



Asthma Knowledge and Self-Reported Management Behaviours among Mothers of Children with Asthma in Taif, Saudi Arabia

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Abstract Objectives: To assess asthma-related knowledge and self-reported management behaviours among mothers of children with asthma in Taif, Saudi Arabia and to explore their association with selected sociodemographic factors. **Methods:** A cross-sectional study was conducted from January 2023 to April 2023 among 224 mothers of children aged 1–12 years with asthma who had hospital files at Children's Hospital, Taif, Saudi Arabia. Data were collected through telephone interviews using a modified Arabic questionnaire based on the Chicago Community Asthma Survey-32 (CCAS-32). The questionnaire assessed maternal knowledge and self-reported behaviours related to asthma management. **Results:** Of the 224 mothers, 151 (67.4%) were older than 30 years, 112 (50.0%) had university-level education and 167 (74.6%) were housewives. Good knowledge was observed in 49.6% of participants, whereas 71.0% demonstrated good behaviour scores. Mothers of female children had significantly better knowledge and behaviour scores. Younger mothers (<30 years) and mothers from larger families also showed significantly better behaviour scores. Mothers with good knowledge demonstrated significantly better behaviours ($p < 0.001$). Despite generally favourable medication-related practices, potentially suboptimal behaviours persisted, including the use of homemade or complementary remedies by 35.7% of respondents. **Conclusion:** Maternal asthma knowledge in this hospital-based sample was moderate, whereas self-reported management behaviours were generally better. Targeted caregiver education is still needed, particularly to address persistent gaps in trigger avoidance, evidence-based home management and avoidance of unsupported complementary practices.

Key Words Asthma, Caregiver Education, Childhood Asthma, Knowledge, Management Behaviour, Saudi Arabia

INTRODUCTION

Asthma is a heterogeneous inflammatory airway disease characterized by recurrent wheeze, cough, chest tightness and shortness of breath that vary over time and in intensity, together with variable expiratory airflow limitation [1]. It remains one of the most common chronic diseases in childhood worldwide and is a major contributor to school absenteeism, emergency care use and impaired quality of life [2,3].

Childhood asthma control is influenced not only by pharmacologic treatment but also by caregiver knowledge, daily management practices, trigger recognition and timely response to worsening symptoms [4-7]. Because mothers are frequently the primary caregivers, their understanding of asthma has a direct influence on home-based care, medication adherence, environmental control and

healthcare-seeking behaviour. However, knowledge does not always translate into appropriate practice and this knowledge-behaviour gap remains clinically important.

The burden of asthma remains substantial globally and regionally. The World Health Organization estimated that 262 million people were living with asthma in 2019 and that asthma accounted for 455,000 deaths [8]. In Saudi Arabia, childhood asthma prevalence has been reported to range from 9% to 33.7% and a study from Taif reported a prevalence of 13.1% among children [9,10]. These data support the need for local caregiver-focused assessments to guide asthma education in routine paediatric practice.

The present study aimed to assess asthma-related knowledge and self-reported management behaviours among mothers of children with asthma in Taif city, Saudi Arabia.

The primary focus was to evaluate maternal knowledge and behaviour levels, while the secondary objective was to examine their association with selected sociodemographic characteristics. We hypothesized that better maternal knowledge would be associated with better self-reported management behaviours.

METHODS

This cross-sectional study was conducted at Children's Hospital in Taif city, Saudi Arabia, from January 2023 to April 2023. Ethical approval was obtained before data collection from the Ethical Committee for Health Research, Taif, Saudi Arabia.

Data Collection

Primary data were collected through telephone interviews with mothers of eligible children with asthma. Contact numbers were obtained from hospital records. Study staff conducted the interviews and completed the questionnaire. Each interview lasted less than 15 minutes. Verbal consent was obtained before participation, anonymity was assured and all behaviour data reflected maternal self-report rather than direct observation.

Study Setting and Targeting Population

Inclusion criteria were: (1) children diagnosed with bronchial asthma, (2) age 1–12 years and (3) admission to the hospital with their mothers for an asthmatic attack or a documented history of asthma. Children with other chronic diseases and children whose primary caregiver was not the mother were excluded. The calculated sample size was 384 mothers based on an assumed population proportion of 10%, absolute precision of 5% and 95% confidence interval [11]. However, 224 eligible mothers ultimately completed the interview and were included in the analysis.

Study Instrument

Data were collected using a modified Arabic questionnaire adapted from the Chicago Community Asthma Survey-32 (CCAS-32), previously tested in a community-based study in Egypt [12]. The instrument comprised two sections: (1) sociodemographic data and (2) asthma-related knowledge and behaviours. The knowledge domain contained 27 dichotomous items covering symptoms, mechanisms, aggravating factors, complications and severity of bronchial asthma. The behaviour domain contained 19 dichotomous items addressing maternal actions during asthma attacks and preventive practices. Scores were converted to percentages and categorized as good (>75%), fair (60%–75%) or poor (<60%).

Data Analysis

Categorical data were summarized using frequencies and percentages. Associations between categorical variables and the main outcomes were assessed using the chi-square test. Because the design was cross-sectional, the analyses were intended to identify associations rather than causality.

RESULTS

This study included 224 mothers of children with asthma in Taif, Saudi Arabia. Among the children, 114 (50.9%) were male and 121 (54.0%) were aged 0–6 years. Among the mothers, 151 (67.4%) were older than 30 years, 199 (88.8%) were married, 136 (60.7%) had 1–3 children, 112 (50.0%) had university-level education, 57 (25.4%) were employed and 167 (71.9%) resided in Taif city (Table 1).

The questionnaire included 27 knowledge items. Scores were converted to percentages and classified as good, fair or poor. Overall, 49.6% of mothers had good knowledge, 30.4% had fair knowledge and 20.1% had poor knowledge (Figure 1).

Mothers of female children showed significantly higher good-knowledge levels than mothers of male children (60.0% vs 39.5%, $p=0.006$). No other sociodemographic variable showed a statistically significant association with knowledge level (Table 2).

Self-reported management behaviours are summarized in Table 3. Most mothers reported giving necessary asthma medications (95.5%), reducing activity during attacks (88.8%),

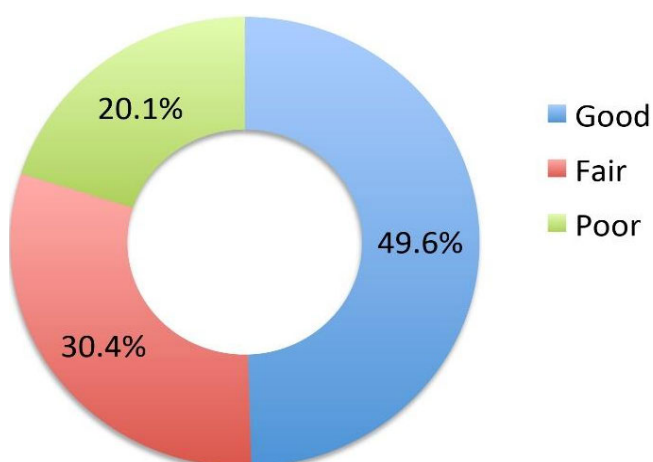


Figure 1: Knowledge level of mothers

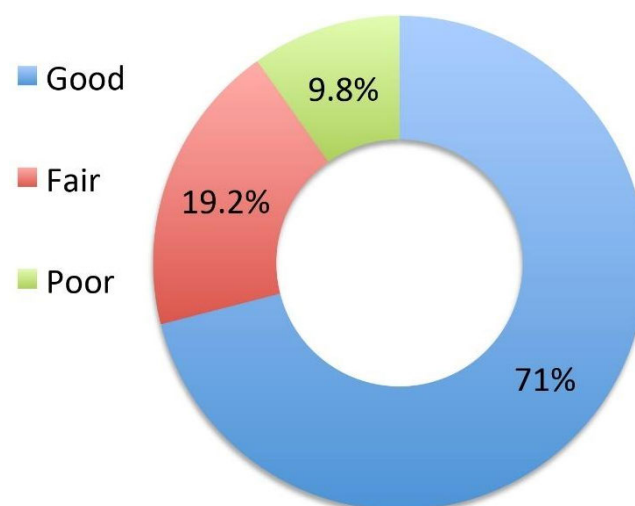


Figure 2: Behaviour level of mothers

Table 1: Sociodemographic characteristics of the participants

Variables	Category	N	Percent
Gender	Female	110	49.1
	Male	114	50.9
Age of the child	0-6 years	121	54.0
	7-14 years	103	46.0
Maternal age	<30 years old	73	32.6
	>30 years old	151	67.4
Marital status	Married	199	88.8
	Separated	19	8.5
	Widow	6	2.7
The number of children in the family	1 to 3	136	60.7
	4 to 6	60	26.8
	7 to 9	21	9.4
	>9	7	3.1
Mother's educational level	No primary education	16	7.1
	Primary	13	5.8
	Middle	19	8.5
	Secondary	64	28.6
	University	112	50.0
Mother's job	Employed	57	25.4
	Housewife	167	74.6
Residence	Taif city	161	71.9
	Villages and suburbs of Taif	63	28.1

Table 2: Relationship between knowledge level and participants characteristics

			Knowledge				P value
			Good	Fair	Poor	Total	
Gender	Female	N	66	29	15	110	0.006
		%	60.0	26.4	13.6	100.0	
	Male	N	45	39	30	114	
		%	39.5	34.2	26.3	100.0	
Age of child	0-6 years	N	56	38	27	121	0.519
		%	46.3	31.4	22.3	100.0	
	7-14 years	N	55	30	18	103	
		%	53.4	29.1	17.5	100.0	
Maternal age	<30 years old	N	37	25	11	73	0.382
		%	50.7	34.2	15.1	100.0	
	>30 years old	N	74	43	34	151	
		%	49.0	28.5	22.5	100.0	
The mother's marital status	Married	N	99	60	40	199	0.897
		%	49.7	30.2	20.1	100.0	
	Separated	N	10	6	3	19	
		%	52.6	31.6	15.8	100.0	
	Widow	N	2	2	2	6	
		%	33.3	33.3	33.3	100.0	
The number of children in the family	1 to 3	N	65	43	28	136	0.313
		%	47.8	31.6	20.6	100.0	
	4 to 6	N	28	16	16	60	
		%	46.7	26.7	26.7	100.0	
	7 to 9	N	13	7	1	21	
		%	61.9	33.3	4.8	100.0	
	>9	N	5	2	0	7	
		%	71.4	28.6	0.0	100.0	
Mother's educational level	No primary education	N	13	1	2	16	0.312
		%	81.3	6.3	12.5	100.0	
	Primary	N	6	5	2	13	
		%	46.2	38.5	15.4	100.0	
	Middle	N	10	7	2	19	
		%	52.6	36.8	10.5	100.0	
	Secondary	N	30	21	13	64	
		%	46.9	32.8	20.3	100.0	
	University	N	52	34	26	112	
		%	46.4	30.4	23.2	100.0	
Mother's job	Employed	N	33	11	13	57	0.109
		%	57.9	19.3	22.8	100.0	
	Housewife	N	78	57	32	167	
		%	46.7	34.1	19.2	100.0	
Residence	Taif	N	79	50	32	161	0.936
		%	49.1	31.1	19.9	100.0	
	Villages and suburbs of Taif	N	32	18	13	63	
		%	50.8	28.6	20.6	100.0	

Table 3: Behaviour among mothers in asthmatic children

Steps taken	N	%
I give the child the necessary medicines	214	95.5
Massage the baby's chest or back	148	66.1
Let the child cough to remove mucus from the lung	168	75.0
Let the child rest and reduce movement	199	88.8
I wait and watch the development of wheezing	177	79.0
Give the child water or juice	151	67.4
Give the child breathing exercises	117	52.2
I give the child home-made folk herbs	80	35.7
Ask for help	181	80.8
Take medications regularly	208	92.9
House cleaning to remove dust	214	95.5
Remove the irritating factors of the disease from home	212	94.6
Treating the common cold	211	94.2
Allow the child to cough to get rid of mucus	177	79.0
Allow the child to rest	213	95.1
Prevent extreme burnout	203	90.6
Prevent vigorous exercise	182	81.3
Continuous practice of breathing exercises	146	65.2

seeking help during attacks (80.8%), taking medications regularly (92.9%) and cleaning the home regularly to reduce dust (95.5%). However, some practices remained potentially suboptimal: 35.7% reported using homemade or complementary remedies and only 65.2% reported regular breathing exercises.

Overall, 71.0% of mothers had good behaviour scores, 19.2% had fair scores and 9.8% had poor scores (Figure 2). Good behaviour was significantly more common among mothers of female children ($p=0.030$), mothers younger than 30 years ($p = 0.043$) and mothers with 4–6 or 7–9 children ($p = 0.025$) (Table 4).

A strong relationship was observed between maternal knowledge and behaviour: mothers with good knowledge were significantly more likely to demonstrate good behaviour, while mothers with poor knowledge were more likely to demonstrate poor behaviour ($p<0.001$) (Table 5).

Table 4: Relationship between behaviour and participants characteristics

Parameters			Behaviour			Total	P value
			Good	Fair	Poor		
Gender	Female	N	84	21	5	110	0.030
		%	76.4	19.1	4.5	100.0	
	Male	N	75	22	17	114	
		%	65.8	19.3	14.9	100.0	
Age of child	0-6 years	N	86	23	12	121	0.996
		%	71.1	19.0	9.9	100.0	
	7-14 years	N	73	20	10	103	
		%	70.9	19.4	9.7	100.0	
Maternal age	<30 years old	N	57	14	2	73	0.043
		%	78.1	19.2	2.7	100.0	
	>30 years old	N	102	29	20	151	
		%	67.5	19.2	13.2	100.0	
The mother's marital status	Married	N	139	42	18	199	0.113
		%	69.8	21.1	9.0	100.0	
	Separated	N	16	1	2	19	
		%	84.2	5.3	10.5	100.0	
	Widow	N	4	0	2	6	
		%	66.7	0.0	33.3	100.0	
The number of children in the family	1 to 3	N	95	30	11	136	0.025
		%	69.9	22.1	8.1	100.0	
	4 to 6	N	44	5	11	60	
		%	73.3	8.3	18.3	100.0	
	7 to 9	N	16	5	0	21	
		%	76.2	23.8	0.0	100.0	
	>9	N	4	3	0	7	
		%	57.1	42.9	0.0	100.0	
Mother's educational level	No primary education	N	10	4	2	16	0.741
		%	62.5	25.0	12.5	100.0	
	Primary	N	10	1	2	13	
		%	76.9	7.7	15.4	100.0	
	Middle	N	16	1	2	19	
		%	84.2	5.3	10.5	100.0	
	Secondary	N	44	13	7	64	
		%	68.8	20.3	10.9	100.0	
	University	N	79	24	9	112	
		%	70.5	21.4	8.0	100.0	
mother's job	Employed	N	43	8	6	57	0.519
		%	75.4	14.0	10.5	100.0	
	Housewife	N	116	35	16	167	
		%	69.5	21.0	9.6	100.0	
Residence	Taif	N	116	28	17	161	0.501
		%	72.0	17.4	10.6	100.0	
	Villages and suburbs of Taif	N	43	15	5	63	
		%	68.3	23.8	7.9	100.0	

Table 5: Relationship between knowledge level and behaviour level among mothers of asthmatic children

Parameters		Behaviour level			Total	P value	
		Good	Fair	Poor			
Knowledge level	Good	N	95	15	1	<0.001	
		%	85.6	13.5	0.9		100.0
	Fair	N	51	11	6		68
		%	75.0	16.2	8.8		100.0
	Poor	N	13	17	15		45
		%	28.9	37.8	33.3		100.0

DISCUSSION

This study showed that maternal knowledge of childhood asthma in this Taif-based sample was moderate, while self-reported management behaviours were generally better. The most important internal finding was the strong association between good knowledge and good behaviour, supporting the practical relevance of caregiver education in paediatric asthma care [13-15]. At the same time, the presence of persistent gaps—such as the continued use of homemade or complementary remedies—suggests that knowledge alone may not be sufficient to ensure optimal evidence-based practice [16,17].

Most mothers reported adherence to prescribed medication and regular healthcare-seeking behaviour, which is encouraging. These findings are consistent with previous studies showing that caregiver engagement, medication adherence and clear response plans contribute to better asthma management in children [18-23]. Nevertheless, the present study measured behaviours through self-report only; therefore, socially desirable responses may have overestimated favourable practices.

Parental education remains a central component of effective asthma management. Education should extend beyond disease awareness and address practical skills such as recognizing symptom deterioration, avoiding triggers, understanding treatment roles and responding appropriately during exacerbations [24-29]. Our results also highlight the need to discuss common home practices directly with caregivers, including complementary remedies, indoor environmental control and safe approaches to symptom relief [30-40].

From a local practice perspective, these findings support brief, repeated and practical caregiver education in paediatric clinics in Taif. Demonstration-based counselling, teach-back methods, simple written or digital action-plan messages and reinforcement during follow-up may be more effective than one-time generic advice. The discussion should remain cautious, however, because this study did not measure clinical outcomes such as emergency visits, hospitalization, asthma control scores or observed inhaler technique.

Our findings are broadly consistent with earlier Saudi data from Aseer, which also showed suboptimal maternal knowledge and behaviour related to childhood asthma [12]. Together, these studies suggest that caregiver-focused asthma education remains an important unmet need in Saudi clinical practice, although regional differences in healthcare access, environment and family practices may influence the pattern of results.

CONCLUSIONS

In this hospital-based sample from Taif, maternal knowledge regarding childhood asthma was moderate, whereas self-reported management behaviours were generally better. Better knowledge was strongly associated with better behaviour, but important gaps persisted, especially the continued use of unsupported complementary remedies. Targeted, practical and repeated caregiver education may help strengthen day-to-day asthma management in this setting.

Limitations

This study had several limitations. First, its cross-sectional design allows assessment of associations but not causation. Second, behaviour data were self-reported through telephone interviews and may therefore be affected by recall bias and social desirability bias. Third, the study was conducted in a single hospital-based sample, which limits generalizability to mothers not linked to hospital care. Fourth, the achieved sample size was smaller than the calculated target and a response rate could not be reported from the available dataset. Finally, no multivariable analysis or objective asthma outcomes were available and the modified questionnaire would benefit from further psychometric reporting in future studies.

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