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Title: Parental practice and attitude toward cold beverages and common cold among children

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Abstract— During the summer, the consumption of cold drinks and ice cream rises, and it is widely believed that they are one of the causes of the common cold and sore throat in children, despite the fact that no scientific research have shown this causative association. The purpose of this research is to examine parents' expectations about ice cream, cold drinks, and hot beverages, as well as their effect on their children's common cold and sore throat. This was a cross-sectional study carried out in the Eastern region of Saudi Arabia. The study was conducted between 2021 to 2022. A self-administrated questionnaire was distributed to all the caregivers who are attending general pediatric clinics.Three hundred seventy-one participants met inclusion criteria, with the majority (59.8%) were mothers. Sixty percent of parents believe that consuming cold drinks and ice cream might lead their children to have cold symptoms. Our respondents had symptoms after the consumption of ice cream (45%) or cold drinks (22.4%). Intriguingly, thirty percent (30.2%) of respondents stated that cold drinks or ice cream ameliorated their symptoms. The majority of parents believed that their children would get a sore throat or a common cold after drinking cold drinks or eating ice cream. Further investigation is necessary to determine the elements that impact parental attitude and practice toward their children's intake of cold drinks and ice cream.

Introduction:

Recently, the frequency of visits to pediatric emergency departments (PEDs) has increased. Upper respiratory infections, such as the common cold and sore throat, were the most often diagnosed [1]. The common cold is one of the most often diagnosed infections in clinical practice, particularly among children [2]. The first symptom of the common cold is a sore throat, which is discomfort or irritation in the throat [3]. Frequent symptoms [4] include fever, nasal discharge, dry cough, and sneezing. Typically, the duration of symptoms did not exceed 7-10 days [4-6]. Despite being a self-limiting disease, it is one of the most common health disorders that pediatric primary care general practitioners (GP) encounter [7-9]. Diagnosis in young children might be challenging due to the reliance on self-reported evaluation of symptoms for such a little time [2]. Few research have documented the incidence and prevalence of this disease. However, they reveal the significant impact on the community [9,10]. It results in a decline in productivity, as it was stated that there were 20 million days of absence from work annually in the United States, with indirect costs estimated at $25 billion [10,11]. In addition, numerous articles have shown that the incidence declines with age [12, 13].

The many causes of sore throat need a variety of treatment approaches [13]. Although viral illness is recognized as the primary cause of sore throat and the majority of cases self-limited, group A B hemolytic streptococcus is the most prevalent bacterial organism requiring antibiotic prescription [7,14]. Physico-chemical (e.g., cigarette smoking inhalation and yelling) and environmental (e.g., climate change and air pollution) elements have a significant influence as cause of sore throat [13]. About 72% and 22% of the individuals had a history of consuming cold beverages and ice creams, respectively, before to the onset of sore throat, according to a single study [5].

The treatment of noninfectious sore throat remains contentious [13]. Not all cases need antibiotics. These over- prescriptions may result in antibiotic resistance, which have a significant impact. The majority of cases may be mannged by over the counter medication. Few research have explored the impact of hot drinks on the treatment of sore throats, but surprisingly, just one study indicated that it had only a physiological and psychological effect, with no clinical or scientific proof [15,16]. On the other hand, some studies have shown that cold drinks and ice cube absorption are beneficial at alleviating sore throat [17]. The public has a widespread perception that drinking cold drinks or eating ice cream may exacerbate the common cold or sore throat, but drinking hot beverages can alleviate the symptoms. Interestingly, there are few publications on this topic and no research that describe this phenomena. Due to this shortage, the purpose of this research is assess the parental practice and attitude toward cold beverages and common cold among children.

Method:

A cross-sectional-based study was conducted in the period between 2021 to 2022. The study population was Saudi citizens who live in the eastern province aged 18 years old and older having at least a child.A questionnaire was fulfilled by caregivers who is

attending general pediaitric clinic through paperbased or interview face to face. Verbal and written consent was obtained from the participant after explaining the purpose of this study. Study objectives guided a self-administered questionnaire. The survey covered four sections. The first section included demographic data. The second section is related to symptoms that the child has. The las section is about the consumption of cold and hot beverages and parental attitude towards them.

Statistical Analysis

Descriptive statistics were presented using numbers and percentages. Chi-square test was performed to determine the factors that influence the expectation of parents that the consumption of cold beverages and ice cream causes symptoms. P-value <0.05 was considered statistically significant. All statistical analyses were performed using Statistical Packages for Software Sciences (SPSS) version 26 Armonk, New York, IBM Corporation.

Results

Table 1: Socio-demographic characteristics of the children and their caregivers
(n=371)

Study Variables	N (%)
Child age group	
• 1 – 2 years	62 (16.7%)
• 3 – 4 years	95 (25.6%)
• 5 – 6 years	74 (19.9%)
• 7 – 8 years	82 (22.1%)
• 9 – 10 years	27 (07.3%)
• 11 – 12 years	21 (05.7%)
• 13 – 14 years	10 (02.7%)
Child gender	
• Male	169 (45.6%)
• Female	202 (54.4%)
Responder to the questionnaire (caregiver):	
• Mother	222 (59.8%)
• Father	149 (40.2%)
Educational level of father	
• High school or below	101 (27.2%)
• Bachelor or higher	270 (72.8%)
Educational level of mother	
• High school or below	78 (21.0%)
• Bachelor or higher	293 (79.0%)
The main reason for being brought your child to the emergency department	

- Sore throat 177 (47.7%)
- Fever 129 (34.8%)
- Runny nose 20 (05.4%)
- Cough 40 (05.4%)
- Sneezing 01 (0.30%)
- Other reasons 04 (01.1%)

Does the child suffer from any chronic diseases (example: asthma)?

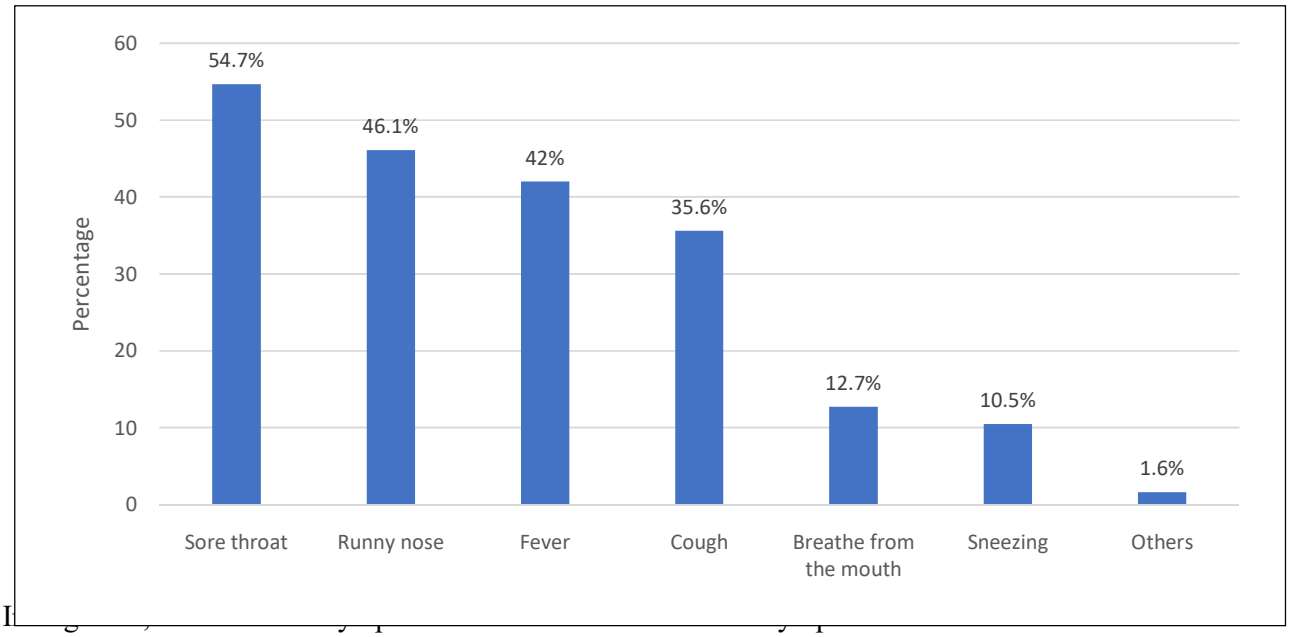
- Yes 36 (09.7%)
- No 335 (90.3%)

Does the child take any immunosuppressive drugs?

- Yes 13 (03.5%)
- No 358 (96.5%)

A total of 371 participants completed the survey. Table 1 presented the socio-demographic characteristics of the participants. 25.6% were aged between 3 to 4 years old with more than half (54.4%) being females. The mother of a child mostly filled out the questionnaire (59.8%). Regarding the father's education, 72.8% were bachelor's or higher degrees while 79% of the child's mothers had the same educational level. The major reasons for visiting the emergency department were due to the child's sore throat (47.7%) and the child's fever (34.8%). The prevalence of children who were suffering from chronic disease was 9.7% and the prevalence of children who were taking immunosuppressive drugs was 3.5%.

Figure 1: Symptoms associated with the main symptom



I (54.7%), followed by a runny nose (46.1%) and fever (42%).

Table 2: Characteristics of the child after consuming cold or warm beverages/ice cream (n=371)

Statement	N (%)
Since when are the symptoms start?	
• Within 24 hours	91 (24.5%)
• 1 to 3 days	156 (42.0%)
• Less than 1 week	75 (20.2%)
• 1 – 2 weeks	39 (10.5%)
• 2 weeks to 1 month	01 (0.30%)
• More than 1 month	09 (02.4%)
Did your child drink a cold beverage or eat ice cream before the symptoms started?	
• Yes, he ate an ice cream	167 (45.0%)
• Yes, he drank a cold beverage	83 (22.4%)
• No	103 (27.8%)
• I do not know	18 (04.9%)
In general, Do you think that drinking cold beverages or eating ice cream may cause these symptoms?	
• Yes	223 (60.1%)
• No	59 (15.9%)
• Maybe	89 (24.0%)
Has your child ever had these symptoms after consuming a cold beverage or ice cream, and do you think it was the cause?	
• No, this is the first time he has had these symptoms	106 (28.6%)
• Yes, and the cold beverage or ice cream was the reason	163 (43.9%)
• Yes, he had the same symptoms but had never had a cold beverage or ice cream before	102 (27.5%)
Do you think warm beverages improve these symptoms?	
• Yes	275 (74.1%)
• No	44 (11.9%)
• Maybe	52 (14.0%)
Did your child have a warm beverage this time and did it relieves his/her symptoms?	
• Yes	167 (45.0%)
• Yes, had a warm beverage but the symptoms did not improve	76 (20.5%)
• No, he did not drink a warm beverage	128 (34.5%)
Are there other non-pharmacological factors that have been observed to relieve these symptoms, now or in the past?	
• No, I did not notice	206 (55.5%)
• Yes, most of the time	53 (14.3%)

• Yes, sometimes symptoms improve with cold beverages, ice cubes, or ice cream	112 (30.2%)
Has anyone in the family members experienced the same symptoms in the same period of time (possibility of infection)?	
• Yes	139 (37.5%)
• No	212 (57.1%)
• I don't know	20 (05.4%)

Regarding the onset of symptoms, 42% started the symptoms in the last 1 to 3 days wherein 45% reported that their children ate ice cream. 60.1% of the parents were of the opinion that drinking cold beverages or eating ice cream could cause symptoms and 43.9% of them indicated consumption of cold beverages and ice cream was the reason for suffering from these symptoms. Approximately three-quarters (74.1%) believed that warm beverages may improve these symptoms and 45% were actually relieved from the symptoms after drinking warm beverages. Only 14.3% indicated other non-pharmacological factors to relieve these symptoms most of the time. In addition, 37.5% of the participants reported a previous history of family members experiencing similar symptoms at the same time (Table 2).

Table 3: Frequency of cold beverages/ice cream consumed per day and frequency of sore throat or cold symptoms in a year (n=371)

Statement	N (%)
Approximately what is the rate of the child drinking a cold beverage per day? (In summer)	
• Sometimes	77 (20.8%)
• Most of the time	216 (58.2%)
• Always (drinks only cold beverages all day)	64 (17.3%)
• He only drinks warm beverage	14 (03.8%)
Approximately, what is the average child eating ice cream per week? (In summer)	
• Once a day	45 (12.1%)
• More than one day a week	122 (32.9%)
• Once a week	90 (24.3%)
• I do not know	10 (02.7%)
• Rarely eats ice cream	104 (28.0%)
Approximately, how often does your child have a sore throat or cold symptoms in a year?	
• Once a year (seasonal: for example, the beginning of every winter or the beginning of every summer)	59 (15.9%)
• Twice a year (seasonal: for example, the beginning of each winter and the beginning of each summer)	91 (24.5%)
• More than twice a year (seasonal with weather fluctuations: winter, summer, dust, ... etc.)	180 (48.5%)

• All the year (chronic: due to chronic tonsillitis, sinusitis, ... etc.)	14 (03.8%)
• All the year (linked to drinking cold and eating ice cream most of the time)	13 (03.5%)
• I do not know	14 (03.8%)

In Table 3, nearly 60% of the caregivers expressed that during summer their child consumed a cold beverage most of the time every day while 32.9% indicated that their child consumed ice cream more than one day per week during the same season. The prevalence of children who suffered a sore throat or cold symptoms more than twice per year was 48.5%.

Table 4: Relationship between parents' expectation toward the consumption of cold beverages/ice cream among the socio-demographic characteristics and the frequency of cold beverages/ice cream consumption (n=371)

Factor	Expectation that the consumption of cold beverages/ice cream causes symptoms		P-value §
	Yes N (%) (n=223)	No/Maybe N (%) (n=148)	
Responder to the questionnaire (caregiver):			
• Mother	127 (57.0%)	95 (64.2%)	0.164
• Father	96 (43.0%)	51 (35.8%)	
Educational level of father			
• High school or below	67 (30.0%)	34 (23.0%)	0.134
• Bachelor's degree or higher	156 (70.0%)	114 (77.0%)	
Educational level of mother			
• High school or below	53 (23.8%)	25 (16.9%)	0.112
• Bachelor's degree or higher	170 (76.2%)	123 (83.1%)	
The main reason for being brought your child to the emergency department			
• Sore throat	116 (52.0%)	61 (41.2%)	
• Fever	67 (30.0%)	62 (41.9%)	0.054
• Runny nose/Cough/Sneezing/Other	40 (17.9%)	25 (16.9%)	
Did your child drink a cold beverage or eat ice cream before the symptoms started?			
• Yes	169 (75.8%)	81 (54.7%)	**<0.001 ****
• No	47 (21.1%)	56 (37.8%)	

• I don't know	07 (03.1%)	11 (07.4%)	
Knowledge that warm beverages improve these symptoms			
• Yes	181 (81.2%)	94 (93.5%)	**<0.001 ****
• No	26 (11.7%)	18 (12.2%)	
• Maybe	16 (07.2%)	36 (24.3%)	
Frequency of drinking cold beverages in summer			
• Sometimes	45 (21.0%)	32 (22.4%)	0.427
• Most of the times	126 (58.9%)	90 (62.9%)	
• Always	43 (20.1%)	21 (14.7%)	
Frequency of eating ice cream in summer			
• Once a day	28 (13.0%)	17 (11.7%)	0.160
• More than one day a week	82 (38.0%)	40 (27.6%)	
• Once a week	48 (22.2%)	42 (29.0%)	
• Rarely eat ice cream	58 (26.9%)	46 (31.7%)	
Suffering from chronic disease			
• Yes	18 (08.1%)	18 (12.2%)	0.192
• No	205 (91.9%)	130 (87.8%)	

§ P-value has been calculated using Chi-square test.
** Significant at $p<0.05$ level.

When measuring the relationship between parents' expectations toward the consumption of cold beverages/ice cream among the socio-demographic characteristics and the frequency of cold beverages/ice cream consumption (Table 4), it was found that a higher expectation that the consumption of cold beverages and ice cream could cause symptoms was significantly related among parents whose children consumed a cold beverage and ice cream before the symptoms started ($p<0.001$) and those who had the knowledge that warm beverages improve these symptoms ($p<0.001$). Other socio-demographic variables and the frequency of cold beverages/ice cream consumption did not show a significant relationship to parents' expectations including respondents to the questionnaire, educational level of the parents, the main reason for visiting the emergency department, frequency of drinking cold beverages in summer, frequency of eating ice cream in summer and child associated chronic diseases ($p>0.05$).

Discussion

The present study is sought to determine parents' expectations regarding ice cream and cold beverages that may cause the common cold and sore throat in their children. Up to our knowledge, there was no study conducted in Saudi Arabia that discuss the expectations of

parents about the association between drinking cold beverages or eating ice cream and the risk of having a common cold and sore throat. The results of this study would be important to literature and will serve as a basis for future research. The parents in this study have high expectations that drinking cold beverages as well as eating ice cream could cause symptoms in their children. Approximately 60.1% believed in this scenario. Furthermore, our subjects indicated that the symptoms experienced by their children started after eating ice cream (45%) or drinking cold beverages (22.4%). Similarly, previous history of the same symptoms had been reported by 43.9% of the parents, stating that their children experienced symptoms wherein consumption of cold beverages and ice cream were the triggering factors. In India[5], investigations revealed that ice cream and sweets appeared to influence in only 22% and 26% of cases respectively, thus this did not show a strong association with the presenting complaint as the other causes. More investigations are warranted to give more insights into the expectation of parents about the effect of the consumption of cold beverages and ice cream in relation to symptoms including sore throat and common cold among children.

Data in our study suggest that children who drank a cold beverage or ate ice cream before the symptoms started could significantly influence parents' expectations that it could actually be the reason for experiencing the symptoms. Likewise, parents who knew that those warm beverages may improve the symptoms had significantly better expectations that the consumption of cold beverages and ice cream could probably cause these symptoms. This is almost consistent with the study conducted in Indonesia[18], findings indicated that drinking cold drinks regularly was predicted to be the risk factor for tonsillitis where the odds ratio was 4.393, suggesting that children who drink cold drinks are 4.393 times higher to develop tonsillitis. Opposing these results, a study conducted among children who underwent tonsillectomy[19], discovered that ice cream intake was probably effective in pain relief after tonsillectomy adding that their findings supported that cold drinks are one of the best methods in the management of pain after post-tonsillectomy. This has been concurred by Sutters et al[20], according to their reports, the administration of cold things by mouth was the number one nonpharmacologic strategy for pain relief identified by 59.5% of the children. The use of popsicles was nominated specifically as an effective intervention. Notwithstanding these reports, in UK[7], cold drinks were also used more often for symptoms thought to be due to physical and environmental causes. However, most of them preferred medical products for all perceived causes specifically for sore throats believed to be due to infections. More evidence is needed in order to determine the influence of certain characteristics from parents' expectations that drinking cold beverages or eating ice cream can cause these symptoms.

Study suggests that drinking hot beverages may also improve the symptoms. In our study, 74.1% of the parents were of the opinion that warm beverages are an alternative option to get better with the symptoms, however, the actual improvement after drinking warm beverages decreased to 45%. These scenarios are in accordance with the study of Sanu and Eccles[16], accordingly, they found out that hot drink had no effect on objective measurement of nasal airflow but it did produce a significant improvement in individual measures of nasal airflow. Similarly, they recognized hot drinks to be effective for relieving symptoms such as sore throat, runny nose, cough, chilliness, sneezing, and tiredness. They further concluded that

their results concurred with the tradition that a hot tasty drink is a beneficial treatment for relief of most symptoms of common cold and flu. Although, hot drinks or hot beverages may not have clinical evidence to support their effectiveness in symptom relief, however, it is worth trying as a home remedy to be an alternative option for the effective relief of symptoms experienced by their children. A randomized control trial is necessary to determine the effectiveness of hot drinks in patients with sore throat-related symptoms.

Conclusion

There was a high expectation among parents that drinking cold beverages and eating ice cream may cause a sore throat or a common cold in their children. These expectations were predicted to increase significantly when their child consumed cold beverages or ice cream before the onset of the symptoms. Further research is required to establish the factors that influence parents' expectations toward child consumption of cold beverages and ice cream.

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