

THE EFFECT OF VARIOUS FACTORS ON SAUDI MOTHERS' BELIEFS REGARDING SYMPTOMS ASSOCIATED WITH TEETHING

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ABSTRACT

The aim of the study was to determine the effect of different demographic variables on Saudi mothers' beliefs regarding symptoms associated with primary teeth eruption. One thousand and four hundred Arabic self administered questionnaires were distributed to Saudi mothers in five different regions of the kingdom of Saudi Arabia. All the mothers included in the study had children aged 4-24 months with at least one erupting primary tooth. Out of 1400 distributed questionnaires, 912 were returned yielding a response rate of 65.14%. The majority of the mothers believed in a strong relationship between teething and some non-specific symptoms. Most of the factors tested showed significant differences between the mothers' responses. The most significant ($p < .05$) factors were the educational level of mothers, region of the country where they lived and their occupation. It can be concluded that Saudi mothers' demographic data has significant effect on their belief regarding teething.

Key words: Beliefs, Teething, Saudi mothers, factors, signs and symptom.

INTRODUCTION

The association between primary tooth eruption and different signs and symptoms occurring in children has been reported by many investigators worldwide¹⁻⁴. Published reports demonstrate great variations between the opinions of health professionals and parents regarding this association. Among various populations, parents believe that general non-specific signs and symptoms such as low-grade fever, restlessness, loss of appetite, diarrhea, drooling, gum-rubbing, and facial rash are associated with the eruption of deciduous teeth^{1,5-10}.

On the other hand, pediatricians believe that there is to a certain extent, an association between teething and some of the signs and symptoms such as fever and diarrhea which they linked to changes in eating habits and stress. Other researchers conclude that teething has an association with some of the previous signs and symptoms but does not cause harsh or potentially fatal symptoms such as increased incidences of infections, severe diarrhea, fever over 102°F, or increase in the

count of white blood cells. These researchers attribute such illnesses to organic causes^{6,8,11-15} and believe that teething continues to be inappropriately diagnosed by both healthcare professionals and parents^{4,9}.

Published literature related to this subject reveals that most of the investigators focused on proving or disproving the association between teething and the different signs and symptoms. Only a few authors discussed the issue of the different factors that might affect the respondents' beliefs. In Saudi Arabia, there has been no previous publication regarding the belief of parents and health care providers in relation to the association between teething and different signs and symptoms on the factors that might have an effect on the belief of the participants. Therefore, the aim of this study was to identify the different demographic variables that might affect the beliefs of Saudi mothers regarding the relationship between primary tooth eruption and local as well as systemic manifestations happening during the teething period in children aged 4 to 24 months.

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MATERIALS AND METHODS

A self-administered Arabic questionnaire was distributed to the major children's hospitals in five different regions around the Kingdom. The target group was Saudi mothers who presently have infants between the age of 4 and 24 months with at least one erupting tooth. The questionnaire was designed to study the effect of different demographic and social variables (e.g. mother's age, educational level, marital status, occupation, region, number of children and gender of the child) on the belief of participating mothers about the relationship between teething and local as well as systemic signs and symptoms.

Local and systemic signs and symptoms that could appear during teething period were displayed to the mothers to identify and choose. The list included increased finger biting and sucking, drooling, fever or temperature elevation, sleep disturbance, loss of appetite for solid foods, stool looseness or diarrhea, upper respiratory tract infection (URTI)/ cough, body or facial rash, nervousness and/or any other signs or symptoms that the mother felt had a relationship with teething. In addition, the mothers were requested to report if they experienced any differences during the teething period between their boys and girls.

A total of 1400 questionnaires were distributed; 400 were distributed in the Central region represented by the city of Riyadh, 250 in the Western region (Jeddah and Makkah), 250 in the Eastern region (Dammam and Dahrhan), 250 in the Southwestern region (Jazan), and 250 in the Northern region (Arar and Skaka). All responses were entered into a computer database and analyzed using Statistical Package for Social Sciences (SPSS) Version #10. Descriptive statistics were generated on all items by cross tabulation as well as step-wise logistic regression to choose the most significant variables that have an effect on the mothers' beliefs, and the most common local and systemic symptom the infants had during teething. Chi-square analysis was performed to test the different variables. Level of significance was set at $P < 0.05$.

RESULTS

Out of 1400 distributed questionnaires, 912 were received yielding a response rate of 65.14%. From the Western region (Jeddah and Makkah), 165 (18%) forms

were collected, 130 (14.2%) forms from the Eastern region (Dammam and Dahrhan), 160 (17.5%) forms from Southwestern region (Jazan), and 136 (14.9) forms from the Northern region (Arar and Skaka), and 321(35.1%) forms from the central region (Riyadh) [Table 1] .

The mothers' perceptions of teething symptoms are shown in Table 2. Most of the mothers 655 (71.8%) believed that teething had an effect on their infant's health and caused local and systemic symptoms, while 104 (11.4%) disagreed and the rest 153 (16.8 %) did not know.

More than half (53%) of the participating mothers were between 20 and 30 years of age. The statistical analysis showed significant variations in the mothers' beliefs between the different age groups. A higher percentage of positive association with beliefs was reported in mothers aged 20-30 years and 31-40 years, at 75.0% and 70.6% respectively. But relatively lower percentages, of 59.5% and 61.3% respectively were observed at younger age group (<20 years) and older age group (>40 years). The variation pattern was found to be significant using Person Chi-square and at $p\text{-value} = 0.011$ (Table 2)

The effect of the educational level on the mothers' beliefs is shown in Table 3. More than one third of the mothers were well educated, having university degrees (38.6%) or high school diplomas (22%). There is a highly significant difference between the mothers' beliefs. The higher educated mothers thought that there was a strong relationship between primary tooth eruption and local as well as systemic manifestations using Person Chi-square test and at $p = 0.000$

Few of the mothers were widowed or divorced while 93.3% of the mothers were presently married (Table 4). More than half of the married (73.4%), widowed (55.2%) and 43.8% of the divorced mothers believed that there was a strong relationship between teething and different signs and symptoms. The statistical analysis showed significant variations between the mothers' beliefs. The variations pattern was found to be significant using Person chi-square test and $p\text{ value} = 0.000$

Table 5 shows the response of the mothers according to their occupation. A large number (59.9%) of the mothers were housewives and most mothers whether

TABLE 1. NUMBER OF DISTRIBUTED QUESTIONNAIRES AND THE RESPONSE RATE
ACCORDING TO THE REGIONS

Region	Questionnaires Number and Percentage		
	Distributed	Returned (%)	% Total Sample
Central (Riyadh)	400	321 (80.25)	35.19
Western (Jeddah & Makkah)	250	165 (66.0)	18.1
Eastern (Dammam & Dahrn)	250	130 (52.0)	14.2
South-western (Jazan)	250	160 (64.0)	17.5
Northern (Arara & Skaka)	250	136 (54.4)	14.9
Total	1400 (100)	912 (65.1)	100

TABLE 2. MOTHERS' RESPONSE ACCORDING TO AGE

Mothers' Age (Years)	No. of participating mothers (%)	Belief of mother that teething has relationship with symptoms		
		Yes (%)	No (%)	Don't know (%)
< 20	42 (4.6)	25 (59.5)	4 (9.5)	13 (31)
20-30	488 (53.5)	366 (75)	48 (9.8)	74 (15.2)
31-40	320 (35.1)	226 (70.6)	38 (11.9)	56 (17.5)
>41	62 (6.8)	38 (61.3)	14 (22.6)	10 (16.1)
Total	912 (100)	655 (71.8)	104 (11.4)	153 (16.8)

P -value = 0.011

TABLE 3. MOTHERS' RESPONSE ACCORDING TO THE EDUCATIONAL LEVEL

Mothers' Educational Level	No. of participating mothers (%)	Belief of mother that teething has a relationship with symptoms		
		Yes (%)	No (%)	Don't know (%)
Illiterate	123 (13.5)	73 (59.3)	15 (12.2)	35 (28.5)
Elementary	112 (12.3)	76 (67.9)	13 (11.6)	23 (20.5)
Intermediate	124 (13.6)	80 (64.5)	16 (12.9)	28 (22.6)
High school	201 (22.0)	150 (74.6)	17 (8.5)	34 (16.9)
University	352 (38.6)	276 (78.4)	43 (12.2)	33 (9.4)
Total	912 (100)	655 (71.8)	104 (11.4)	153 (16.8)

P -value = 0.011

TABLE 4. MOTHERS' RESPONSE ACCORDING TO MARITAL STATUS

Mothers' Marital Status	No. of participating mothers (%)	Belief of mother that teething has a relationship with symptoms		
		Yes (%)	No (%)	Don't know (%)
Married	815 (93.3)	625 (73.4)	92 (10.8)	134 (15.7)
Widowed	29 (3.2)	16 (55.2)	9 (31.0)	4 (13.8)
Divorced	32 (3.5)	14 (43.8)	3 (9.4)	15 (46.9)
Total	912 (100)	655 (71.8)	104 (11.4)	153 (16.8)

P -value = 0.000

TABLE 5. MOTHERS' RESPONSE ACCORDING TO THEIR OCCUPATION

Mothers' Occupation	No. of participating mothers (%)	Belief of mother that teething has a relationship with symptoms		
		Yes (%)	No (%)	Don't know (%)
Housewife	547 (59.9)	383 (70.0)	58 (10.6)	106 (19.3)
Employed	365 (39.9)	272 (74.5)	46 (12.6)	47 (12.8)
Total	912 (100)	655 (71.8)	104 (11.4)	153 (16.8)

P -value = 0.032

TABLE 6. MOTHERS' RESPONSE ACCORDING TO THEIR REGIONS

Mothers' Region	No. of participating mothers (%)	Belief of mother that teething has a relationship with symptoms		
		Yes (%)	No (%)	Don't know (%)
Central	321 (80.25)	245 (76.3)	35 (10.9)	41 (12.8)
Western	165 (66.0)	103 (62.4)	12 (7.3)	50 (30.0)
Eastern	130 (52.0)	90 (69.2)	22 (16.9)	18 (13.8)
South-western	160 (64.0)	115 (71.9)	17 (10.6)	28 (17.5)
North	136 (54.4)	102 (75.0)	18 (13.2)	16 (11.8)
Total	912 (100)	655 (71.8)	104 (11.4)	153 (16.8)

P -value = 0.000

TABLE 7. MOTHERS' RESPONSE ACCORDING TO NUMBER OF CHILDREN

Number of Children	No. of participating mothers (%)	Belief of mother that teething has a relationship with symptoms		
		Yes (%)	No (%)	Don't know (%)
1 - 3	447 (49.0)	330 (73.8)	49 (10.9)	68 (15.21)
4 - 6	286 (31.4)	205 (71.7)	37 (13.9)	44 (15.38)
7 - 9	132 (14.4)	88 (66.7)	14 (10.6)	30 (22.7)
> 9	47 (5.2)	32 (68.1)	4 (8.5)	11 (23.4)
Total	912 (100)	655 (71.8)	104 (11.4)	153 (16.8)

P -value = 0.329

TABLE 8. THE MOTHERS' PERCEPTION OF TEETHING SIGNS AND SYMPTOMS

Signs and symptoms	Number (%)
Fever	711 (77.9)
Diarrhea	573 (62.8)
Loss Of Appetite	404 (44.3)
Sleeping Disturbance	293 (32.1)
Nervous-Ness	257 (28.2)
Urti	92 (10.1)
Cough	86 (9.4)
Body & Face Rash	39 (4.3)
Increased Tears	10 (1.2)
No Symptoms	8 (0.9)
Increased Salivation	7 (0.8)
Total Of Respondent	912 (100)

housewives or employed believed a positive association between teething and symptoms. However, the positive belief was higher (74.5%) among employed mothers than among housewives (70.0%). The variations were significant using Persons Chi-square test and at $p=0.032$

The effect of the region on the mothers' beliefs is shown in Table 6. The majority of the mothers believed a positive association between teething and symptoms. However, there were significant variations between the different regions. The highest percentage of mothers who reported a positive association (76.3%) was from the central region followed by 75.0% from the north region, and 71.8% from the south-western re-

TABLE 9: MOTHERS' EDUCATIONAL LEVEL, OCCUPATION, AND REGION AND DIFFERENT TESTED SIGNS AND SYMPTOMS

Factor	Item	Fever	Sleeping disturbance	Loss of appetite	Diarrhea	URTI/cough	Nervousness	No symptoms
Mother Educational Level	Illiterate	95 (77.2)	38 (30.9)	48 (39)	68 (.3)	5 (4.1)	22 (17.9)	3 (2.4)
	Elementary	83 (74.1)	23 (20.5)	39 (34.8)	61 (54.5)	8 (7.1)	16 (14.3)	2 (1.8)
	Intermediate	91 (73.4)	33 (26.6)	55 (44.4)	75 (60.5)	11(8.9)	34 (27.4)	2 (1.6)
	High school	160 (79.6)	73 (36.3)	93 (46.3)	129 (64.2)	20 (10)	66 (32.8)	1(0.5)
	University	282 (80.1)	126 (35.8)	169 (48)	240 (68.2)	48 (13.6)	119 (33.8)	-
	P value	0.437	0.014	0.101	0.025	0.026	0.000	0.068
Occupation	Housewife	151 (75.1)	48 (23.9)	78 (38.8)	110 (54.7)	17 (8.5)	47 (23.4)	3 (1.5)
	Employed	350 (79.5)	166 (37.7)	210 (47.7)	291 (66.1)	49 (11.1)	148 (33.6)	2(0.5)
	P value	0.445	0.001	0.091	0.021	0.550	0.002	0.378
Region	Central	271 (84.4)	93 (29)	148 (46.1)	217 (67.6)	24 (7.5)	125 (38.9)	6 (1.9)
	Western	119 (72.1)	49 (29.7)	62 (37.6)	83 (50.3)	13 (7.9)	34 (20.6)	2 (1.2)
	Eastern	80 (61.5)	34 (26.2)	55 (42.3)	62 (47.7)	10 (7.7)	34 (26.2)	-
	Southwestern	129 (80.6)	61 (38.1)	92 (57.5)	116 (72.5)	33 (20.6)	28 (23.8)	-
	Northern	112 (82.4)	56 (41.2)	47 (34.6)	95 (69.9)	12 (8.8)	26 (19.1)	-
	P value	0.000	0.019	0.000	0.000	0.000	0.000	0.107
	Total	711(78)	293 (32.1)	404 (44.3)	573 (62.8)	92 (10.1)	257 (28.2)	8 (0.9)

gion. A lower percentage of 69.2% and 62.4 % were reported from the Western and Eastern regions respectively. The variations were significant using Person-

*,Chi square test and $p=0.00$

The effect of the number of children a mother has on her belief is shown in table 7. The results showed that, 49% of the mothers had 1-3 children 31.4% had 46 children and 14.5 % had 7-9 children. Only 5.2% of the mothers had more than 9 children in the family. The analysis showed that the percentage of positive response decreased with increase in the number of children and the variation was not significant as the p-value was 0.329

The mothers' response about the difference in the appearance of symptoms between boys and girls showed that some mothers had observed that there were no differences between boys and girls (37.8%) but 27% had observed a difference. Some mothers reported that boys had more severe symptoms while 23.4% did not remember if there was any difference in teething symptoms between boys and girls. Some mothers did not answer this question because they only had one child or all their children were of the same gender.

Most of the respondents had observed that multiple symptoms had affected their child's health (Table 8). The most common symptoms were fever (77.9%), diarrhea (62.8%), loss of appetite (44.3%), sleeping disturbance (32.1%), and nervousness (28.2%). Few mothers reported that teething was associated with upper respiratory tract infection (10.1%), cough (9.4%), and body rash (4.3%). A few children had increased salivation (0.8%) and tears (1.2%) without crying. Some mothers reported one or more of the following symptoms; eye allergy, asthma attack, body weight loss, thirst, laziness, and over sleeping.

Table 9 illustrates the mothers' responses regarding the symptoms they experienced with their infants according to the most significant factors in a step-wise regression analysis. All the factors were entered with probability of (F) to enter ≤ 0.050 and probability of (F) to remove ≥ 0.100 . The overall effect of the three variables; education, occupation and region were highly significant at $p=0.00$ (Table 8)

DISCUSSION

A careful review of the pertinent literature revealed not so many studies conducted in Saudi Arabia

and neighboring countries on the relationship between teething and the associated signs and symptoms. In a study by Wake et al⁹ conducted in Australia, similar findings to this study were reported regarding the percentage of respondents who believed that there was a relationship between teething and the associated symptoms. On the other hand, there was an obvious difference in the percentage of respondents who did not believe in the relationship. The percentage of respondents of this group in the Australian population was less than 1% whereas the percentage was 16.3% in the Saudi population.

A possible relationship between teething and different factors (age, level of education, marital status, occupational, region, and number of children), was found in mothers with a higher level of education who observed symptoms and signs at higher percentage than mothers with a lower level of education. The possible explanation is that the less educated mothers did not observe the symptoms unless they were severe, a situation that could be due to the increased number of children they had.

There are highly significant differences among mothers from different regions of the Kingdom. It may be possible that this finding is related to the climate of the region. For example the Southwestern region of the kingdom has environment that appears to be more suitable for higher infection rates. It is interesting that this region had the highest percentage of URTI and diarrhea.

The occupation of the mother was one of three most significant factors that might affect the mothers' beliefs. Most of the housewives believed in a positive association between teething and the appearance of different signs and symptoms which could be explained by the possibility that mothers as housewives spent more time with their children and were therefore more familiar with the infants' status than working mothers.

The lack of published literature on this important subject in the region highlighted the need to obtain some baseline information on this topic. The common problems associated with this type of survey were encountered in the form of difficulties in collecting the questionnaires from the different hospitals in various regions other than Riyadh.

CONCLUSIONS

- 1 The majority of the mothers believed that there was a strong relationship between teething and non-specific signs and symptoms.
- 2 Saudi mothers' demographic data had significant effect on their belief regarding teething
- 3 The highly significant factors were mothers' educational level, occupation and region of the country.

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