior to oral drugs.[17] Even though inhaler therapy has been accepted as the first-line therapy, the level of acceptance in our country is poor.

Only 8 patients knew that asthma medicines are of two types and only 5 patients knew which is for regular use. This finding was similar to the study done by Omole et al, in which 20 patients had clear knowledge regarding preventer medication and only 8 patients had clear knowledge regarding reliever medication.[18]

Seventy patients could not say if most effective medication was steroids and only 5 patients believed that most effective medication was steroids; this was in concordance with the study done by Borges MC et al, in which 63% patients believed that inhaled corticosteroids should not be used in asthma.[19] Forty six patients could not say if steroids as inhalers were safe. But in the study done by Leonardo et al, 33.4% patients knew that inhaled drugs have fewer side effects and 63% believed that short courses of steroids do not have much of side effects.[16] In this study, 45% patients said that they believed that medicines have to be taken till symptoms persist and this was in concordance with the study done by Kumar et al, in which 45% patients also said that medications were taken till they felt well or till no symptoms of asthma are seen.[20]

Prevention

In this study only 10 patients believed that they could avoid factors that can increase asthma while in the study done by Gupta PP et al, the proportion of patients ranged from 18 to 54% depending on the degree and specialty of the doctor consulted.[17] In this study only 5 (6%) patients knew how to change medication in case asthma worsens while in the study done by Leonardo et al, 39% of the patients knew correctly as to which drug should be used in case of an acute asthma attack.[16]

Natural history

In this study, 46 patients did not know if asthma could be cured or not; however 44 patients believed that although asthma could not be cured, it can be controlled. This was also seen in a study done by Kumar et al, in which patients believed that if the medications of asthma are taken regularly, they could live a normal life.[20]

CONCLUSION

A good level of knowledge about asthma and better practices are rigorously important to prevent asthma

exacerbations. More comprehensive, regular and patient centred counselling programs will be beneficial in improving awareness of asthma. Physicians and patients need to work together to develop an asthma care program that aims for a life free from asthma. In conclusion, sincere and sustained efforts are required to disseminate knowledge about all aspects of asthma and its management among patients and to dispel their myths and misconceptions associated with diseases and its therapy. This will help patients to participate in self-management plans and attain better control of their asthma. So how informed are your asthma patients?.

REFERENCES

1. Aggarwal AN, Chaudhry K, Chhabra SK, D Souza GA, Gupta D, Jindal SK, et al. Prevalence and risk factors for bronchial asthma in Indian adults: a multicentre study. Ind J Chest Diseases Allied Sci. 2006 Jan 18;48(1):13-22.
2. Wilson SR, Scamagas P, German DF, Hughes GW, Lulla S, Coss S, et al. A controlled trial of two forms of self-management education for adults with asthma. Am J Med. 1993 Jun 1;94(6):564-76.
3. Prabhakaran L, Lim G, Abisheganaden J, Chee CB, Choo YM. Impact of an asthma education programme on patients' knowledge, inhaler technique and compliance to treatment. Singapore Med J. 2006 Mar;47(3):225-31.
4. Hilton S, Anderson HR, Sibbald B, Freeling P. Controlled evaluation of the effects of patient education on asthma morbidity in general practice. The Lancet. 1986 Jan 4;327(8471):26-9.
5. Lai CK, Teresita S, Kim YY, Kuo SH, Mukhopadhyay A, Soriano JB, et al. Asthma control in the Asia-Pacific region: the asthma insights and reality in Asia-Pacific study. J Allergy Clin Immunol. 2003 Feb 1;111(2):263-8.
6. Burke W, Fesinmeyer M, Reed K, Hampson L, Carlsten C. Family history as a predictor of asthma risk. Am J Preventive Med. 2003 Feb 1;24(2):160-9.
7. Eder W, Ege MJ, von Mutius E. The asthma epidemic. New Eng J Med. 2006 Nov 23;355(21):2226-35.
8. Evans GW, Kantrowitz E. Socioeconomic status and health: the potential role of environmental risk exposure. Annual review of public health. 2002 May;23(1):303-31.
9. Bousquet J, Bousquet PJ, Godard P, Daures JP. The public health implications of asthma. Bulletin of the World Health Organization. 2005;83:548-54.
10. Scherer YK, Bruce S. Knowledge, attitudes, and self-efficacy and compliance with medical regimen, number of emergency department visits, and hospitalizations in adults with asthma. Heart & Lung: J Acute and Critical Care. 2001 Jul 1;30(4):250-7.
11. Uchmanowicz B, Panaszek B, Uchmanowicz I, Rosińczuk J. Clinical factors affecting quality of life of patients with asthma. Patient preference and adherence. 2016;10:579.
12. Taylor L. India's asthma market to grow 10% a year. Pharma times online, 2010. Available at: www.pharmatimes.com/article/10-12-08/.
13. Khan S, Roy A, Christopher DJ, Cherian AM. Prevalence of bronchial asthma among bank employees of Vellore using questionnaire-based data. J Indian Med Assoc 2002;100(11):643-55.
14. Gajanan G, Padbidri VS, Chaudhury A. Assessment of knowledge and attitude of parents towards the allergy and bronchial asthma in their children. Inter J Med Pub Heal. 2016;6(3).
15. Kotwani A, Chhabra SK, Tayal V, Vijayan VK. Quality of asthma management in an urban community in Delhi, India. Indian J Med Res. 2012 Feb;135(2):184-92.
16. Cabelloa ML, Oceja-Setienb E, Higueraa LG, Caberoa M, Belmontea EP, Gómez-acebob I. Assessment of parental asthma knowledge with the Newcastle Asthma Knowledge Questionnaire. Rev Pediatr. 2013;15:117-26.
17. Gupta PP, Gupta KB. Awareness about the disease in asthma patients receiving treatment from physicians at different levels. Indian J Chest Dis Allied Sci. 2001;43(2):91-5.
18. Omole MK, Ilesanmi NA. Patient medication knowledge governing adherence to asthma pharmacotherapy: a survey in rural Lagos, Nigeria. African J Biomed Res. 2010;13(2):93-8.
19. Borges MC, Ferraz É, Pontes SM, Cetlin AD, Caldeira RD, Silva CS, et al. Development and validation of an asthma knowledge questionnaire for use in Brazil. J Brasileiro De Pneumologia. 2010 Feb;36(1):8-13.
20. Mahendra Kumar BJ, Jimmy Jose, Kumarswamy M, Naveen MR. Assessing the knowledge, attitude and medication adherence among asthma patients in a rural population. Asian J Pharm Clin Res. 2011;4(1):93-7.

Annexure I: Asthma knowledge questionnaire for asthmatics

Question	Yes	No	Can't say
Section A: Etiology of asthma			
Asthma symptoms are caused by:			
Allergy	60(80%)	4(5%)	1(15%)
Air pollution	46(62%)	13(17%)	16(21%)
Living with person having asthma	5(7%)	31(41%)	39(52%)
A common cold	10(13%)	38(51%)	27(36%)
Exercise	18(24%)	41(55%)	16(21%)
Certain food	5(6%)	47(63%)	23(31%)
Certain drugs	5(6%)	31(41%)	39(53%)
Without obvious reason	6(8%)	38(51%)	31(41%)
Can pass on asthma	5(6%)	23(31%)	47(63%)
Asthma is family or blood related	28(38%)	7(9%)	40(53%)
Section B: Pathophysiology			
The breathing tubes can become narrow due to swelling	3(4%)	0	72(96%)
The breathing tubes can become narrow due to muscle tightening	2(3%)	2(3%)	71(95%)
The breathing tubes also become narrow due to mucous	3(4%)	2(3%)	70(93%)
Section C: Symptoms and assessment			
Symptoms are wheezing or whistling sound	59(79%)	5(6%)	11(15%)
Can change in severity	30(40%)	4(5%)	41(55%)
More likely to occur at night or early morning	40(53%)	9(12%)	26(35%)
Can judge severe asthma	14(19%)	17(23%)	44(58%)
Severity can be tested by blowing air	15(20%)	5(6%)	55(74%)
Severity assessed at home using peak flow meter	11(15%)	4(5%)	60(80%)
Asthma attacks can be dangerous	15(20%)	23(31%)	37(49%)
Can make out asthma worsening	10(13%)	46(61%)	19(26%)
Section D: Medication			
Can be given as tab/syrup/inhaler	49(65%)	0	26(35%)
Best way is inhalation	12(16%)	2(3%)	61(81%)
Asthma medicines are of two types	8(11%)	1(1%)	66(88%)
Knows which is for regular use and note	5(7%)	24(32%)	46(61%)
Most effective are steroids	5(7%)	0	70(93%)
Steroids can be harmful but inhalers are safe	5(7%)	24(32%)	46(61%)
Medicines to be taken till symptoms persist	5(7%)	26(35%)	44(59%)
Medicines has to be taken till doctor advise	8(11%)	1(1%)	66(88%)
Section E: Prevention			
Can avoid factors that can increase my asthma	10(13%)	45(60%)	20(27%)
Can prevent by taking inhaler prior to triggering	11(15%)	45(60%)	19(25%)
Can prevent if I take inhaler regularly	4(5%)	26(35%)	45(60%)
Know how to change my medication if worsen	5(6%)	26(35%)	44(59%)
Section F: Natural history			
Asthma can be cured	8(11%)	23(30%)	44(59%)
Although not cured can be controlled	44(59%)	2(3%)	29(38%)