



## KNOWLEDGE REGARDING ASTHMA AMONG PARENTS OF ASTHMATIC CHILDREN IN AL-NAJAF AL-ASHRAF CITY

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### KeyWords

Knowledge, Asthma, Parents, Asthmatic Children

### ABSTRACT

**Methodology:** A descriptive cross-sectional study was applied on parents of asthmatic children in Al-Najaf city. Furthermore; the study continued from 1st October 2016 to 4th May 2017, in order to assess participants' knowledge toward asthma, as well as, to find any significant relation for parents socio-demographic characteristic with their knowledge regarding asthma. By using a nonrandomized sampling, purposive sample of 201 parents were selected from three hospitals, five primary health care centers and three Private Medical Clinics. A questionnaire composed of two parts was used, the first part included inquiry regarding socio-demographic characteristic of participants, and the second part included questions concerning knowledge about asthma, which was divided into six domains. **Results:** The result showed that from total 201 parents included in the study, 187 (93%) of them had total poor knowledge and only 14 (7%) of participant teachers had fair knowledge, besides no one of them had good knowledge. Furthermore, the result showed that the sociodemographic characteristic of parents had no significant relation to their level of knowledge about asthma. **Conclusions and Recommendations:** the conclusion and summary of the study showed very unsatisfactory knowledge about asthma among parents of asthmatic children. Therefore, the researchers recommended on establishing educational meetings for parents and community and applying further studies regarding this subject.

## INTRODUCTION

Asthma continues to be an important public health problem, affecting about 235 million people worldwide. Asthma is the most common chronic pediatric disease. Symptoms can occur several times a day if the disease is not controlled. Uncontrolled symptoms considerably decrease the quality of life for patients and family members because of reduced activity levels, daytime fatigue, sleeplessness, and absences from school or work (A. a BinSaeed et al., 2014; Covaciu, Bergström, Lind, Svartengren, & Kull, 2013; Sullivan et al., 2013). Asthma is a disease that affects your lungs. It causes repeated episodes of wheezing, breathlessness, chest tightness, and nighttime or early morning coughing. Asthma can be controlled by taking medicine and avoiding the triggers that can cause an attack (CDC, 2012).

Children with asthma are susceptible for serious complications include chronic airway remodeling, status asthmatics and respiratory failure. Prolonged use of steroid therapy may complicate the child condition. Children with asthma are also more susceptible for serious bacterial and viral respiratory infection, and disturbed family functions. Impairment of growth may often be seen in children with asthma as in other chronic childhood disease (Amin et al., 2014)

Parents play pivotal role in the children adjustment to the illness, especially children who suffer from severe episodic manifestations of asthma have been found to experience increased amounts of stress and anxiety over their illness and have difficulty in maintaining a sense of well-being (Zedan, El Regal, Osman, & Fouda, 2010).

Furthermore, asthma defined as a chronic inflammatory disease of the airways that causes airway hyperresponsiveness, mucosal edema, and mucus production. This inflammation ultimately leads to recurrent episodes of asthma symptoms: cough, chest tightness, wheezing, and dyspnea (Smeltzer, Bare, Hinkle, & Cheever, 2010)

Asthma considered as very common respiratory disorders, and higher level for asthma incidence recorded throughout the last decades. Likewise, asthma is a world challenging health problem, which according to WHO it affects around 235 million persons around the globe and annually kills more than 180.000 person, and as well as global childhood mortality due to asthma range between 0.0 to 0.7 per 100.000 every year. Furthermore, the children are the most age group influenced by asthma which is most common chronic childhood illness especially between ages of 5 to 14 years. Many epidemiological reports and studies recorded mutable increasing or decreasing in asthma prevalence, which it probably linked to environmental factors rather than genetic ones. Also, asthma rates recorded to be higher in urban areas more than rural areas. Moreover, asthma mortality rate noticed to be higher in low-income countries (Abdulhamid, Beck, Millard, Chen, & Prasad, 2008; Anderson et al., 2004; Asher & Pearce, 2014; Burney, 2002; Subbarao, Mandhane, & Sears, 2009; Toelle et al., 2004; WHO, 2013, 2016; Wong et al., 2004; YinPing et al., 2013).

Asthma increases health care expenditures, reduces productivity, in-creases school and work absenteeism, and decreases the quality of life of affected persons and their families (Rosas-Salazar, Apter, Canino, & Celedón, 2012).

Asthma and asthma morbidity result from incompletely understood interactions among heredity, environment, and life-style (Canino, McQuaid, & Rand, 2009)

There is a shortage in scientifically sound data and only few studies are interested with this subject generally in Iraq and especially in Al-Najaf, so that, the assessment of knowledge of parents about asthma will help in establishment of educational programs, workshops and public meetings about the asthma, which will resulting in development of parents' knowledge toward asthma. Besides, assessment of parent knowledge is a significant requirement if we need to improve childhood asthma management.

## MATERIAL AND METHODS:

A descriptive, cross-sectional study design was carried out. The study was conducted at 3 governmental hospitals of (Al-Sadr Medical City, Al-Hakim General Hospital and Al-Zahra Teaching Hospital), and 5 selected primary health care centers in Al-Najaf City. Likewise, three Private Medical Clinics were visited for collecting further study samples. A purposive sample of 201 parents of asthmatic children (mother or father) who attended the aforementioned Hospitals, Primary Health Care Centers and Private Medical Clinics in Al-Najaf City was selected by means of non-randomization technique. Sampling Criteria included: 1. Parents of asthmatic children aged between 2 to 12 years. 2. Only the parents of children that certainly diagnosed with asthma by a physician. Through reviewing related literatures and studies the questionnaire was prepared; and modified depending on previous studies e.g. (Zhao et al., 2002; Prapphal et al., 2007; Al-Binali et al., 2010; Zhao et al., 2013; Amin et al., 2014), and it was divided into two main parts (part one contained socio-demographic information, part two included questions on parents' knowledge about asthma and it was also sub-divided into six domains). The study sample statistically analyzed by using IBM SPSS Statistic V.23 2015, and Microsoft Excel 2016. In addition, descriptive (frequency (F), percentage (%), mean of score) and inferential statistical analysis approaches (Chi-Squared test) were used.

**RESULTS:**

Table (1) Distribution of the Study Sample by Their Socio-Demographic Characteristics.

Variable	Items	Frequency	Percent
Residence	Urban	155	77.1
	Rural	46	22.9
Gender	Male	131	65.2
	Female	70	34.8
Age	<= 33	98	48.8
	34 - 49	88	43.8
	50+	15	7.5
Fathers' education	Illiterate	19	9.5
	read and write	51	25.4
	Primary school	28	13.9
	Secondary	44	21.9
	Junior	55	27.4
	College	4	2.0
Mothers' education	Illiterate	22	10.9
	read and writer	58	28.9
	Primary school	44	21.9
	Secondary	39	19.4
	Junior	37	18.4
	College	1	0.5
Fathers' occupation	Employee	56	27.9
	free business	130	64.7
	Retired	7	3.5
	Unemployed	8	4.0
Mothers' occupation	Employee	21	10.4
	free business	3	1.5
	Retired	3	1.5
	Housewife	173	86.1
Number of family in a house	<= 2	34	16.9
	3 - 5	76	37.8
	6 - 7	64	31.8
	8+	27	13.4
Number of rooms in a house	<= 1	5	2.5
	2 - 3	137	68.2
	4 - 6	51	25.4
	7+	8	4.0
Ownership of residential unit	House rent	166	82.6
	Common House	27	13.4
	Other	8	4.0
Family income	Sufficient	90	44.8
	Barely sufficient	102	50.7
	Insufficient	9	4.5

Table (1) revealed that, majority of 201 parents were enrolled in this study, had age less or equal to 33 years, furthermore, males were the dominant represented 65.2% of the studied group compared to 70 female parents (34.8%). Majority of the participants (77.1%), were urban residents. Regarding the educational level of the fathers, the majority of the them ranged from secondary to Junior high school, while about a quarter of fathers were only reading and writing. However, for mothers, the level of education ranged from Primary to Secondary and Junior, but about a third of them (29%) were reading and writing, which is higher comparing to the fathers percentage that is (25%). Concerning the fathers' occupation, majority of them were practicing free businesses (64.7%), while (86.1%) of mothers' were housewives (without job). Approximately (51%) of the participants had a barely sufficient monthly income, while 90 (44.8%) had sufficient monthly income.

Table (2) Information related to the parents' knowledge regarding asthma.

No	1st Domain: general information about asthma.	Mean	Assessment
1.	Asthma considered as a non-curable disease	1.37	Poor
2.	Asthma is an inflammation that leads to a total or partial blockage in the airways	1.38	Poor
3.	Asthma is not considered as a contagious disease	1.56	Poor
4.	Asthma is a hereditary disease that occur in children and cannot happen in adults	1.13	Poor
5.	Occurrence of asthma during childhood does not mean that the it will continue through lifetime	1.04	Poor
6.	Asthma is not necessarily an allergic disease	1.21	Poor
	2nd Domain: the mechanism of asthma occurrence.	Mean	Assessment
7.	Inflammation causes severe stenosis in the trachea.	1.67	Fair
8.	Immune reactions in airways resulting from exposure to stimulants.	1.12	Poor
9.	An asthma attack does not cause difficulty in the airflow within the bronchi.	1.31	Poor
10.	The mucous secretions in the chest are increasing during the asthma attack.	1.54	Poor
	3rd Domain: signs and symptoms of asthma	Mean	Assessment
11.	Wheezing occurs in asthma patients when breathing.	1.77	Fair
12.	Most of the time, asthma patients suffering from the cough.	1.67	Fair
13.	The occurrence of asthma attacks at night is more common than day.	1.77	Fair
14.	The asthmatic child suffers from breathing difficulties during exercise only.	1.12	Poor
15.	Feeling of chest tightness considered a symptom for asthma.	1.39	Poor
16.	Occurrence of frequent coughs and wheezing during a day or week are a possible sign of asthma.	1.19	Poor
	4th Domain: factors that aggravate asthma.	Mean	Assessment
17.	Colds affect asthma patients.	1.75	Fair
18.	Weather change affects asthma patients.	1.82	Fair
19.	The odor of insecticides affects asthma patients.	1.78	Fair
20.	The dust increases the asthma attacks.	1.89	Fair
21.	Smoking is linked to asthma disease.	1.71	Fair
22.	Exercise affects asthma patients.	1.36	Poor
23.	Anxiety affects asthma patients.	1.13	Poor
24.	Insects' bite is a potential cause for asthma.	0.85	Poor
	5th Domain: complications of asthma.	Mean	Assessment
25.	Asthma causes sleep disorders.	1.72	Fair
26.	An acute asthma attack leads to sudden death.	1.18	Poor
27.	Acute asthma leads to the inability to work and walking.	1.46	Poor

28	Asthma may leads to heart failure.	0.74	Poor
29	Asthma affects the growth and development of the child.	1.08	Poor
30	Asthma disease may leads to sinusitis.	1.24	Poor
31	Long-term use of asthma medication for children will cause a decline in their stature.	0.84	Poor
6th Domain: treatment of asthma.		Mean	Assessment
32	Asthma treatments are divided into fast acting (short-term) and long-term drugs.	1.31	Poor
33	Bronchial heat treatment is a treating method for acute asthma.	0.97	Poor
34	Herbal remedy is an alternative to the use of asthma medications.	0.94	Poor
7th Domain: first aid regarding asthma.		Mean	Assessment
35	Transferring asthma patient to the nearest health institution regardless severity of the condition.	1	Poor
36	Helping the child to take four puffs of his treatment sprayer with a 4-breath break for each puff.	1.34	Poor
37	Sitting straight will relieve an asthma attack.	1.62	Poor
38	Opening windows and ventilating the environment is useful for asthma.	1.80	Fair
39	Giving warm fluids positively affects asthma patients.	1.67	Fair
40	The slapping on the back helps to breathe during an asthma attack.	0.91	Poor

This table reveals that  $\leq 1.66$  indicates poor knowledge, 1.67-2.33 indicates fair knowledge and  $\leq 2.34$  indicates good knowledge.

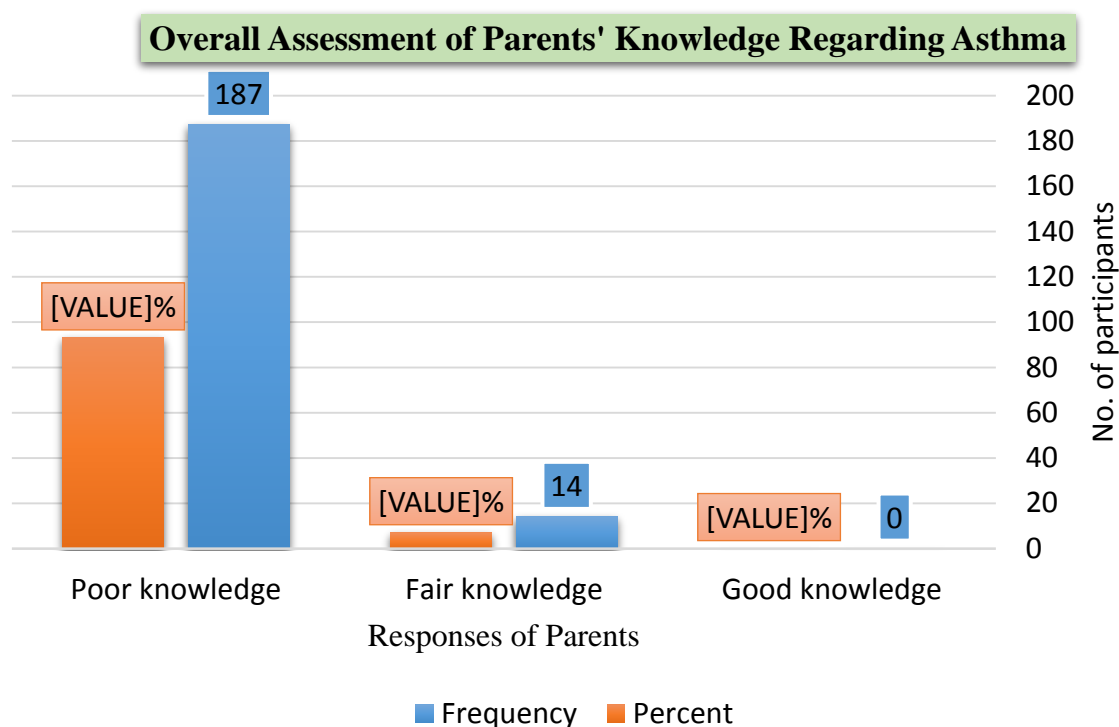
TABLE (2) shows parents' responses to the questions about asthma, which categorized into seven domains. However, participants' responses ranged between poor and fair, while none of the questions had good response. Generally, mainstream of questions regarding asthma had poor assessment.

Table (3) Assessment of parents' overall knowledge about asthma.

Overall Assessment of Parents' Knowledge Regarding Asthma		
Assessment	Frequency	Percent
Good knowledge	0	0
Fair knowledge	14	7.0
Poor knowledge	187	93.0
Total	201	100.0

Mean  $\pm$  SD 1.359  $\pm$  0.239

This table revealed the overall responses of parents regarding asthma knowledge, which was poor with total mean score of (1.359), additionally, only (7%) of parents had fair knowledge , while (93%) of them had poor knowledge.

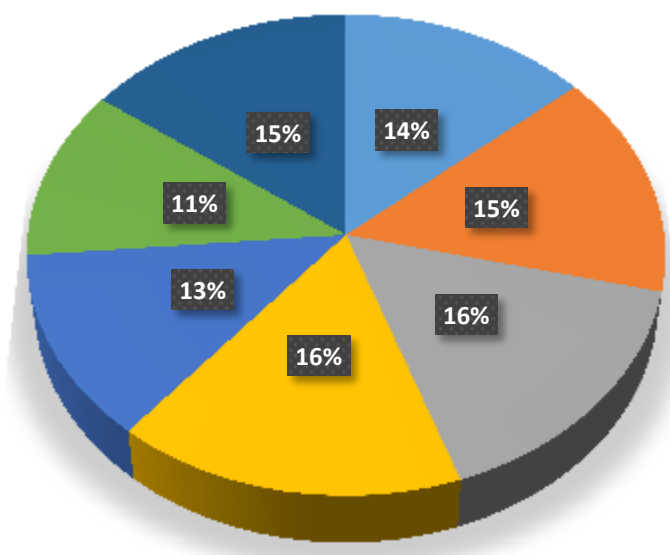


**Figure (1): distribution of parents' knowledge according to their overall responses.**

This figure expresses parents' responses that fluctuated between poor and fair, while no one of them had good knowledge about asthma. Which total mean score of poor knowledge was (1.359), additionally, only (7%) of parents had fair knowledge , while (93%) of them had poor knowledge

### Percentage of Correct Answers

- 1st Domain: general information about asthma.
- 2nd Domain: the mechanism of asthma occurrence.
- 3rd Domain: signs and symptoms of asthma
- 4th Domain: factors that aggravate asthma.
- 5th Domain: complications of asthma.
- 6th Domain: treatment of asthma.
- 7th Domain: first aid regarding asthma.



**Figure (2): distribution of correct answers according to domains regarding asthma.**

Figure (2) revealed that the highest percentage for correct answers were in the 3rd and 4th domains about (16%) for each, and followed by 2nd and 5th domains approximately (15%) for each, while the lowest response was in sixth domain.

**Table (4) Relationship between Socio-Demographic characteristic of parents and Overall knowledge concerning Asthma.**

Socio-Demographic Characteristics	Items	Asthma knowledge		Sig.
		Fair	Poor	
Residence	Urban	9	146	p-value (0.236) d.f = 1 NS
	Rural	5	41	
Gender	Male	7	124	p-value (0.217) d.f = 1 NS
	Female	7	63	
Age	<= 33	8	90	p-value (0.511) d.f = 2 NS
	34 - 49	6	82	
	50+	0	15	
Father's education	Illiterate	0	19	p-value (0.792) d.f = 5 NS
	read and writer	4	47	
	Primary school	3	25	
	Secondary	3	41	
	Junior	4	51	
	College	0	4	
Mothers education	Illiterate	1	21	p-value (0.896) d.f = 5 NS
	read and writer	6	52	
	Primary school	3	41	
	Secondary	2	37	
	Junior	2	35	
	College	0	1	
Family income	Sufficient	4	86	p-value (0.244) d.f = 2 NS
	Barely sufficient	10	92	
	Insufficient	0	9	

Table (4) revealed that there was no significant relationship between parents' knowledge regarding asthma and their socio-demographic characteristics.

#### DISCUSSION:

The current study included (201) Iraqi parents, majority of them were in age below (50) years of age, whereas, the males constituted about two third of study sample and female constituted approximately one third of parents participated in the study. These findings is consistent with Indian study done in 2016 by Gajanan and others, and found that the proportion of male parents were slightly higher than female parents which is almost similar to the present study (Gajanan et al., 2016). Regarding the residency about four fifth of respondents were urban residence which is obviously can be attributed to applying the study inside the Al-Najaf City not in its country. Likewise, concerning mothers and fathers educational level, majority of them had an educational level that ranged from primary school reaching to Junior high school. This outcome closely approved with another Indian research done in 2005 by Shivba-

lan and others, and found that the educational level of highest proportion of parents varied from just reading and writing until reaching high school while small proportion of them were illiterate as the findings of the current study (Shivbalan et al., 2005).

With regard to the fathers and mothers occupation, the result revealed that majority of fathers worked in free businesses and overwhelming number of mother were housewives. Saudi Arabian study conducted in 2014 by BinSaeed disagreed with existing work, which found that around sixty percent of mothers were employed (A. A. BinSaeed, 2014).

With respect to the monthly income, the present work revealed that more than half of parents enrolled in the study had barely sufficient monthly income that is steady with findings of BinSaeed et al., in 2014 which found that more than half of parents had insufficient to barely sufficient monthly income (A. a BinSaeed et al., 2014).

Concerning parents' knowledge about asthma, it found very unsatisfactory which triggers the alarm and draws attention. Parents had overall poor knowledge regarding asthma with Mean  $\pm$  SD of  $(1.359 \pm 0.239)$ , whereas the percentage for poor knowledge among parents was (93%) and for fair knowledge was (7%), with taking into consideration that there was no good assessment for responses to any question or domains of asthma knowledge. However, Zhao et al., the Chinese researchers in 2013 had similar findings where parents exhibited a low level of asthma-related knowledge, which almost (18.31%) of them succeeded in responding correctly to ( $\geq 60\%$ ) of the asthma knowledge questions (J. Zhao et al., 2013). Conversely, Ramesh et al., in 2014 had different results, where approximately three fifths of study sample possessed moderate knowledge, while about 30% had poor knowledge, and little minority gained good assessment regarding asthma knowledge (Ramesh et al., 2014).

Totally, from current study researchers point of view the included Iraqi parent in the study had poor knowledge due to noticed paucity in studies regarding such subjects in Iraq, as well as, due to absence of adopting official programs by in relation to asthma or other serious chronic conditions that helps in educating parents and community in front of uprising health problems in our today world.

Regarding Relationship between Parents' Knowledge about Asthma and Their Socio-Demographic Characteristics: The outcome of current study showed that the socio-demographic characteristic of parents had no significant relationship with their level of knowledge about asthma. However, these results are similar to the findings of Amin et al., and Ramesh et al., studies that done in 2014, which they revealed that there was no statistically significant association between levels of parents' knowledge about asthma and their socio demographic characteristics (Amin et al., 2014; Ramesh et al., 2014).

Another study done in 2007 by Prapphal et al., revealed that the duration of parents caring for their asthmatic child was the only significant factor associated with adequate knowledge about asthma (Prapphal et al., 2007). From current study researchers' point of view, this might be related to the fact that parents due to long duration of dealing with their asthmatic child would gain more knowledge and expertise which raising their level of awareness and knowledge about asthma more than parents with recently child diagnosed with asthma.

## Conclusions and recommendations:

The vast majority of parents had overall poor knowledge regarding asthma (93%) which is very unsatisfactory, while no one had good knowledge about asthma. In addition, no significant association was found between parents knowledge about asthma and their socio demographic characteristics. Researcher recommended that further studies should be applied with larger samples, in order to get data that are more reliable concerning current subject and the establishment of educational meetings or training courses regarding asthma and other chronic diseases first aid for parents would be helpful. Besides educating parents, the effort must be directed toward educating children who are eligible for learning (at proper age). Likewise, using Mass Media and TV or at least educational posters and leaflets, for purpose of health education and raising awareness of individuals, families and community toward health issues.

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## References

- [1] Abdulhamid, I., Beck, F. W. J., Millard, S., Chen, X., & Prasad, a. (2008). Effect of zinc supplementation on respiratory tract infections in children with cystic fibrosis. *Pediatr Pulmonol*, 287(May 2007), 281–287. <https://doi.org/10.1002/ppul>
- [2] Al-Binali, A., Maltfouz, A., Al-Fifi, S., Naser, S., & Al-Gelban, K. (2010). Asthma knowledge and behaviours among mothers of asthmatic children in Aseer, south-west Saudi Arabia. *Eastern Mediterranean Health Journal*, 16(11), 1153–8.
- [3] Amin, G. M., Elsamman, G. a, & Hussein, H. a. (2014). Knowledge of Mothers of Children with Bronchial Asthma. *Medical Journal of Cairo Univesity*, 82(2), 63–70.
- [4] Anderson, H. R., Ruggles, R., Strachan, D. P., Austin, J. B., Burr, M., Jeffs, D., ... Goulding, R. (2004). Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002: questionnaire survey. *Bmj*, 328(7447), 1052–1053. <https://doi.org/10.1136/bmj.38057.583727.47>
- [5] Asher, I., & Pearce, N. (2014). Global burden of asthma among children. *The International Journal of Tuberculosis and Lung Disease : The Official Journal*



- of the International Union against Tuberculosis and Lung Disease, 18(11), 1269–1278. <https://doi.org/10.5588/fijtld.14.0170>
- [6] BinSaeed, A. A. (2014). Caregiver knowledge and its relationship to asthma control among children in Saudi Arabia. *J Asthma*, 51(8), 870–875. <https://doi.org/10.3109/02770903.2014.906608>
- [7] BinSaeed, A. a, Torchyan, A. a, Alsadhan, A. a, Almidani, G. M., Alsubaie, A. a, Aldakhail, A. a, ... Alsaadi, M. M. (2014). Determinants of asthma control among children in Saudi Arabia. *The Journal of Asthma: Official Journal of the Association for the Care of Asthma*, 51(4), 435–439. <https://doi.org/10.3109/02770903.2013.876649>
- [8] Burney, P. (2002). The changing prevalence of asthma. *Thorax*, 57(Suppl II), 36–39. <https://doi.org/10.1136/thorax.57.suppl>
- [9] Canino, G., McQuaid, E. L., & Rand, C. S. (2009). Addressing asthma health disparities: a multilevel challenge. *Journal of Allergy and Clinical Immunology*, 123(6), 1209–1217.
- [10] Centers for Disease Control and Prevention. (2012). Asthma.
- [11] Covaciu, C., Bergström, A., Lind, T., Svartengren, M., & Kull, I. (2013). Childhood allergies affect health-related quality of life. *Journal of Asthma*, 50(5), 522–528.
- [12] Gajanan, G., Padbidri, V. S., & Chaudhury, A. (2016). Assessment of Knowledge and Attitude of Parents Towards the Allergy and Bronchial Asthma in Their Children. *International Journal Medicine and Public Health*, 6(3), 121–125.
- [13] Prapphal, N., Laosunthara, N., Deerojanawong, J., & Sritippayawan, S. (2007). Knowledge of Asthma among Caregivers of Asthmatic Children: Outcomes of Preliminary Education. *Journal of the Medical Association of Thailand*, 90(4), 748–753.
- [14] Ramesh, N., Nisha, C., & Jose, S. K. (2014). Knowledge Regarding Childhood Asthma among Mothers of Asthmatic Children Presenting to a Selected Hospital, Bangalore, South India. *National Journal of Research in Community Medicine*, 3(3), 224–229.
- [15] Rosas-Salazar, C., Apter, A. J., Canino, G., & Celedón, J. C. (2012). Health literacy and asthma. *Journal of Allergy and Clinical Immunology*, 129(4), 935–942. <https://doi.org/10.1016/j.jaci.2012.01.040>
- [16] Shriobalan, S., Balasubramanian, S., & Anandnathan, K. (2005). What Do Parents of Asthmatic Children Know About Asthma?: An Indian Perspective. *The Indian Journal of Chest Diseases & Allied Sciences*, 47(2), 81–87.
- [17] Smeltzer, S. C., Bare, B. G., Hinkle, J. L., & Cheever, K. H. (2010). *Brunner & Suddarth's textbook of medical-surgical nursing* (12th ed.). Hong Kong: Wolters Kluwer Health / Lippincott Williams & Wilkins.
- [18] Subbarao, P., Mandhane, P. J., & Sears, M. R. (2009). Asthma: Epidemiology, etiology and risk factors. *CMAJ*, 181(9), 181–190. <https://doi.org/10.1503/cmaj.080612>
- [19] Sullivan, P. W., Smith, K. L., Ghushchyan, V. H., Globe, D. R., Lin, S.-L., & Globe, G. (2013). Asthma in USA: its impact on health-related quality of life. *Journal of Asthma*, 50(8), 891–899.
- [20] Toelle, B. G., Ng, K., Belousova, E., Salome, C. M., Peat, J. K., & Marks, G. B. (2004). Prevalence of asthma and allergy in schoolchildren in Belmont, Australia: three cross sectional surveys over 20 years. *BMJ (Clinical Research Ed.)*, 328(7436), 386–387. <https://doi.org/10.1136/bmj.328.7436.386>
- [21] WHO. (2013). Media Centre: Asthma. Retrieved June 2, 2016, from <http://www.who.int/mediacentre/factsheets/fs307/en/>
- [22] WHO. (2016). Media Centre: Bronchial asthma. Retrieved February 6, 2016, from <http://www.who.int/mediacentre/factsheets/fs206/en/>
- [23] Wong, G. W. K., Leung, T. F., Ko, F. W. S., Lee, K. K. M., Lam, P., Hui, D. S. C., ... Lai, C. K. W. (2004). Declining asthma prevalence in Hong Kong Chinese schoolchildren. *Clinical & Experimental Allergy*, 34(10), 1550–1555.
- [24] YinPing, Z., BaiZhan, L., Chen, H., Xu, Y., Hua, Q., QiHong, D., ... Sundell, J. (2013). Ten cities cross-sectional questionnaire survey of children asthma and other allergies in China. *Chinese Science Bulletin*, 58(34), 4182–4189. <https://doi.org/10.1007/s11434-013-5914-z>
- [25] Zedan, M. M., El Regal, M. E., Osman, E. A., & Fouda, A. E. (2010). Steroid phobia among parents of asthmatic children: Myths and truth. *Iranian Journal of Allergy, Asthma and Immunology*, 9(3), 163.
- [26] Zhao, J., Shen, K., Xiang, L., Zhang, G., Xie, M., Bai, J., & Chen, Q. (2013). The knowledge, attitudes and practices of parents of children with asthma in 29 cities of China: a multi-center study. *BMC Pediatrics*, 13(1), 20. <https://doi.org/10.1186/1471-2431-13-20>
- [27] Zhao, X., Furber, S., & Bauman, a. (2002). Asthma knowledge and medication compliance among parents of asthmatic children in Nanjing, China. *The Journal of Asthma: Official Journal of the Association for the Care of Asthma*, 39(8), 743–747. <https://doi.org/10.1081/JAS-120015798>