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KNOWLEDGE AND AWARENESS LEVEL OF CAREGIVERS TOWARDS BRONCHIAL ASTHMA IN THEIR CHILDREN

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Abstract

Introduction: The impact of asthma on the healthcare system is significant. Breathing problems and restricted airflow are indicative of asthma and can include coughing, sneezing, chest tightness, and dyspnea. The main objectives of medical care for asthma patients are to minimize the likelihood of future exacerbations and to manage the symptoms. Caregivers' education plays an important role in helping their children adjust to their illness. Various studies conducted in Saudi Arabia showed low knowledge about pediatric asthma. Other studies found that there is a moderate awareness of bronchial asthma. This study aimed to assess the knowledge and awareness level of caregivers towards bronchial asthma in their children.

Methodology: This is a cross-sectional study that conducted from July to December 2024 among caregivers of children with asthma from different regions of Saudi Arabia. The data collected through a self-administered electronic questionnaire. The inclusion criteria are children diagnosed with asthma between the ages of two and fourteen who are under the care of their caregivers. The exclusion criteria are children younger than two years old and older than fourteen years old. The data analyzed using SPSS version 20. The sample size by determined using the Raosoft sample size calculator, with the assumption that the response rate is 50%, an acceptable error of 5%, and a confidence level of 95%.

Results: The study involving 497 participants. Key findings revealed that while 63.4% of caregivers understand that asthma attacks can be prevented with regular medication, misconceptions persist; notably, 32.4% fear inhalers lead to addiction. A substantial 54.7% recognized mucus obstruction as a cause of asthma, yet 18.5% were unaware of this fact. Alarmingly, 71.2% of caregivers exhibited very low awareness of asthma management. Overall, the results indicate significant gaps in caregivers' understanding, highlighting an urgent need for targeted educational interventions to improve asthma care for children.

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Conclusion: The findings underscore the importance of implementing targeted educational interventions and awareness campaigns to empower caregivers in effectively managing their children's asthma, ultimately leading to better health outcomes and reduced healthcare burden.

Keywords: knowledge, awareness, bronchial asthma, Saudi Arabia, pediatric, caregivers

Introduction:

Chronic paediatric asthma is a significant burden on the healthcare system, resulting in recurrent ER visits and hospitalizations [1]. Asthma presents as breathing difficulties and airflow limitation, which results in sneezing, coughing, tightness in the chest, and shortness of breath. These manifestations may occur often during the day or once a week [2]. Provided that, managing the symptoms and minimizing the chance of further exacerbations are the two major goals of asthma medical care [3]. One of the most effective and sustainable therapies is asthma education. By implementing this strategy into practice, parents would become more confident, skilled, and motivated to control their children's condition [4]. Paediatric patients with severe episodic asthma attacks have shown higher levels of stress and worry about their situation and have difficulty maintaining a sense of well-being. Parents play an essential role in helping them adjust to their illnesses [5]. Additionally, proper treatment allows the clinical symptoms of asthma to be managed. Similarly, the establishment of a doctor-patient relationship is crucial to identify and reduce exposure to risk factors, order necessary tests and medications, and monitor the patient's health to prevent severe attacks and minimize symptoms [6]. What's more, the incidence, severity, and death of childhood asthma vary among countries worldwide [7]. Based on published data, over 300 million people globally have asthma, and the number of children and teenagers with asthma has been rising [8]. Over the last three decades, studies have found a general prevalence of paediatric asthma in the Kingdom of Saudi Arabia varying from 8% to 25%, with uncontrolled asthma accounting for 45% [9]. Alruwaili et al. published a systematic review of parental awareness of asthma in eight countries, including approximately 3700 parents. The study found a global lack of awareness among parents of asthmatic children, and that shows the necessity for interventions that enhance parental knowledge, attitudes, and practices toward asthma management [10]. In 2020, a survey was obtained in Al Madinah Al Munawarah and found that a significant number of the young population suffered from uncontrolled asthma. Also, it revealed that the knowledge score is lower for caregivers of children with uncontrolled asthma compared to others with controlled asthma [11]. Another research done in Riyadh in 2018 examined the awareness of bronchial asthma among parents or other caregivers of paediatrics with asthma. It showed that caregivers' awareness of paediatric asthma was moderate [12]. This study focuses on enhancing asthma management by addressing the existing knowledge gaps, reducing symptom exacerbation, reducing the need for hospitalization, and empowering caregivers to participate actively in the healthcare of their children. Most of the similar studies were performed in specific regions of Saudi Arabia. Therefore, the purpose of this research is to assess knowledge and practices among caregivers of children with asthma in Saudi Arabia.

Materials and Methods:

Study design:

This cross-sectional study was conducted between July 2024 and December 2024 in Saudi Arabia. The Saudi Arabian caregivers of children with asthma make up the study's population. Caregivers were asked to fill out a questionnaire about their awareness and knowledge about pediatric bronchial asthma.

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Inclusion and Exclusion Criteria:

The inclusion criteria for this study are the children who are diagnosed with asthma between the ages of two and fourteen and are under the care of their caregivers. The exclusion criteria are children younger than two years old and those who are older than fourteen years old.

Sample size:

The sample size for the study was estimated to be minimum 384 participants and determined using the Rao soft sample size calculator. On the assumption that, the response rate is 50% with an accepted margin of error of 5% and a confidence level of 95%.

Method for data collection and instrument (*data collection technique and tools)*:

Data collection for this study was carried out using a detailed questionnaire, which was carefully crafted based on previous research. Then, it was distributed online to be filled by targeted audiences anonymously. The questionnaire was organized into several sections. The first section gathered socio-demographic information, including the child's age, gender, the duration of their asthma, family history of asthma, residence, and the educational level and occupation of the caregivers. Along with that, it inquired about where parents obtained their information about asthma. The second section delved into the caregiver's beliefs regarding asthma management. Participants responded with (yes) or (no) to various statements about inhaler use, medication practices, and emergency care. The third section assessed parents' understanding of asthma, focusing on symptoms, mechanisms, triggers, and potential complications. Likewise, responses were recorded as (yes) or (no). The fourth section addressed what actions caregivers take during the asthma attack, including medication administration, physical interventions, and seeking additional help. Finally, the questionnaire explored preventive measures caregivers employ, such as regular medication use, maintaining a clean home environment, and avoiding asthma triggers.

Scoring system:

In all, fifty-two statements served to evaluate the participants knowledge and degree of awareness. Thirty-five statements for knowledge and seventeen for awareness. One point is given for the correct answer, and no points are given for incorrect and I-don't-know answers. For scoring, we utilized Likert scales (three points). The maximum score was fifty-two points and divided by the original Blooms cut-off points, 80.0%-100.0%, 60.0%-79%, and 59.0%. Knowledge score varied from 0 to 35 points and was classified into three levels as follows: A high level of knowledge is defined as a score of 28 or higher (>28), a moderate level of knowledge is defined as a score between 21 and 27, and a low level of knowledge is defined as a score of 20 or below (≤ 20). Awareness scores varied from 0 to 17 points and were classified into three levels as follows: A high level of awareness is defined as a score of 13 or above (>13), a moderate level of awareness is defined as a score between 11 and 12, and a low level of awareness is defined as a score of 10 or below (≤ 10).

Pilot test:

Twenty people were given the questionnaire and asked to complete it. The purpose of this step was to test the study's feasibility and the ease of use of the questionnaire. The pilot study's results were not included in the study's final analysis.

Analyzes and entry method:

Data were gathered and electronically input into the Windows version of Microsoft Excel 2016. Thereafter, data were sent to the Statistical-Package of Social-Science Software (SPSS) program using the 20th version, for statistical analysis.

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Results:

Table (1) displays various demographic parameters of the participants with a total number of (497). In particular, the proportion of the age distribution of children clearly shows that the vast majority (53.3%) are aged between 6 and 10 years, thus indicating a considerable number of cases in this developmental stage. Gender analysis reveals a predominance of males (54.1) that is consistent with known trends in the asthma prevalence. We look at birth order and find nearly 30.4% of them are firstborns, so this could have to do with different aspects of familial dynamics and health risks. In a relatively balanced duration of the diagnosis of the child's asthma, 48.5% is <2 years and indicates ongoing management challenges. However, there was a potentially genetic basis to the asthma given 39.8 per cent had a family history of the condition. A geographical analysis reveals that there is the largest representation (39.4%) of the Western region, indicating regional health disparities within the context. Additionally, educational attainment is notable: Mothers and fathers both with a bachelor's degree hold 3% and 57.9% respectively, potentially affecting health literacy and access to information in asthma management.

Table (1): Sociodemographic characteristics of participants (n=497)

Parameter		***No.***	***Percent (%)***
Child's age (Mean: 7.7, STD:3.2)	5 years or younger	141	28.4
	6 to 7 years old	122	24.5
	8 to 10 years	143	28.8
	11 to 14 years old	91	18.3
Gender	Female	228	45.9
	Male	269	54.1
Birth order of the child (median:3)	1	151	30.4
	2	97	19.5
	3	99	19.9
	4	63	12.7
	5	46	9.3
	6 or after	41	8.2
Duration of child's asthma since diagnosis	Less than two years	241	48.5
	More than or equal to two years	256	51.5
Have any of the child's parents or siblings been diagnosed with asthma?	No	299	60.2
	Yes	198	39.8
Region	Northern region	10	2.0
	Southern region	114	22.9
	Central region	117	23.5
	Eastern region	60	12.1
	Western region	196	39.4
Mother's age (Mean: 36.9, STD:7.7)	30 or less	122	24.5
	31 to 39	180	36.2
	40 to 44	97	19.5

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	45 years or more	98	19.7
Mother's educational level	Primary school	8	1.6
	Middle school	15	3.0
	High school	98	19.7
	Diploma	35	7.0
	Bachelor's degree	285	57.3
	Postgraduate degree	38	7.6
	Uneducated	18	3.6
Father's educational level	Primary school	8	1.6
	Middle school	11	2.2
	High school	82	16.5
	Diploma	45	9.1
	Bachelor's degree	288	57.9
	Postgraduate degree	61	12.3
	Uneducated	2	.4
Father's occupational status	Student	1	.2
	Worker	397	79.9
	Unemployed	15	3.0
	Freelancer	31	6.2
	Retired	53	10.7
Mother's occupational status	Student	12	2.4
	Worker	230	46.3
	Unemployed	228	45.9
	Freelancer	15	3.0
	Retired	12	2.4
What is your source of information about asthma? *	Pediatrician	305	61.4
	General practitioner	169	34.0
	Health educator	103	20.7
	Nurse	65	13.1
	Health book or magazine	111	22.3
	Relatives or friends	172	34.6
	Social media/Internet	236	47.5
	Television	76	15.3
	Other (please specify)	64	12.9

Results may overlap

As shown in figure 1, The collected data also provides solid insights in the perceptions on the possibility of inhaler use as an addiction. 226 individuals, or around 45.5 percent of the sample, said they don't believe using an inhaler can result in addiction. 161 participants, approximately 32.4 percent, acknowledged concern over the addictive potential of inhalers and stated they believe there is an addictive relationship between inhalers. Meanwhile, 110 respondents or roughly 22.1% had no clue on the entire issue.

Figure (1): Illustrates whether inhaler may lead to addiction among participants.

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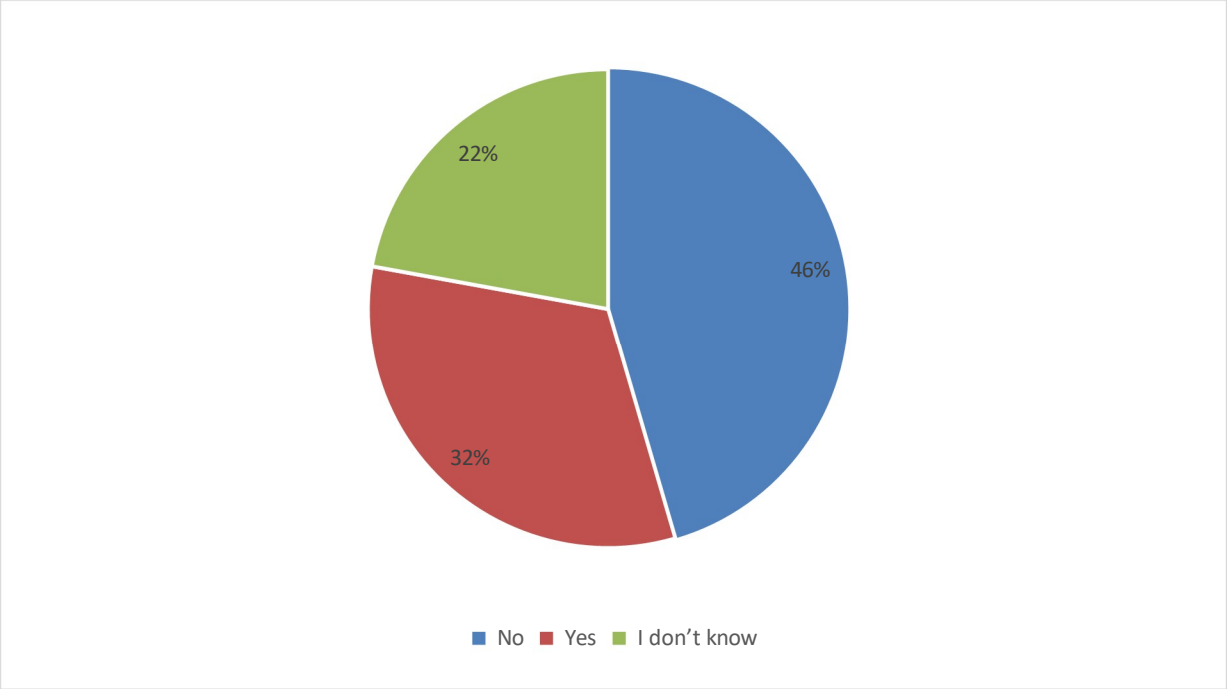

Table 2 presents in full a sample of 497 respondents' knowledge on bronchial asthma in children, which reveals the data presented. Notably, several caregivers (63.4%) correctly believe that asthma attacks can be averted with regular preventive medication and a commendable 69.0% correctly say that asthma is caused by inflammation with resultant airway obstruction, which are excellent indications of basic understanding of how asthma operates. But many parts of understanding know-how are unfilled with proof, such as 32.4% of caregivers consider that using an inhaler can assist you develop addicted to it, or 20.3% that using an inhaler can harm your coronary heart. It suggests that there is a need for greater education to reveal misconceptions. Additionally, while 55.7 percent of caregivers know that asthma medication must be taken consistently, as opposed to only when symptoms occur, a hefty 49.3 percent believe that a medication can be cessed post treatment for an attack.

Table (2): Parameters related to knowledge of caregivers towards bronchial asthma in their children (n=497).

Parameter		***No.***	***Percent (%)***
Using the inhaler may lead to addiction	No	226	45.5
	Yes	161	32.4
	I don't know	110	22.1
Using the inhaler may harm the heart	No	224	45.1
	Yes	101	20.3
	I don't know	172	34.6
The inhaler should not be used for long periods of time	No	146	29.4
	Yes	221	44.5
	I don't know	130	26.2
You should stop using asthma medicine as soon as the asthma attack is over.	No	143	28.8
	Yes	245	49.3
	I don't know	109	21.9

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Asthma medicine should only be used when you have asthma symptoms.	No	132	26.6
	Yes	277	55.7
	I don't know	88	17.7
It is best to use the inhaler directly	No	102	20.5
	Yes	296	59.6
	I don't know	99	19.9
You should go to the emergency room even if your asthma symptoms are mild.	No	279	56.1
	Yes	151	30.4
	I don't know	67	13.5
Asthma attacks can be avoided by using medication (as a prevention) between attacks.	No	55	11.1
	Yes	315	63.4
	I don't know	127	25.6
Mechanism of asthma is that inflammations lead to airway obstruction	No	41	8.2
	Yes	343	69.0
	I don't know	113	22.7
Mechanism of asthma is blockage of airways by mucus secretions	No	92	18.5
	Yes	272	54.7
	I don't know	133	26.8
Mechanism of asthma is narrowing of the airways	No	48	9.7
	Yes	343	69.0
	I don't know	106	21.3
The symptoms of asthma are *	Wheezing	308	61.9
	Cough	274	55.1
	Chest tightness	282	56.7
	Shortness of breath	428	86.1
Factors that cause asthma are *	A cold	290	58.4
	Climate changes	330	66.4
	Insecticides	315	63.4
	Fatigue or exhaustion	173	34.8
	Dust	409	82.1
	Smoke (including cigarette smoke)	372	74.9
	Certain foods	107	21.5
	Muscular effort	163	32.8
	Psychological state	142	28.6
The conditions related to asthma are *	Deformities in the chest cage	152	30.6
	Sleeping disorders	351	70.6
	Respiratory failure	331	66.6
	Sudden death	170	34.2
	Negative effect on the child's development	174	35.0
Symptoms of severe asthma attacks include *	Severe shortness of breath	413	83.1
	Severe and persistent cough	328	65.9
	Inability to speak or walk	261	52.5

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	Inability to play	236	47.5
	Lips and nails turning blue	269	54.1
	Asthma attack lasts 1-3 hours after taking the medicine	222	44.7

Results may overlap

As shown in figure (2), From a sample size of 497, there was a notable majority accounting for about 54.7% (272 respondents) who understand that mucus secretions block the airways as a cause of asthma. Paradoxically, a sizeable minority (18.5%, that is, 92 respondents) was either unaware of, or did not subscribe to, this conception of asthma. In addition, a large segment of the sample, 133 respondents (26.8%), expressed uncertainty of the assertion with selection of "I don't know."

Figure (2): Illustrates if mechanism of action of asthma is the blockage of airways by mucus secretions among participants.

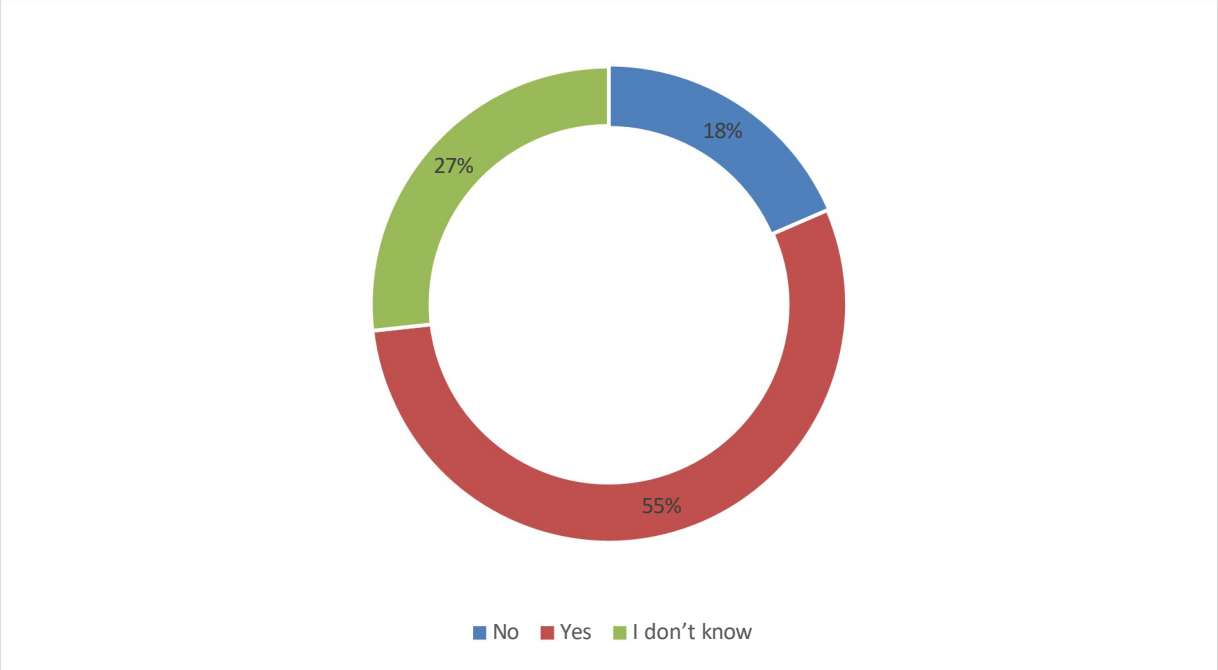

Table 3 presents the amount of awareness caregivers have when it comes to the management of bronchial asthma in children and surprisingly there is a great variance in what they know about effective practices during an asthma attack. A solid foundation in acute management strategy is evident as over 83.5% of participants recognize the critical need to administer necessary medication during an attack. On the other hand, 42.9% of the respondents do not value the value of providing warm liquids or herbs, which might be improved through educational enhancement. In addition, the preventive practices appear to be similarly conformist; 73.0% of caregivers actively encourage their home to be cleaned and dusted and 72.8% seek to eliminate irritants like smoking. Prevention measures, such as prompt treatment of cold (54.3%) and effective coughing practice (34.8%), are neither frequent suggesting gap in knowledge that could be filled via focused educational efforts.

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Table (3): participants' awareness of caregivers towards bronchial asthma in their children (n=497).

Parameter		***No.***	***Percent (%)***
During an asthma attack, you have to *	Give the necessary medication	415	83.5
	Massage the child's chest and back	170	34.2
	Let the child cough to get rid of the mucous secretions	150	30.2
	Reduce the child's movement to rest	284	57.1
	Wait to see how the wheezing progresses and persists	127	25.6
	Give warm liquids, water or herbs	213	42.9
	Ask for help from others	187	37.6
	Encourage the child to do deep breathing exercises	182	36.6
Practices for the prevention of asthma attacks *	Regular use of medication	353	71.0
	Clean and dust the house	363	73.0
	Eliminate irritants, such as smoking	362	72.8
	Treat colds quickly	270	54.3
	Encourage the child to cough to get rid of mucous	173	34.8
	Encourage the child to get some rest	238	47.9
	Avoid excessive stress	289	58.1
	Avoid heavy exercise	202	40.6
	Do deep breathing exercises regularly	197	39.6

****Results may overlap***

Table 4 presents data on the knowledge levels of the caregivers as regards bronchial asthma of their children and note concerning trends that require urgent attention. Interestingly, a significant deficiency in knowledge about elements of asthma control was demonstrated among just 5.8% of the caregivers, reflecting a wide knowledge chasm. While some caregivers have learned a bit about this condition, 30.4 percent of respondents reported moderate knowledge. An alarming 63.8 percent of the caregivers who responded were low knowledge level.

Table (4): Shows knowledge of caregivers towards bronchial asthma in their children score results.

	Frequency	**Percent**
High knowledge level	29	5.8
Moderate knowledge	151	30.4
Low knowledge level	317	63.8
Total	497	100.0

Table 5 presents a disturbing trend regarding caregivers' awareness of bronchial asthma in their children. Caregivers are only seen as being high aware, 16.1%, and moderate aware, 12.7%. Notably, a very significant majority, of 71.2%, have very low awareness about this major health matter.

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Table (5): Shows awareness of caregivers towards bronchial asthma in their children score results.

	Frequency	**Percent**
High awareness level	80	16.1
Moderate awareness	63	12.7
Low awareness level	354	71.2
Total	497	100.0

Table (6) shows that knowledge of caregivers towards bronchial asthma in their children has statistically insignificant relation to gender, child's age, birth order of the child, duration of child's asthma since diagnosis, any of the child's parents or siblings been diagnosed with asthma, region, mother's age, mother's educational level, father's educational level.

Table (6): Relation between knowledge of caregivers towards bronchial asthma in their children and sociodemographic characteristics.

Parameters		***Knowledge level***		***Total (N=497)***	***P value****
		High or moderate knowledge	**Low knowledge level**		
Gender	Female	85	143	228	0.650
		47.2%	45.1%	45.9%	
	Male	95	174	269	
		52.8%	54.9%	54.1%	
Child's age	5 years or younger	56	85	141	0.528
		31.1%	26.8%	28.4%	
	6 to 7 years old	45	77	122	
		25.0%	24.3%	24.5%	
	8 to 10 years	45	98	143	
		25.0%	30.9%	28.8%	
	11 to 14 years old	34	57	91	
		18.9%	18.0%	18.3%	
Birth order of the child	1	55	96	151	0.166
		30.6%	30.3%	30.4%	
	2	38	59	97	
		21.1%	18.6%	19.5%	
	3	38	61	99	
		21.1%	19.2%	19.9%	
	4	16	47	63	
		8.9%	14.8%	12.7%	
	5	13	33	46	
		7.2%	10.4%	9.3%	
	6 or after	20	21	41	
		11.1%	6.6%	8.2%	
Duration of child's	Less than two	83	158	241	0.424

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asthma since diagnosis	years	46.1%	49.8%	48.5%	
	More than or equal to two years	97	159	256	
		53.9%	50.2%	51.5%	
Have any of the child's parents or siblings been diagnosed with asthma?	No	106	193	299	0.662
		58.9%	60.9%	60.2%	
	Yes	74	124	198	
		41.1%	39.1%	39.8%	
Region	Northern region	3	7	10	0.628
		1.7%	2.2%	2.0%	
	Southern region	42	72	114	
		23.3%	22.7%	22.9%	
	Central region	37	80	117	
		20.6%	25.2%	23.5%	
	Eastern region	26	34	60	
		14.4%	10.7%	12.1%	
	Western region	72	124	196	
		40.0%	39.1%	39.4%	
Mother's age (Mean: 36.9, STD:7.7)	30 or less	43	79	122	0.284
		23.9%	24.9%	24.5%	
	31 to 39	73	107	180	
		40.6%	33.8%	36.2%	
	40 to 44	28	69	97	
		15.6%	21.8%	19.5%	
	45 years or more	36	62	98	
		20.0%	19.6%	19.7%	
Mother's educational level	Primary school	1	7	8	0.128
		0.6%	2.2%	1.6%	
	Middle school	3	12	15	
		1.7%	3.8%	3.0%	
	High school	34	64	98	
		18.9%	20.2%	19.7%	
	Diploma	10	25	35	
		5.6%	7.9%	7.0%	
	Bachelor's degree	117	168	285	
		65.0%	53.0%	57.3%	
	Postgraduate degree	11	27	38	
		6.1%	8.5%	7.6%	
	Uneducated	4	14	18	
		2.2%	4.4%	3.6%	
Father's educational level	Primary school	2	6	8	0.267
		1.1%	1.9%	1.6%	
	Middle school	2	9	11	
		1.1%	2.8%	2.2%	

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	High school	27	55	82	
		15.0%	17.4%	16.5%	
	Diploma	14	31	45	
		7.8%	9.8%	9.1%	
	Bachelor's degree	117	171	288	
		65.0%	53.9%	57.9%	
	Postgraduate degree	18	43	61	
		10.0%	13.6%	12.3%	
	Uneducated	0	2	2	
		0.0%	0.6%	0.4%	
Father's occupational status	Student	0	1	1	0.310
		0.0%	0.3%	0.2%	
	Worker	149	248	397	
		82.8%	78.2%	79.9%	
	Unemployed	5	10	15	
		2.8%	3.2%	3.0%	
	Freelancer	6	25	31	
		3.3%	7.9%	6.2%	
	Retired	20	33	53	
		11.1%	10.4%	10.7%	
Mother's occupational status	Student	3	9	12	0.628
		1.7%	2.8%	2.4%	
	Worker	80	150	230	
		44.4%	47.3%	46.3%	
	Unemployed	84	144	228	
		46.7%	45.4%	45.9%	
	Freelancer	7	8	15	
		3.9%	2.5%	3.0%	
	Retired	6	6	12	
		3.3%	1.9%	2.4%	

P value was considered significant if ≤ 0.05.

Table (7) shows awareness of caregivers towards bronchial asthma in their children has statistically insignificant relation to gender, child's age, birth order of the child, duration of child's asthma since diagnosis, any of the child's parents or siblings been diagnosed with asthma, region, mother's age, mother's educational level, father's educational level.

Table (7): Awareness of caregivers towards bronchial asthma in their children in association with sociodemographic characteristics.

Parameters		***Awareness level***		***Total (N=497)***	***P value****
		High or moderate awareness	**Low awareness level**		
Gender	Female	69	159	228	0.499

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		48.3%	44.9%	45.9%	
	Male	74	195	269	
		51.7%	55.1%	54.1%	
Child's age	5 years or younger	41	100	141	0.427
		28.7%	28.2%	28.4%	
	6 to 7 years old	39	83	122	
		27.3%	23.4%	24.5%	
	8 to 10 years	34	109	143	
		23.8%	30.8%	28.8%	
	11 to 14 years old	29	62	91	
		20.3%	17.5%	18.3%	
Birth order of the child	1	45	106	151	0.119
		31.5%	29.9%	30.4%	
	2	29	68	97	
		20.3%	19.2%	19.5%	
	3	30	69	99	
		21.0%	19.5%	19.9%	
	4	10	53	63	
		7.0%	15.0%	12.7%	
	5	12	34	46	
		8.4%	9.6%	9.3%	
	6 or after	17	24	41	
		11.9%	6.8%	8.2%	
Duration of child's asthma since diagnosis	Less than two years	66	175	241	0.508
		46.2%	49.4%	48.5%	
	More than or equal to two years	77	179	256	
		53.8%	50.6%	51.5%	
Have any of the child's parents or siblings been diagnosed with asthma?	No	88	211	299	0.690
		61.5%	59.6%	60.2%	
	Yes	55	143	198	
		38.5%	40.4%	39.8%	
Region	Northern region	0	10	10	0.301
		0.0%	2.8%	2.0%	
	Southern region	36	78	114	
		25.2%	22.0%	22.9%	
	Central region	34	83	117	
		23.8%	23.4%	23.5%	
	Eastern region	19	41	60	
		13.3%	11.6%	12.1%	
	Western region	54	142	196	
		37.8%	40.1%	39.4%	
Mother's age (Mean: 36.9, STD:7.7)	30 or less	33	89	122	0.940
		23.1%	25.1%	24.5%	

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	31 to 39	52	128	180	
		36.4%	36.2%	36.2%	
	40 to 44	30	67	97	
		21.0%	18.9%	19.5%	
	45 years or more	28	70	98	
		19.6%	19.8%	19.7%	
Mother's educational level	Primary school	0	8	8	0.118
		0.0%	2.3%	1.6%	
	Middle school	4	11	15	
		2.8%	3.1%	3.0%	
	High school	27	71	98	
		18.9%	20.1%	19.7%	
	Diploma	12	23	35	
		8.4%	6.5%	7.0%	
	Bachelor's degree	90	195	285	
		62.9%	55.1%	57.3%	
	Postgraduate degree	9	29	38	
		6.3%	8.2%	7.6%	
	Uneducated	1	17	18	
		0.7%	4.8%	3.6%	
Father's educational level	Primary school	3	5	8	0.786
		2.1%	1.4%	1.6%	
	Middle school	3	8	11	
		2.1%	2.3%	2.2%	
	High school	23	59	82	
		16.1%	16.7%	16.5%	
	Diploma	16	29	45	
		11.2%	8.2%	9.1%	
	Bachelor's degree	84	204	288	
		58.7%	57.6%	57.9%	
	Postgraduate degree	14	47	61	
		9.8%	13.3%	12.3%	
	Uneducated	0	2	2	
		0.0%	0.6%	0.4%	
Father's occupational status	Student	0	1	1	0.304
		0.0%	0.3%	0.2%	
	Worker	110	287	397	
		76.9%	81.1%	79.9%	
	Unemployed	7	8	15	
		4.9%	2.3%	3.0%	
	Freelancer	7	24	31	
		4.9%	6.8%	6.2%	
	Retired	19	34	53	
		13.3%	9.6%	10.7%	

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Mother's occupational status	Student	2	10	12	0.556
		1.4%	2.8%	2.4%	
	Worker	63	167	230	
		44.1%	47.2%	46.3%	
	Unemployed	67	161	228	
		46.9%	45.5%	45.9%	
	Freelancer	6	9	15	
		4.2%	2.5%	3.0%	
	Retired	5	7	12	
		3.5%	2.0%	2.4%	

P value was considered significant if ≤ 0.05.

Discussion:

The purpose of this cross-sectional study was to measure the level of knowledge and the level of awareness of the caregivers regarding bronchial asthma of the children. Importantly, findings offer insights into current knowledge of asthma management among caregivers in Saudi Arabia.

It was shown through the demographic analysis that most of the children (53.3%) were aged between 6 to 10 years and that there was a male majority of children (54.1%). This is consistent with previously published asthma prevalence trends, with previous studies noting that asthma is more prevalent among younger children and males [13, 14]. Another component of this study revealed that nearly 30.4% of the children were first borns, further supporting familial dynamics that could impact health risk and the finding of 39.8 per cent had a family history of asthma amongst cases [15, 16].

Both positive and concerning findings were found in the assessment of caregivers' knowledge. On the more positive side, 63.4% of individuals recognized that regular preventive medication can prevent asthma attacks, while 69.0% chose that inflammation leads to airway obstruction in asthma [17, 18]. Yet there were lots of misconceptions; 32.4 percent thought that inhaler use could be addictive and 20.3 percent felt that it may harm the heart [19]. Over half (55.7%) knew that asthma medication should be taken regularly, while nearly half (49.3%) thought that treatment could be halted once symptoms resolve [20]. These findings may indicate the need for targeted educational efforts to correct commonly held misconceptions and enhance caregivers' knowledge of asthma management.

Caregiver awareness regarding effective practices for asthma management was found to be extensive, but also to vary widely in terms of its understanding about. Notably, more (83.5%) were aware of the need for such medication for an attack yet only 42.9 percent recognized that provision of warm liquids or herbal remedies was important [21, 13], suggesting an area of knowledge deficits that could be addressed by educational initiatives. Preventive measures are less successful, as 73.0% of participants encourage a clean environment, however, only 54.3% routinely treat colds promptly, indicating an opportunity to improve caregivers' preventive knowledge [22, 20].

Unsurprisingly, though just 5.8% of caregivers displayed significant knowledge deficiency, 63.8% represented the low knowledge levels domain in asthma management, demonstrating a great educational resource gap [23, 16]. Moreover, caregivers had extraordinarily little awareness of bronchial asthma, as 16.1 percent were rated highly knowledgeable and 12.7 percent moderately knowledgeable. At least 71.2% fell in the very low awareness category implying the need for urgent awareness campaigns on asthma management [24, 25].

Additionally, we found that caregivers' knowledge and awareness of asthma symptoms and their treatment did not vary significantly by family asthma history, the educational level of either parent,

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region, child's age, birth order or duration of the child's diagnosis. The results of these interventions suggest the need for tailored education to increase caregivers' understanding and awareness of bronchial asthma with the intent of improving pediatric asthma management [26, 27].
Limitations of the present study include the cross-sectional design and use of self-reported data that might be subject to recall bias. The study was also run in Saudi Arabia and findings may not be applicable to other contexts (8, 28, 18). The result of this study emphasizes the necessity to enhance the care givers' knowledge and awareness on bronchial asthma in Saudi Arabia.

Conclusion:
The findings highlight how educational orientation and public awareness of these caregivers are crucial for delivering targeted interventions and campaigns in order to enable caregivers to play a proactive role in their children's asthma management and bring about better health outcomes and lower healthcare burden. Further research should be done to ascertain the efficacy of such interventions and what factors affect caregiver knowledge and awareness among diverse populations.

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Ethical approval:

After fully explaining the study and emphasizing that participation is optional, each participant gave their informed consent. The information gathered was safely stored and utilized exclusively for study.

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Conflict of interests:

The authors declare no conflict of interest.

Informed consent:

Written informed consent was acquired from each individual study participant.

Data and materials availability:

All data associated with this study are present in the paper.

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