Original Article

Asthma Knowledge, Attitude, and Self-Efficacy in Iranian Asthmatic Patients

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Abstract

Background: Worldwide, numerous people of all ages and ethnicities experience asthma. The achievements of current medical regimens for patients frequently depend on three factors: 1) knowledge of patients regarding this disease, 2) patient's attitude about asthma, including willingness to collaborate with the therapeutic group for disease control, and 3) patient's self-efficacy for controlling asthma. Therefore, this study examined the relationship between knowledge, attitudes, and self-efficacy with socio-economic factors in Iranian asthmatic patients during 2006 – 2008.

Methods: Participants consisted of 120 adults referred to Milad Hospital, Tehran, Iran during 2006 to 2008 whose physicians diagnosed their asthma. Socio-demographic factors such as sex, age, education level, occupation, marital status, family history of asthma, disease costs, and period of sickness were reviewed. Assessments of knowledge, attitudes and self-efficacy were performed by the Persian version of an international standard questionnaire (KASE-AQ). Data were analyzed by SPSS version 14.

Results: Among respondents, only 9 (7.5%) patients had good knowledge about asthma, 108 (90%) patients had a suitable attitude about their asthma and 103 (85.3%) patients had proper self-efficacy. We found a significant association between self-efficacy and attitude in asthmatic patients ($P<0.05$).

Conclusion: Although specific knowledge about asthma is low, however, favorable attitudes toward asthma create opportunities to intervene and improve asthma management among patients. However, the use of educational tools depends on patients' educational levels. Therefore, we recommend elevating asthma knowledge.

Keywords: asthma, attitude, knowledge, self-efficacy

Introduction

Worldwide, many people of all age groups and ethnicities are diagnosed with asthma. The burden of this disease to national administrators, health care organizations, families, and patients is growing.[1] Despite developments in the pathophysiology of asthma and accessibility of efficient pharmacologic agents, the occurrence and mortality rates of asthma have increased in recent years. Many issues are probable causes of the raise in morbidity and mortality of asthma, such as low patient comprehension of disease development, inability to properly use medications, and non-cooperation of the patients with given medical regimens.[2]

Knowledge, Attitude, and Practice (KAP) studies assess changes in people's knowledge, attitudes, and practices in reaction to a particular subject. The knowledge applies to their ability to comprehend a specific topic. Attitude is their feelings on a subject and ideas that they may possess about that topic. Practice refers to actions that influence their knowledge and attitudes that may include individuals' self-efficacy such as patients' independent effectiveness in controlling their disease.

Achievements of medical regimens frequently depend on three factors: 1) patients' knowledge regarding the disease enabling them to perform suitable procedures for symptom management; 2) patients' attitudes about asthma, including willingness to collaborate with the therapeutic group for disease control, and 3) self-efficacy regarding the patients' skills for controlling asthma. Knowledge, attitude, and self-efficacy work together to add to the patient's compliance with the treatment process.[3]

The effects of knowledge, attitude, and self-efficacy are important in asthma treatment programs. Therefore, the aim of this study is to examine the relationship between knowledge, attitude, and self-efficacy with socio-economic aspects of Iranian asthmatic patients during 2006 – 2008.

Materials and Methods

Participants

Participants consisted of 120 patients referred to Milad Hospital in Tehran, Iran during 2006 to 2008. Inclusion criteria for respondents were age 18 years old or greater to ensure respondent comprehension of the questions and a physician diagnosis of asthma according to American Thoracic Society (ATS) guidelines.[4] Exclusion criteria were the presence of any chronic pulmonary diseases other than asthma. Socio-demographic factors such as sex, age, education level, occupation, marital status, family history of asthma, disease costs, and period of sickness were reviewed. We used a translated version of the international standard questionnaire (KASE-AQ) to assess patients' knowledge, attitudes, and self-efficacy. Two medical students trained for this purpose interviewed the patients. Respondents were given the opportunity to

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refuse participation and confidentiality was ensured. Only those respondents above the age of 18 years were interviewed to ensure respondent comprehension of the questions. According to P=0.5, $α$=0.05, and d=0.1, the sample size was calculated at 96 persons. However, 24 additional asthmatic patients were included to take into account likely refusals and missing information.

Instrument

Data were collected by KASE-AQ as developed by Wigal et al.[3] KASE-AQ consists of 20 asthma knowledge questions, in addition to 20 attitude and 20 self-efficacy questions. The 60 item KASE-AQ is proven reliable and internally consistent. Test-re test reliability coefficients have been calculated independently for each of the three scales (knowledge, attitude and self-efficacy). Pearson correlation coefficients between the first and second administrations of the KASE-AQ for the three subscales were as follows: knowledge (r=0.82, P<0.001); attitude (r=0.77, P<0.001); and self-efficacy (r=0.85, P<0.001). Coefficient alpha was 0.88 for knowledge, 0.90 for attitude and 0.89 for self-efficacy. In general, coefficient alpha was 0.88 for the first administration and 0.92 for the second administration, which shows the instrument is internally consistent.

Questionnaire translation

The original KASE-AQ version was translated into Persian by two independent health professionals after, which a consolidated Persian version was produced. The consolidated version was backward translated into English by another qualified translator to check for differences between the Persian and original versions. After a careful evaluation and cultural adaptation, some changes were incorporated and a temporary version was provided.[5] We calculated Cronbach's alpha coefficient to test for reliability of the internal consistency in the translated version of the questionnaire. The sample size for test-retest reliability method was computed, of which 17 individuals (95% confidence interval and 90% power of test) completed the

translated questionnaire and answered it again, 7 – 10 days later. An alpha score equal to or greater than 0.70 was considered acceptable.

Analysis

The highest score a subject can achieve on the knowledge questions is 20. The maximum score on attitude and self-efficacy is 100. Patients' scores of at least 50% of each field of knowledge, attitude and self-efficacy are presumed suitable. Scores less than 50% are unsuitable.

Data were analyzed by SPSS version 14 and $χ^2$ was calculated to test the hypothesis of a relationship between knowledge, attitude, and self-efficacy with demographic factors. P values less than 0.05 were considered significant.

Results

Totally, of the 120 respondents who participated in the study, there were 60 (50%) males and 60 (50%) females. Of these, 55 (44.1%) were less than 40 years old and 65 (55.9%) were over the age of 40 years. Among respondents, only 9 (7.5%) patients had good knowledge about asthma and 108 (90%) respondents had suitable attitudes about their asthma; 103 (85.3%) patients had proper self-efficacy. Tables 1 – 3 show the relationships between attitude and knowledge, self-efficacy and attitude, and self-efficacy and knowledge. The relationship between knowledge and background factors such as sex, age, birth rank, educational level, marital status, period of illness, family history of asthma, and costs of disease are shown in Tables 4 – 6, respectively.

Discussion

Various studies have shown that psychosocial factors such as knowledge, attitudes, and self-efficacy are potent predictors of barriers to asthma self-management in adolescents. Totally, 32% of

Table 1. The association between attitude and knowledge in asthmatic patients.

Knowledge	Attitude		
	Improper	Proper	Total
Improper	12 (10.8%)	99 (82.2%)	111 (100.0%)
Proper	0 (0.0%)	9 (100.0%)	9 (100.0%)
Total	12 (10.0%)	108 (90.0%)	120 (100.0%)
P=0.298			

Table 2. The association between self-efficacy and attitude in asthmatic patients.

Attitude	Self-efficacy		
	Improper	Proper	Total
Improper	7 (58.3%)	5 (41.7%)	12 (100.0%)
Proper	10 (9.3%)	98 (90.7%)	108 (100.0%)
Total	17 (14.2%)	103 (85.8%)	120 (100.0%)
P<0.05			

Table 3. The association between self-efficacy and knowledge in asthmatic patients.

Knowledge	Self-efficacy		
	Improper	Proper	Total
Improper	16 (14.4%)	95 (85.6%)	111 (100.0%)
Proper	1 (11.1%)	8 (88.9%)	9 (100.0%)
Total	17 (14.2%)	103 (85.8%)	120 (100.0%)
P=0.785			

Table 4. The association between knowledge and demographic factors among asthmatic patients.

Variable	Variable level	Number of respondents	Number of patients with proper knowledge	Patients with proper knowledge (%)	*P*-value
Sex	Male	60	5	8.3	1.000
	Female	60	4	6.7	
Age	≤25 years	13	1	8.3	0.836
	26 – 40 years	40	4	10	
	40 – 55 years	55	4	7.3	
	≥56 years	12	0	0.0	
Birth rank	<4	75	6	8.0	1.000
	≥4	45	3	6.7	
Education	Illiterate	14	0	0.0	0.003
	Primary school	39	1	2.6	
	Guidance school	36	4	11.1	
	High school	19	0	0.0	
	University	12	4	33.3	
Occupation	No job	5	1	20.0	0.271
	House-keeper	49	4	8.2	
	Employee	16	3	18.8	
	Business	35	1	2.9	
	Student	13	0	0.0	
	Worker	2	0	0.0	
Marital status	Married	95	8	8.4	0.707
	Single	18	1	5.6	
	Divorced	0	0	0.0	
	Widow	6	0	0.0	
Disease duration	<5 years	39	0	0.0	0.037
	5 – 10 years	9	0	0.0	
	>10 years	71	9	12.7	
Family history of asthma	Yes	69	6	8.7	0.7310
	No	51	3	5.9	
Disease expenses/month	>10 USD	47	3	6.4	0.699
	10 – 20 USD	21	2	9.5	
	<20 USD	47	2	4.3	

the barrier perceptions were related to these three factors.[5]

According to our results, the knowledge of asthmatic patients about their disease was very low, and only 9 (7.5%) patients were knowledgeable about asthma. Worldwide, other studies have shown a lack of knowledge about asthma. In a study conducted in Australia by Gibson et al. in 1995, asthma knowledge was low in students and teachers. Students with asthma knew significantly more about their disease than other students (*P*<0001). Main deficits of asthma knowledge were in the domains of disease recognition and control of exercise induced asthma.[6] Another study in Lisbon showed that asthmatic students, their peers and teachers lacked knowledge about asthma, chiefly in the areas of asthma recognition and management.[7]

Klein et al. established that adult asthmatic patients did not have enough knowledge about their medications. The researchers suggested that improving patients' knowledge about medication should be a main factor in the development of self-management programs.[8] Asthma education programs lead to better knowledge and self-management abilities, reducing asthma morbidity rate.[9–12] The level of patient knowledge can influence a patient's ability to handle an asthma attack.[13]

Our results showed a significant relation between education level and knowledge of asthma. Educational levels of asthmatic patients have been described as significant key in the success of asthma control.[12,14] Recent evidence has demonstrated the importance of patients' literacy ability in an asthma treatment program.[12,15] Scherer and Bruce noted a significant correlation between literacy and scores on the knowledge and attitude scales. College educated people obtained significantly higher scores on the knowledge (*P*=0.039) and attitude scales (*P*=0.026) than people with just a high school education.[2] Williams et al. in 2006 showed that scores of asthma knowledge were directly dependent upon school grade levels (*P*<0.01). Patient literacy was the most effective predictor of asthma knowledge. They concluded that self-management abilities such as the use of metered-dose inhaler (MDI) rather than knowledge, were limited among patients with lower educational status.[12]

In addition, we found a significant relation between disease length and asthma knowledge. Patients who had asthma for longer periods showed higher degrees of asthma knowledge.

We did not find a relation between sex and asthma knowledge,

Table 5. The association between attitude and demographic factors among asthmatic patients.

Variable	Variable level	Number of respondents	Number of patients with proper attitude	Patients with proper knowledge (%)	*P*-value
Sex	Male	60	55	91.7	0.543
	Female	60	53	88.3	
Age	≤25 years	13	12	92.3	0.922
	26 – 40 years	40	37	92.5	
	40 – 55 years	55	48	87.3	
	≥56 years	12	11	91.7	
Birth rank	<4	75	68	90.7	0.753
	≥4	45	40	88.9	
Education	Illiterate	14	12	85.7	0.132
	Primary school	39	32	82.1	
	Guidance school	36	36	100.0	
	High school	19	17	89.5	
	University	12	11	91.7	
Occupation	No job	5	4	80.0	0.244
	House-keeper	49	45	91.8	
	Employee	16	15	93.8	
	Business	35	30	85.7	
	Student	13	13	100.0	
	Worker	2	1	50.0	
Marital status	Married	95	85	89.5	0.299
	Single	18	18	100.0	
	Divorced	0	0	0.0	
	Widow	6	5	83.3	
Disease duration	<5 years	39	35	89.7	0.571
	5 – 10 years	9	9	100.0	
	>10 years	71	63	88.7	
Family history of asthma	Yes	69	62	89.9	1.000
	No	51	46	90.2	
Disease expenses/month	>10 USD	47	43	91.5	0.090
	10 – 20 USD	21	21	100.0	
	<20 USD	47	39	83.0	

which has been confirmed by a previous study conducted in Tehran,[16] however, the results of other studies do not support our results.[2,8]

We did not find an association between occupation and asthma knowledge, although Scherer et al. found a significant difference between employment and knowledge scores.[2]

According to results seen in Table 4, we there was no association between asthma knowledge and age, birth rank, occupation, marital status, family history of asthma, and disease expenses per month.

In our study, most asthmatic patients (90%) had suitable attitudes about their asthma, which paralleled the findings of Australia, Lisbon, and New York.[2,6,7] Although Cohen et al. have shown that negative attitudes toward asthma are widespread in adolescents.[17] Negative attitudes toward asthma is a convincing predictor of insufficient adherence to asthma control programs in pediatrics and adults.[17–19] Forero et al. have demonstrated a relationship between negative attitudes and morbidity in asthma.[20] However, Jones et al. revealed an association between patients' degree of asthma control

and their attitudes.[21] Rhee et al. have shown that negative attitudes make patients more susceptible to perceptive barriers such as forgetfulness or weakness in following treatment regimens, which lead to reduced adherence. Negative attitudes affect individuals' mental abilities and subsequently lead to failure of management plans.[5] However Jones et al. have revealed an association between patients' degree of asthma control and their attitudes.[21]

Our findings did not prove an association between attitude and sex that was similar to a previous study in Tehran[16] but Scherer and Bruce found a significant difference (*P*=0.045) between males and females.[2] In addition, we found no association between attitude and age, however, Klein et al. established this relationship.[8] Moreover, other background factors studied did not have significant relations with asthma attitude.

We noted a high self-efficacy score among respondents; 103 (85.5%) asthmatic patients had suitable self-efficacy in their ability to control asthma. Self-efficacy has been accepted as a main feature of asthma self management.[22–24] Rhee et al. provided evidence that self-efficacy could promote adherence through its miti-

Table 6. The association between self-efficacy and demographic factors among asthmatic patients.

Variable	Variable level	Number of respondents	Number of patients with proper self-efficacy	Patients with proper knowledge (%)	*P* value
Sex	Male	60	50	83.3	0.602
	Female	60	53	88.3	
Age	≤25 years	13	11	84.6	0.922
	26 – 40 years	40	35	87.5	
	40 – 55 years	55	47	85.5	
	≥56 years	12	10	83.3	
Birth rank	<4	75	67	89.3	0.182
	≥4	45	36	80.0	
Education	Illiterate	14	10	71.4	0.209
	Primary school	39	32	82.1	
	Guidance school	36	33	91.7	
	High school	19	16	84.2	
	University	12	12	100.0	
Occupation	No job	5	5	100.0	0.758
	House- keeper	49	42	85.7	
	Employee	16	14	87.5	
	Business	35	28	80.0	
	Student	13	12	92.3	
	Worker	2	2	100.0	
Marital status	Married	95	82	86.3	0.222
	Single	18	17	94.4	
	Divorced	0	0	0.0	
	Widow	6	4	66.7	
Disease duration	<5 years	39	34	87.2	0.766
	5 – 10 years	9	7	77.8	
	>10 years	71	61	85.9	
Family history of asthma	Yes	69	57	82.6	0.296
	No	51	49	90.2	
Disease expenses/month	>10 USD	47	42	89.4	0.508
	10 – 20 USD	21	18	85.7	
	<20 USD	47	38	80.9	

gating effect on barrier cognition in asthmatic adults.[5] We found no relation between self-efficacy and background factors of patients. Scherer et al. established a significant difference between employment and scores on the self-efficacy scales grade of asthma severity was also significantly related to the self-efficacy scale. Patients with mild asthma obtained higher scores on the self-efficacy scale than persons with moderate or severe disease.[2]

In this study, we found a significant relation between self-efficacy and attitude among participants. Positive attitude toward asthma affected patients, self-efficacy that subsequently helped with better asthma self-management. Another study conducted in New York to verify whether there was a relationship between knowledge, attitudes, and self-efficacy found significant correlations between attitude and self-efficacy (r=0.702, P ≤0.01).[2]

The association between knowledge and attitude was not established in this study. This result indicated that although the knowledge of asthmatic patients about their disease was very low, how-ever, the patients had positive attitudes toward their disease and a lack of comprehension about asthma did not affect their mind-set. Our results in this area were similar to the results of Tettersell et al. that the level of patient knowledge had no significant effect on compliance to drug therapy[13] whereas Scherer et al.[2] found significant correlations between attitude and knowledge (*P*=0.04). In addition, other studies in Tehran, New York, and Lisbon showed opposing results in that patients' attitudes had a significant relation with their knowledge.[2,7,16]

Our results did not establish a significant relation between self-efficacy and knowledge. The results of another research showed that numerous asthmatic patients presumed they would know how to control an asthma attack, but only 34.4% were estimated to have the proper ability in a scoring system.[13]

In conclusion, we can state that among our study patients specific knowledge on asthma was low. Favorable attitudes and self-efficacy towards asthma create opportunities to intervene and improve

asthma management among patients. However, according to low asthma knowledge, the use of educational tools is recommended and depends on the educational levels of asthmatic individuals. Elevating asthma knowledge requires the futures.

References

1. Masoli M, Fabian D, Holt S, Beasley R. The global burden of asthma: executive summary of the GINA Dissemination Committee report. *Allergy.* 2004; **59:** 469 – 478.

2. 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.* 2001; **30:** 250 – 257.

3. Wigal JK, Stout C, Brandon M, Winder JA, McConnaughy K, Creer TL, et al. The Knowledge, Attitude, and Self-efficacy Asthma Questionnaire. *Chest.* 1993; **104:** 1144 – 1148.

4. Standards for the diagnosis and care of patients with chronic obstructive pulmonary disease (COPD) and asthma. This official statement of the American Thoracic Society was adopted by the ATS Board of Directors, November 1986. *Am Rev Respir Dis.* 1987; **136:** 225 – 244.

5. Rhee H, Belyea MJ, Ciurzynski S, Brasch J. Barriers to asthma self-management in adolescents: relationships to psychosocial factors. *Pediatr Pulmonol.* 2009; **44:** 183 – 191.

6. Gibson PG, Henry RL, Vimpani GV, Halliday J. Asthma knowledge, attitudes, and quality of life in adolescents. *Arch Dis Child.* 1995; **73:** 321 – 326.

7. Leiria PP, Cordeiro M, Pinto R. Adolescents and school asthma knowledge and attitudes. *Allergol Immunopathol.* 1999; **27:** 245 – 253.

8. Klein JJ, van der PJ, Seydel ER, Kerkhoff AH. Knowledge about drugs used by adult patients with asthma for self-treatment. *Ned Tijdschr Geneeskd.* 1998; **142:** 711 – 715.

9. Hindi-Alexander MC. Asthma education programs: their role in asthma morbidity and mortality. *J Allergy Clin Immunol.* 1987; **80:** 492 – 494.

10. 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; **94:** 564 – 576.

11. Yoon R, McKenzie DK, Bauman A, Miles DA. Controlled trial evaluation of an asthma education programme for adults. *Thorax.* 1993; **48:** 1110 – 1116.

12. Williams MV, Baker DW, Honig EG, Lee TM, Nowlan A. Inadequate literacy is a barrier to asthma knowledge and self-care. *Chest.* 1998; **114:** 1008 – 1015.

13. Tettersell MJ. Asthma patients› knowledge in relation to compliance with drug therapy. *J Adv Nurs.* 1993; **18:** 103 – 113.

14. Bone RC. Goals of asthma management. A step-care approach. *Chest.* 1996; **109:** 1056 – 1065.

15. Lang DM, Sherman MS, Polansky M. Guidelines and realities of asthma management. The Philadelphia story. *Arch Intern Med.* 1997; **157:** 1193 – 1200.

16. Tavasoli S, Heidarnazhad H, Kazemnejad A. Factors affecting patients› compliance to metered-dose inhaler drugs in two asthma clinics in Tehran, Iran. *Iran J Allergy Asthma Immunol.* 2006; **5:** 187 – 193.

17. Cohen R, Franco K, Motlow F, Reznik M, Ozuah PO. Perceptions and attitudes of adolescents with asthma. *J Asthma.* 2003; **40:** 207 – 211.

18. Yoos HL, Kitzman H, McMullen A. Barriers to anti-inflammatory medication use in childhood asthma. *Ambul Pediatr.* 2003; **3:** 181 – 190.

19. Williams LK, Joseph CL, Peterson EL, Wells K, Wang M, Chowdhry VK, et al. Patients with asthma who do not fill their inhaled corticosteroids: a study of primary nonadherence. *J Allergy Clin Immunol.* 2007; **120:** 1153 – 1159.

20. Forero R, Bauman A, Young L, Larkin P. Asthma prevalence and management in Australian adolescents: results from three community surveys. *J Adolesc Health.* 1992; **13:** 707 – 712.

21. Jones CA, Bender BG, Haselkorn T, Fish JE, Mink DR, Peters SP, et al. Predicting asthma control using patient attitudes toward medical care: the REACT score. *Ann Allergy Asthma Immunol.* 2009; **102:** 385 – 392.

22. Bartholomew LK, Gold RS, Parcel GS, Czyzewski DI, Sockrider MM, Fernandez M, et al. Watch, discover, think, and act: evaluation of computer-assisted instruction to improve asthma self-management in inner-city children. *Patient Educ Couns.* 2000; **39:** 269 – 280.

23. Bodenheimer T, Lorig K, Holman H, Grumbach K. Patient self-management of chronic disease in primary care. *JAMA.* 2002; **288:** 2469 – 2475.

24. Guevara JP, Wolf FM, Grum CM, Clark NM. Effects of educational interventions for self management of asthma in children and adolescents: systematic review and meta-analysis. *BMJ.* 2003; **326:** 1308 – 1309.