

Evaluation of Prevalence and Risk Factors of Dental Caries: Cross Sectional Study

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ABSTRACT

Oral health in the nation's evolution, especially in this globalization, an absence of illness in the population plays a key role for a fecund and well established society.

Purpose: To find the prevalence of dental caries along-with the risk factors related to them in rural children of District Kasur.

Study Design: Cross sectional study.

Methodology: Children (n=383) were included in present study through non-probability, convenient sampling technique. Children who fulfilled the inclusion criteria were examined with the examination tools on the dental unit office in the RHC for caries risk using a pre-validated caries risk assessment checklist and Dental Caries detection form.

Statistical analysis: Data analyzed by SPSS 21.0v.

Results: There are 83 (22%) male and 300 (78%) females in the present study. The respondents of age 7 and over with active and smooth surface caries 383 (100%). The DMFT status for respondents with age 7-10 was 26.4% , age 11-13 was 53.5% , age 14-15 with was 18.8%. Overall dental caries risk in the participants while categorizing them on the basis of high risk i.e. 55.6% , moderate risk i.e. 42% and low risk i.e. 2.3%.

Conclusion: This study concluded that caries are present in the form of tooth decay, molars, plaque, lesions, cavities, and gingivitis. The dental problems can be prevented with cleaning teeth at least twice a day with fluoride toothpaste.

Key Words: Early Childhood Caries, Risk Assessment, Prevalence and Oral Hygiene.

INTRODUCTION

Oral health in the nation's evolution, especially in this globalization, an absence of illness in the population plays a key role for a fecund and well established society.¹ Oral health is considered as a significant determinant of general health.² Dental caries is known to have high risk of accuracy among the oral diseases as estimated 3.58 billion people are affected globally.³ Good oral health due to increased awareness has shown a decline in the prevalence of dental caries and periodontal disease thus making the population healthy.^{4,5}

A complete dental care includes dietary modifications, oral health education, regular visits to a dentist and use of fluorides.⁶ The attitude and practices of maintaining good oral health are directly related to the disease knowledge of patients with periodontitis and dental caries.⁷ Oral cavity is a hub to several diseases and is directly or indirectly linked with many health problems which may contribute to poor quality of life.⁸ Dental decay is the most commonly observed dental disease , whereas succeeded by periodontal disease.⁹ Exploring the preventive options for dental caries is also important as it reports in infancy as well as childhood due to the dietary habits of modern era and many other associated factors.¹⁰ The prevalence affecting nearly 100% of population in various parts of the world.¹¹ Increased prevalence is observed worldwide including China, Pakistan, Jordan and Kuwait.¹²

In the reported diseases in our children, dental caries takes the most prominent ranking .¹³ High level of caries

have been reported in different cities. Significant ratio i.e. 71.7% of caries was observed in School going children in a study done in Karachi in 2013. ¹⁴ Whereas the level of 72.4% of this disease was reported in capital of khayber Pakhtunkhwa in 2011.¹⁵

Prevention is one of the key components in maintaining good health.⁴ Regular cleaning of all the five visible surface of the teeth and adding the medications and dentifrices which strengthen the tooth enamel maintains the oral health thus preventing the diseases.¹⁶ The primary preventive services has decreased the rate of dental decay thus improving oral hygiene.¹⁷ Whereas in the developing world where the dentistry is not the part of the medical system, showed a rise in oral health related disorders.¹⁸ In many developing countries, the unhealthy dietary habits and limited access to the dentist are the most common etiological factors increasing the dental decay.¹⁷ In the current era the oral health is a center of attention and after the Alma-Ata declaration it has become an important pillar of health care system in parts of the globe. However Pakistan stands on 146 out of 187 in the human development index, though 0.5% of the total Gross Domestic Product is allocated for the health, which is majorly consumed by the general health and with such scare resources it is nearly impossible to provide good levels of oral health services and make it available for the general population at an affordable cost.¹⁹ Hence, in the light of above description, we planned current project to

observe the prevalence of dental caries among children in Kasur.

Objective: To find the prevalence of dental caries along with the risk factors related to them in rural children of District Kasur.

METHODOLOGY

Children (n=383) were included in present study through non-probability, convenient sampling technique. It was conducted in 10 RHCs including Phool Nagar and Mustafa abad, District Kasur Punjab for 18 months after approval from Ethical Review Board. Children of both sexes with age (08-16 years) visiting rural health centers for treatment of Dental and other diseases were enrolled. However, those who failed to communicate in local language were excluded. Children who fulfilled the inclusion criteria were examined with the examination tools on the dental unit office in the RHC for caries risk using a pre-validated caries risk assessment checklist and Dental Caries detection form. An informed consent from their guardians/ parent was taken. This enabled the investigators to screen out children with carious teeth.

STATISTICAL ANALYSIS

The data was summarized and analyzed on Statistical package for social sciences (SPSS) version 21.0. Appropriate Descriptive inferential statistics were performed. P-value ≤ 0.05 was taken as significant.

RESULTS

General distribution of parameters among subjects in present study was presented as frequency and percentage (%) in Table-1.

Table-1: General Distribution of Parameters Among Subjects (n=383)

Gender	Categories	Frequency	Percentage (%)
	Male	83	21.7
	Female	300	78.3
Age Groups (yrs)	7-10	102	26.63
	11-13	203	53
	14-17	78	20.36
	≥7 years	383	100
S.Surface Caries	Yes	383	100
New Caries (last 12 Months)	Yes	383	100
Hypomineralized molars	Yes	383	100
Deep Pits & Fissures	Yes	271	70.8
	No	112	29.2

Table-2: Frequency Distribution of DMFT Status Among Subjects (n=383)

DMFT Status	Categories	Frequency	Percentage (%)
	Age 7-10 DMFT>3 or DMFT>0	101	26.4
	Age 11-13 DMFT>2	205	53.5
	Age 14-15 DMFT>4	72	18.8
Sweet Or Drink Between Meals	No	169	44
	Yes	214	56
Brushes Twice a Day	No	199	52
	Yes	184	48
Uses tooth paste containg fluoride	No	252	65.8
	Yes	131	34.2

The DMFT status for respondents with different age groups with other parameters were presented as frequency and percentage (%) in Table-2.

Risk factors status for respondents with different age groups was presented as frequency and percentage (%) in Table-3.

Table-3: Frequency Distribution of Risk Factors Among Subjects (n=383)

Cavitated / Non-Cavitated Carious Lesion	Categories	Frequency	Percentage (%)
	Low risk	1	0.3
	Moderate risk	169	44
	High risk	213	55.6
Frequency of Sweet Or Drink	Low risk	169	44
	High risk	214	56
C. Exposure Of Mother, siblings	Moderate risk	169	44
	High risk	214	56
Visible Plaque	Low risk	165	43
	Moderate risk	218	57
Unusual Tooth Morphology	No	353	92
	Yes	30	7.8
Interproximal Restorations	No	283	73.9
	Yes	100	26
Overall Dental Caries Risk	Low risk	9	2.3
	Moderate risk	161	42
	High risk	213	55.6

DISCUSSION

Dental caries is widely prevalent in people. It has different risk factors that can damage teeth. This study examines the impact of dental caries and the intervention of oral health education for the improvement of health practices. It discovers the development of carious lesions – structural changes to teeth such as tooth decay and loss, infections, injuries and diseases after the intervention of oral health education lasted for 3 months. Primarily, dental care contains dietetic change, use of fluorides, oral exams, cleanings, x-rays, oral health education and regular visits to dentist, while fillings, anesthetics, crowns, dentures and bridges consider as major care of teeth.²⁰

Oral disease, as estimated by the Global Burden of Disease affected half of the world’s population (3.58 billion people) in which dental caries (tooth decay) was found to be the most prevalent.²¹ Oral health is considered pivotal for general health as it prevents many problems leading to certain diseases. It is the basis of overall health, wellbeing and quality of life.²⁰ After the oral health education intervention, about 31% of participants have improved oral hygiene and reduced level of dental caries by using toothbrush with paste and oral hygiene instruction This is similar to the study conducted on the children where 25% of the participants showed improvement²¹ the interventions have shown significant results, which exhibit that motivation and education need to be increased and personalized to incline them for the improvement of their oral health.²² Overall, about 31% participants benefited from the interventions for the improvement of their oral health. This differs significantly from the results reported by Elzahaf, et al, where 81.3% of the participants benefited from the intervention.²⁰

Cleaning teeth twice a day plays a key role in our oral health. The participants not brushing twice a day, now they have initiated brushing by 9% with the intervention of tooth brush with paste, while about 11% with the intervention of oral hygiene instruction²¹. Overall, 10% of participants

began using brushes more than twice a day. Which is similar to the results reported in another study i.e. 20.6%.²⁰ This finding was in contrast to the study done in Egypt, which found that 45.7% of primary schoolchildren.²³ The interventions have made reasonable developments in convincing participants to use tooth paste that contains fluoride. The results have shown that about 17% and 22% began using tooth paste containing fluoride through the interventions of tooth brush with paste and oral hygiene instruction respectively. This was reported even higher in a study conducted in Libya i.e. 65.7%.²⁰

Children are more likely to have problems and diseases. They have high risks of getting caries. The participants have shown significant results as about 48% and 44% children became risk free from caries using tooth brush with paste and oral hygiene instruction respectively. This was similar in study conducted in Libya where it was reported to be 87%.²⁰

The results have significant improvement to avoid sugary food and drink. The participants have avoided sugary food and drink by 40% and 9% with high risks and by 8% and 66% with low risks using tooth brush with paste and oral hygiene instruction respectively. Overall, it became stimulus for 24% and 37% with high risk and low risk participants through the interventions of tooth brush with paste and oral hygiene instruction correspondingly. This was similar in a study conducted in Libya.²⁰

Those participants who had moderate risk and high risk of cavitated or non-cavitated carious lesion improved by 9% and 21% through tooth brush with paste intervention and by 80% and 4% with oral hygiene instruction. All together participants who had moderate risk of carious lesion have improved by 45% and high-risk holders by 12%. These are significant contributions of tooth brush with paste and oral hygiene instruction interventions. The results have displayed that low risk and moderate risk participants have avoided by 31% and 23% through tooth brush with paste intervention, while by 56% and 17 % through oral hygiene instruction intervention. The results are similar to a study conducted in Libya.²⁰

Limitations: Our limitations included time with financial constrains and limited resources. No genetic workup was done for enrolled subjects.

CONCLUSION:

This study concluded that caries are present in the form of tooth decay, molars, plaque, lesions, cavities, and gingivitis. The dental problems can be prevented with cleaning teeth at least twice a day with fluoride toothpaste. However, these problems can be avoided by minimizing or abandoning the use of foods and drinks that cause complications for teeth and mouth.

Author's contribution: FI & MSR: Conceptualized the study, analyzed the data, and formulated the initial draft.

MT & SH: Contributed to the histomorphological evaluation.

MA & AH: Contributed to the analysis of data and proofread the draft.

AAK: Contributed to data collection.

TL: Contributed to the proofreading the manuscript for intellectual content.

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