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Knowledge & Attitude among Parents of Children with Bronchial Asthma whom Attending Iraq Pediatric Hospital

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ABSTRACT

Background: Asthma is a prevalent chronic condition in pediatric populations. The rising incidence, morbidity, and mortality rates associated with asthma have heightened public health concerns. Pediatric asthma imposes a substantial burden on affected children, their families, and the broader community. Effective asthma management encompasses regular monitoring, symptom control, and the prevention of exacerbations. Objectives: The study aimed to document the knowledge, attitudes of parents of children with asthma and to identify the factors associated with parent knowledge and attitude. Method: A study was conducted involving 205 parents of children under five years old with asthma, who attended the Karbala Pediatric Hospital between February 15 and May 15, 2023. A specially designed questionnaire was utilized, comprising three sections: the first section addressed socio-demographic information of both children and parents, the second section evaluated the parents' knowledge, and the third section assessed the parents' attitudes. Responses were scored with one point for correct answers and zero points for incorrect or "I don't know" answers. Statistical analyses, including the Student's T-test, ANOVA, and linear regression, were employed to identify factors associated with parental knowledge. Results: The results indicated that the majority of participants were mothers, with a mean age of 29 years, and the majority of asthmatic children were male (69.3%), with a mean age of 34.4 months. It was found that 48.8% of participants had a poor knowledge score, while 61% had a poor attitude score. Key factors influencing knowledge scores included the family's place of residence, the child's birth order, the duration of the disease, the age at disease onset, the participant's age, and the mother's educational level. Conclusion: Overall, the parents demonstrated limited knowledge and unfavorable attitudes regarding childhood asthma. Enhancing their understanding and attitudes could potentially lead to improved management practices among parents of children with asthma.

Keywords: Knowledge, Attitude, Children, Bronchial, Asthma, Iraq.

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INTRODUCTION

Bronchial asthma is a heterogeneous condition, typically marked by chronic inflammation of the airways, leading to airflow obstruction that can be fully or partially reversible, with or without specific treatment. The inflammation within the airways results from complex interactions among various cells, cellular components, and cytokines. In individuals who are susceptible, this inflammation can trigger recurrent or persistent bronchospasm, manifesting as symptoms such as wheezing, shortness of breath, chest tightness, and coughing, especially during the night or in the early morning hours, or following physical exertion. (Reddel et al., 2021). In Iraq the overall prevalence of asthma was 8.3 and the prevalence of asthma in (0-4) years was 4.7 according to most recent Iraq family health survey 2006/7.

Childhood asthma represents a significant burden. According to annual report of ministry of health in Iraq (2016), the percentage of respiratory disease from all inpatients for all reason in Karbala in under five years was 4.7% and percentage of respiratory disease outpatient visit in the hospital in under five years was 26% (Pniewska & Pawliczak, 2013: Devereux, Matsui, & Burney, 2014).

In developed countries, the prevalence of asthma is notably higher among low-income populations residing in urban areas and inner cities compared to other demographic groups (Abu-Shaheen, Nofal, & Heena, 2016). The precise cause of asthma remains unclear. While it is thought to have a genetic component, a variety of environmental, infectious, and chemical factors also play a role. When a child is exposed to a specific trigger, the body releases histamine and other substances that can lead to inflammation in the airways. In children aged 5 years and younger, an asthma diagnosis is often determined by evaluating specific symptom patterns (such as wheezing, coughing, breathlessness, and nocturnal symptoms or awakenings), the presence of risk factors associated with asthma development, and the child's therapeutic response to controller treatment (Herzog & Cunningham-Rundles, 2011).

Study Methods

The study was a cross- sectional study with analytic elements. The data collection was carried out in pediatric clinic, emergency unit and asthma clinic which open one day weekly of Karbala pediatric hospital at Karbala city, Iraq. The data collection was done between the 15 of February to the 15 of May 2023. A consentient and purposeful sample of parents who had child with asthma and attend the Karbala pediatric hospital. A sample size of 205 participants were included in our

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study. Inclusion criteria included all parents who had child with: Age of five years and younger, also children with History of asthma.

A single tool was used to collect the necessary data, which was a self-constructed questionnaire designed to gather information from participants regarding specific variables. Data collection was conducted through direct interviews with the participants. The first section of the questionnaire focused on the socio-demographic characteristics of the child and their family, comprising sixteen questions.

The second part of the questionnaire includes information about disease duration and type of treatment and includes five questions. The third part includes information about the participant's knowledge, this part used to assess participants' knowledge about asthma. It included ten questions about definition of bronchial asthma, cause of asthma, symptoms asthma, and asthma stimulus, asthma medication and medication devices.

The total scores of parents' knowledge were 15 scores. The answer of each question was as the following: I don't know=0 score, inaccurate answer=0 score and correct answer=1 scores. The fourth part includes information about the participant's attitude and belief, this part used to assess participant's attitude about asthma. It included six questions about participant's attitude about child playing outdoor like normal child, attitude about regular treatment and uses any alternative medications.

The total scores of participants' attitude were 8 scores. The answer of each question was as the following: I don't know=0 score, inaccurate answer=0 score and correct answer=1 scores. An official permission obtained from This study take approval of ethical committee from Arab board for health specialty , department of family medicine in Iraq, *Karbala health office and* Karbala pediatric hospital. *The procedure of study explained to participant to get verbal informed consent.*

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) software, version 23. Descriptive statistics were presented in the form of frequency tables, with continuous variables expressed as mean ± standard deviation and categorical variables as numbers and percentages. The Student's t-test and ANOVA were employed to examine associations between categorical and continuous variables. An association was considered statistically significant if the P-value was less than 0.05.

RESULTS

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Table 1: *Distribution of some sociodemographic variables among parents*.

Variable		Frequency	Percent
Responding parents	Mother	151	73.7%
	Father	54	26.3%
Mean(±SD) age of responding parents	Main mother age 29 (±5.9) years, Maximum=48,Minimum=18		
	Main father age 35.2(±6.6)years, Maximum=57,Minimum =20		
Educational level of mother	Uneducated	21	10.2%
	Read and write	14	6.8%
	Primary school	61	29.8%
	Secondary school	61	39.8%
	University	48	23.4%
Educational level of father	Uneducated	18	8.8%
	Read and write	7	3.4%
	Primary school	54	26.3%
	Secondary school	81	39.5%
	University	45	22%

A total of 205 responded parents enrolled in this study, mother to father ratio was 2.79:1. The mean age of mother was 29 years, while mean age of father was 35.2 years. The percentage of having university education for responded parents was 23.4% for mother participants and 22% for father participants.

Table 2: *Distribution of some sociodemographic variables among asthmatic children.*

Variable		Frequency	Percent
Age of asthmatic child	≤ 1 years	24	11.7%
	1-3 years	76	37.1%
	>3 years	105	51.2%
	Means(± SD) in months=34.4 (±16.4) Maximum=60 months, Minimum=5 months.		
Gender of child	Male	124	69.3%
	female	63	30.7%
Sequence of child in his/here family	First child	38	18.5%
	Middle child	65	31.7%
	Last child	102	49.8%

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The mean age of asthmatic child was 34.4 months; male to female ratio was 1.96:1. The last child sequence in his/her family was found in 102(49.8%) of asthmatic child.

Table 3: *Distribution of some household condition among family of asthmatic children.*

Variable		Frequency	Percent
Residence	Rural	36	17.6%
	Urban	169	82.4%
Type of family	Extended	75	36.6%
	Nuclear	130	63.4%
Economic level	Week	72	35.1%
	Fair	109	53.2%
	Good	24	11.7%
Type of house heating	Gas burner	3	1.5%
	Oil heater	16	7.8%
	Electrical heater	83	40.5%
	Two devices	82	40%
	Three devices	15	7.3%
	Not use	6	2.9%
History of Breed animal	Yes	71	34.6%
	No	134	65.4%
parent smoking status	Yes	116	56.6%
	No	89	43.4%
Crowding index	Overcrowding	97	47.3%
	Normal	1.8	52.7%

About some household condition, 169(82.4%) of asthmatic child's lived in urban area, 130(63.4%) of child lived with nuclear family, majority of child lived in fair economic level 109(53.2%), only 6(2.9%) of child not use any heating method in their house and 83(40.5%) of family use electrical heater, 71(34.6%) have animal in their house from them 51(71.8%) breed poultry in their house and 13(18.3%) breed cattle and 7(9.9%) breed both poultry and cattle in their house, 116(56.6%) of asthmatic child had smoker parent and 97(47.3%) lived in crowded house.

Table 4: *Distribution of some medical asthma characteristic among children.*

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Variable		Frequency	Percent
Age at onset of asthma	≤ 1 years	141	68.8%
	>1 years	64	31.2%
	Mean (±SD) 13.9(±11.2) months. Maximum=48 months, Minimum =2months		
Duration of disease	Mean (±SD) 20.4(±13.1) months. Maximum=56 month, Minimum =1 months		
Type of treatment now	For exacerbation of asthma	148	72.2%
	On control treatment	57	27.8%
History of hospital admission	Yes	118	57.8%
	No	86	42.2%
	Mean=3, maximum=15, minimum=1		
Past medical history	+ ve	128	62.4%
	- ve	77	37.6%
Past family history	+ve	176	85.9%
	-ve	29	14.1%

About history of asthma in child's, 141(68.8%) of child developed asthma at one years and younger, mean duration of asthma was 20.4(±13.1) months, 148(72.2%) of child on treatment for worsening of asthma attack, 118(57.8%) had previous hospital admission because of asthma, 128 (62.5%) had past medical history of allergic condition like eczema and 176 (85.9%) had past family history of asthma.

Table 5: *Distribution of parents according to knowledge score.*

knowledge score	NO(%)	Mean(±SD)	Mean percent	Median
Weak	100(48.8%)	6.9(±1)	46%	7
Fair	89(43.4%)	9.9(±0.8)	66%	10
Good	16(7.8%)	12.4(±0.6)	82.6%	12
Total	205	8.6(±2)	57.3%	9

Regard the knowledge score, the parents who had weak knowledge score were 100(48.8%) with mean 6.9, the parents who had fair knowledge score were 89(43.4%) with mean 9.9 and only 16(7.8%) had good knowledge score with mean 12.4. the total mean was 8.9(±2), standard error of mean was 0.124 and 95% confidence interval was 8.41-8.91

Table 6: *Distribution of parents according to attitude score.*

Attitude score	NO (%)	Mean(±SD)	Mean percent	Median
Weak	125(61%)	3.1(±0.8)	38.7%	3

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Fair	72(35.1%)	5.5(0.5)	68.7%	5
Good	8(3.9%)	7.1(±0.3)	88.7%	7
Total	205	4.1(±1.4)	51.2%	4

Majority of parents had weak attitude score 125(61%) of parents while only 8(3.9%) of parents had good attitude score about childhood asthma. The total mean attitude score was 4.1(±1.4), standard error of mean was 0.09 and 95% confidence interval were 3.9-4.3.

Table 7: *Relation of knowledge score with some child's variables.*

Variable		Knowledge score	
		Mean (±SD)	Significant
Age of asthmatic child	≤ 1 years	8.5(±2)	0.28*
	1-3 years	8.9(±2.2)	
	>3 years	8.4(±1.7)	
Gender of child	Male	8.5(±1.9)	0.34**
	female	8.8(±2.1)	
Sequence of child in his/here family	First child	7.8(±1.7)	0.004*
	Middle child	8.5(±1.7)	
	Last child	8.8(±2)	

*ANOVA test ** Student –T test significant P value ≤0.05.

The age of asthmatic child was not associated significantly with parent's knowledge (P value >0.05). The mean score for parents with female asthmatic child was higher than mean knowledge score for parents with male asthmatic child with no significant association with participants knowledge score (P value >0.05) . The knowledge score increases with increase chance of being the last baby in family 7.8, 8.5and 8.8 for first, middle and last child, respectively, with significant association between them (P value ≤0.05).

Table 8: *Relation of some medical asthma characteristic among participant parents .*

Variable		knowledge score	
		Mean (±SD)	Significant
Age at onset of asthma	≤ 1 years	8.9(±2)	0.006**
	>1 years	8.1(±1.7)	
Type of treatment now	For exacerbation of asthma	8.7(±1.9)	0.75**
	On control treatment	8.5(±2.1)	
History of hospital admission	Yes	8.7(±2)	0.52**
	No	8.5(±1.9)	
Past medical history	+ ve	8.7(±1.9)	0.29**
	- ve	8.3(±2.2)	
Past family	+ve	8.8(±2)	0.02**

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history	-ve	7.8(±1.8)	

*ANOVA test ** Student –T test significant P value ≤0.05.

The participants with positive family history of asthma have high knowledge score (8.8) than those with negative family history of asthma (7.8) with significant association between them (P value ≤0.05).

Table 9: Relation between duration of asthma in child and score of knowledge in parent.

Variables	Mean(±SD)	Correlation coefficient	Significant
Duration of disease	20.6(±13)		
Score of knowledge	8.6(±2)	0.17	0.01***

*** Correlation test . significant P value ≤0.05.

An association between duration of asthma in child and score of knowledge in parent and found there was a significant association between duration of asthma in child and score of knowledge (p value ≤0.05) and there was very weak direct positive linear correlation between them.

Table 10: *Relation of some parents related variable with knowledge score.*

Variable		Knowledge score	
		Mean (±SD)	Significant
Responding parents	Mother	8.6(±2)	0.45**
	Father	8.8(±1.8)	
Educational level of mother	Uneducated	7.9(±1.7)	0.02*
	Read and write	7.5(±1.9)	
	Primary school	8.5(±2)	
	Secondary school	8.9(±1.6)	
	University	9(±2.2)	
Educational level of father	Uneducated	8.6(±1.7)	0.23*
	Read and write	8.8(±2.6)	
	Primary school	8.2(±2)	
	Secondary school	8.6(±1.8)	
	University	9.3(±2.1)	

*ANOVA test ** Student –T test significant P value ≤0.05.

The relation of responding parents to their child not associated with knowledge score (P value > 0.05). The educational level of mother associated significantly with knowledge score of participant's parents (P value ≤0.05) with highest mean (9) was found in the parent with

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highest educational level (university). But the educational level of father not associated significantly with knowledge score of participant's parents (P value >0.05).

Table 11: *Relation between ages of participant's parents and score of knowledge in parent.*

Variables	Mean(±SD)	Correlation coefficient	Significant
Age of participant parents	30.7(±6.7)		
Score of knowledge	8.6(±2)	0.23	0.001***

*** Correlation test. Significant P value ≤0.05.

A correlate between ages of participant's parents with knowledge score, and found there was a significant association between age of participant's parents and score of knowledge (p value ≤0.05) and weak direct positive linear correlation between them.

Table 12: *Relation of some house related variables with knowledge score.*

Variable		Score of knowledge	
		Mean (±SD)	Significant
Residence	Rural	7.5(±1.6)	0.001**
	Urban	8.9(±1.9)	
Economic level	Week	8.4(±1.9)	0.309
	Fair	8.7(±1.9)	
	Good	9(±2.3)	
Type of family	Extended	8.6(±2.1)	0.5**
	Nuclear	8.7(±1.9)	
Crowding index	Overcrowding	8.6(±2.1)	0.87**
	Normal	8.6(±1.8)	

** Student –T test significant P value ≤0.05.

Type of family and crowding index were not associated with knowledge score of parents (P value >0.05), table 12. The participant's parents who lived in urban region had higher mean knowledge score (8.9) than those lived in rural region (7.5) with significant association with knowledge score (P value ≤0.05). The mean knowledge score increases with raise in economic level but there were no significant association with knowledge score (P value >0.05).

Table 13: *Linear regression for some variables in relation to knowledge score.*

Variable	OR	Significant	95% confidence interval	
			Lower	Upper

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Resident	3.39	0.001	0.46	1.74
Sequence of child	2.63	0.009	0.11	0.77
Duration of disease	2.14	0.017	0.004	0.043
Age of onset of asthma	-2.2	0.029	-1.16	-0.063
Past family history	-0.85	0.39	-0.73	0.27
Age of participant	3.13	0.002	0.022	0.098
Educational level of mother	2.74	0.007	0.080	0.489

OR= Odd ratio , significant P value ≤0.05.

Using linear regression analysis, the most significant factor that influenced the level of parent asthma knowledge were resident, sequence of child, duration of disease, age of onset of asthma, age of participant and educational level of mother.

DISCUSSION

Asthma is a prevalent chronic disease and a significant public health concern, particularly within the pediatric population. Insufficient parental knowledge and attitudes frequently contribute to inadequate management, resulting in shortcomings in the care of their child according to Zhao et al. (2013).

In this study, table 1, the distribution of asthma was higher in male (69.3%) than female, the percent was higher in 3-5 years (51.2%), in urban area (82.4%), and in child with positive medical (62.4%) and family (85.9%) history. The current result was similar to Li et al., (2020), study that reveal the childhood asthma more prevalence in male, in urban area may be due to more pollution in urban than rural area and our study done in center of city so more patient from urban. And with positive medical and family history due to genetic cause of asthma.

In study the family structure for child involved in our study, minority of children lived in extended family 36.6%, this similar to study conducted by Celedón et al. (2002). This finding aligns with recent studies on asthma prevalence, which suggest that a larger family size is associated with a reduced risk of developing asthma.

Postnatal exposure to environmental tobacco smoke, especially from parents, has been consistently associated with respiratory symptoms of wheezing and it also consistently worsens asthma symptoms and is a risk factor for severe asthma according to Dezateux et al. In this study 56.6% of asthmatic child had smoker parents.

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Several studies have shown that exposure to farm animals early in life is associated with an increased risk of developing atopy and asthma, in current study majority of children who breed animal exposed to poultry allergen , according to Simpson& Custovic (2005), this may be attributed to higher concentrations of particulate matter found in the poultry dust make the child more prone to suffer from respiratory ailments.

The high percent of child in this study exhibit asthma symptoms at night (nocturnal asthma), the mechanisms of nocturnal asthma are intimately related to circadian rhythms, which influence inflammatory cells and mediators, hormone levels and cholinergic tone. This similar to study by Skloot (2002), that show 64.4% of studied child had nocturnal asthma.

About type of household heating, 40.5% of studied family used healthy and clean heating device this may be due to the majority of studied family had fair and good socioeconomic level, had good educational level and from urban area.

Participant's knowledge

In the current study, 48.8% of participants demonstrated poor knowledge about asthma. These findings underscore significant gaps in parental understanding of the condition. This deficiency may be attributed to the lack of structured health education programs specifically designed for asthmatic patients and their families. Additionally, physicians often do not prioritize patient education, the development of self-management skills, or encouraging an appropriate level of responsibility for pediatric asthma care, as these activities demand considerable time and effort.

In compare with other study that done on same objective like Indian study at 2014 that showed The knowledge regarding asthma was inadequate among 13 (32.5%) of mothers(

In compare with other study that done on same objective like Indian study by Zaraket et al., (2011), which showed The knowledge regarding asthma was inadequate among 13 (32.5%) of mothers, while other prospective study done in India at 2005 on one hundred parents of asthmatic children , showed more than half of the parents of asthmatic children had no real idea about the asthma, in another study by Ramesh, Nisha, & Jose(2014), that done in china that involve 29 city at 2013 done on 2960 parents with asthmatic child (0-14 years) and showed 81.69% of parents had poor knowledge on asthma.

In other Brazilian study by Shivbalan, Balasubramanian, & Anandnathan (2005), that includes 93 parents with asthmatic children aged between 29 days and 18 years old and found

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that 93.1% of parent had poor knowledge. In other study that done by Rancé, et al., (2010), that show 97.1% of participant had poor knowledge score, the cause of this high percentage may because small sample size (70) and the low percentage of high education of participants (4.3%).

Increasing Age of participant and educational level of mother associated significantly with knowledge score, and it compatible to study by Zhang et al.,. (2005). While other study that done in south India by Zaraket et al, on 40 mothers and revealed that there was no statistically significant relationship between knowledge level with age, and or educational of mothers.

The place of living in current study also affect on knowledge about asthma, family that lived on urban area had higher knowledge than family lived in rural area. Also there was a study done by Al-Binali et al., show that parents from rural area had poor knowledge than those parents from urban area, this may be due to parents who lived in urban area had more educational level and had easily access to hospital and had more chance to get information about asthma than parents who lived in far and difficult to access area like rural area.

The history of disease (age at onset and duration of asthma) associated with level of knowledge on parent this similar to study done in KSA by Al-Binali et al., at 2010 on 171 mothers of asthmatic children that showed that duration of asthma affected on knowledge.

The sequence of child also effect on level of parents knowledge, the reason for this may be with increase the number of child the parents will get more experience on medical condition. While other study that done by Rancé et al., (2010) . on 70 convenient mother had child between 1-5 years, showed no association with number of sibling. The cause of that difference may be due to different sample size and majority of mothers had poor knowledge (97.1%).

Participant's attitude

Despite the parent with poor knowledge was 48.8% of total participants, the percent of participants with poor attitude were 61%. That mean the parents had better knowledge on child asthma than attitude. This study result was similar to study done in India by Sreeram & Aparna (2016), on 303 parents that show 48.18% (146/303) of parents who correctly responded of the knowledge questions, while only 17.16% (52/303) of parents correctly responded of the attitude questions. the cause of this may be due to both study and Indian

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study involve parent from urban area and had moderate socioeconomic level that may be responsible for better knowledge than attitude.

CONCLUSION

The parents of asthmatic child had inadequate knowledge and or attitude for childhood asthma. The knowledge of parents mostly affected by residence, educational level of mother, sequence of child in family, duration of asthma, age of asthma onset and age of participants. The attitude of parents mostly affected by sex of child, age at onset of asthma and crowding index.

Recommendations

- Improve the knowledge and attitude of parents by provide adequate education to parents about asthma cause, signs and symptoms, triggering factors of asthma, treatment and important of compliance on treatment.
- Provide educational program designed for asthmatic patients and their families.
- Further research is needed to assess whether targeted interventions could be effective in improving outcomes.

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References

Al-Binali, A. M., Mahfouz, A. A., Al-Fifi, S., Naser, S. M., & Al-Gelban, K. S. (2010). Asthma knowledge and behaviours among mothers of asthmatic children in Aseer, south-west Saudi Arabia. *Eastern Mediterranean health journal = La revue de sante de la Mediterranee orientale = al-Majallah al-sihhiyah li-sharq al-mutawassit*, *16*(11), 1153–1158.

Abu-Shaheen, A. K., Nofal, A., & Heena, H. (2016). Parental Perceptions and Practices toward Childhood Asthma. *BioMed research international*, *2016*, 6364194. https://doi.org/10.1155/2016/6364194

Celedón, J. C., Litonjua, A. A., Ryan, L., Weiss, S. T., & Gold, D. R. (2002). Day care attendance, respiratory tract illnesses, wheezing, asthma, and total serum IgE level in early childhood. *Archives of pediatrics & adolescent medicine*, *156*(3), 241–245. https://doi.org/10.1001/archpedi.156.3.241

Devereux, G., Matsui, E. C., & Burney, P. G. J. (2014). Epidemiology of Asthma and Allergic Airway Diseases. *Middleton's Allergy*, 754–789. https://doi.org/10.1016/B978-0-323-08593-9.00049-8.

Dezateux, C., Stocks, J., Dundas, I., & Fletcher, M. E. (1999). Impaired airway function and wheezing in infancy: the influence of maternal smoking and a genetic predisposition to asthma. *American journal of respiratory and critical care medicine*, *159*(2), 403–410. https://doi.org/10.1164/ajrccm.159.2.9712029

Herzog, R., & Cunningham-Rundles, S. (2011). Pediatric asthma: natural history, assessment, and treatment. *The Mount Sinai journal of medicine, New York*, *78*(5), 645–660. https://doi.org/10.1002/msj.20285.

Li, L. X., Lin, S. Z., Zhang, R. P., & Chen, S. W. (2020). *Zhongguo dang dai er ke za zhi = Chinese journal of contemporary pediatrics*, *22*(4), 380–386. https://doi.org/10.7499/j.issn.1008-8830.1910164\

Shivbalan, 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.

Simpson, A., & Custovic, A. (2005). Pets and the development of allergic sensitization. *Current allergy and asthma reports*, *5*(3), 212–220. https://doi.org/10.1007/s11882-005-0040-x

Skloot G. S. (2002). Nocturnal asthma: mechanisms and management. *The Mount Sinai journal of medicine, New York*, *69*(3), 140–147.

Sreeram, V., & Aparna, N. (2016). Effect of parental knowledge and attitude in the control of childhood asthma. International Journal of Contemporary Pediatrics . Nov;3(4):1385-1388.

Pniewska, E., & Pawliczak, R. (2013). The involvement of phospholipases A2 in asthma and chronic obstructive pulmonary disease. *Mediators of inflammation*, *2013*, 793505. https://doi.org/10.1155/2013/793505.

DOI: 10.48165/sajssh.2024.5502

Ramesh, N., Nisha, C.M., & Jose, S.K. (2014). Knowledge Regarding Childhood Asthma among Mothers of Asthmatic Children Presenting to a Selected Hospital, Bangalore, South India.

Rancé, F., Deschildre, A., Bidat, E., Just, J., Couderc, L., Wanin, S., & Weiss L. *(*2010*)* . Secondary and tertiary prevention of allergic asthma in children. Rev Mal Respir. Dec;27(10):1221-30. doi: 10.1016/j.rm.

Reddel, H. K., Bacharier, L. B., Bateman, E. D., Brightling, C. E., Brusselle, G. G., Buhl, R. (2021). Global Initiative for Asthma Strategy 2021: executive summary and rationale for key changes. *The European respiratory journal*, *59*(1), 2102730. https://doi.org/10.1183/13993003.02730-2021

Zaraket, R., Al-Tannir, M. A., Bin Abdulhak, A. A., Shatila, A., & Lababidi, H. (2011). Parental perceptions and beliefs about childhood asthma: a cross-sectional study. *Croatian medical journal*, *52*(5), 637–643. https://doi.org/10.3325/cmj.2011.52.637

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*, 20. https://doi.org/10.1186/1471-2431-13-20

Zhang, L., Costa, M. G., Avila, L. H., Bonfanti, T., & Ferruzzi, E. H. (2005). Conhecimentos de pais de crianças asmáticas sobre a doença no momento da admissão a um serviço especializado [Asthma related knowledge among parents of asthmatic children at the moment of admission to a specialized service]. *Revista da Associacao Medica Brasileira (1992)*, *51*(6), 342–347. https://doi.org/10.1590/s0104-42302005000600018

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