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Knowledge, Attitudes, and Practices Regarding Conjunctivitis Among Students in Punjab, Pakistan: Insights from the 2023 Outbreak

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A B S T R A C T

Background: Conjunctivitis is an important public health concern in Pakistan. The diagnosis and management of conjunctivitis are often challenging, as the clinical presentation of different types of conjunctivitis can overlap, and the etiological agent is not always identified.

Objective: To examine the knowledge, attitudes, and practices of students in Punjab, Pakistan, regarding conjunctivitis during the 2023 outbreak.

Methodology: A cross-sectional survey using a self-administered questionnaire that was distributed to 1000 students from randomly selected schools, colleges, and universities in Punjab, Pakistan. The questionnaire included questions about demographic characteristics, conjunctivitis history, knowledge, attitudes, and practices related to conjunctivitis prevention and management, and sources of information and health-seeking behaviour. Only 399 students out of 1000 responded and were part of this study.

Results: The majority of the participants had basic knowledge about the causes, transmission, and prevention of conjunctivitis. Total 71.68% had heard of conjunctivitis, 78.70% knew it spreads from person to person, 75.94% recognized the importance of hand and eye hygiene, and 66.67% identified symptoms of bacterial conjunctivitis correctly. Regarding their attitudes and practices related to conjunctivitis, 43.36% preferred allopathy, while 27.07% used alternative medicine; 52.38% consulted a physician within 2–3 days of symptoms; 51.13% used or would use local remedies; and 84.71% said they would take precautions to limit the spread of conjunctivitis. Moreover, female participants had a significantly higher level of knowledge about conjunctivitis being contagious and the importance of hygiene. Males were more likely to use allopathy and local remedies.

Conclusion: This article concludes that there is a need to improve the knowledge, attitudes, and practices of the target population regarding conjunctivitis prevention and management and to increase the access and utilization of health care services. Health education campaigns, school-based interventions, and community-based initiatives are recommended to address this public health issue.

Keywords: Conjunctivitis, Knowledge, Attitudes, Practices, Pakistani students

Introduction

Conjunctivitis, also known as pink eye, is an inflammation of the conjunctiva, the thin membrane that covers the white part of the eye and the inner surface of the eyelids. [1] Conjunctivitis can be caused by various agents, such as bacteria, viruses, allergens, irritants, or contact lenses. [2] The most common symptoms of conjunctivitis are redness, itching, tearing, discharge, and sensitivity to light. [1] Depending on the cause, conjunctivitis may be contagious and can spread easily from person to person or from one eye to another. [1,2]

Conjunctivitis is a public health concern, as it can affect people of all ages and backgrounds and impair vision, productivity, and quality of life. Conjunctivitis can also be a sign of more serious ocular or systemic diseases, such as trachoma, herpes simplex, chlamydia, measles, or HIV. [3,4] Further, it is reported that over 80% of all cases of conjunctivitis are analyzed by non-

ophthalmologists. [5] A huge proportion of the adult population is infected by bacteria, and the most severe infectious conjunctivitis cases are found in children. [6] Hyperacute bacterial conjunctivitis is caused by *Neisseria gonorrhoeae* [6]. According to reports, about 60% of all victims of acute conjunctivitis use antibiotic eye drops. [5] The most general reason for infectious conjunctivitis is viral conjunctivitis, followed by bacterial conjunctivitis. [7] In the United States, it is estimated that $857 million is used annually in the treatment of bacterial conjunctivitis. [8] Therefore, timely diagnosis and appropriate treatment of conjunctivitis are essential to prevent complications and transmission.

However, the diagnosis and management of conjunctivitis are often challenging, as the clinical presentation of different types of conjunctivitis can overlap, and the etiological agent is not always identified. Moreover, there is a lack of standardized guidelines and evidence-based practices for the treatment of conjunctivitis, especially in low-resource settings. Many patients with conjunctivitis self-medicate or use traditional remedies, which may be ineffective or harmful. [9] Furthermore, there is a gap in the knowledge, attitudes, and practices (KAP) of students regarding conjunctivitis, its causes, prevention, and treatment. This gap may lead to misconceptions, stigma, and poor adherence to preventive measures and treatment recommendations. [10,11]

A prospective study organized on 50 patients in Pakistan in 2021 revealed that 68% of patients had conjunctivitis due to a virus, while 32% had conjunctivitis caused by a bacteria. [12] Recently, 86000 cases of conjunctivitis were reported from Punjab in September 2023, and even 13000 new cases on a single day (September 26, 2023) from Punjab, showing the high prevalence throughout the Punjab province, as reported by the Provisional Health Authority. [13]

Therefore, this study was designed to assess the KAP of students regarding conjunctivitis in selected schools in Punjab, Pakistan. The study also aims to determine the prevalence and etiology of conjunctivitis among the participants and to evaluate the impact of an educational intervention on their KAP. The study will provide valuable insights into the epidemiology, awareness, and behavior of students regarding conjunctivitis and will contribute to the development of effective strategies to prevent and control conjunctivitis in school settings.

Methodology

This was a cross-sectional study that was conducted between September 2023 and November 2023 (during the peak outbreak of conjunctivitis) after getting ethical approval from the University of Okara's research ethics committee with reference number UO/ETH/2023/CONJ. This study was in accordance with the Declaration of Helsinki Principles and informed consent was obtained from the research participants.

A questionnaire related to knowledge, attitudes, and practices was made on Google Forms and distributed randomly online to students at different schools, colleges, and universities in Punjab Province, Pakistan. The form was available in both English and Urdu (the local language). The questionnaire consisted of two parts: 1) Demographic characters of participants; and 2) questions related to the knowledge, attitudes, and practices of participants related to conjunctivitis. These questions were taken from the previous KAPs study conducted in the Subcontinent. [14-16] Participants were guided to submit their consent online before answering the survey form, and they did so voluntarily. The agreed-upon students were included, and on the other hand, those who did not agree were removed. The online questionnaire was sent to 1000 students, and only 399 duly filled and complete responses were obtained. Therefore, the current study's finalized sample size, which underwent analysis, included 399 participants.

GraphPad Prism (version 9.5.1) was used to analyze the collected data. Descriptive statistics were used to present the data in tables, and comparisons among groups were done using the chi-square test. <0.05 and <0.01 were considered to be significant and highly significant statistical levels, respectively.

Results

A descriptive analysis was performed to summarize the demographic characteristics of the participants, such as gender, age, occupation, and education level. The results are presented in Table I, which shows the frequency and percentage of each category. The majority of the respondents were male (51.62%), aged between 19 and 25 years (74.44%), and studying at the university level (76.44%).

Table I: Demographic characteristics of the participants.

Participant Characteristics	**Number of Respondents** *n (%)*
Gender	
Male	206 (51.62)
Female	193 (48.38)
Total	399 (100)
Age	
≤ 18 years	66 (16.54)
19-25 years	297 (74.44)
> 25 years	36 (9.02)
Total	399 (100)
Education Level	
School	32 (8.02)
College	62 (15.54)
University	305 (76.44)
Total	399 (100)

Table II shows the knowledge level of participants related to conjunctivitis. Female participants had a significantly higher level (P<0.01) of knowledge than male participants about the term conjunctivitis, knew that conjunctivitis is a contagious disease, hand and eye hygiene is an important preventive measure to reduce its transmission, and discarded the lens that the affected person was using when symptoms of conjunctivitis appeared. While male participants had significantly higher (P<0.01) knowledge about symptoms of bacterial conjunctivitis, contact lenses have the potential to cause conjunctivitis, and the use of an eye swab is done for sampling and culture for further evaluation of conjunctivitis. Male participants also know more (P<0.05) than females that mild conjunctivitis is diagnosed through signs and symptoms, and artificial tears provide relief for this disease. No significant difference between male and female participants regarding questions related to knowledge about conjunctivitis was observed.

Table *II:* Knowledge of participants related to Conjunctivitis.

Questions related to Conjunctivitis	Total Respondents *n* (%)	Male *n* (%)	Female *n* (%)	χ^2, *P*
Have you ever heard of a disease termed conjunctivitis?				
Yes	286 (71.68)	138(34.59)	148(37.09)	12.39, <0.0020**
No	98 (24.56)	64(16.04)	34(8.52)	
Not sure	15 (3.76)	4 (1.00)	11(2.76)	
Does conjunctivitis mainly affect the eye?				
Yes	322 (80.70)	159 (39.85)	163 (40.85)	5.48, 0.0646
No	44 (11.03)	30 (7.52)	14 (3.51)	
Not Sure	33 (8.27)	17 (4.26)	16 (4.01)	
Pink eye is a common name for conjunctivitis?				
Yes	286 (71.68)	142 (35.59)	144 (36.09)	2.44, 0.2952
No	61(15.29)	37 (9.27)	24 (6.02)	
Not sure	52(13.03)	27 (6.77)	25 (6.26)	
Conjunctivitis is contagious (spreads from person to person)?				
Yes	314 (78.70)	153 (38.35)	161 (40.35)	9.59, 0.0083**
No	45 (11.28)	33 (8.27)	12 (3.01)	
Not sure	40 (10.02)	20 (5.01)	20 (5.01)	
Is conjunctivitis an allergic disease?				
Yes	277 (69.42)	143 (35.84)	134 (33.58)	0.29, 0.8649
No	84 (21.06)	42 (10.53)	42(10.53)	
Not sure	38 (9.52)	21 (5.26)	17 (4.26)	
Red eyes and watery discharge from the eyes are common symptoms of viral conjunctivitis?				
Yes	330 (82.71)	164 (41.10)	166 (41.60)	3.36, 0.1862
No	37 (9.27)	24 (6.01)	13 (3.26)	
Not sure	32 (8.02)	18 (4.51)	14 (3.51)	
Irritation, burning, sensitivity to light, and blurred vision are also symptoms of conjunctivitis?				
Yes	320 (80.20)	164(41.10)	156(39.10)	2.00, 0.3675
No	47 (11.78)	28 (7.02)	19 (4.76)	
Not sure	32 (8.02)	14 (3.51)	18 (4.51)	
Purulent (pus) formation in the eye, crust over the eyelashes, and an inflamed eye are symptoms of bacterial conjunctivitis?				
Yes	266 (66.67)	135(83.83)	131(32.83)	9.51, 0.0086**
No	55 (13.78)	38 (9.52)	17 (4.26)	
Not sure	78 (19.55)	33 (8.27)	45(11.28)	
Can irritant materials and substances in the eye cause conjunctivitis?				
Yes	232 (58.15)	122(30.58)	110(27.57)	0.27,
No	101 (25.31)	50(12.53)	51(12.78)	0.8746
Not sure	66 (16.54)	34 (8.52)	32 (8.02)	
Do contact lenses have the potential to cause conjunctivitis?				
Yes	215 (53.89)	109(27.32)	106(26.57)	13.76, 0.0010**
No	92 (23.06)	61(15.29)	31 (7.77)	
Not sure	92 (23.06)	36 (9.02)	56(14.04)	
Conjunctivitis spreads through the shearing of a contact lens, eye makeup, towel, or eye drop?				
Yes	287 (71.93)	145(36.34)	142(35.59)	0.88, 0.6453
No	65 (16.29)	37 (9.27)	28 (7.02)	
Not sure	47 (11.78)	24 (6.02)	23 (5.76)	
Can mild conjunctivitis be diagnosed through signs and symptoms?				
Yes	275 (68.92)	139(34.84)	136(34.08)	7.57, 0.0227*
No	53 (13.28)	36 (9.02)	17 (4.26)	
Not sure	71 (17.79)	31 (7.77)	40(10.02)	
Is sampling done through an eye swab and culture for further evaluation?				
Yes	241 (60.40)	131(32.83)	110 (27.57)	9.82, 0.0074**
No	50 (12.53)	32 (8.02)	18 (4.51)	
Not sure	108 (27.07)	43 (10.78)	65(16.29)	
A slit lamp (bio-microscopy) examination is done to diagnose conjunctivitis?				
Yes	207 (51.88)	115 (28.82)	92 (23.06)	14.40, 0.0007**
No	63 (15.79)	41 (10.28)	22 (5.51)	
Not sure	129 (32.33)	50 (12.53)	79(19.80)	
Is hand and eye hygiene an important preventive measure to reduce transmission?				
Yes	303 (75.94)	144 (36.09)	159 (39.85)	11.77, 0.0028**
No	52 (13.03)	38 (9.52)	14(3.51)	
Not sure	44 (11.03)	24 (6.02)	20(5.01)	
Discard the lens that you were using when symptoms of conjunctivitis appeared?				
Yes	275 (68.92)	126(31.58)	149(37.34)	15.77, 0.0004**
No	66 (16.54)	48(12.03)	18 (4.51)	
Not sure	58 (14.54)	32 (8.02)	26 (6.52)	
Conjunctivitis is self-limiting without any treatment?				
Yes	217 (54.39)	111(27.82)	106(26.57)	0.07, 0.9634
No	110 (27.57)	58(14.54)	52(13.03)	
Not sure	72 (18.04)	37 (9.27)	35 (8.77)	
Wash cloth, soak in warm water, and put on eye for a few minutes, 3–4 times a day. Does this provide relief?				
Yes	254 (63.66)	136 (34.09)	118 (29.57)	2.62, 0.2703
No	75 (18.80)	40 (10.02)	35 (8.77)	
Not sure	70 (17.54)	30 (7.52)	40(10.02)	
Do artificial tears provide relief?				
Yes	166 (41.60)	89 (20.30)	77(19.30)	9.15, 0.0103*
No	117 (29.32)	70 (17.54)	47(11.78)	
Not sure	116 (29.07)	47 (11.78)	69(17.29)	
Are antibiotics used for the treatment of bacterial conjunctivitis?				
Yes	245(61.40)	119 (29.82)	126 (31.58)	2.55, 0.2793
No	89 (20.30)	49 (12.25)	40(10.02)	
Not sure	65 (16.29)	38 (9.52)	27 (6.77)	
Can conjunctivitis cause loss of vision?				
Yes	179 (44.86)	99 (24.81)	80 (20.05)	2.64, 0.2675
No	137 (34.34)	70 (17.54)	67(16.79)	
Not sure	83 (20.80)	37 (9.27)	46(11.53)	

The attitudes and practices of participants related to conjunctivitis are shown in Table III. Males had a significantly higher (P<0.01) tendency to use allopathy and any local remedy if subjected to conjunctivitis than females.

Table III: Attitude and Practices of Participants related to Conjunctivitis.

Attitude and Practices related to Conjunctivitis	Total Respondents *n* (%)	Male *n* (%)	Female *n* (%)	χ^2, *P*
What treatment did you follow/or will follow if subjected to Conjunctivitis?				
Allopathy	173(43.36)	107(26.82)	66 (16.54)	10.36, 0.0056**
Alternative medicine	108(27.07)	47 (11.78)	61 (15.29)	
Nill	108(27.07)	52 (13.03)	56 (14.04)	
When did or will you approach physician/ophthalmologist if subjected to Conjunctivitis?				
Within 2-3 days	209(52.38)	121(30.32)	88(22.06)	7.03, 0.0709
After 2-3 days	80 (20.05)	37 (9.27)	43 (10.78)	
Used medicine consulted by a doctor to other patients	76 (19.05)	33 (8.27)	43 (10.78)	
Never consulted a doctor	34 (8.52)	15 (3.76)	19 (4.76)	
Did you use or will you use any local remedy if subjected to conjunctivitis?				
Yes	204 (51.13)	121(30.32)	83(20.80)	9.87, 0.0017**
No	195 (48.87)	85 (21.30)	110(27.57)	
What was the duration of illness or what do you think will be the duration of illness if subjected to Conjunctivitis?				
2-3 days	173 (43.35)	84(21.05)	89(20.30)	2.51, 0.4721
4-6 days	144 (36.09)	81(20.30)	63(15.79)	
1-2 weeks	59 (14.79)	31 (7.77)	28 (7.02)	
>2 weeks	23 (5.77)	10 (2.51)	13 (3.26)	
Did you or will you take precautions to limit the spread of the disease, if subjected to Conjunctivitis?				
Yes	338 (4.71)	171(42.86)	167(41.85)	0.95, 0.3290
No	61 (15.29)	35 (8.77)	26 (6.52)	
What precautions did you take, or will you take to limit the spread of Conjunctivitis? (you can select more than 1 answers).				
Used separate towels, soaps, etc.	214 (27.19)	107(13.59)	107(13.59)	2.60, 0.4577
Avoided Contact	187 (23.76)	88 (11.18)	99 (12.58)	
Used eye drops as prescribed	194 (24.65)	99 (12.58)	95 (12.07)	
Frequent Eye wash	192 (24.40)	106 (13.47)	86 (10.93)	
What is the cause of the spread of Conjunctivitis? (you can select more than 1 answers).				
Infected material	237 (22.66)	122 (12.69)	115 (11.97)	9.20, 0.1016
Contact with a suffering patient	212 (22.06)	103 (10.72)	109 (11.34)	
Looking at infected eyes	156 (16.23)	74 (7.70)	82 (8.53)	
Eye discharge	112 (11.65)	64 (6.66)	48 (4.99)	
Through water	98 (10.19)	58 (6.03)	40 (4.16)	
Through dust	146 (15.19)	88 (9.16)	58 (6.03)	

Discussion

Conjunctivitis is an eye infection that spreads from person to person.[17] In addition, it occurs throughout the year. [17] Most cases are revealed in our state during the hot and drizzly seasons. [17] This study revealed that about 71.62% of the respondents were aware of conjunctivitis in general. When compared with the surveys organized at the University of Baluchistan and Umm Al-Qura University, they revealed that their participants had heard about conjunctivitis terms at 100% and 39%, respectively. [15,18] In all our respondents, 80% were aware that it primarily influences the eyes, compared with 97.6% of Baluchistan University and 37% of Umm Al-Qura University. [15,18] In our survey, 71.68% had knowledge about the pink eye; on the other hand, Baluchistan students and Umm Al-Qura University students' knowledge about the pink eye was 56.2% and 26%, respectively. [15,18]

By assessing the causative agents, 58% of the respondents replied accurately about irritant material as a cause, and 54% replied accurately that contact lenses have the potential to cause conjunctivitis. While Baluchistan University students and Umm Al-Qura University students responded accurately with 53.8%, 39.0%, and 40.3%, respectively. [15,18] This study revealed that 60% responded accurately to sampling techniques for further assessment. Whereas 59% were aware of the slit lamp value in diagnosing, while 23% responded in Baluchistan University's students for the same question. [15] When cure and prohibition questions are assessed, 76.1% of our samples are aware of the hygienic condition of their hands, which could avert conjunctivitis. The majority (66.18%) responded accurately that disregarding the lens you were utilizing when symptoms of conjunctivitis were revealed would be a preventative measure. Almost 54% of our participants responded that conjunctivitis is a self-healing disease, compared to Baluchistan students, with a large number of participants (49.8%) who don't know, while 16.7% replied accurately. [15]

Although a study conducted in Western Nepal [17] revealed that 61.6% of secondary school students are aware of conjunctivitis. In addition, a study in Africa [19] showed that 81% of their senior secondary school students are well aware of conjunctivitis. Astonishingly, the earlier studies [18,20] addressed the fact that respondents in nearly similar age groups with different educational levels corresponded remarkably with conjunctivitis symptoms.

Study Limitations: It is important to recognize the limitations of this research. First off, the study sample was small (N=399) and might not accurately reflect Pakistani students as a whole. Second, there was no comparison of the knowledge, attitudes, and practices of students from various educational backgrounds, geographical locations, or educational levels, which may have affected their conjunctivitis awareness and behavior. Further research that employs more

extensive and varied sample sizes, impartial and trustworthy data gathering techniques, and a thorough evaluation of conjunctivitis-associated variables is thus advised to overcome these constraints and offer additional understanding of this crucial public health concern.

Conclusion

Conjunctivitis is a common eye infection that can affect students' health and academic performance. It can be caused by various factors, such as bacteria, viruses, allergens, or contact lens use. The main symptoms are redness, itching, discharge, and discomfort in the eyes. The treatment depends on the cause and severity of the infection, but it usually involves eye drops, hygiene measures, and avoiding contact with others. We hope that this paper will encourage school and college authorities to adopt and support the proposed awareness and prevention programs and campaigns and to create a safe and healthy environment for their students so that such a severe outbreak (like that of September 2023 in Pakistan) can be prevented in the future.

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