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Posted Date: 27 March 2025

doi: 10.20944/preprints202502.2168.v2

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Article

Knowledge, Attitudes, and Practices about Trachoma in Four Evaluation Units of Low Endemic Areas, in Yemen: Implications for Prevention and Control

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Abstract: Background: Trachoma is a bacterial infection that causes blindness worldwide and affects impoverished communities disproportionately. Despite these interventions, Yemen has made strides towards trachoma elimination. **Objective:** To assess the knowledge, attitudes, and practices (KAP) regarding trachoma and its associated factors among rural communities in six districts within four Evaluation Units (EUs) of Hodeidah and Ibb governorates in, Yemen. **Methods:** A community-based cross-sectional study was conducted in six districts from four Evaluation Unites (EUs)of the Hodeidah and Ibb governorates in January 2025. Bivariate analysis (chi-square) identified variables for multivariable logistic regression ($p < 0.25$). Multicollinearity was addressed by excluding relevant variables from each model. **Results:** Among the 1164 interviewed participants, 38.8% (435) exhibited good knowledge, 19.1% (222) demonstrated good attitudes, and 46.5% (541) practiced good hygiene related to trachoma prevention. Significant associations were observed between KAP and several factors: **Age of the head of household:** Inversely associated with adequate knowledge (AOR = 0.13, 95% CI 0.08-0.22, P < 0.001), good attitudes (AOR = 3.12, 95% CI 2.23-4.36, P < 0.001), and good practices (AOR = 0.26, 95% CI 0.18-0.39, P < 0.001). **Mother's literacy status:** Significantly and positively associated with adequate knowledge (AOR = 102, 95% CI 47.7-219.4, P < 0.001), good attitudes (AOR = 3.60, 95% CI 2.50-5.17, P < 0.001), and good practices (AOR = 170, 95% CI 82-358, P < 0.001).**Father's occupational status:** Significantly and positively associated with adequate knowledge (AOR = 43.6, 95% CI 22.2-85.5, P < 0.001) and good practices (AOR = 3.67, 95% CI 2.35-5.73, P < 0.001), but inversely associated with good attitudes (AOR = 0.43, 95% CI 0.31-0.61, P < 0.001).**Household size:** Inversely associated with adequate knowledge (AOR = 0.62, 95% CI 0.40-0.99, P < 0.001) and good attitudes (AOR = 1.82, 95% CI 1.33-2.50, P < 0.001).**Wealth index:** Significantly and positively associated with adequate knowledge (AOR = 6.47, 95% CI 3.94-10.62, P < 0.001) and good practices (AOR = 1.57, 95% CI 1.03-2.40, P < 0.001).**Gender of the head of household:** Male-headed households were less likely to have a good knowledge than female-headed households (AOR = 0.59, 95% CI 0.37-0.96, P < 0.001). **Conclusions:** This study found significant disparities in KAP related to trachoma prevention, influenced by factors like the age of the household head, parental literacy, and household wealth.

Keywords: trachoma; evaluation unites; KAP

Author Summaries

Trachoma, a bacterial infection causing blindness, disproportionately affects impoverished communities. While Yemen has made progress toward eliminating this disease, it remains a public health concern. This study explored community knowledge, attitudes, and practices (KAP) regarding trachoma in rural areas of Hodeidah and Ibb governorates. Researchers interviewed over 1,1164

 doi:10.20944/preprints202502.2168.v2

people and found that while some had good hygiene practices (46.5%), knowledge (38.8%) and positive attitudes (19.1%) about trachoma prevention were less common. The study revealed strong links between KAP and factors like the age and gender of the head of household, parental literacy, family size, and wealth. For example, children whose mothers were literate were significantly more likely to have good trachoma-related knowledge, attitudes, and practices. Similarly, wealthier households tended to have better understanding and practices These findings highlight the need for targeted interventions that address these social and economic disparities to effectively combat trachoma in Yemen.

1. Introduction

Trachoma, a bacterial infection of the eye, constitutes the second leading cause of preventable blindness worldwide. This treatable and preventable disease disproportionately affects impoverished populations [1–4]. Trachoma disproportionately affects individuals in disadvantaged rural areas with limited access to necessities like clean water and sanitation [5,6]. Globally, an estimated 142.2 million people are at risk of trachoma, and it is responsible for visual impairment in approximately 1.9 million individuals [7,8]. The World Health Organization (WHO) endorses the SAFE (Surgery, Antibiotics, Facial cleanliness, and Environmental improvement) strategy for trachoma elimination, which has been implemented in over 40 countries worldwide where trachoma is endemic [9,10]. The SAFE strategy can eliminate trachoma, but its proper application remains crucial as the disease continues to pose a global health threat [11]. Trachoma persists as a significant health issue in the world's poorest communities. Several factors contribute to an increased risk of trachoma, including limited access to clean water, poor personal hygiene, and inadequate environmental sanitation [12–14]. In Yemen 2024, the adjusted prevalence of the clinical sign trachomatous inflammation-follicular [15] among children aged 1–9 years in the enumeration units encompassing highly endemic areas specifically Hodeidah and Ibb was 0.9 % and 0.8%, respectively.(Unpublished) Trachoma is a substantial segment of the population that exhibits unfavorable attitudes and a lack of knowledge concerning trachoma infection. Although the implementation of various interventions, including annual mass drug administration (MDA), for trachoma control has expanded in Yemen in recent years, significant knowledge gaps persist among vulnerable populations, particularly those residing in remote rural areas and those experiencing economic hardship [16]. These populations may have limited awareness and adherence to recommended trachoma prevention and control measures. However, there is currently a dearth of data on KAP regarding trachoma prevention and control within rural communities in the six districts. The research findings shed light on critical gaps in knowledge, community practices, and perceptions surrounding trachoma, and how these factors influence patient health-seeking behavior. This valuable information is crucial for promoting health and preventing trachoma by addressing the underlying causes and drivers of disease spread. Ultimately, these findings can significantly enhance the impact of programs aimed at preventing and eliminating trachoma within the country. Furthermore, these findings will provide valuable insights for policymakers in formulating appropriate interventions to implement the SAFE strategy effectively. However, the study aimed to assess the KAP to give us more concepts for eliminating the disease.

2. Methods

2.1. Study Design, Population and Setting

A community-based cross-sectional study was conducted among households in six low-endemic trachoma districts across four Evaluation Units (EUs) in January 2025. These districts, identified in 2024 with a TF prevalence exceeding 5%, included Far Aludayan and Mudaykhirah in Ibb Governorate, and Almighalf, Almunirah, As Salif, and Azayadyah in Hodeidah Governorate (Figure 1). Eligible participants were male and female heads of households who provided informed consent.

 doi:10.20944/preprints202502.2168.v2

2.2. Sample Size Calculation

The sample size was calculated to be 1164 using standard epidemiological procedures. This calculation incorporated the following assumptions: a 95% confidence level ($Z\alpha/2 = 1.96$), an estimated population proportion of 60% with adequate knowledge regarding trachoma, a desired margin of error of 5%, a design effect of 2.63, and an inflation factor of 1.2 to account for potential data loss [17].

2.3. Sampling Strategy

A two-stage cluster sampling approach was utilized. In the first stage, 30 clusters were systematically selected from villages within the study districts, and grouped into (EUs) according to WHO criteria [18]. In the second stage, a compact segment sampling method was used to select households from each cluster, with selection proportional to cluster population size. Households were defined as individuals residing in a dwelling unit, regardless of marital status. Households were then randomly selected from the lists. Informed consent was obtained from the heads of selected households (or their adult representatives) before study participation, as per WHO guidelines [18].

2.4. Data Collection

A structured questionnaire was adapted from a previous study [19,20]. Face-to-face interviews with eligible household heads were conducted. Direct observations were used to measure personal and household practices. A qualitative method was used to determine the attitudes of the community toward the trachoma. Before conducting interviews with respondents, the team was trained on research tools. To prevent disease transmission among participants, investigators used disposable gloves or cleaned their hands with 70% alcohol.

2.5. Operational Definition

Knowledge was assessed using nine questions, with correct answers scored as 1 and incorrect as 0. Good knowledge was defined as scoring above the median score. Attitudes and practices were similarly assessed using seven questions each. Individuals scoring above the median on the attitude and practice scales were categorized as having good attitudes, and good practices, respectively. Therefore, participants scoring above the median of 7, 7, and 24 were considered to have good knowledge, practice, and attitude, respectively.

2.6. Statistical Analysis

SPSS version 26 was used for data analysis. All the total KAP score variables were not normally distributed, as determined by the Shapiro-Wilk test (p-value ≤ 0.05). However, the median was used as the cutoff point for the categorizing of the total knowledge, practice, and attitude scores. Frequency, and percentage were used to present categorical variables.

Bivariate analyses were conducted to identify potential associations between independent and dependent variables. Variables with p-values less than 0.25 in the bivariate analyses were included in a multivariable logistic regression model. Multicollinearity was checked using variance inflation factors (VIF), and variables with high multicollinearity were removed. For example, the practice variable was removed during the multivariate analysis for knowledge, the knowledge variable was removed during the multivariate analysis for practice, and both knowledge and practice variables were removed during the multivariate analysis for attitude. A p-value < 0.05 was considered statistically significant.

 doi:10.20944/preprints202502.2168.v2

3. Results

3.1. Characteristics of the Study Population

A majority of household heads were female (68.3%), and aged 40 years or younger (57.6%), and a substantial portion of households had more than 7 members (49.1%). Most fathers were literate (79.0%) and mothers were literate (58.7%), and the majority of fathers were employed (77.2%). Also, a significant proportion of households were classified as "poor" in terms of the Wealth index (38.8%) (Table 1).

Table 1. Sociodemographic characteristics of study participants (N=1164).

Characteristics	***n***	**(%)**
Gender of the household head		
Male	369	**31.7**
Female	795	**68.3**
Age of the household head (years)		
≤40	671	**57.6**
>40	493	**42.4**
Family size (members)		
≤7	592	**50.9**
>7	572	**49.1**
Father's literacy status		
Literate	919	**79.0**
Illiterate	245	**21.0**
Mother's literacy status		
Literate	683	**58.7**
Illiterate	481	**41.3**
Father's employment status		
Employed	899	**77.2**
Unemployed	265	**22.8**
Wealth index		
Rich	712	**61.2**
Poor	452	**38.8**

3.2. Knowledge of Trachoma

A majority 983 (84.5%) of the study subjects had heard about trachoma. However, 722 (62.0%) of them had heard through MDA. Two hundred and thirty-seven (20.4%) of the respondents correctly answered the cause of trachoma. Regarding measures that can be taken to prevent trachoma 402 (34.5%) daily hand washing with water and soap, symptoms of redness and tearing of the eye 352 (30.2%),362 (31.1%) respectively. Transmission of trachoma, 570 (46.6%), 90 (7.7%), and 175 (15.0%) of the study subjects correctly responded that contact with an unhygienic environment, through flies landing on the face and contact with nasal or eye discharges respectively. 941(80.5%) knowing trachoma can be treated. Less than two quarters, 435 (38.8%) of the study subjects had a good knowledge of trachoma (Table 2).

 doi:10.20944/preprints202502.2168.v2

Table 2. Knowledge, of study Community Toward trachoma in Four Evaluation Units in Yemen,2025.

Characteristics	***n***	**(%)**
Heard about trachoma disease		
Yes	983	**84.5**
No	181	**15.5**
By what have you heard		
MDA	722	**62.0**
Community	90	**7.7**
TV	56	**4.8**
Radio	98	**8.4**
Others	198	**17.0**
What do you think causes trachoma		
Bacteria	237	**20.4**
Dust	542	**46.6**
Flies	201	**17.3**
Virus	74	**6.4**
I don't know	110	**9.5**
What measures can be taken to prevent trachoma		
Avoid contact with nasal or eye discharges	88	**7.6**
Avoid sharing clothes	125	**10.7**
Daily hand wash with water and soap	402	**34.5**
Improving access to clean water	141	**12.1**
Use medicine	408	**35.1**
What are the symptoms of trachoma that you know		
Itching	219	**18.8**
Photophobia	86	**7.4**
Redness of the eye	352	**30.2**
Scratching of the eyelashes	145	**12.5**
Tearing of the eye	362	**31.1**
How is trachoma transmitted?		
Unhygienic environment	570	**46.6**
Through flies landing on the face	90	**7.7**
Contact with nasal or eye discharges	175	**15.0**
Sharing clothes or fomites	206	**17.7**
I don't know	110	**9.5**
How often should a person wash their face to prevent trachoma		
One	157	**13.5**
Twice	185	**15.9**
Three times	452	**38.8**
When it dirty	370	**31.8**
Can trachoma be treated?		
Yes	941	**80.8**

 doi:10.20944/preprints202502.2168.v2

No	155	**13.3**
I don't know	68	**5.8**
Where would you go if a family member had symptoms of trachoma		
Hospital	351	**30.2**
Local Clinic	298	**25.6**
Ophthalmologist	207	**17.8**
Traditional Healer	217	**18.6**
I don't know	91	**7.8**
Knowledge status		
Good	435	**38.8**
Poor	712	**61.2**

3.3. Attitude on Trachoma Prevention and Control

Nine hundred and forty-two (80.9%) of the study participants had a poor attitude toward trachoma infection. According to this study, 471 (40.5%) strongly agreed that trachoma is a health problem in the community. Conversely, 535 (46.0%) agreed and 426 (36.6%) agreed that Flies are the main vector of the disease and transmitted from person to person. 369 (31.7%) of the study subjects disagreed that trachoma may eventually lead to blindness. Nearly 370 (31.8%),334 (28.7%), and 458 (39.3%) of the respondents agreed and strongly agreed that hygiene and sanitation are preventing disease, disposing of waste is a protection from disease, and taking drugs is important to prevent and control, respectively (Table 3).

Table 3. Attitude of the Study Community Toward Trachoma in Four Evaluation Units in Yemen,2025.

Variables	Likert Scale				
	Agree	**Strongly agree**	**Disagree**	**Strongly disagree**	**Neutral**
Trachoma is a health problem in your community	392 (33.7%)	471(40.5%)	123(10.6%)	127(10.9%)	51(4.4%)
Flies are the main vector of the disease	535(46.0%)	219(18.8%)	142(12.2%)	101(8.7%)	167(14.3%)
Trachoma transmitted from person to person	426(36.6%)	273(23.5%)	168(14.4%)	147(12.6%)	150(12.9%)
The disease may eventually lead to blindness.	132(11.3%)	145(12.5%)	191(16.4%)	369(31.7%)	327(28.1%)
Hygiene and sanitation are a preventing disease	370(31.8%)	288(24.7%)	301(25.9%)	183(15.7%)	22(1.9%)
Disposing of waste is a protection from disease	332(28.5%)	334(28.7%)	103(8.8%)	291(25.0%)	104(8.9%)

 doi:10.20944/preprints202502.2168.v2

Taking drugs is important to prevent and control	458(39.3%)	360(30.9%)	96(8.2%)	106(9.1%)	144(12.4%)
Attitude Category					
Good	222 (**19.1%**)				
Poor	942 (**80.9%**)				

3.4. Practices on Trachoma Prevention and Control

The majority of respondents, 348 (29.9%), and 347(29.7%) reported that the main source of water for domestic use during the dry season was from wells and springs respectively. 862 (74.1%) reported a distance between home and water source of less than 30 minutes. The majority,1003 (86.2%) reported no presence of flies on the child's face and 987 (84.8%) reported no presence of animals in the house. However, 781 (67.1%),667 (57.3%) and 912 (78.4%) used enough water for bathing, had proper solid and liquid waste disposal management, and utilized a latrine, respectively. Out of the total, 541 (46.5%) respondents were classified as having good practices towards trachoma prevention and control (Table 4).

Table 4. Practices of study Community of trachoma in Four Evaluation Units in Yemen,2025.

Characteristics	***n***	**(%)**
The main source of water for domestic use during the dry season		
Rainwater	118	**10.1**
River	87	**7.5**
Spring	347	**29.8**
Transportation tankers	264	**22.7**
Well	348	**29.9**
Distance between home and water source		
<30 Min	862	**74.1**
>30Min	302	**25.9**
The presence of flies on the child's face		
No	1003	**86.2**
Yes	161	**13.8**
The presence the feces around the house		
No	987	**84.8**
Yes	177	**15.2**
The presence of animals in the house		
No	541	**46.5**
Yes	623	**53.5**
Use enough water for bathing		
No	383	**32.9**
Yes	781	**67.1**
Having proper solid &liquid waste disposal management		
No	497	**42.7**
Yes	667	**57.3**

 doi:10.20944/preprints202502.2168.v2

Latrine utilization		
No	252	**21.6**
Yes	912	**78.4**
Practice Category		
Good	541	**46.5**
Poor	623	**53.5**

3.5. Multivariable Logistic Regression Analysis for Factors Associated with Knowledge of Study Participants about Trachoma in Four Evaluation Units in Yemen, 2025

Multivariable logistic regression analysis revealed that age of the head of household, gender of the head of household, household size categories, mother's literacy status, father's occupation status, and wealth index were significantly associated with knowledge status of the participants AOR=0.13,95%CI:0.08–0.22), (AOR=0.59,95%CI:0.37–0.96),(AOR=0.62,95%CI:0.40–0.99),(AOR=102,95%CI:47.7–219.4), (AOR=43.6,95%CI:22.2–85.5), and AOR=6.47, 95%CI: 3.94–10.62), respectively (Table 5).

Table 5. Logistic regression analysis of selected variables with knowledge of study participants on trachoma in Four Evaluation Units in Yemen,2025.

Variables	Knowledge		COR (95% CI)	P-value	AOR (95% CI)	P-value
	Adequate %	Inadequate %				
Age of the head of household (years)						
≤40	75(16.6%)	418(58.7%)	0.14(0.11-0.19)	<0.001	**0.13(0.08-0.22)**	**<0.001**
>40	377(83.4%)	294(41.3%)	Ref		Ref	
Gender of the head of household						
Male	96(21.2%)	273(38.3%)	0.43(0.33-0.57)	<0.001	**0.59(0.37-0.96)**	**0.033**
Female	356(78.8%)	439(61.7%)	Ref		Ref	
Household size categories						
≤7	195(43.1%)	397(55.8%)	0.60(0.48-0.76)	<0.001	**0.62(0.40-0.99)**	**0.044**
>7	257(56.9%)	315(44.2%)	Ref		Ref	
Father's literacy status						
Literate	373(98.2%)	239(33.6%)	1.44(1.065-1.935)	0.010	0.59(0.33-1.06)	0.076
Illiterate	8(1.8%)	473(66.4%)	Ref		Ref	
Mother's literacy status						
Literate	444(86.6%)	82(17.4%)	109(53.7-224.8)	<0.001	**102(47.7-219.4)**	**<0.001**
Illiterate	93(13.4%)	388(82.6%)	Ref		Ref	
Father's occupation status						
Employed	438(96.9%)	461(64.7%)	17.03(9.79-29.64)	<0.001	**43.6(22.2-85.5)**	**<0.001**
Unemployed	14(3.1%)	251(35.3%)	Ref		Ref	
Wealth Index						
Rich	366(81.0%)	346(48.6%)	4.50(3.41-5.94)	<0.001	**6.47(3.94-10.62)**	**<0.001**
Poor	86(19.0%)	366(51.4%)	Ref		Ref	
Practice Category						
Good	451(100.0%)	89(12.5%)	6.08(5.03-7.35)	<0.001		
Poor	0(0.0%)	623(87.5%)	Ref			
Attitude Category						
Good	66(14.6%)	156(21.9%)	0.61(0.44-0.84)	0.001	0.98(0.57-1.69)	0.939
Poor	386(85.4%)	556(78.1%)	Ref		Ref	

 doi:10.20944/preprints202502.2168.v2

3.6. Multivariable Logistic Regression Analysis for Factors Associated with Attitudes of Study Participants about Trachoma in Four Evaluation Units in Yemen,2025

Multivariable logistic regression analysis showed that age of the head of household, household size categories, Mother's literacy status, and father's occupation status, were significantly associated with attitudes status of the participants AOR=3.12, 95%CI: 2.23–4.36), AOR=1.82, 95%CI: 1.33–2.50), AOR=3.60, 95%CI: 2.50–5.17) and AOR=0.43, 95%CI: 0.31–0.61) respectively (Table 6).

Table 6. Logistic regression analysis of selected variables with Attitude of study participants on trachoma in Four Evaluation Units in Yemen,2025.

Variables	Attitudes		COR (95% CI)	P-value	AOR (95% CI)	P-value
	Good (%)	Poor (%)				
Age of the head of household (years)						
≤40	123(55.4%)	370(39.3%)	1.92(1.43-2.58)	<0.001	**3.12(2.23-4.36)**	**<0.001**
>40	99(44.6%)	572(60.7%)	Ref		Ref	
Gender of the head of household						
Male	148(66.7%)	647(68.7%)	0.91(0.67-1.25)	0.307		
Female	74(33.3%)	295(31.3%)	Ref			
Household size categories						
≤7	135(60.8%)	457(48.5%)	1.65(1.22-2.22)	0.001	**1.82(1.33-2.50)**	**<0.001**
>7	87(39.2%)	485(51.5%)	Ref		Ref	
Father's literacy status						
Literate	45(20.3%)	200(21.2%)	0.94(0.656-1.36)	0.415		
Illiterate	177(79.7%)	742(78.8%)	Ref			
Mother's literacy status						
Literate	160(72.1%)	523(55.5%)	2.07(1.50-2.85)	<0.001	**3.60(2.50-5.17)**	**<0.001**
Illiterate	62(27.9%)	419(44.5%)	Ref		Ref	
Father's occupation status						
Employed	147(66.2%)	752(79.8%)	0.50(0.36-0.68)	<0.001	**0.43(0.31-0.61)**	**<0.001**
Unemployed	75(38.8%)	190(20.2%)	Ref		Ref	
Family ownership of land						
Rich	133(59.9%)	579(61.5%)	0.94(0.70-1.26)	0.362		
Poor	89(40.1%)	363(38.5%)	Ref			
Knowledge Category						
Good	66(29.7%)	386(41.0%)	0.61(0.44-0.84)	0.001		
Poor	156(70.3%)	556(59.0%)	Ref			
Practice Category						
Good	155(69.8%)	386(41.0%)	3.33(2.43-4.56)	<0.001		
Poor	67(30.2%)	556(59.0%)	Ref			

3.7. Multivariable Logistic Regression Analysis for Factors Associated with Practices of Study Participants about Trachoma in Four Evaluation Units in Yemen,2025

Multivariable logistic regression analysis indicated that age of the head of household, mother's literacy status, father's occupation status, and wealth index were significantly associated with practices status of the participants AOR=0.26, 95%CI: 0.18–0.39), AOR=170, 95%CI: 82–358), AOR=3.67, 95%CI: 2.35–5.73), and AOR=1.57, 95%CI: 1.03–2.40), respectively (Table 7).

 doi:10.20944/preprints202502.2168.v2

Table 7. Logistic regression analysis of selected variables with Practice of study participants on trachoma in Four Evaluation Units in Yemen,2025.

Variables	Practices		COR (95% CI)	P-value	AOR (95% CI)	P-value
	Good (%)	Poor (%)				
Age of the head of household (years)						
≤40	106(19.6%)	387(62.1%)	0.15(0.11-0.19)	<0.001	**0.26(0.18-0.39)**	**<0.001**
>40	435(80.4%)	236(37.9%)	Ref		Ref	
Gender of the head of household						
Male	133(24.6%)	236(37.9%)	0.54(0.42-0.69)	<0.001	0.70(0.47-1.06)	0.088
Female	408(75.4%)	387(62.1%)	Ref		Ref	
Household size categories						
≤7	234(43.3%)	358(57.5%)	0.56(0.45-0.71)	< 0.001	0.75(0.50-1.11)	0.148
>7	307(56.7%)	265(42.5%)	Ref		Ref	
Father's literacy status						
Literate	105(19.4%)	140(22.5%)	1.20(0.91-1.60)	0.114		
Illiterate	436(80.6%)	483(77.5%)	Ref			
Mother's literacy status						
Literate	533(98.5%)	150(24.1%)	210(102-432)	< 0.001	**170(82-358)**	**<0.001**
Illiterate	8(1.5%)	473(75.9%)	Ref		Ref	
Father's occupation status						
Employed	457(84.5%)	442(70.9%)	2.23(1.67-2.98)	< 0.001	**3.67(2.35-5.73)**	**<0.001**
Unemployed	84(15.5%)	181(29.1%)	Ref		Ref	
Wealth Index						
Rich	380(70.2%)	332(53.3%)	2.07(1.62-2.65)	< 0.001	**1.57(1.03-2.40)**	**0.038**
Poor	161(29.8%)	291(46.7%)	Ref		Ref	
Knowledge Category						
Good	452(83.5%)	623(100.0%)	0.12(0.10-0.15)	< 0.001		
Poor	89(16.5%)	0(0.0%)	Ref			
Attitude Category						
Good	155(28.7%)	67(10.8%)	3.33(2.43-4.56)	< 0.001		
Poor	386(71.3%)	556(89.2%)	Ref			

Discussion

The study revealed significant associations between good knowledge, attitudes, and practices regarding trachoma and several factors, including the age of the head of household, the mother's literacy status, and the father's occupation status. Good knowledge and good attitudes were significantly associated with household size, while good knowledge and good practices were significantly associated with the wealth index. Additionally, the gender of the head of the household was significantly associated with good knowledge.

Regarding knowledge, the majority of respondents (84.5%) had heard of trachoma, comparable to findings in Northern Ethiopia (89.2%) and Bangladesh (86%) [19,21]. However, this rate was higher than that reported in Kenya (65.7%) and lower than in other countries [22,23], suggesting that community mobilization and sensitization efforts may have been implemented in the study sites. MDA campaigns were the primary source of information for 62% of participants, suggesting that these initiatives have significantly contributed to raising awareness about trachoma. Similar to studies in other countries like Zambia, Ethiopia, and Kenya [24–26]. The present study revealed that (46.6%), (20.4%), and (17.3%) of respondents reported correctly that trachoma can be transmitted by dust, bacteria, and flies respectively, Similar studies from Kenya and Ethiopia reported that the most reported mode of trachoma transmission was contact with flies and dirt [21,27]. and daily

 doi:10.20944/preprints202502.2168.v2

handwashing with soap and water and the use of medication were identified as the most common preventive measures. While less frequent, other preventive measures mentioned, such as avoiding contact with eye discharges and sharing clothes, demonstrate some understanding of potential trachoma transmission routes. This suggests a gap in the understanding of trachoma's true etiology, and the likely reason would be the lack of awareness of the participants toward trachoma this finding is in line with a study done in other countries [3,28,29]. Participants identified several potential transmission routes for trachoma, including unhygienic environments, contact with nasal or eye discharges, and the sharing of clothes or contaminated items. They also recognized that trachoma can be prevented by going to the hospital or health facility, seeing specialists, use of appropriate medications, improving sanitation, and regular hand and face washing with soap. Similar findings have been reported in studies conducted in other countries [30–32]. Finally, (61.2%) of the community demonstrated inadequate knowledge regarding trachoma.

Regarding attitudes, a majority (74.2%) of respondents agreed or strongly agreed that trachoma is a health problem in their community, indicating a general awareness of the issue. Similar findings have been reported in studies conducted in other countries [20,28,30,33]. A considerable proportion (64.8%) agreed or strongly agreed that flies are the main vector of the disease, highlighting a significant misconception about trachoma transmission, (59.1%) agreed or strongly agreed that trachoma is transmitted from person to person, indicating a partial understanding of transmission routes [34,35]. (23.8%) agreed or strongly agreed that trachoma may eventually lead to blindness, suggesting limited awareness of the potential severity of the disease [36–38]. A majority (56.5%) agreed or strongly agreed that hygiene and sanitation are important for preventing the disease, indicating some understanding of preventive measures. A large proportion (70.2%) agreed or strongly agreed that taking drugs is important for prevention, and control, suggesting a positive perception of medical interventions. Overall Attitude: A significant proportion (80.9%) of the community demonstrated poor attitudes towards trachoma, characterized by misconceptions about transmission, limited awareness of potential consequences, and inadequate understanding of preventive measures.it is crucial to emphasize that medication is part of a comprehensive approach to trachoma control and should be used in conjunction with other preventive measures [14,39–41]. Regarding practices, water source, and accessibility: the majority of the households (74.1%) had access to water sources within a 30-minute walk, Springs (29.8%) and wells (29.9%) were the common sources of domestic water [42–44]. Hygiene Practices: A significant proportion of households (67.1%) reported using enough water for bathing A significant proportion of households (86.2%) reported no presence of flies on children's faces [45,46]. Environmental Factors: The majority of households (84.8%) reported no presence of feces around the house. More than half of the households (53.5%) reported the presence of animals inside the house [33,47,48]. Reducing the burden of flies and improving environmental sanitation through proper human excreta disposal are crucial for public health [49]. Waste Disposal: A substantial proportion of households (57.3%) reported having proper solid and liquid waste disposal management. Latrine utilization was high, with 78.4% of households reporting using a latrine [50,51]. Overall Practices: A significant proportion (53.5%) of households demonstrated poor practices related to trachoma prevention [19,28].

Regarding reparation multivariate knowledge, the study found that adequate trachoma knowledge was linked to several socioeconomic factors, including the age of the head of the household, parental literacy, father's occupation, and household wealth. This suggests that socioeconomic disparities significantly influence knowledge levels within the community. The finding that female-headed households demonstrated higher levels of adequate knowledge is a significant observation and warrants further investigation [52]. The strong association between good practices and adequate knowledge highlights the importance of promoting and reinforcing positive health behaviors within the community. Targeted interventions are needed to address knowledge gaps among vulnerable populations, particularly those from low-income households and those with limited access to education [53,54].

 doi:10.20944/preprints202502.2168.v2

Regarding reparation multivariate attitudes, Several socioeconomic factors, such as the age of the head of household, household size, mother's literacy status, and father's occupation status, were significantly associated with attitudes towards trachoma [32,44]. This suggests that socioeconomic disparities play a crucial role in shaping community attitudes. The finding that households with good knowledge were less likely to have good attitudes towards trachoma is unexpected and warrants further investigation. It is possible that individuals with some knowledge may be more aware of the complexities of the disease and may have developed more nuanced (and potentially more negative) perspectives. Improving community knowledge about trachoma is crucial for fostering positive attitudes and promoting effective preventive behaviors. Interventions to improve attitudes towards trachoma should be tailored to address the specific needs and concerns of different population groups, such as younger heads of households and those from low-income households.

Regarding reparation multivariate practices, several socioeconomic factors, such as the age of the head of household, the mother's literacy status, the father's occupation status, and household wealth, were significantly associated with good practices related to trachoma prevention. This emphasizes the importance of addressing socioeconomic disparities to improve health outcomes. The strong association between good knowledge and good practices highlights the crucial role of health education in promoting positive health behaviors. The finding that maternal literacy is significantly associated with good practices underscores the importance of women's education in improving household health outcomes. Trachoma prevention interventions should be tailored to address the specific needs and circumstances of different population groups, such as low-income households and those with limited access to education.

Conclusions and Recommendation

Our study suggests that even in areas with low trachoma prevalence, community KAP regarding trachoma prevention and control must be enhanced to achieve elimination. This necessitates health education campaigns focused on the SAFE strategy, implemented at the community level, during mass drug administration campaigns, and at health facilities. The aim is to increase knowledge, address cultural perceptions that hinder behavior change, and ultimately promote positive behaviors for trachoma prevention and control within communities. Interestingly, our findings revealed higher levels of knowledge among female-headed households, warranting further investigation into the factors contributing to this observation. Notably, we observed an association between good knowledge and less favorable attitudes toward trachoma prevention and control, suggesting a need for further research to understand this unexpected relationship and tailor interventions accordingly.

Author Contributions: SAA conceived the study idea and implemented the fieldwork. SAA, MAA, and AHN designed the study. SAA, MAA, and AHN analyzed the data, interpreted the results, and drafted the manuscript. All authors read, revised, and approved the final version of the manuscript.

Funding: The authors received no financial support for the research, authorship, and/ or publication of this article.

Institutional Review Board Statement: The protocol of this study was approved by the Research Ethics Committee of the Faculty of Medicine and Health Sciences at Sana'a University, Yemen. Oral informed consent was obtained from the heads of the households or their legal representatives after they were briefed about the nature and purpose of the study. The privacy of participants and the confidentiality of their data were assured. The study was conducted according to the guidelines of the Declaration of Helsinki.

Informed Consent Statement: Not applicable.

Data Availability Statement: All relevant data are included in the manuscript, and the datasets for the study are available from the corresponding author upon reasonable request.

 doi:10.20944/preprints202502.2168.v2

Acknowledgments: The authors thank the head household and their families for participation in the study. They also thank the ophthalmologists who examined the children. Special thanks are due to the team from the districts and governorates targeted.

Conflicts of Interest: The authors declare that they have no competing interests.

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