

Misconceptions and Cultural Practices toward Infant Teething among Mothers Visiting a Public Dental Hospital

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ABSTRACT

Aim: The purpose of this study was to ascertain mothers' awareness of the teething process in children, their associated symptoms, adopted cultural practices, and medicines given to relieve these symptoms.

Materials and methods: A total of 115 mothers participated in this study that was conducted in the Dental Outpatient Department (OPD) of Dow University of Health Sciences from July 2021 to September 2021. The prevalidated adapted questionnaire consisting of 20 items which included mothers' sociodemographic details, mothers' awareness regarding the teething process, and cultural practices to relieve these symptoms was administered. Chi-square tests of significance (Fisher's exact test) were used with a 95% confidence interval while the *p*-value was set at less than 0.05 for statistical significance.

Results: Out of 115, half of the mothers knew the completion dates of deciduous dentition, that is, approximately 3 years that was statistically significant with education. Fifty-two percent of the mothers expressed their concern when their children started teething which was correlated with education. Ninety percent of the mothers reported that teething was associated with different symptoms. Fever was the most reported symptom during teething followed by diarrhea and poor appetite. On worsening of teething symptoms, 61 (53%) mothers took their children to the hospital. Paracetamol was the most common medicament given by 59 (51.3%) mothers which was associated with their education and occupation. The majority of mothers did not associate teething symptoms with their older children and siblings and this was correlated with mothers' education.

Conclusion: In this study, awareness of teething symptoms was directly correlated with mothers' educational levels. Misbeliefs of teething such as the association of diarrhea and fever with teething and the use of medicines for teething was prevalent in mothers having no professional education. Half of the mothers gave paracetamol during the teething period but some from the other half were dependent on harmful unregulated homeopathic drugs.

Clinical significance: Mothers have wrongful beliefs regarding infant teething in Pakistan which endangers children's well-being. Harmful homeopathic drugs are being given for symptoms which have no relation to the teething process. Moreover, these misconceptions might delay accurate diagnosis of other ongoing diseases.

Keywords: Hospital, Infant, Mothers, Teething.

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BACKGROUND

Teething is a natural physiological phenomenon in which the tooth emerges from its pre-eruptive stage to its functional occlusal stage during a varied period at a certain age. The eruption process starts at about 6 months of age and lasts up to 3 years of age.¹ Teething brings about an inflammatory response that may involve several signs and symptoms including pain, sleep disturbance, swollen gums, and restlessness which have been linked to maternal factors such as, vitamin deficiency, smoking, mode of delivery, and ethnicity.² These symptoms though noteworthy are not severe, hence, they must be distinguished from serious symptoms in an infant-like fever, diarrhea, convulsions, gastric discomfort, and vomiting which occur due to the loss of maternal antibodies in the same period of the infant's life.³ It is due to this temporal relationship of time coincidence that maternal immunity wanes and the child gets exposed to various childhood illnesses, hence, the array of symptoms have been proven false with no relation to the teething process for which it is often blamed.⁴ RS Illingworth, in 1975, stated that "Teething produces nothing but teeth."⁵ Based on the assumptions made by people, different treatment modalities were considered since the dawn of the time, for instance in the early centuries procedures and treatments such as lancing (giving incision at the site of the erupting tooth), opiates, coral use, and

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homeopathic ointments were very dominant.⁶ Consequently, these treatments might worsen the infant's condition in addition to giving firm roots to wrong beliefs and practices, furthermore, the fact that infant mortality rate was comparatively higher in earlier centuries corresponding with the same age as teething (6 months to 2 years) gave rise to the groundless belief that teething can even lead to death.⁵

Literature provides a wide range of explanations including authentic reasons for the occurrence of the disturbed immune response at the same time as teething. The declining immunity and

the evident symptoms can be due to the ongoing developmental process, where the child is exposed to many infections and as this development coincides with tooth eruption, the symptoms are often misunderstood as tooth erupting symptoms.⁷ These manifestations must not be confused with the natural teething phenomenon as coincidence does not imply causation.⁴ Besides, it can lead to mismanagement and misdiagnosis and infants can often remain undiagnosed from several threatening illnesses.⁸ Different parental views and cultural practices from different regions of the world can have detrimental effects on the health and well-being of infants.⁹ The misconceptions can be influenced by parents' educational level.¹⁰ The educational level of mothers has been associated with a better understanding of teething and its associated symptoms.¹¹

There is a lack of data regarding parental beliefs concerning infant teething in Pakistan. Mothers resort to self-medication and produce hindrance in timely detection of serious diseases. Addressing cultural practices for relieving symptoms falsely associated with teething will help parents look at teething from an evidence-based perspective.¹² Hence, the present study focuses on parental beliefs and awareness of mothers regarding teething attending the OPD of Dow Dental College. The knowledge, methods, and cultural practices adopted by mothers regarding teething were assessed. Influencing factors like educational level, age, and the source of their information were also taken into account.

MATERIALS AND METHODS

This cross-sectional study was conducted in the OPD of Dow Dental College, Dow University of Health Sciences, Karachi, Pakistan, from July 2021 to September 2021. A simple random convenience sampling method was used. This study was conducted in commonly accepted educational settings and was by the ethical standards of the Helsinki Declaration. This study was exempted from ethical review as per Ref. No. ERC/3498/June/6/27. The anonymity and confidentiality of participants were guaranteed.

The sample population included all the mothers coming for their dental visits to the OPD of Dow Dental College from July 2021 to September 2021. In that period, 115 mothers consented and participated in this study. A 20-item validated questionnaire adapted from a previous study¹ was developed which included parent's age, level of education, occupation, general awareness regarding the eruption process, the beliefs regarding the teething process, symptoms associated, adopted practices they used to alleviate the symptoms, and the source of their information. The question regarding socioeconomic status was categorized into three types of income classes: low income earning up to 20k,

middle income earning up to 20–40k, and high income earning up to 40–60k and above. This classification was based upon the Household Integrated Economic Survey 2018–19 conducted by the Pakistan Bureau of Statistics.

There was an open-ended question that inquired about the medications that they usually gave their children during teething. The questionnaire was designed in English and was administered. For those who could not understand English, it was translated into the local language to them which was then back-translated into English and verified by English language translators. The purpose of the study was explained, and informed consent was taken before administering the questionnaire.

Statistical Analysis

Data were analyzed by SPSS software (version 24). Descriptive statistics were used. Chi-square tests of significance (Fisher's exact test) were used with a 95% confidence interval while the *p*-value was set at less than 0.05.

RESULTS

There was a total of 115 mothers who participated in the study. Most of the mothers that visited the OPD came from the immediate vicinity of the hospital and were residing in the same postcode. They were categorized into three different socioeconomic strata, low income, middle income, and high income. Fifty-nine (36.4%) mothers belonged to middle income. The mean age of mothers was 38.234 ± 1.0171 (median 39). Among 115 mothers, 49 (43%) were working and the remaining were housewives. Educational level was widely dispersed as the majority of mothers 69 (60%) had no formal education, and only 46 (40%) mothers were graduated or had postgraduation qualifications as shown in Table 1.

Knowledge of Mothers about Teeth Eruption

Ninety-seven (84.3%) mothers knew that deciduous teeth erupt at 6–7 years of age, and 89 (77.4%) of the mothers knew that the first teeth to appear were lower central incisors. Almost half of the mothers (58.3%) agreed that the eruption of deciduous teeth is completed by approximately 3 years of age. This knowledge of eruption of deciduous teeth was found statistically significant with mothers' educational level (*p*-value: 0.034). Forty-four mothers (38.3%) considered delayed eruption to be an indication of systemic disease. Sixty (52.2%) mothers expressed their concerns when their children's teeth started erupting, which was found statistically significant with the educational level of mothers (0.061). Seventy percent of mothers (81) believed that deciduous teeth should be treated when decayed. Awareness of mothers about teeth eruption patterns has been depicted in Table 2.

Table 1: Sociodemographic profile of study participants

Variables	Categories	n = 115 (%)	Mean ± SD
Age	14–35 years	48 (41.7%)	38.234 ± 10.171
	36–60 years	67 (58.3%)	
Education	Primary–intermediate	69 (60%)	1.140 ± 0.492
	Graduate–postgraduate	46 (40%)	
Occupation	Housewives	65 (57%)	0.4298 ± 0.497
	Working	49 (43%)	
Income	Low income	43 (26.5%)	1.739 ± 0.650
	Middle income	59 (36.4%)	
	High income	13 (8%)	

Perception of Mothers toward Teething

A vast majority of mothers 104 (90%) accepted that teething is usually accompanied by some problems, 10% did not associate symptoms with teething and considered it a physiological process. The perception of mothers toward symptoms associated with teething was different, 25 (21.7%) mothers reported fever as a common symptom, 16 (13.9%) mothers associated diarrhea, 14 (12.2%) mothers said their children had poor appetite, and 44 (38.3%) mothers reported almost all the mentioned symptoms mentioned in Table 3 were associated with teething. A percentage of 51.3% of mothers took their children to hospital when their children's teething symptoms persisted longer and got sick which was statistically significant with the older age group of mothers (0.093). Regarding the treatment of these symptoms, 51.3% of mothers (59) treated their children by giving paracetamol which was statistically significant with education level and occupations (0.005), only a few mothers (5) had their children's teeth removed or extracted when they had symptoms. A percentage of 42.6% of mothers claimed that the growth and well-being of the child will be affected if these teething symptoms were not treated. Most of the

mothers (86.1%) had not seen any child dying from these symptoms (Table 3) the association of teething symptoms with other older siblings was not supported by many mothers (75.7%), which was also statistically significant with education (0.004).

The responses to the open-ended question enquiring about the various medicaments used for teething along with their active ingredients are shown in Table 4.

DISCUSSION

Teething and most of the accompanying symptoms are physiological but usually are associated with myths and misconceptions that may result in using different herbal and homeopathic medicines that can aggravate a child's illnesses.

Our major age-group of mothers was from 30–50 years consisting mostly of housewives who had not completed their formal education.

Awareness of Teething

Regarding the knowledge of the mothers about the first tooth's eruption, our study reported 84.3% of mothers knew about eruption

Table 2: Mother's knowledge about teething

Questions	Yes n = 115 (%)	No/don't know/not sure n = 115 (%)
1. Do you think baby's teeth start to erupt around 6–7 years?	97 (84.3%)	18 (15.7%)
2. Do you think that first teeth to erupt are lower central incisors?	89 (77.4%)	26 (22.6%)
3. Do you think the eruption of teeth gets completed at approximately 3 years?	67 (58.3%)	48 (41.7%)
4. Do you think that delayed eruption of teeth may be an indication of presence of systemic disease?	44 (38.3%)	71 (61.7%)
5. Do you worry about the time your baby's teeth start to erupt?	60 (52.2%)	55 (47.8%)
6. Do you think babies have problem when their teeth are erupting?	104 (90.4%)	11 (9.6%)
8. Do you take your child to hospital if he gets sick during teething?	61 (51.3%)	54 (48.7%)
9. Did teething affect your older children?	28 (24.3%)	87 (75.7%)
10. Do you think milk teeth should be treated if they are decayed?	81 (70.4%)	34 (29.6%)

Table 3: Mother's knowledge about symptoms associated with teething

<i>Symptoms associated with teething</i> n = 115 (%)							
<i>Fever</i>	<i>Loose stool</i>	<i>Vomiting</i>	<i>Poor appetite</i>	<i>Undue crying</i>	<i>Desire to bite</i>	<i>Increased salivation</i>	<i>Almost all of above</i>
25 (21.7%)	16 (13.9%)	3 (2.6%)	14 (12.2%)	5 (4.3%)	6 (5.2%)	2 (1.7%)	44 (27.2%)
<i>Treatment of the symptoms of teething</i> n = 115 (%)							
<i>Paracetamol</i>		<i>Rubbing gum with garlic</i>		<i>Giving pacifier</i>		<i>Herbs</i>	<i>Extracting teeth</i>
59 (51.3%)		10 (8.7%)		22 (19.1%)		19 (16.5%)	5 (4.3%)
<i>Who gave you information on how to handle teething in babies?</i> n = 115 (%)							
<i>Mother</i>		<i>Grandmother</i>		<i>Friends</i>		<i>From observation</i>	<i>Doctor</i>
53 (46.1%)		9 (7.9%)		3 (2.6%)		24 (20%)	26 (22.6%)
<i>What do you think will happen if you do not give baby anything for teething?</i> n = 115 (%)							
<i>Poor growth</i>		<i>Severe illness</i>		<i>Nothing</i>		<i>Death</i>	
49 (42.6%)		19 (16.5%)		29 (25.2%)		18 (15.7%)	
<i>Have you ever seen any child die from teething?</i> n = 115 (%)							
<i>Yes</i>			<i>No</i>			<i>Heard stories</i>	
9 (7.8%)			99 (86.1%)			7 (6.1%)	



Table 4: Common medications used for teething in children

Name of medicine	Medicine type	Ingredients
Bioplasgen No. 21	Tablets	Calcarea phosphorus, ferrous phosphorus
R 35 Chadontin	Drops	Aconitum, bryonia, calcium carbonicum, colocynthis, ignatia, staphisagria,
Doltee Teething Drops	Drops	Benzyl alcohol, lignocaine, methyl salicylate
Orajel	Gel	Benzocaine 7.5%
Naunehal Herbal Gripe Water	Liquid	Sodium bicarbonate, mentha arvensis, oleum anethi
Somogel	Gel	Lignocaine 0.60%/ethanol/cetylpyridinium chloride
Chamomilla Rec 30	Liquid	Aconite, belladonna, calcarea carbonica, mag-carb, pulsatilla, sanicula, silicea
Teething 21	Syrup	Calcium phosphate, ferrous phosphate, atropa belladonna, chamomile, methylparaben
Teething 21	Tablets	Calcarea phosphorus, ferrous phosphate, atropa belladonna, chamomile, methylparaben
Baby Teething Drops	Drops	Sucrose, benzyl alcohol, lignocaine
Rex Infant Teething Drops	Drops	Chamomilla 9C, phytolacca decandra, rheum 5C
K.B-21 (Teething)	Tablets	Calcarea phosphorus, 30 gm dextrose base
Easy Teething Tablets	Tablets	Calcium phosphoricum (calcarea phosphate), ferrum phosphoricum (iron phosphate)

dates of the first tooth in the oral cavity. This finding is higher than that of the study conducted in Ethiopia¹ and similar to the research conducted in India¹¹ but lower than the study conducted in Malaysia.¹³ The majority of mothers (77.4%) knew that the first tooth to appear in the oral cavity was the lower central incisor and these findings were similar to the research conducted in Ethiopia¹ but slightly less than Indian research.¹¹ Sixty-seven mothers (58.3%) knew that eruption gets completed at approximately 3 years of age which is more than the findings that came in previous researches of Ethiopia¹ but almost the same as the research conducted in Malaysia¹³ and much less than another research in Udaipur, India.¹¹ A percentage of 38.3% of mothers believed that delayed eruption may be an indication of systemic disease, 44.7% agreed in the research of India but only 27.1% agreed in Ethiopia.¹ Most of the mothers (90.4%) perceived that teething is associated with multiple problems in the child which is similar to the results associated with previous research in Ethiopia¹ and research conducted in Western Nigeria.¹⁴

Cultural Beliefs about Symptoms Associated with Teething

Most of the mothers in this study perceived multiple symptoms with teething (38.3%) including fever, diarrhea, irritability, desire to bite, and persistent crying. Few mothers associated fever (21.7%) as the most common symptom of teething, which also has been reported in a case report in Tanzania.¹⁵ However, these findings are contrary to the results perceived in Ethiopia where 90.7% of mothers associated diarrhea as the most common symptom, and the research in West Nigeria where 80.8% of mothers associated fever with 51.8% diarrhea,¹⁴ fever as the main symptom 83.2% in Egypt,¹⁶ and the other research in India reported fever 34.1% with diarrhea 35.4% in its population.¹⁷ These differences across the countries may be related to the different levels of literacy and awareness toward primary teeth and besides this, the attitude of mothers is very important, some take such symptoms seriously and take their children to a hospital when they experience these symptoms. Half of the mothers in the present study (51.3%) were confident that if the symptoms worsened then they would take their children to a hospital. These findings were less than the results reported in previous studies in Ethiopia 64.3%, Western Nigeria 92.8%, and India 76%.^{1,14,17} Most of our mothers treated their

children teething symptoms with paracetamol (51.3%) thereby presented significant *p*-values among primary–intermediate (educational level 0.053) and housewives (occupation 0.005) population, which was slightly less than the findings of Udaipur, India 62.7%¹¹ but a lot more than the findings of Ethiopia which reported analgesics only 1% but 44%, 71% of people used teething analgesics in Western Nigeria and Egypt, respectively. A percentage of 19.1% of mothers in current research gave pacifiers to their crying babies which helped by relieving the pain, this was not similar to the results of Ethiopia (4.7%) and Egypt (31.3%). Due to lack of proper knowledge mothers may prefer getting the troubling tooth extracted, only 4.3% of mothers accepted that they got them extracted, which was less than the findings in Ethiopia¹ where 9.3% of mothers opted for extraction of their baby’s tooth. Almost half of the mothers got the information to handle their teething babies from their mothers (46.1%), some reported other sources like a doctor (22.6%), friends (2.6%), and from observation (20%). These were slightly less than the findings (50.0%) in Western Nigeria.¹⁴ Seventy-five percent of mothers (0.004) did not agree that teething affected their older children or other siblings as well. Most of the mothers (70.4%) considered primary teeth important enough to get treated which is far better than the previous research conducted in the same region which reported 56.3% importance.¹⁸

Proposed Treatments Used for Teething

The most common systemic medicament used by mothers was paracetamol followed by homeopathic medicines. The United Kingdom’s Medicines and Healthcare Regulatory Body has recommended against using unlicensed homeopathic medicines due to its risk of serious side effects.¹⁹ National Institute for Health and Care Excellence (NICE) guidelines state that lack of evidence exists regarding the effectiveness of homeopathic teething products.²⁰

All homeopathic medicines widely purchased and used in the country are depicted in Table 4. Benzyl alcohol was present in teething gels and drops in over the counter teething products²¹ as shown in Table 4. A metabolite of benzyl alcohol, benzoic acid, is known to produce “gasping syndrome”.²² Sucrose was present in some teething products that can present a risk of dental caries in newly erupted teeth of children.¹⁹

Lidocaine/lignocaine and benzocaine present in some teething products to provide pain relief during teething are associated with serious side effects even in formulations of 2% lignocaine.²³ Lidocaine is readily absorbed from the mucous membranes of the oral cavity spreading inadvertently to the bloodstream. Viscous lidocaine in teething products can easily cause lidocaine toxicity, resulting in confusion, seizures, and cardiac arrest.²⁴ Lignocaine solutions have been advised against in the period of teething and particularly in children less than 3 years of age.²¹ Food and Drug Administration (FDA), a government regulatory body has recommended against the use of benzocaine-containing teething products in infants due to the risk of methemoglobinemia that may present with the decreased oxygen-carrying capacity of red blood cells leading to cyanosis, confusion, shortness of breath, and even death.²⁵ Moreover, FDA has warned against the use of any topical medications including homeopathic medicines in children as they offer little or no benefit and are associated with serious side effects.²⁵ The American Academy of Pediatrics and American Academy of Pediatric Dentistry have suggested that topical anesthetics such as lignocaine and benzocaine be avoided for infant teething as they are associated with potential toxicity and harm.^{26,27}

The use of belladonna containing homeopathic teething medicines in infants has been associated with seizures, toxicity, and death.²⁸ Moreover, aspirin should be avoided in children as it leads to Reye's syndrome.²⁹

Low levels of sugar, lidocaine, and alcohol present with a low risk of harm but coupled with a lack of evidence of the effectiveness of homeopathic teething products raises questions about their efficacy, safety, and general use by the public. The only two recommended medicines for teething pain relief are weight-based pediatric doses of paracetamol and ibuprofen.³⁰

Limitations

The study lacked data from fathers, as children's upbringing is predominantly conducted by mothers in our culture, so false beliefs of mothers have more impact on malpractice regarding teething. The present data were based on a limited number of participants recruited through a convenience sampling method so the results cannot be generalized. However, this study can act as a baseline for further studies with robust sample size. More local studies are needed to identify the concept of misbelief related to teething, so that custom-made awareness programs can be initiated.

Recommendations

A targeted approach of health education and advocacy to these mothers can play a significant role in debunking these myths. Rigid education is warranted to ensure mothers or caretakers are given basic knowledge and awareness of handling physiological teething symptoms after the delivery of their first child from their primary health care and to avoid the use of potentially harmful teething products. This can be achieved by the collective effort of higher educational institutes and health departments. Long-held cultural beliefs and practices for relieving teething pain will need social and behavior change communication by involving all the stakeholders. Drug Regulatory Authority of Pakistan should take strict action on the sale of these harmful homeopathic medicines just like in the United States and the United Kingdom and issue trigger warning statements with all other teething products regarding their safety, efficacy, and potential harm.

CONCLUSION

Based on the findings of this study, the mothers visiting the public sector hospital of Karachi, Pakistan, had a lack of sufficient knowledge regarding the teething process in children that was directly correlated with mothers' educational levels. Long-held cultural beliefs persist among mothers and erroneously relate a variety of serious and systemic symptoms with teething. Most of the teething products especially homeopathic medicines used by mothers have potential harm and serious side effects.

CONSENT

Informed consent was taken from all participants. Anybody who did not give consent was excluded from the study.

ETHICS APPROVAL/DISCLOSURE

This study was conducted in commonly accepted educational settings and was by the ethical standards of the Helsinki Declaration. This study was exempted from ethical review as per Ref. No. ERC/3498/June/6/27.

AVAILABILITY OF DATA AND MATERIAL

The datasets used and/or analyzed during the current study are available from the corresponding author on request.

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