



## Knowledge, Attitude, Practices and Factors associated with Practices of Caregivers of Children with Allergic Conjunctivitis in Kano, Northwestern Nigeria

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### Abstract

**Background:** Ocular allergies, including allergic conjunctivitis (AC), have become increasingly prevalent globally. In West Africa, AC affects up to 39.2% of children. In Nigeria, approximately 18% of children in hotspots are affected by it. Despite the high prevalence of AC, there is limited research on the knowledge, attitude, and health-seeking practices of caregivers.

**Objective:** The study assessed the knowledge, attitude, practices and factors associated with practices of caregivers of children with allergic conjunctivitis in Kano, Northwestern Nigeria.

**Materials and Methods:** A facility-based cross-sectional study was conducted in three health facilities in Kano metropolis among caregivers of children with allergic conjunctivitis. Respondents were selected using systematic sampling and data were collected using an interviewer-administered, pretested questionnaire assessing knowledge, attitude and practices. Knowledge (11 items), attitude (10 Likert items), and practices (9 items) were scored and categorised into predefined levels.

Data was analysed using SPSS version 27. Descriptive statistics were presented as means, standard deviations, frequencies and percentages. Associations between socio-demographic characteristics and caregivers' practices were tested using Pearson's Chi-square or Fisher's exact test. A p-value  $\leq 0.05$  was considered statistically significant.

**Results:** A total of 398 caregivers participated, (365,89.4%) were mothers, predominantly aged 21-40 years (320,80.4%) and of Hausa ethnicity (322,80.9%). Majority had secondary education (220,55.3%), and (247,62.1%) earned less than ₦40,000 monthly. About 260(65.3%) had good knowledge of allergic conjunctivitis. and 209(52.5%) had a negative attitude toward allergic conjunctivitis. Health-seeking practices were suboptimal, and only 59(14.8%) demonstrated good practices. No socio-demographic factors were significantly associated with caregivers' practices ( $p > 0.05$ ).

**Conclusion:** This study revealed gaps in caregivers' practices despite adequate knowledge of allergic conjunctivitis, with socioeconomic factors like low-income influencing care. To improve practices, Context-specific interventions addressing misconceptions and structural barriers are needed to improve health-seeking behaviours. interventions and treatment adherence, timely medical care while addressing

logistical barriers.

**Keywords:** Allergic conjunctivitis, Attitude, Health seeking practices, Care givers, Kano

### Introduction

Over the past few decades, ocular allergies have become increasingly common worldwide, emerging

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as one of the most widespread allergic conditions.<sup>1,2</sup> The International Study of Asthma and Allergies in Childhood (ISAAC) identified regions such as Africa, Latin America, and Japan as having significant spatial distribution and a high number of hotspots for ocular allergies. Allergic conjunctivitis (AC) is a common ocular condition affecting 15-20% of the global population.<sup>3</sup> In another study that assessed its prevalence across several countries, it ranged as high as 38% in the general population,<sup>4</sup> with a prevalence of 20.7% among adolescents.<sup>5,6</sup> In Ghana, a community-based study found AC prevalence of 39.9% among basic school children.<sup>6</sup> A study in Gambia reported a prevalence of AC as high as 54.5% in children, especially during dry seasons. In Nigeria, approximately one in every five children (18%) in identified hotspots was estimated to be affected by AC.<sup>1</sup>

Allergic conjunctivitis (AC) is a prevalent ocular inflammatory condition characterized by an immune-mediated response to allergens, resulting in conjunctival and ocular surface inflammation.<sup>7</sup> Clinically, it manifests through an allergen-induced inflammatory response, presenting with symptoms such as itching, redness, and tearing. Clinical signs include conjunctival vessel injection, chemosis, and eyelid edema.<sup>8</sup> AC is further classified into various forms, including Seasonal Allergic Conjunctivitis (SAC), Perennial Allergic Conjunctivitis (PAC), Vernal keratoconjunctivitis (VKC), and Atopic Keratoconjunctivitis (AKC), among others, based on the specific clinical features of the condition.<sup>9</sup>

In Africa and other regions with warm tropical climates, vernal keratoconjunctivitis (VKC) is the most prevalent form of allergic conjunctivitis.<sup>6,7</sup> It accounts for a substantial proportion (21.0%) of cases seen in general eye clinics and is a common complaint in paediatric outpatient settings, often leading to referrals to tertiary healthcare facilities.<sup>8</sup> It significantly impacts children's daily activities, frequently causing school absenteeism and disruptions of normal activities at school or work. It substantially affects patients' quality of life, extending beyond direct medical expenses to impose a high social cost.<sup>8,9</sup> A significant proportion of caregivers recognized the impact of VKC on their children's school attendance and recreational activities ( $P < 0.001$ ).<sup>10</sup>

Caring for a child with allergies presents significant challenges, primarily due to the chronic nature of the

condition, which adds to the overall burden of caring for them.<sup>11</sup> Parents' knowledge is often shaped by their personal experiences with allergic conditions, leading them to develop explanations that help them make sense of their child's condition. Their understanding is typically multifaceted, encompassing factors such as the child's physical environment, family dynamics, lifestyle, or genetic predisposition.<sup>12</sup> Given the chronic nature of the condition, a mother's knowledge about her child's illness is crucial for providing ongoing support at home.<sup>13</sup> A study assessing caregivers of children with vernal keratoconjunctivitis (VKC) revealed that majority (69.2%) had poor knowledge of the condition's symptoms, and up to 83% were unaware of the side effects of the eye drops they administered to their children.<sup>10</sup>

Another study that assessed the care-seeking behaviour of caregivers of children with this condition reported that a significant proportion (57%) did not seek hospital care, and among those who did, only a small fraction (4.6%) completed their treatment.<sup>2</sup> Care-seeking behaviour was closely linked to the severity of the child's eye symptoms. Poor compliance with medication was commonly reported, largely due to the challenges of administering eye drops multiple times per day. Moreover, compliance further declined with increasing frequency of VKC episodes and longer symptom durations.<sup>10</sup>

Parents often sought care promptly when they noticed symptoms, they deemed significant, such as redness and tearing.<sup>14</sup> Various factors influenced their care-seeking behaviour, including financial status, family history of the condition, and logistical barriers such as transportation to healthcare facilities. These factors were identified as critical determinants of care-seeking practices.<sup>15</sup> Mothers also reported using home remedies to alleviate their children's symptoms. Common practices included rinsing the eyes with running water, with a small proportion (7.3%) using cold water for relief. Additionally, a few mothers applied traditional oils, such as rose water extract, as part of their home management strategies.<sup>2</sup> Research into the knowledge, attitudes, and home and health-seeking practices of caregivers of children with allergic conjunctivitis is limited. Therefore, this study which aimed to reduce these gaps can serve as a foundation for designing health education programs to raise awareness among caregivers, improve

understanding of the rationale for management, and ultimately provide better support for children with this condition.

### Materials and Methods

**Study Area:** The study was conducted in three health facilities within Kano metropolis: The federal and a state owned tertiary health care centre tertiary hospital, Aminu Kano Teaching Hospital (AKTH), Murtala Muhammad Specialist Hospital (MMSH) respectively, and Makkah Eye Specialist Hospital, established by Albasar International Foundation, Saudi Arabia based non-governmental organization.

**Study Design:** A cross-sectional study design was used to obtain information from caregivers of children who had been diagnosed with allergic conjunctivitis. The respondents were assessed on their knowledge, attitude, health seeking and home practices of Allergic conjunctivitis.

**Sample size calculation:** The minimum sample size was obtained using Fisher's formula ( $n = Z^2 pq/d$ ).<sup>16</sup>

Where  $n$  = minimum sample size

$Z$  = point on the normal distribution curve equivalent to 95% confidence interval usually 1.96

$P$  = Prevalence of allergic conjunctivitis in a previous study in Jos. AC was more prevalent in those aged 1–16 years is 38.4%  $p = 0.384$

$q$  = Complementary probability of  $p$ , i.e.,  $1 - p = (1 - 0.38) = 0.62$

$d$  = degree of precision or margin of error which is 5% or 0.05

The minimum sample size was calculated thus:

$$n = [(1.96)^2 * 0.38 * 0.62] / (0.05)^2$$

$$n = 362$$

An additional 10% was added to the calculated minimum sample size to account for possible non-response and incomplete data.

$$10\% \text{ of } 362 = 36.2$$

$$\text{So, } n = 362 + 36.2 = 398$$

**Sampling Technique.** A multistage sampling technique was used as follows:

#### Stage 1: Selection of hospitals

We used a simple random sampling technique (balloting) to select three of the five hospitals in Kano metropolis that provide a wide range of specialist eye services. Subsequently, the sample size estimated was proportionately allocated to these three health facilities based on average monthly patient turnout.

#### Stage 2: Selection of respondents

A systematic sampling technique was used to select respondents. Using the clinics appointment registers, the monthly clinic attendance and sample size, we determined the sampling frame, and the sampling interval. The first respondent was the caregiver whose serial number corresponded with a random number between 1 and the sampling interval for each of the study sites. Successive participants were identified by summing the sampling interval to the preceding respondent's serial number. All caregivers were assessed to ensure they fulfilled the eligibility criteria before questionnaire administration.

**Study population:** These were caregivers of children attending eye clinics in the sampled hospitals. However eligible respondents comprised of caregivers who had children diagnosed with Allergic conjunctivitis and were at the study sites for a follow up visit. Those on their first visit to the clinic or who were diagnosed on that day of the survey were excluded.

**Study instrument:** An interviewer-administered, pretested, semi structured questionnaire adapted from previous studies was used.<sup>17,18</sup> The questionnaire consists of four sections (A, B, C and D). Section A collected information on the socio-demographic data of the respondents, section B assessed the mother's knowledge on allergic conjunctivitis, Section C assessed the attitudes of mothers on allergic conjunctivitis and Section D on the mother's home and care seeking practices.

#### Measures and Statistical Analysis

**Knowledge:** An eleven-point scale was used to score the caregivers knowledge on Allergic conjunctivitis, one point for each correct response given and zero point for incorrect or responses the respondent was unsure of. These scores were used to grade respondents' knowledge as having good, fair, and poor knowledge. Good knowledge if they scored between 8 and 11, fair knowledge as scores of 5–7, and poor knowledge as score of 0–4.

**Attitude:** Ten responses were used to assess caregivers' attitude towards allergic conjunctivitis on a five-point Likert scale. Their attitude was based on their responses. Those who strongly agreed were scored 5 ranging down to those who strongly

disagreed with the positive behaviour who scored a point each The Maximum obtainable score by respondents was 50 and the minimum 5. Those who scored less than or equal to 24 were categorised to have a negative attitude while those that scored 25 and above were considered to have a positive attitude.

**Practices:** Care giver practices were based on 9 responses. A correct response had a score of 2, unsure practices were scored 1, while an incorrect response had a score of 0. The total maximum score is 18. Those who scored above 13 were categorised as having good practices, those with scores between 12 down to 7 points had fair practices, and those who scored less than 6 had poor practices.

**Statistical Analysis:** Data were analysed using SPSS Version 27 (IBM Corp., Armonk, NY). Numeric variables were summarized using means, standard deviation, while Categorical variables were presented as frequencies and percentages. Pearson’s Chi-square or Fisher’s exact test where appropriate was used to test the association between socio-demographic (respondent’s sex, age group, ethnic group, religion, education, occupation, monthly income) and caregivers’ practices. A P-value of  $\leq 0.05$  was considered statistically significant.

**Ethical Clearance :** The Study adhered to the tenets of declaration of Helsinki. Ethical clearance was obtained from the Kano State Ministry of health and Aminu Kano Teaching Hospital Research Ethics Committees. Prior to each interview written informed consent was obtained after providing detailed information about the study to potential participants. The informed written consent form was translated into Hausa language and signed by participants before the questionnaire administration.

For those who were not literate, details of the consent form were explained to them in Hausa language, and they were asked to thumbprint to indicate consent with a witness. Respondents were informed that participation was voluntary, were assured of anonymity, and that non-participation had no consequences on their care. There were no incentives provided to consenting respondents.

**Results**

This study included a total of 398 respondents. More than half of the index children were below 5 years

(229,57.5%), the sample comprised 229 (57.5%) males and 169 (42.5%) females. Caregivers were predominantly mothers (356,89.4%), with smaller proportions of grandmothers (21,5.3%), fathers (14,3.5%), and few other caregivers which were all relatives (7,1.8%). Majority of caregivers were aged 21–40 years (320,80.4%) and were Muslims 373 (93.7%). Hausa ethnicity was most common (322,80.9%), followed by Fulani (40,10.1%). Table 1.

Caregivers demonstrated relatively high levels of knowledge about allergic conjunctivitis. A substantial proportion correctly identified the condition (268,67.3%) and recognized common symptoms such as itching (300,75.4%), redness (310,77.9%), and photophobia (280,70.4%). Many caregivers were aware of environmental triggers,

**Table 1: Sociodemographic characteristics of index Child and Caregivers**

Variable	Frequency N	Percentage %
<b>Age group of Index Child (years)</b>		
1-5	229	57.5
5-10	126	31.7
11-15	43	10.8
<b>Gender (child)</b>		
Male	229	57.5
Female	169	42.5
<b>Caregivers' relationship with index child</b>		
Mothers	356	89.4
Grandmothers	21	5.3
Fathers	14	3.5
Others	7	1.8
<b>Age group of caregivers (years)</b>		
15-20	14	3.5
21-40	320	80.4
41-60	55	13.8
61-70	9	2.3
<b>Religion</b>		
Islam	373	93.7
Christianity	25	6.3
<b>Ethnicity</b>		
Hausa	322	80.9
Fulani	40	10.1
Igbo	19	4.8
Yoruba	15	3.8
Others	2	0.4
<b>Marital Status of caregiver</b>		
Married	356	89.4
Widowed	31	7.8
Single	8	2.0
Divorced	3	0.8
<b>Caregivers Highest level of Education.</b>		
Secondary school	220	55.3
NCE Diploma	59	14.8
HND Degree	10	2.5
Master	10	2.5
Quarant	99	24.9
<b>Caregivers Income</b>		
< 40,000	214	53.8
40,000	181	45.2
<b>Caregivers Occupation</b>		
Civil servant	35	8.8
Business	48	12.1
Unemployed	118	29.6
Self-employed	194	48.7
Others	3	0.8

including dust (290,72.9%), sunlight (275,69.1%), and pollen/dust (320,80.4%). Additionally (285,71.6%) correctly acknowledged that symptoms tend to occur seasonally. However, misconceptions persisted, as (103,25.9%) incorrectly believed the condition to be contagious. Awareness of potential complications if left untreated was reported by (265,66.6%) of respondents. Table 2

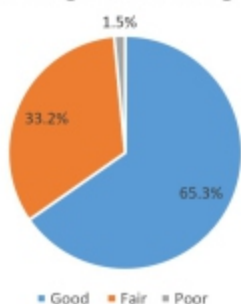
Based on composite scoring, nearly two-thirds of caregivers demonstrated good knowledge of allergic conjunctivitis (65.3%), while one-third had fair knowledge (33.2%). Only a small minority (1.5%) showed poor understanding, indicating generally satisfactory poor awareness among the study population. Fig 1

Caregiver attitudes towards allergic conjunctivitis varied. Less than half believed the condition is

**Table 2: Domains assessed for Knowledge of caregivers on Allergic Conjunctivitis**

Domains	Correct responses n (%)	Incorrect responses n (%)
Aware child's condition is called allergic conjunctivitis	268 (67.3)	130 (32.7)
Itching is a symptom of Conjunctivitis	300 (75.4)	98 (24.6)
Redness is a symptom of Conjunctivitis	310 (77.9)	88 (22.1)
Photophobia is a symptom of Conjunctivitis	280 (70.4)	118 (29.6)
Infection causes the condition	270 (67.8)	128 (32.2)
Dust Triggers the condition	290 (72.9)	108 (27.1)
Sunlight Triggers the condition	275 (69.1)	123 (30.9)
Pollen grain dust Triggers the condition	320 (80.4)	78 (19.6)
Aware of Season symptoms usually occur	285 (71.6)	113 (28.4)
Condition is contagious	295 (74.1)	103 (25.9)
Aware of Consequences if left untreated (blindness, school absenteeism)	265 (66.6)	133 (33.4)

Knowledge of Caregivers on Allergic Conjunctivitis



**Figure 1: Graded Knowledge of respondents on Allergic Conjunctivitis**

**Table 3: Domains assessed for Caregivers' Attitude towards Allergic Conjunctivitis**

Domains	Positive responses n (%)	Negative responses n (%)
Believes allergic conjunctivitis is a curable condition	189 (47.5)	209 (52.5)
Agrees that allergic conjunctivitis is manageable with appropriate care	200 (50.3)	198 (49.7)
Believes allergic conjunctivitis be inherited	190 (47.7)	208 (52.3)
Allergic conjunctivitis improves as a child grows older	180 (45.2)	218 (54.8)
Do you believe allergic conjunctivitis can lead to blindness in your child	170 (42.7)	228 (57.3)
Trusts that the current treatments for allergic conjunctivitis can effectively control their child's symptoms	200 (50.3)	198 (49.7)
Thinks exposure to dust can trigger allergic conjunctivitis	210 (52.8)	188 (47.2)
Allergic conjunctivitis can negatively affect their child's school performance	185 (46.5)	215 (53.5)
Allergic conjunctivitis impacts your child's participation in social activities	195 (49.0)	205 (51.0)
Considers allergic conjunctivitis to be a preventable condition	190 (47.7)	208 (52.3)

curable (189,47.5%), and a comparable proportion considered it manageable with appropriate care (50.3%). Beliefs regarding heritability were almost evenly divided (190,47.7% affirmative), and more than half of caregivers (218,54.8%) disagreed that symptoms improve with age. Notably, 57.3% did not believe the condition could potentially lead to blindness. Trust in the effectiveness of current treatment options was reported by (200,50.3%) of participants. While most caregivers agreed that dust exposure may trigger symptoms (210,52.8%), fewer acknowledged potential impacts on school performance (185,46.5%) or social participation (195,49.0%). Only (190,47.7%) perceived allergic conjunctivitis as preventable. Table 3

The overall assessment of attitudes showed that slightly fewer than half of the respondents had a positive attitude (187,47.5%), whereas the majority (209,52.5%) held negative attitudes Figure 2

Caregivers' practices were generally suboptimal. Only a small proportion demonstrated good practices with regards to presenting to the hospital for appropriate reasons (57,14.3%), attending follow-up appointments (62,15.6%), complying with eye-drop usage (56,14.1%), and practicing hand hygiene before administering medication (52,13%). A significant proportion engaged in fair practices across most domains, with values ranging from 47% to 67%. Use of traditional or herbal remedies was reported by (111,28%) of caregivers, and (123,31%) required permission before taking a child for treatment.

Caregivers' attitude towards allergic conjunctivitis

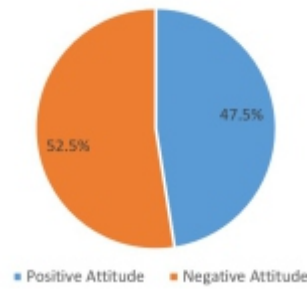


Figure 2: Graded Attitude of Caregivers' Towards Allergic Conjunctivitis

Table 4: Domains assessed for Caregiver Practices for Allergic Conjunctivitis

Domains	Practices		
	Good n (%)	Fair n (%)	Poor n (%)
Reason for bringing the child to the hospital	57 (14.5)	150 (37.8)	111 (27.9)
Attends follows up with a health care provider	61 (15.6)	128 (32.3)	108 (27.1)
Compliance with eye drops	56 (14.1)	133 (33.3)	109 (27.4)
Repeats the prescription instead of coming back	58 (14.5)	120 (30.3)	110 (27.6)
Seeks care from Pharmacy/ Chemist	55 (13.8)	123 (31.1)	110 (27.6)
Requires permission before taking your child to the hospital for treatment	48 (12.0)	107 (27.0)	123 (31.0)
Washes Eyes repeatedly	67 (16.9)	137 (34.4)	119 (29.9)
Practice Hand Hygiene before administering eye drops	51 (12.8)	127 (32.0)	119 (29.9)
Used traditional or herbal remedies to treat your child's allergic conjunctivitis	20 (5.0)	167 (42.0)	111 (28.0)

Caregiver practices for Allergic Conjunctivitis



Figure 3: Caregiver Practices in managing Children with Allergic Conjunctivitis

Repeated eye washing was prevalent, with (179,45%) of respondents reporting this practice. Table 3 The graded practice scores indicated that only (59,14.8%) of caregivers adhered to recommended practices for allergic conjunctivitis. More than half (231,58.1%) demonstrated fair practices, while (108,27.1%) fell into the poor practice category.

Table 5: Factors associated with caregiver health seeking and care practices

Variables	Caregivers' Health Seeking/ Care Practices			Chi-square (χ²)	P-value
	Good (%)	Fair (%)	Poor (%)		
<b>Gender</b>					
Male	5 (4.7)	10 (4.3)	3 (5.3)	0.116	0.943
Female	131 (95.3)	225 (95.7)	54 (94.7)		
<b>Religion</b>					
Islam	99 (91.7)	217 (93.9)	57 (96.6)	1.410	0.443
Christianity	3 (8.3)	14 (6.1)	2 (3.6)		
<b>Educational Status</b>					
Quranic Primary	16 (14.1)	56 (24.2)	17 (28.8)	1.662	0.198
Secondary	62 (55.1)	123 (52.3)	112 (19.9)		
Tertiary and above	23 (18.8)	50 (21.5)	9 (15.3)		
<b>Respondent's Relationship to Index Child</b>					
Mother	96 (88.9)	208 (90.0)	121 (88.1)	0.931	0.108
Grandmother	5 (4.4)	9 (3.9)	4 (6.8)		
Father	1 (0.9)	10 (4.3)	0 (0.0)		
Other	0 (0.0)	1 (1.7)	3 (5.1)		
<b>Ethnicity of caregiver</b>					
Hausa	85 (76.7)	184 (79.7)	111 (88.6)	10.608	0.113
Fulani	13 (9.3)	28 (12.1)	2 (3.4)		
Igbo	8 (7.4)	6 (3.9)	2 (3.4)		
Yoruba	3 (2.8)	10 (4.3)	2 (3.4)		
Other	1 (0.9)	0 (0.0)	0 (0.0)		
<b>Occupation Status of Caregiver</b>					
Self-employed	11 (10.0)	21 (9.1)	3 (5.1)	9.711	0.190
Trade	13 (11.9)	20 (8.5)	11 (18.6)		
Unemployed	34 (31.5)	65 (28.1)	22 (37.9)		
Self-employed	48 (44.4)	123 (53.2)	23 (39.0)		
<b>Income of Caregiver</b>					
<₦20,000	23 (64.8)	172 (74.5)	35 (64.4)	4.255	0.107
₦20,000	13 (11.9)	30 (13.1)	21 (37.6)		

Discussion

A total of 398 questionnaires were administered to consenting respondents giving a response rate of 100%. Most caregivers were mothers (89.4%), predominantly within the 21–40-year age group (80.4%), married (89.4%), and of Hausa ethnicity (80.9%). These characteristics are consistent with typical caregiving patterns in Northern Nigeria.<sup>19</sup> Most caregivers had secondary education (55.3%), with a smaller proportion attaining higher education, a significant number (24.9%) reported to have only Qur'anic education. We also observed that 62.1% earned less than ₦40,000 monthly, putting them in the low-income earners group.

The knowledge assessment revealed that 65.3% of caregivers had good knowledge of allergic conjunctivitis. In specific areas assessed, a large proportion of the caregivers, up to 80.4% recognized pollen and dust as triggers, only 66.5% were aware of the potential consequences of untreated allergic conjunctivitis, such as visual impairment and school absenteeism. On the contrary, a study in Egypt reported poor knowledge among 91.5% of mothers about causes and symptoms of allergic conjunctivitis, with only 2.5% demonstrating good knowledge.<sup>13</sup> Another study in northern India reported that 69.2% of caregivers lacked awareness of symptoms, seasonal variation, and consequences of untreated

vernal keratoconjunctivitis (VKC).<sup>10</sup> In this study, caregivers demonstrated relatively better knowledge levels, possibly reflecting the more recent nature of this study and increased awareness possibly over time about allergic conjunctivitis through informal channels or personal experiences.

This study reveals predominantly negative attitudes among caregivers toward allergic conjunctivitis, with 52.5% having negative perceptions. This aligns with findings from another study in Nigeria on parental attitudes toward childhood eye care,<sup>20</sup> where 60% of fathers and 57% of mothers believed routine eye examinations were unnecessary, and knowledge about eye care was limited. In our study, only 47.5% of caregivers believed allergic conjunctivitis is curable, while 47.7% considered it preventable. Both studies highlighted significant barriers, including misconceptions and lack of awareness, highlighting the need for parent education campaigns to improve attitudes and encourage proactive health-seeking behaviours.

The findings in this study contradicted those of a similar Ethiopian study on childhood eye care.<sup>21</sup> While 88.5% of Ethiopian caregivers believed childhood eye diseases could be completely cured, only 47.5% of caregivers in our study shared this belief. Also, while 86.7% of the respondents in Ethiopia perceived blindness as a complication, 57.3% of caregivers in our study shared this view. Preventive attitudes were more positive in Ethiopia, with 83.6% associating prevention with hygiene, compared to 47.7% in our study. These variations emphasize the importance of context-specific interventions to address misconceptions and promote better health practices across regions. A study in China showed slightly lower results compared with this study in terms of attitudes, where about 32.6% strongly agreed it affects their work or study<sup>18</sup>

The findings from this study revealed caregivers' health care seeking and home care practices towards the index patient's allergic conjunctivitis management were also suboptimal, despite a significant proportion of the caregivers demonstrating good knowledge, only about one in seven caregivers had good practices, significant proportion of caregivers demonstrated fair practices (58%), while (27.1%) of the care givers had poor practices. This trend was observed across specific domains, such as follow-ups with healthcare providers, compliance with eye drops, and seeking

care from pharmacies or chemists. These findings align with previous studies, which have also highlighted a gap between caregivers' knowledge and their health-seeking behaviours. In a study that assessed the care-seeking behaviour of caregivers of children with vernal keratoconjunctivitis (VKC) it revealed that 57% of caregivers did not seek hospital care, and among those who did, only 4.6% completed their treatment.<sup>13</sup> Additionally, poor compliance with prescribed treatments was commonly reported, was due to the difficulty in administering eye drops multiple times a day. Our study is consistent with this finding, where only 13% of caregivers adhered to prescribed eye drop regimens. A similar study in Nigeria<sup>20</sup> although not exclusively focused on allergic conjunctivitis, reported a common trend: parents delayed seeking eye care for their children until noticeable problems arose. Similarly, our study found that caregivers primarily sought care reactively, only seeking help once issues became apparent. Similarly, in Ethiopia<sup>21</sup> a study found inappropriate practices in diagnosing and managing paediatric eye conditions, with many children receiving unverified diagnoses or unsuitable treatments. These findings align with our observation of caregivers relying on traditional remedies or pharmacy consultations instead of professional medical advice.

No statistically significant association was observed between caregivers' socio-demographic characteristics and their health-seeking practices for children with allergic conjunctivitis. Gender, religion, ethnicity, educational status, occupation, relationships to the index child, and caregiver income did not demonstrate statistically significant relationships with caregivers' practices.

Despite the absence of statistically significant associations, some descriptive patterns were observed. Mothers constituted the majority of the caregivers who demonstrated good health-seeking practices compared with grandmothers, fathers, and other caregivers. Similarly, caregivers with higher levels of education appeared more likely to demonstrate better practices compared with those with lower educational attainment. Comparable findings have been reported in other studies where higher maternal education was associated with improved knowledge and practices regarding childhood eye conditions.<sup>13</sup> Caregivers earning  $\leq$  ₦40,000 appeared to constitute a larger proportion of those with good and fair practices, however this may

likely reflect the overall income distribution of the study population, where the majority of respondents were in the lower income category. On the contrary previous studies highlighted economic and logistical barriers, such as transportation costs, distance to health facilities as significant.<sup>22</sup>

Caregivers who were self-employed appeared to demonstrate relatively higher proportions of good practices compared with those in other occupational groups. This may be related to the greater flexibility often associated with self-employment, which may allow caregivers to attend clinic visits and follow-up appointments more easily. Previous studies have identified the need to take time off work as a significant barrier to healthcare-seeking behaviour among caregivers of children with health conditions.<sup>23</sup> Caregivers in formal employment may experience greater difficulty leaving work during clinic hours, which could delay or limit healthcare utilization. Thus, addressing these contextual barriers remains important for improving timely and appropriate care-seeking among caregivers.

### Conclusion

This study assessed caregivers' knowledge, attitudes, and practices regarding the management of allergic conjunctivitis among children. Although most caregivers demonstrated good knowledge of allergic conjunctivitis and its common triggers, this did not translate into optimal health-seeking and home care practices. Many caregivers had misconceptions regarding the curability and preventability of the condition, and awareness of the potential consequences of untreated allergic conjunctivitis was not universal. In addition, only a small proportion of caregivers demonstrated good practices, particularly in relation to adherence to prescribed medications, follow-up care, and timely consultation with healthcare providers. Although socio-demographic characteristics were not statistically associated with caregivers' practices, descriptive trends suggested that mothers, caregivers with higher educational attainment, and those who were self-employed demonstrated better care seeking better practices. Overall, the findings highlight a gap between caregivers' knowledge and their actual practices in the management of allergic conjunctivitis.

### Recommendations

Caregiver education should be strengthened to

address misconceptions about allergic conjunctivitis and promote appropriate care-seeking practices. Emphasis should be placed on early presentation to healthcare facilities, adherence to prescribed treatment, and avoidance of self-medication or traditional remedies. Improving awareness and accessibility of eye care services may further enhance appropriate management among caregivers.

### Strengths and Limitations

A key strength of this study is its important contribution to the field by providing baseline literature on caregivers' knowledge, attitudes, and practices regarding allergic conjunctivitis, addressing a relatively underexplored area. This study provides a useful foundation for future research and interventions. However, the study may have been subject to social desirability bias, as caregivers interviewed in a hospital setting might have felt compelled to provide responses they perceived as favourable or acceptable to healthcare professionals. This could have influenced the accuracy of self-reported practices and attitudes. Additionally, the paucity of comparable studies limited the ability to compare the findings within the broader literature. Being a hospital-based study, may not be a true reflection of knowledge, attitudes and practices of persons in the community.

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### Authors' Contributions:

- Rilwan C. Muhammad: Conceptualization of the study and manuscript review.
  - Muazzam S. Usman: Data collection and manuscript drafting.
  - Sadiq Hassan: field supervision and critical revision of the manuscript.
  - Sadiya H. Warshu: Methodological input, data analysis support, and manuscript editing.
  - Aliyu Ibrahim Shehu: Literature review, data management, and manuscript drafting.
  - Aminatu A. Kwaku: Study conceptualization, overall supervision, critical revision of the manuscript, and final approval.
  - Saudat G. Habib : Final extensive editing of the manuscript.
- All authors read and approved of the final manuscript.

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