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RESEARCH ARTICLE

IMPACT OF ECC ON THE ORAL HEALTH RELATED QUALITY OF LIFE OF PRESCHOOL CHILDREN AND THEIR FAMILIES

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Abstract

Introduction: Early Childhood Caries (ECC) is the presence of one or more decayed, missing or filled tooth surfaces in any primary tooth in a child 71 months of age or younger. Quality of life is "people's perception of their position in life, in context to the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." Presence of dental caries in preschool children affects their quality of life and also, has negative impact on the parent's quality of life.

Aim: Aim of the study was to assess the impact of ECC on the oral health related quality of life of urban preschool children aged 24-71 months.

Methodology: The present study was carried out to determine the impact of various oral conditions on the oral health-related quality of life of 24-71 months old urban preschool children.

Result: Presence of ECC was found to significantly affect **(p=0.003)** the oral health related quality of life of preschool children and their families.

Introduction:-

WHO defines Health as "a complete state of physical, mental and social well-being and not just the absence of disease" .[1] Thus the concept of health status embraces the biopsychosocial model of health into which symptoms, physical functioning, and emotional and social well being are incorporated.[2]

The term "quality of life" (QoL) is defined as "people's perception of their position in life, in context to the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". Health related quality of life is a term used to assess how pain/discomfort affects the physical, psychological, social functioning and well-being of an individual.[3]

The impact of oral health on one's life is termed as "oral-health related quality of life" (OHRQoL) and is defined as "the symptoms and functional and psychological impacts that emanate from oral diseases and disorders".[4] It is the result of an interaction between and among oral health conditions, social and contextual factors and the rest of the body.[5]

Children in their preschool are affected by plethora of oral conditions. These, Early Childhood Caries (ECC), Traumatic dental injuries and early onset of malocclusion. Although rarely life-threatening, oral disease during early childhood can have negative impact on the quality of life of preschool children. Various problems associated are

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pain, discomfort, sleep disturbances, behavioural problems, loss of function and adverse effect on the developing occlusion and aesthetics. These conditions in turn affect the children physically, emotionally and psychologically therefore, adversely affecting the QoL of children and their families

Thus, the present study was planned to assess the impact of ECC on the oral health related quality of life of children aged 27-71 months using the (oral health related early childhood quality of life OH-ECQoL) scale.

Materials and Methodology:-

The present study was carried out to determine the impact of various oral conditions on the oral health-related quality of life of 24-71 months old urban preschool children.

Materials:-

The following materials will be used for the study:

1. A portable light source positioned on the examiners head
2. Disposable examination gloves
3. Disposable face mask
4. CPI-TN probe (API AshooSons)
5. William's probe (API AshooSons)
6. Kidney trays
7. Gauze
8. Stainless Steel drum
9. Questionnaire (English/Hindi)

Methodology:-

Sample characteristics

Sample size

The study cohort consisted of 600 children aged 24-71 months selected from various schools located in Pinjore Block (Urban) of Panchkula.

Sampling strategy

A two-phase random sampling strategy was used to ensure representativeness of the total population under study. In the first phase, schools were selected from a list of schools obtained from the Department of Elementary Education, Panchkula. In the second phase, permission was taken from the administrative authorities of the selected schools. All children aged 24-71 months present at the schools were provided consent forms describing the design of the study at hand. On the following day, all children returned with the letters of consent, were selected to participate.

Sample design

The minimum sample size for this study was calculated based on a power of 80.0%, a standard error of 5.0%. An estimated 59.0% and 41% prevalence rate of dental caries among the cases and controls, which were determined in a previously performed study on a population belonging to same area and same age-group (Sujlana A et al, 2015).[6] Considering the ratio of cases and controls as 1.5:1, the minimum sample size to satisfy the requirements for the study had 240 controls and 360 cases.

Eligibility criteria

The inclusion criteria:

1. Children aged twenty four to seventy one months.
2. Children free of any systemic disease according to parent/caregiver's reports.
3. Parental-child dyads willing to participate in the study.
4. Parents /caregiver fluent in English or Hindi language.

The exclusion criteria:

1. Inadequate cooperation during the examination.
2. A child with all four maxillary incisors missing due to caries or physiological exfoliation which can compromise the clinical diagnosis of TDI.

Non-clinical data collection

Prior to beginning the study, the program design and objectives were explained to the parents /guardians via a letter and, they were asked to sign a statement of informed consent. After obtaining the consent, the parents were invited to answer two questionnaires at the school premises. The first questionnaire contained questions related to the socio-demographic details of the family. The second questionnaire collected information regarding the impact of oral conditions on the oral health- related quality of life of the children and their family. The questionnaires were provided to the parents in either English or Hindi as per the parents' preference and were collected after 15 minutes.

The **oral health-related early childhood quality of life (OH-ECQOL) scale**[7] will be used to assess the impact of various oral conditions on the quality of life of children and their families. This tool has been evaluated among North Indian preschool children and has shown acceptable reliability and validity (Mathur VP et al, 2014).[7] (ANNEXURE-1)

The OH-ECQOL scale contains 16 items relating to child impact and family impact information.
The child impact items are as follows:

1. child symptom (4 items)
2. child function (5 items)
3. child psychology (2 items)
4. child social interaction (1 item)

The family impact items are as follows:

1. family distress (2 items)
2. family function (2 items)

The response options for all items include;

1. never
2. occasionally
3. often

Furthermore, two more questions asked from the parent / caregiver about the overall rating of their child's general and oral health to assess the parental perceptions about the child's general and oral health.[7] These ratings have a five point response format:

1. 1= Excellent
2. 2 = Very Good
3. 3 = Good
4. 4 = Fair
5. 5 = Poor.

Clinical data collection

Calibration of the examiner was performed with an intraoral examination of 20 children (who will not take part in the main study) on two separate occasions, with a one-week interval between the two sessions. The clinical examination was performed with the child seated on an ordinary chair using sterilized instruments and a light source positioned on the examiner's head. After the required training, the examiner assessed children for the ECC at the school premises.

Dental caries will be assessed using the **International Caries Detection and Assessment System(ICDAS-II),** [8] which is a scoring system ranging from 0 (absence of dental caries) to 6. Code Description for ICDAS-II is as follows[8]: (ANNEXURE-2)

1. 0- Sound
2. 1- First visual change in enamel (seen only after prolonged air drying or restricted to within the confines of a pit or fissure)
3. 2- Distinct visual change in enamel
4. 3- Localized enamel breakdown (without clinical visual signs of dentinal involvement)
5. 4- Underlying dark shadow from dentin
6. 5- Distinct cavity with visible dentin
7. 6- Extensive distinct cavity with visible dentin

Due to the epidemiological nature of this study, Code 1 will not be used, as drying of the teeth will be performed using gauze rather than compressed air.

Figure 1:- A-Frequency diagram of responses to the OH-ECQoL questionnaire assessing for child impact in the two groups.

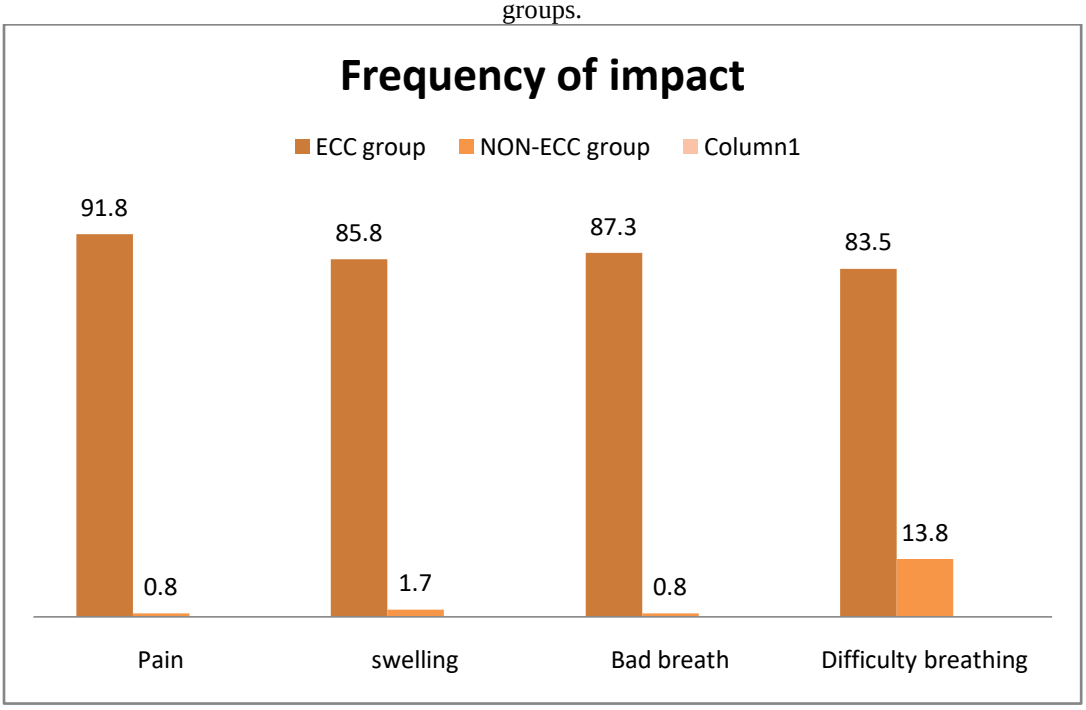

Figure 2:- Frequency diagram of responses to the OH-ECQoL questionnaire assessing for family impact in the two groups.

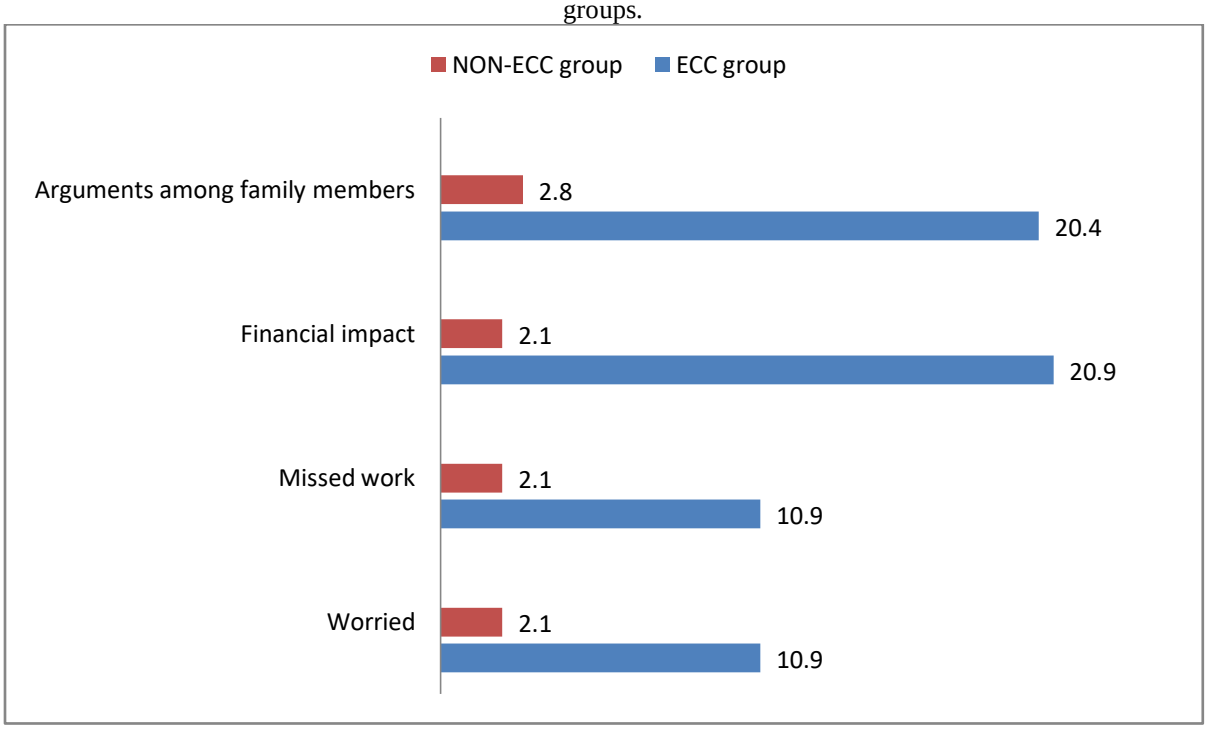

Table1:- Frequency chart of responses to the OH-ECQOL questionnaire assessing for child impact in the two groups.

IMPACTS	ECC GROUP			NON ECC GROUP		
	N (%)			N (%)		
CHILD IMPACT ITEMS	Never	Occasionally	Often	Never	Occasionally	Often
Pain	31 (8.6)	318 (88.6)	10 (2.8)	238 (99.2)	2 (0.8)	0
Swelling	51 (14.2)	302 (84.1)	6 (1.7)	236 (98.2)	3 (1.3)	1 (0.4)
Bad breath	46 (12.8)	308 (85.9)	5 (1.4)	238 (99.2)	1 (0.4)	1 (0.4)
Difficulty breathing	59 (16.4)	292 (81.3)	8 (2.2)	207 (86.3)	33 (13.8)	0
Food caught between teeth	52 (14.5)	300 (83.6)	7 (1.9)	153 (63.8)	87 (36.2)	0
Mouthbreathing	79 (22.0)	276 (76.9)	4 (1.1)	117 (48.8)	82 (34.2)	41 (17.1)
Difficulty cleaning teeth	212 (59.1)	142 (39.6)	5 (1.4)	229 (95.4)	5 (2.1)	6 (2.5)
Trouble sleeping	301 (83.8)	53 (14.8)	5 (1.4)	237 (98.8)	3 (1.3)	0
Irritable,crying	319 (88.9)	37 (10.3)	3 (0.8)	235 (97.9)	5 (2.1)	0
Fever	250 (69.6)	107 (29.8)	2 (0.6)	240 (100)	0	0
Told by teachers or school about bad teeth	340 (94.7)	19 (5.3)	0	239 (99.6)	1 (0.4)	0
Missed school	339 (94.4)	19 (5.3)	1 (0.3)	237 (98.8)	2 (0.8)	1 (0.4)

Table 2:- Frequency chart of responses to the OH-ECQOL questionnaire assessing for impact on the families in the two groups.

IMPACTS	ECC GROUP			NON ECC GROUP		
	N (%)			N (%)		
FAMILY IMPACT ITEMS	Never	Occasionally	Often	Never	Occasionally	Often
Worried	320 (89.1)	34 (9.5)	5 (1.4)	235 (97.9)	5 (2.1)	0
Missed work	320 (89.1)	37 (10.3)	2 (0.6)	235 (97.9)	4 (1.7)	1 (0.4)
Financial impact	284 (79.1)	71 (19.8)	4 (1.1)	235 (97.9)	4 (1.7)	1 (0.4)
Arguments amongst family members	286 (79.7)	71 (19.8)	2 (0.6)	238 (99.2)	2 (0.8)	0

Results:-

A total of 600 parents children dyads participated in the study, 57.6% of whom were boys and rest were girls (42.4%). Of the 600 children examined, 360 were found to suffer from ECC which accounted for 60% of the sample. In ECC group, the most commonly reported problems in the child impact section were pain (88.6%), bad breath(86.9%) followed by swelling (84.1) and food caught between teeth (83.6%). On the contrary, in non-ECC group, the most commonly reported problems in child impact section were food caught between teeth (36.2%) and

mouth breathing (34.2%). 99.2% of children in the non-ECC group had never experienced pain or had bad breath.ECC had 1.18 times more impact on the quality of life of child (figure-1, table-1) and 2.29 times having impact on the family w.r.t family being worried, parents missing the work, having financial impact and arguments among the family members. (figure-2, table-2). When assessing the family impact of ECC we found that the parents only occasionally reported having a financial impact (19.8%) or having arguments in family members (19.8%), with very few missing work (10.3%) or being worried (9.5%). In the families with children not suffering from ECC the parents rarely reported any family impact.

Conclusion:-

Our study sirens the call for urgent need to implement the preventive and curative oral health programs for preschools in our society. A more effective and acceptable prevention program should be implemented during the baby steps of child's life. Thus, pediatric dentists need to work in unison with pediatricians and other general health care professionals dealing with children to help control and combat oral diseases in preschoolers.

Discussion:-

Children with carious lesions in the primary dentition have a greater chance of developing carious lesions in the permanent dentition than children who are caries free. Therefore, preventive initiatives should be planned and implemented for preschool children who are identified as being at risk (Jose B et al. 2003)[9]. Also this is the period wherein a dentist can offer guidance to parents by supplementing their knowledge of preventive practices.

Dental caries may have an impact on children's oral health status throughout their lives. The study by the Third National Health and Nutrition Examination Survey-Phase I, from1988-1991 in the United States, revealed that 8% of infants between 12-23 months of age had early childhood caries and17% of children aged 2-4 years were affected by caries.(Kaste LM et al. 1996)[10] Rampant or nursing caries has shown to adversely affect the growth of the body, specifically body weight and height. (Ayhan H et al. 1997).[11] It has also been reported that nursing or rampant caries is one of the factors causing insufficient development in children who have no other medical problems.(Acs G et al. 1992).[12]There may be a general decrease in dental caries in children and adolescents; however dental caries is still a major health problem for many preschool children. Thus, evaluating this age bracket has become increasingly important.

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Annexure-1

Oral Health Related Early Childhood Quality of Life Questionnaire (OH-ECQOL) (English)

The oral health of a child will affect the overall health and quality of life of a child. Through this survey we are trying to assess the relationship between oral health and the quality of life of a child. Kindly answer the following questions as per both yours' as well as your child's experience by selecting the most appropriate option.

1. How often has your child had pain due to a dental problem?
   Never / occasionally / often
2. How often has your child had a swelling, ulceration or an abscess due to a dental problem?
   Never / occasionally / often
3. How often has your child had difficulty eating sweet/ drinking cold beverages?
   Never / occasionally / often
4. How often has your child had food stuck in their teeth when eating?
   Never / occasionally / often
5. How often has your child had bad breath due to dental problems?
   Never / occasionally / often
6. Does your child breathe through the mouth?
   Never / occasionally / often
7. How often has your child had fever due to dental problems?
   Never / occasionally / often
8. How often has your child had trouble sleeping because of dental problems?
   Never / occasionally / often
9. Has your child ever been irritable, troubled or cranky due to dental problems?
   Never / occasionally / often
10. Has your child had difficulty in brushing his/her teeth due to dental problems?
    Never / occasionally / often
11. How often has your child had missed school or given up on any recreational activities due to dental problems?
    Never / occasionally / often
12. How often has a teacher or school officials complained of your child having poor oral hygiene?
    Never / occasionally / often
13. In the last 3 months have you or another family member been worried /upset about your child's eating habits or his/her oral health?
    Never / occasionally / often
14. In the last 3 months have you or another family member taken time off from work due to dental health related problems?
    Never / occasionally / often
15. In the last 3 months have you or another family member had financial liabilities due to dental health related problems?
    Never / occasionally / often
16. In the last 3 months have you or your family members been tensed or had arguments regarding your child's dental health?
    Never / occasionally / often
17. How do you rate your child's overall health?
    Excellent / Very good / Good / Poor
18. How do you rate your child's dental health?
    Excellent / Very good / Good / Poor

Thank you for your valuable time.

Date:

Annexure -2

Dental caries assessment Performa

	55	54	53	52	51	61	62	63	64	65
Occ										
Mes										

Buc										
Dis										
Palat										

	85	84	83	82	81	71	72	73	74	75
Occ										
Mes										
Buc										
Dis										
Palat										

International Caries Detection and Assessment Criteria (ICDAS II)

Description	Code
Sound	0
First visual change in enamel (seen after prolonged air drying or restricted to within confines of a pit or fissure)	1
Distinct visual change in enamel	2
Localized enamel breakdown (without clinical visual signs of dentinal involvement)	3
Underlying dark shadow from dentin	4
Distinct cavity with visible dentin	5
Extensive distinct cavity with visible dentin	6