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Knowledge, attitude, and practice toward rheumatic fever and rheumatic heart disease among parents in Al-Baha Region, Saudi Arabia: A Cross-Sectional study

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Abstract

Rheumatic fever (RF) is an autoimmune inflammatory process that develops as a sequela of untreated group A streptococcal pharyngitis and primarily affects children. It can lead to rheumatic heart disease (RHD), a major cause of cardiovascular morbidity and mortality. Awareness and preventive measures are crucial to mitigate its impact, particularly in low-resource settings. This study aimed to assess the knowledge, attitudes, and practices toward RF and RHD among parents living in Al-Baha Region. And to determine its association with other different sociodemographic variables. This was a cross-sectional study included 415 parents in Al-Baha region, Saudi Arabia. using a self-administered questionnaire distributed online. Of the total 415 participants, more than half were females 223 (53.7%), and 149 (35.9%) participants aged between 45 and 55 years. The knowledge regarding RF was classified as good 20 (4.8%), fair 104 (25.1%), and bad 291 (70.1%). The attitude towards RF showed that about half of the participants 206 (49.7%) had a negative attitude, 169 (40.7%) natural and 40 (9.6%) positive attitudes. While the total practice level was classified as Bad 15 (3.6%), Fair 113 (27.2%) and Good 287 (69.2%), females were more likely than males to exhibit good practices (p = 0.001). The study concluded that knowledge about RF and RHD among parents in the Al Baha region, Saudi Arabia, is very poor. Most participants lacked sufficient understanding of the definition of RF, its relationship with bacterial sore throats, prophylactic treatments, and the vulnerable age group. Attitudes towards RF were relatively negative. Therefore, healthcare authorities and providers should raise awareness and create educational programs to improve public understanding of RF and RHD, aiding in their prevention and control in the Al Baha region.

Keywords: Rheumatic fever, Rheumatic Heart Disease, AL-Baha, Attitude, Knowledge, and Practice.

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Introduction

Rheumatic fever (RF) is defined as an inflammatory disorder due to an immune response following repeated *Streptococcus pyogenes* infection, which is also known as *S. pyogenes*, and Group a *Streptococcus.*[1] *S. pyogenes* can be the causative pathogen for a wide range of diseases, such as impetigo, pharyngitis, and more severe rheumatic heart disease. The most affected group by this infection are children and adolescents living in developing and underprivileged countries.[2]

The diagnosis of RF is achieved by utilizing the Jones criteria; it was first introduced in 1944 by T. Duckett Jones, MD. Since the introduction of Jones criteria, it underwent multiple revisions, the latest being in 2015 by the American Heart Association.[3] The newest revision emphasized the importance of echocardiography and doppler in confirmed and suspected cases of acute RF. The Jones criteria is divided into major and minor clinical manifestations, with the diagnosis being reached when two major criteria, or one major and two minor criteria are met.[3]

Rheumatic heart disease (RHD) can occur as sequelae of RF, it is a chronic illness that results in damage to the heart valves. RHD is considered endemic in Saudi Arabia and neighboring gulf countries, and the leading cause of heart failure in children and adolescents in developing countries.[4] Every year, it is the cause of 250,000 young fatalities globally. There is evidence of RHD in more than 15 million individuals.[5] The incidence of acute RF has declined in the developed world. However, RHD remains a significant cause of cardiovascular disease.[6] RHD is a preventable but major public health problem in low- and middle as well as high-income countries.[11]

The awareness and knowledge levels about RF and RHD have been previously proven to be modest at best in Saudi Arabia, according to studies done to assess awareness, knowledge, and attitude in cities such as Taif, Makkah, and all over Saudi Arabia.[7,8,9] However, a study conducted in 2019, concluded that the public that participated in their study had higher levels of awareness, knowledge, and attitude toward RF in comparison to other previously done studies.[10]

In the management of RF and RHD, penicillin is the recommended antibiotic for treatment and eradication of *S. pyogenes*. *S. Pyogenes* eradication may also be achieved with a single intramuscular dosage of penicillin G benzathine. When a history of penicillin anaphylaxis exists, cephalosporins are advised, as are macrolides in situations of confirmed penicillin allergy. Depending on the severity, a patient could undergo surgical or pharmacological therapy for heart failure or RHD.[12] This study aimed to assess the knowledge, attitudes, and practices toward RF and RHD among parents living in Al-Baha Region, Saudi Arabia. And to determine its association with other different sociodemographic variables.

Subjects and Methods

In this observational cross-sectional study, participants were recruited from the general public in the Al-Baha region of Saudi Arabia. Data collection was through a self-administered questionnaire and conducted over one month, from the third of April to the third of May 2024.

The sample size was calculated using the Raosoft sample size calculator[13], considering 5% margin of error, a 95% confidence interval, an estimated population of 487,108, and an assumed 50% response distribution. This calculation resulted in a final sample size of 384. The study successfully enlisted 415 participants.

Study Population

The target population included parents residing in the Al-Baha region, with at least one child. Participating respondents had to meet the residency and parental criteria and be willing to participate in the survey and complete the questionnaires. Parents who did not live in the Al-Baha region, those who did not have children, and those who refused to give consent or were unable to complete the survey/questionnaire and excluded from the study.

Data Collection Methods

This study collected data by administering an online, self-administered questionnaire through social media to parents residing exclusively in the Al-Baha region. The questionnaire was designed to evaluate participants' knowledge, attitude, and practice regarding RF and RHD. The data collected from the questionnaire was validated to ensure accuracy. The questionnaire was developed following a comprehensive literature review of RF and RHD. Its purpose was to encompass all pertinent information to address the research inquiries. The questionnaire was initially written in English and then translated into Arabic to ensure better comprehension among the local population. Following this, the back-translation method was used to confirm the accuracy and reliability of the translation. The questionnaire underwent review and adjustments with input from two pediatrician experts regarding content validity. This was a critical step in improving the reliability of the questionnaire.

A pilot testing of the proposed questionnaire with 20 participants was conducted to reduce the risk of receiving inaccurate data. This process allowed for identifying and correcting any potential confusion in the questions or answers. It facilitated data collection when the questionnaire was later distributed to additional participants for the more extensive study. Any required modifications were made based on the feedback received.

The researcher then developed the questionnaire on Google Forms and administered it in Arabic to residents of Al-Baha region through the social media application of Snapchat, WhatsApp, and Instagram.

Data Collection and Statistical Analysis

The survey used in this study was divided into several sections, each with its own variables and scoring system. The first section concerned the sociodemographic characteristics. The second section included the knowledge section, which contained 13 questions related to RF and RHD. Each correct answer was awarded one point, with a maximum possible score of 15. The resulting scores were then grouped into three categories: poor scoring below 7, average scoring between 7 and 12, and good scoring 13 and above. The third attitude section consisted of 7 questions that reflected the attitude toward RF and RHD. The score ranged from one to 9, with negative scores less than 5, neutral scores 6 to 7, and positive scores eight and above. Finally, the practice section included four questions on RF and RHD practices, each with scores ranging from one to 10, categorized as poor (less than 5), fair (6 to 8), and good (9 and higher).

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 25. All the variables were summarized and reported across the study using descriptive statistics. At the same time, the categorical variables regarding the frequency distribution were summarized and reported. The chi-square test was used to evaluate the associations. A $p \leq 0.05$ was considered as statistically significant.

Results

A total of 595 responses were collected. Following data filtration, 180 surveys were excluded based on our predefined exclusion criteria, resulting in a final sample of 415 participants. Of these, 53.7% were female. The most prevalent age group was 45 - 54 years, accounting for 35.9% of the participants, followed by the 35 - 44 age group, which represented 33.5%.

In terms of employment, 56.9% of the participants worked in the governmental sector. Educationally, a significant majority (approximately 75%) had attained higher education degrees or postgraduate qualifications. Additionally, 40.5% of the participants reported having five or more children (Table 1).

Table 1. Sociodemographic characteristics of the 415 study participants.

Sociodemographic variables		No (%)
Age group (years)	18-34	81 (19.5)
	35-44	139 (33.5)
	45-54	149 (35.9)
	55 or more	46 (11.1)
Gender	Male	192 (46.3)
	Female	223 (53.7)
Educational level	No	14 (3.4)
	Primary	33 (8)
	Secondary	63 (15.2)
	High level	266 (64.1)
	Postgraduate.	39 (9.3)
Marital status	Married	389 (93.7)
	Widowed	8 (1.9)
	Divorced	18 (4.4)
Occupation	Student	15 (3.6)
	Unemployed	124 (29.9)
	Private sector	29 (7)
	Governmental sector	236 (56.9)
	Medical sector	11 (2.6)
Number of children	1	35 (8.4)
	2	59 (14.2)
	3	68 (16.4)
	4	85 (20.5)
	5 or more	168 (40.5)
Income	Less than 5000 SAR	40 (9.6)
	5k-10000 SAR	119 (28.7)
	10k-15 SAR	146 (35.2)
	15k -20000 SAR	110 (26.5)

SAR: Saudi Riyal.

Regarding knowledge questions and the knowledge level of the participants, 245 (59%) of the total study population had heard about RF. Only 29.2% knew the correct definition of RF as an inflammatory disease due to an untreated bacterial throat infection, while 37.7% did not know the answer. Additionally, 40.5% knew that there was a relationship between bacterial throat infection and RF, and only 14.5% thought that there was no relation between RF and viral throat infection. About 70% of the total population knew at least one symptom of RF. Regarding the definition of rheumatic heart disease, 190 (45.8%) of respondents thought that it is a valvular heart lesion due to untreated bacterial throat infection, 21 (5.1%) an autoimmune disease affects the lungs, 11 (2.6%) congenital heart disease since birth and 193 (46.5%) did not know. Lastly, 45.1% of the participants knew that antibiotics could prevent RF (Table 2).

Table 2. Knowledge questions and knowledge level of the 415 participants.

Knowledge questions		**No (%)**
Is there a relation between bacterial throat infection and rheumatic fever	Yes	168 (40.5)
	No	43 (10.3)
	Do not know	204 (49.2)
Symptoms of rheumatic fever	Fever	20 (4.8)
	Joint pain	41 (9.8)
	Arthritis	60 (14.5)
	Skin rash	2 (0.4)
	Carditis	9 (2.2)
	Involuntary movements	3 (0.7)
	All of the above	151 (36.5)
	Do not know	129 (31.1)
Is rheumatic fever infectious?	Yes	71 (17.1)
	No	180 (43.4)
	Do not know	164 (39.5)
Children from 5-15 years are more liable to RF	Yes	148 (35.6)
	No	53 (12.8)
	Do not know	214 (51.6)
Untreated RF causes valvular heart disease	Yes	198 (47.7)
	No	15 (3.6)
	Do not know	202 (48.7)
Antibiotics for bacterial throat infection prevent RF.	Yes	187 (45.1)
	No	24 (5.7)
	Do not know	204 (49.2)
Antibiotics are prophylactic against rheumatic heart disease after throat infection	Yes	159 (38.3)
	No	46 (11.1)
	Do not know	210 (50.6)
Is there an available treatment for rheumatic heart disease?	Yes	204 (49.2)
	No	12 (2.8)
	Do not know	199 (48)
Surgical treatment for rheumatic heart disease is costly and has many complications.	Yes	140 (33.7)
	No	41 (9.9)
	Do not know	234 (56.4)
Total knowledge level	Good	20 (4.8)
	Fair	104 (25.1)
	Bad	291 (70.1)

According to the total knowledge score, we found that only 4.8% (n = 20) had a good level of knowledge, while 25.1% (n = 104) had a fair level of knowledge.

Regarding attitude questions and the overall attitude level of the participants, only 19% (n=79) thought that sore throat infections are caused by viral or bacterial infections. Most participants (86.1%, n=357) answered that

physicians are the appropriate professionals to prescribe treatment. Additionally, 80.5% (n=334) knew that antibiotics are the proper management for bacterial throat infections. Moreover, 61% (n = 253) reported that they always visit a physician if their child has a sore throat. Furthermore, 30.6% (n=127) expressed significant concern about the effects of RF and RHD on their child (Table 3).

Table 3. Attitude questions and total attitude level of the 415 participants.

Attitude questions		No (%)
Throat infection is caused by	Cold drinks	30 (7.2)
	Cold weather	12 (2.9)
	Bacterial or viral infections	79 (19)
	All of the above	269 (64.9)
	Do not know	25 (6)
Do you think it is important to visit a doctor if your child has a sore throat?	Yes always.	253 (61)
	Yes sometimes.	151 (36.4)
	Not important	11 (2.6)
The person who recommends the suitable treatment for sore throat	Personal experience	31 (7.5)
	Friends and family	15 (3.6)
	physician	357 (86.1)
	Do not know	12 (2.9)
Management of bacterial throat infection	Antibiotics prescribed by the physician.	334 (80.5)
	Herbals	21 (5)
	Gargle with water and salt	35 (8.5)
	Do not know	25 (6)
Are you worried about the effect of rheumatic fever and rheumatic heart disease on your child?	Very worried	127 (30.6)
	Sometimes worried	226 (54.5)
	Not worried	62 (14.9)
Would you search for more information regarding RF and RHD to know the risk and prevention?	Yes	341 (82.2)
	No	74 (17.8)
Would you contact a physician to know the screening methods regarding RF and RHD for your child?	Yes	341 (82.2)
	No	74 (17.8)
Total attitude level	Positive	40 (9.6)
	Neutral	169 (40.7)
	Negative	206 (49.7)

According to the total attitude score, we found that 9.6% of participants had a good attitude, while about half (49.7%, n=206) had a negative attitude.

Regarding practice questions and the overall practice level of the participants, 93% (n=386) of parents confirmed that their child took the full dose of antibiotics prescribed for their bacterial throat infection. Most of them (63.4%, n=263) always seek medical advice. Additionally, 73% (n = 303) follow preventive measures against bacterial throat infections (Table 4).

Table 4. Practice questions and total practice level of the study 415 participants.

Practice questions		No (%)
Do you confirm that your child took the full dose of antibiotic prescribed for his bacterial throat infection?	Yes	386 (93)
	No	29 (7)
What is the probability of seeking medical advice to avoid RF if your child has a fever, joint pain, and sore throat?	Always	263 (63.4)
	Sometimes	114 (27.5)
	Rare	25 (6)
	Never	13 (3.1)
Do you follow preventive measures to ensure clean hands, avoid sharing personal items, and maintain a healthy lifestyle for your child to prevent bacterial throat infection?	Always	303 (73)
	Sometimes	95 (22.9)
	Rare	10 (2.4)
	Never	7 (1.7)
What is the probability of adherence to follow-up and management plans if your child is diagnosed with RF?	Always	332 (80)
	Sometimes	68 (16.4)
	Rare	9 (2.2)
	Never	6 (1.4)
Total practice level	Good	287 (69.2)
	Fair	113 (27.2)
	Bad	15 (3.6)

According to the total practice score, we found that most parents (69.2%, n=287) have a good level of practice. The Chi-squared tests were conducted to assess differences in knowledge, attitude, and practice across various sociodemographic characteristics of the participants (Tables 5-7). It was found that a higher prevalence of good knowledge was observed among participants with higher education levels (p=0.003) and those employed in the private sector (p = 0.001) (Table 5).

Table 5. Association of sociodemographic variables with level of knowledge.

Sociodemographic	Categories	Level of knowledge			p value
		Poor No (%)	Fair No (%)	Good No (%)	
Age group	18-34	61 (21)	16 (15.4)	4 (20)	NS
	35-44	92 (31.6)	39 (37.5)	8 (40)	
	45-54	101 (34.7)	41 (39.4)	7 (35)	
	55 or more	37 (12.7)	8 (7.7)	1 (5)	
Gender	Male	130 (44.7)	53 (51)	9 (45)	NS
	Female	161 (55.3)	51 (49)	11 (55)	
Educational level	No	14 (4.8)	0	0	0.003
	Primary	27 (9.3)	5 (4.8)	1 (5)	
	Secondary	48 (16.5)	13 (12.5)	2 (10)	
	High level	183 (62.9)	72 (69.2)	11 (55)	
	Postgraduate	19 (6.5)	14 (13.5)	6 (30)	

Table 5. Continued.

Sociodemographic	Categories	Level of knowledge			*p* value
		Poor No (%)	Fair No (%)	Good No (%)	
Marital status	Married	274 (94.2)	2 (1.9)	0	NS
	Widowed	6 (2.1)	95 (91.3)	20 (100)	
	Divorced	11 (3.8)	7 (6.7)	0	
Occupation	Student	11 (3.8)	3 (2.9)	1 (5)	0.001
	Unemployed	97 (33.3)	24 (23.1)	3 (15)	
	Private sector	160 (55)	67 (64.4)	9 (45)	
	Governmental sector	20 (6.9)	8 (7.7)	1 (5)	
	Medical sector	3 (1)	2 (1.9)	6 (30)	
Number of children	1	23 (7.9)	11 (10.6)	1 (5)	NS
	2	39 (13.4)	15 (14.4)	5 (25)	
	3	55 (18.9)	11 (10.6)	2 (10)	
	4	53 (18.2)	30 (28.8)	2 (10)	
	5 or more	121 (41.6)	37 (35.6)	10 (50)	
Income	Less than 5000 SAR	4 (26.7)	6 (5.3)	40 (9.6)	0.04
	5k-10000 SAR	6 (40)	37 (32.7)	119 (28.7)	
	10k-15000 SAR	3 (20)	38 (33.6)	146 (35.2)	
	15k -20000 SAR	2 (13.3)	32 (28.3)	110 (26.5)	

SAR: Saudi Riyal. $p > 0.05$ is not significant (NS).

No significant differences were found in attitude levels across the different sociodemographic characteristics, except for income level (p=0.03) (Table 6).

In terms of practice levels, females were more likely than males to exhibit good practices (p=0.001) (Table 7).

Table 6. Association of sociodemographic variables with the level of attitude.

Sociodemographic	Variable	Level of attitude			*p* value
		Negative No (%)	Neutral No (%)	Positive No (%)	
Age group	18-34	37 (18)	32 (18.9)	12 (30)	NS
	35-44	73 (35.4)	50 (29.5)	16 (40)	
	45-54	68 (33)	69 (40.8)	12 (30)	
	55 or more	28 (13.6)	18 (10.7)	0	
Gender	Male	90 (43.7)	85 (50.3)	17 (42.5)	NS
	Female	116 (56.3)	84 (49.7)	23 (57.3)	
Educational level	No	11 (5.3)	3 (1.8)	0	NS
	Primary	20 (9.7)	12 (7.1)	1 (2.5)	
	Secondary	34 (16.5)	26 (15.4)	3 (7.5)	
	High level	125 (60.7)	110 (65.1)	31 (77.5)	
	Postgraduate.	16 (7.8)	18 (10.7)	5 (12.5)	

Table 6. Continued.

Sociodemographic	Variable	Level of attitude			*p* value
		Negative No (%)	Neutral No (%)	Positive No (%)	
Marital status	Married	6 (2.9)	0	2 (5)	NS
	Widowed	189 (91.7)	163 (96.4)	37 (92.5)	
	Divorced	11 (5.3)	6 (3.6)	1 (2.5)	
Occupation	Student	6 (2.9)	7 (4.1)	2 (5)	NS
	Unemployed	69 (33.5)	46 (27.2)	9 (22.5)	
	Governmental sector	118 (57.3)	97 (57.4)	21 (52.5)	
	private sector	10 (4.9)	14 (9.3)	5 (12.5)	
	Medical sector	3 (1.5)	5 (3)	3 (7.5)	
Number of children	1	19 (9.2)	14 (8.3)	2 (5)	NS
	2	27 (13.1)	23 (13.6)	9 (22.5)	
	3	34 (16.5)	26 (15.4)	8 (20)	
	4	41 (19.9)	36 (21.3)	8 (20)	
	5 or more	85 (41.3)	70 (41.4)	13 (32.5)	
Income	Less than 5000 SAR	23 (11.2)	16 (9.5)	1 (2.5)	0.03
	5k-10000 SAR	71 (34.5)	40 (23.7)	8 (20)	
	10k-15000 SAR	66 (32)	60 (35.5)	20 (50)	
	15k -20000 SAR	46 (22.3)	53 (31.4)	11 (27.5)	

SAR: Saudi Riyal. $p > 0.05$ is not significant (NS).

Table 7. Association of sociodemographic variables with level of practice.

Sociodemographic	Variable	Level of practice			*p* value
		Poor No (%)	Fair No (%)	Good No (%)	
Age group	18-34	5 (33.3)	22 (19.5)	54 (18.8)	NS
	35-44	4 (26.7)	35 (31)	100 (34.8)	
	45-54	2 (13.3)	42 (37.2)	105 (36.6)	
	55 or more	4 (26.7)	14 (12.4)	28 (9.8)	
Gender	Male	6 (40)	69 (61.1)	117 (40.8)	0.001
	Female	9 (60)	44 (38.9)	170 (59.2)	
Educational level	No	2 (13.3)	3 (2.7)	9 (3.1)	NS
	Primary	1 (6.7)	8 (7.1)	24 (8.4)	
	Secondary	4 (26.7)	12 (10.6)	47 (16.4)	
	High level	8 (53.3)	74 (65.5)	184 (64.1)	
	Postgraduate.	0	16 (14.2)	23 (8)	
Marital status	Married	0	3 (2.7)	5 (1.7)	NS
	Widowed	14 (93.3)	104 (92)	271 (94.4)	
	Divorce	1 (6.7)	6 (5.3)	11 (3.8)	

Table 7. Continued.

Sociodemographic	Variable	Level of practice			*p* value
		Poor No (%)	Fair No (%)	Good No (%)	
Occupation	Student	0	6 (5.3)	9 (3.1)	NS
	Unemployed	5 (33.3)	24 (21.2)	95 (33.1)	
	Governmental sector	8 (53.3)	74 (65.5)	154 (53.7)	
	Private sector	2 (13.3)	5 (4.4)	22 (7.7)	
	Medical sector	0	4 (3.5)	7 (2.4)	
Number of children	1	1 (6.7)	8 (7.1)	26 (9.1)	NS
	2	1 (6.7)	16 (14.2)	42 (14.6)	
	3	3 (20)	18 (15.9)	47 (16.4)	
	4	3 (20)	28 (24.8)	54 (18.8)	
	5 or more	7 (46.7)	43 (38.1)	118 (41.1)	
Income	Less than 5000 SAR	3 (20)	38 (33.6)	105 (36.6)	NS
	5k-10000 SAR	2 (13.3)	32 (28.3)	76 (26.5)	
	10k-15000 SAR	6 (40)	37 (32.7)	76 (26.5)	
	15k-20000 SAR	4 (26.7)	6 (5.3)	30 (10.5)	

SAR: Saudi Riyal. $p > 0.05$ is not significant (NS).

Discussion

The present study was conducted among 415 residents of Al Baha region to assess their knowledge, attitude, and practices about RF and RHD because the public's understanding and awareness are essential for managing these diseases.[14]

The results showed that participants' knowledge about RF and RHD was low. Only 4.8% had a good level of knowledge about RF and its complications, while 25.1% had fair knowledge and 70.1% had poor knowledge. These results are similar to those reported by a study conducted among 256 adults and children in Cameroon.[15] That study showed very low awareness levels, with about 5% of participants having an adequate level of awareness of RF.[15] This was also comparable to finding of another Saudi study as the knowledge level indicated that only 3.6% had a good level of knowledge.[7] In contrast, a study conducted in Makkah among 1,364 participants showed that 23.3% had a high level of knowledge.[8] However, another study in Iran found that 86% had a high level of awareness.[16] Another study done in Najran, Saudi Arabia showed that more than half (59.1%) of the participants had unsatisfactory knowledge concerning RF and RHD.[17]

In our study, a high level of knowledge was significantly associated only with educational level, with no significant association with age or gender. When comparing the level of education, age, and gender in our study with another study done in Saudi Arabia. The other study found that the level of knowledge about RHD was significantly associated with age, indicating that participants aged more than 35 years had the highest level of knowledge compared to other age groups. On the contrary, gender and educational level did not have any significant impact on knowledge about RHD.[18]

In our study, about 198 (47.7%) of the participants knew that RF causes valvular heart

disease if left untreated. This is comparable to finding of a study conducted in Saudi Arabia, which reported that 41.6% of participants did not know that a sore throat infection could be related to heart disease.[19] In contrast, other studies found that the vast majority of participants knew that a sore throat was associated with cardiac complications.[20,21] The present study revealed that 40.5% of the participants knew the relationship between a bacterial sore throat and RF, which is comparable to findings of another study that reported about 50% of participants knew such relationship.[15] There was also a lower level of knowledge when compared to finding of a study done in New Zealand which showed adequate knowledge, and the majority knew that sore throat could cause RF.[22] However, only 6.2% knew the relationship between a sore throat and heart disease in the Ethiopian population.[23] Although, in a study done in Egypt, most respondents (62%) knew the association between RHD and sore throat, but only a small fraction (1.9%) correctly identified the cause.[24]

Additionally, in our study, 38.3% of the participants knew about the prophylactic use of antibiotics against RHD after RF which is similar to finding of a study by Fakieha et al., 2024,[8] who reported that 56.5% knew the prophylactic effect of antibiotics against RF. These findings were higher than those reported by a study done in Ethiopia which found that only 8·1% answered that regular penicillin injection is useful as secondary prevention in RHD.[23] Secondary prophylaxis is a core component of RF/RHD management strategies.[25]

In our study, the age group vulnerable to RF was known by 35.6% of the respondents, which agreed with data reported by a study included children from Nepal, showed that the prevalence of RHD was significantly higher in the age group of 11–16 years than in the 5–10-year age group.[26] Therefore, health awareness campaigns are needed to provide more information about RF.

Concerning the attitude towards RF, our study showed that about 10% of the participants had a positive attitude, 40% had a neutral attitude, and half of the participants had a negative attitude, which was generally better than their knowledge levels. In contrast, the practice level was higher than both, with about 70% having a good practice level and 27% having a fair practice level. These findings regarding attitude are worse than those observed by the study of Fakieha et al., 2024 [8], who reported positive attitudes and practices in 23.4% of participants and negative attitudes and practices in 27.9%. The study by Almadhi et al., 2021,[7] showed that 25.8% of participants had a good attitude and 41.7% had a poor attitude. Another study done in Najran, Saudi Arabia, showed that more than three-quarters (80.2%) had a positive attitude regarding RF treatment and preventive measures.[17]

We did not find any association between the attitude level and sociodemographic characteristics, but females had a higher practice level than males ($p < 0.05$). In contrast, another study in Saudi Arabia conducted by Kamal et al., 2019,[9] included 1,596 participants and found that a good attitude towards RF was associated with age, gender, and accommodation ($p < 0.05$).

In our study, about 65% of participants thought that sore throat is caused by cold weather, drinks, as well as bacterial and viral throat infections. When comparing our results with those of a study done in Taif, Saudi Arabia, we found that 56% of the respondents mentioned that the cause of sore throat is Bacteria.[27] In contrast, the study by NKoKe et al., 2018,[15] showed that 73.4% of their study subjects were unaware of the reasons for sore throat.

The causes and proper management of RF should be thoroughly covered in public health education sessions to enable individuals to protect themselves and their children from sore throat, which is a primary route for streptococcal infections and subsequent complications.

In the present study, 357 (86.1%) participants believed that only physicians are responsible for the correct management of sore throats. This finding agreed with that disclosed by the study of Nkoke et al., 2018,[15] who reported that 90.4% of participants chose the same answer.

Strengths of our study include that this is the first research covering parents' knowledge, attitudes, and practices toward RF and RHD in children in Al-Baha region, Saudi Arabia. This focus is crucial as parents play a key role in recognizing symptoms and seeking appropriate care for their children.

However, limitations of our study include that it was an online survey, which may be susceptible to sampling bias, potentially excluding individuals who do not use social media. To address these limitations, future research should use face-to-face interview questionnaires to capture perspectives from the entire population, ensuring a more comprehensive understanding. Additionally, self-reported data may introduce bias related to participants' answers. It is also important to note that a cross-sectional study design cannot prove causality.

In conclusion, this study reported that there is very poor knowledge about RF and RHD among parents living in Al-Baha region, Saudi Arabia. It was observed that people did not have sufficient knowledge about the definition of RF, the relationship between RF and bacterial sore throat, prophylactic treatment against RHD after RF, and the vulnerable age group affected by RF. Additionally, the attitude towards RF was relatively negative. Therefore, healthcare authorities and providers should raise awareness about RF and RHD in the community and create health education programs to educate the public about the diseases. This will help in the prevention and control of RF and RHD in the Al Baha region.

Author Contributions

KAAM, EMMS, Preparation of the proposal and questionnaire, Data analysis, writing, and finalization of the manuscript. FAA, Data analysis, writing, and revision of the manuscript. ASA, HMA, MAA, MHMA, MMAA, and OKA, Preparation of the research proposal and questionnaire, data collection, entry, participation in data analysis.

Declaration of Conflicting Interests

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Ethical approval

The study protocol was reviewed and approved by the Research Ethics Committee of the Faculty of Medicine, Al-Baha University (approval No. REC/PEA/BU-FM/2024/29).

Informed consent

The participants were informed about the study aims and assured of data confidentiality, and a verbal consent was obtained from each participant before completing the questionnaire.

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