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CORRELATION OF DISTRACTION, TENDENCY TO EAT, TOWARDS AN EXPANDED MODEL OF MINDLESS EATING AND ITS EFFECT ON ORTHODONTIC PATIENTS: A QUESTIONNAIRE SURVEY

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ABSTRACT:

Aims & Objective : To study the effect of mindless eating on oral health of patients undergoing orthodontic treatment.

Material & Method : Participants were given a questionnaire consisting of questions referred to five conditions: studying, television viewing, social interaction, being alone, or any form of stress or high emotional levels. Questionnaire which comprises of 5 questions on 5 point Likert scale will be used to assess the impact of distraction on eating behaviour on orthodontic treatment outcome correlating it to the DMFT & OHIS index.

Result: The results showed that those watching television underwent mindless eating more frequently than the social interaction or studying conditions whereas being alone being the least. This in turn when was compared to various dental changes using dentals indices like DMFT & OHIS index, that occurred due to mindless eating, it was noted that the more the participant consumed and did not maintain a proper oral hygiene increased the rate of dental hazards during orthodontic treatment.

Conclusion : A regular detailed follow up regarding the information related to increase tendency of mindless eating is very important to be obtained by the orthodontist in order to prevent further complications. Also if the patient is confirmed with such tendencies then further counseling is required regarding the orthodontic implication of mindless eating and various approaches should be considered either to reduce the tendency or having the last resort of having working towards reducing the complications.

Keyword: Mindless Eating, Distraction Tendency, White Spot Lesions, Periodontium .

INTRODUCTION

Although the literature indicates a role for biological factors in the regulation of food intake [1,2] much research highlights that the desire to eat and eating behavior are influenced by a multitude of psychological factors [3,4]. One area that has received much attention over the past few years is the impact of distraction and the ways in which factors such as television viewing, aspects of the food environment and social interaction influence how much food is consumed.

Research has also explored the ways in which aspects of the food environment can distract an individual making it easier to overeat and harder to monitor how much is being consumed.[5,7] For example, a multitude

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of studies indicate that over eating can be triggered by factors such as the ambience of the room, container size, plate size, variety of food and perceived time of day.[8-11] In particular, research indicates that the environment distracts the individual and that not only do people make automatic decisions to eat without any conscious processing, they also deny that the environment has an impact of their food intake [7,12-15]. This process has been termed 'mindless eating' and can be contrasted with 'mindful' eating when people are encouraged to self-monitor and process what they eat [14].

It is also parallel to the notion of hunger as a symptom which is perceived and modified through processes such as mood, attention and social influence.[4,16] Accordingly, it was predicted that distraction would result in increased or decreased eating behavior. In addition, it was also predicted that distraction would disrupt the relationship between food intake and a reduction in the desire to eat as participants would be less able to monitor the impact of any food consumed on their perceptions of hunger. No specific pre- dictions were made as to which condition would be the most distracting or whether the mechanisms linking distraction with changes in food intake would be consistent or different across the different forms of distraction being manipulated.[17]

Oral diseases such as dental caries and periodontal diseases which are highly prevalent in today's world not only determine the physical status but also helps in establishing the social, economic and psychological status of an individual. This in turn hammers the outcome of the orthodontic treatment along with the time consumed and totally treatment time. However, there is growing recognition of importance of quality of life in the field of dentistry and thus there is need to consider oral health as an integral part of health and its contribution to overall health related quality needs to be stressed on. [18]

Thus the purpose of this study is to evaluate the condition during which the participant consumes more food (mindless eating), which could in turn affect the oral health and the treatment outcome of the patients undergoing orthodontic treatment.

Aims and Objectives: To study the effect of mindless eating on oral health of patients undergoing orthodontic treatment.

Need of the Study: Mindless eating can affect the prognosis and the duration of the Orthodontic treatment. So in our study, we are correlating the various conditions of distraction in relation to mindless eating and thus assessing the most common distraction which could be controlled resulting in a better oral health of the patient and ultimately improving the orthodontic treatment outcome.

MATERIALS AND METHODS

Inclusion Criteria:

Patients undergoing Orthodontic treatment between the age group 18-35 years of age.

Exclusion Criteria:

- Patients who are not willing to participate in the study.
- Patients who did not fall under the category of mindless eating.

Tools used:

- Oral Hygiene Index Simplified (OHIS) and Decayed, Missed, Filled Teeth Index (DMFT) will be used to assess the oral health status of the participants.
- Questionnaire which comprises of 5 questions on 5 point scale will be used to assess the impact of distraction on eating behavior on orthodontic treatment outcome.

Armamentarium used:

- Mouth Mirror
- Straight probe
- Explorer

Methodology:

The study will be conducted in the Dept of Orthodontics, Rural Dental College, PIMS, Loni, Maharashtra. A Descriptive cross sectional study will be performed. An informed written consent in marathi/english will be taken from all the participants, and those who are willing to participate for the study will be examined. Participants who have given the consent will be included. Random sampling of the patients undergoing orthodontic treatment will be done. The demographic data will be recorded firstly, excluding their name to maintain the confidentiality.

A Questionnaire which comprises of 5 questions on 5 point scale will be used to assess the impact of distraction on eating behavior on orthodontic treatment outcome.

The participants will be examined, to assess the oral health status by clinical examination using Oral Hygiene Index Simplified (OHIS) and Decayed, Missed, Filled Teeth Index (DMFT) at the start and end of the study with an interval of one month.

Universal protocol for sterilization and disinfection will be followed during the examination process. Fresh set of instruments will be used for every participant

The data collected will be tabulated and subjected to statistical analysis using SPSS 20.0 software and descriptive statistics will be used.

RESULTS:

A total of 342 patients between ages 18-35 years, gave back the questionnaire.

Of these 9 parents declined to participate in the study, 6 refused due to time restraints, 2 were not able to communicate in any appropriate language. So, total sample size was 325 patients who took part and completed the questionnaire.

All data is collected and chi-squared test is performed to find significant values. And graphs are made which shows positive or yes values of result.

The present study showed that those in the television condition, not only did they consume maximum amount of food rather than people being in other condition but they also experienced increase in the DMFT and OHIS index suggesting poor oral health which then hampered their orthodontic treatment outcome. The results (Table 4 and graph 1) showed that the frequency of mindless eating during television watching was 264 times i.e. 81.2% being the highest, after which the social interaction condition, being under an emotionally stressed condition and studying condition were hand in hand having not much of difference in their frequency and correlation to the DMFT and OHIS scales. The mindless eating during emotionally stressed condition was with a frequency of 203 times i.e. 62.5 %, studying condition being 171 times i.e. 52.6% and social interaction condition being 182 times i.e. 56.0%. Amongst all these conditions and least tendency was observed in the state of being alone, having a frequency of 96 times i.e. 29.5%.

When these dimensions were correlated to the DMFT index (table 5 and graph 2) they concluded that television watching condition was highly significant ($p<0.005$) i.e. 94%. The social interaction condition 72%, the studying condition 66% and emotional stressed condition 74% all showed values being significant ($p< 0.05$). Whereas the state of being alone 31% showed values of being non-significant ($p>0.05$).

When these dimensions were correlated to the OHIS index (table 6 and graph 2) they concluded that television watching condition was significant ($p<0.05$) i.e. 61%. The social interaction condition 41% and emotional stressed condition 45% all showed values being significant ($p< 0.05$). Whereas the state of being alone 20% and the studying condition 35% showed values of being non-significant ($p>0.05$).

DISCUSSION :

The present study aimed to evaluate the effect of mindless eating onto oral health and treatment outcome of patients undergoing orthodontic treatment and showed that those in the television condition, not only did they consume maximum amount of food rather than people being in other condition but they also experienced increase in the DMFT and OHIS index suggesting poor oral health which then hampered their orthodontic treatment outcome. This supports previous research which has highlighted how television viewing increases food intake

[19] [20] [21]. The results also indicated that television viewing has a greater impact on mindless eating than other forms of distraction, namely studying and alone being the least.

In most of our households, these days everybody tend to eat their meals watching television. For most people to has become a necessity while a few still believe in concentrating on their meal while eating and not investing into the television or causing any sort of distraction. Research has also explored the ways in which aspects of the food environment can distract an individual making it easier to overeat and harder to monitor how much is being consumed [22] [23] [7]. For example, a multitude of studies indicate that over eating can be triggered by factors such as the ambience of the room, container size, plate size, variety of food and perceived time of day.[8,9,11] In particular, research indicates that the environment or company or presence of being surrounded by people distracts the individual and that not only do people make automatic decisions to eat without any conscious processing, they also deny that the environment has an impact of their food intake.[7,12,15,14] This process has been termed 'mindless eating' and can be contrasted with 'mindful' eating when people are encouraged to self-monitor and process what they eat. [14]

Research has also addressed the impact of social influence on eating behaviour and several studies indicate that that people tend to eat more food in the presence of others or in groups rather than when eating alone.[24-28] In line with research on television viewing it has been argued that social influence is also a type of distraction, as attention is generally diverted away from the meal to concentrate on actions such as talking and interpreting information.[29]

However, not many people are often conscious about maintaining their oral hygiene after their meals. This is often associated with them being distracted by the television watching or being amongst people or in a social environment which does not permit them so indulgent in maintaining their oral hygiene leading them to neglecting their oral hygiene in turn.

Mindless eating and its Orthodontic implication

White Spot Lesions (WSLs)

The increased amount of food consumed due various distractions related to mindless eating and negligence of maintaining oral hygiene was related to the increase in plaque accumulation at a number of retention sites namely banding and bonding of orthodontic appliances onto the teeth. As a result, oral hygiene becomes more difficult to maintain. The low pH of plaque adjacent to orthodontic brackets hinders the remineralization process, and decalcification of enamel can occur. As enamel translucency is directly related to the degree of mineralization, initial enamel demineralization usually manifests itself clinically as a "white spot

lesion".[30] Orthodontic patients have more tendency of developing more WSLs than non-orthodontic patients. If WSLs are left untreated, they may progress to produce carious cavitation, and may also present esthetic problems.

The plaque-retentive properties of the fixed appliance predispose the patient to an increased cariogenic risk.[31] Furthermore, there is a rapid shift in the composition of the bacterial flora of the plaque following the introduction of orthodontic appliances. More specifically, the levels of acidogenic bacteria, such as S. mutans, become significantly elevated in orthodontic patients. If these bacteria have an adequate supply of fermentable carbohydrates, acid by-products will be produced, lowering the pH of the plaque. As the pH drops below the threshold for remineralization, carious decalcification occurs. The first clinical evidence of this demineralization is visualized as a WSL. Such lesions have been clinically induced within a span of 4 weeks, which is typically within the time period between one orthodontic appointment and the next. This is a significant finding and is important for both the patient and the clinician to realize.

In the highly cariogenic environment adjacent to orthodontic appliances or under loose bands, these lesions can rapidly progress. If left untreated, they may produce carious cavitation that will need an appropriate restoration. Thus, the prevention, diagnosis, and treatment of WSLs is crucial to prevent tooth decay as well as minimize tooth discoloration that could compromise the esthetics of the smile.

Periodontium

A build-up of plaque and tartar (calculus) can lead to inflamed and infected gums. Mild gum disease is called gingivitis and is not usually serious. More severe gum disease, called periodontitis, can lead to teeth falling out. Dental plaque contains many different types of germs (bacteria) and some types of bacteria are associated with developing gum disease. The gums can often resist, or limit, the invasion of bacteria. It is thought that a more marked gingivitis, which leads to periodontitis, is more likely to develop if you have a lot of plaque and/or your defense or resistance against bacteria is reduced in some way.

The greater incidence of gingival hyperplasia around the posterior teeth as compared with the anterior teeth has been reported by others.[32] While there was great variation among individual patients, the fact that the average incidence of gingival hyperplasia was four times greater for the premolar and molar teeth than for incisors and canines seem significant. The reason for this distributional difference are :-

1) Mechanical irritation by the orthodontic bands which are more likely to come in contact with the gingiva around the posterior than anterior teeth;

2) Chemical irritation by the exposed cement at the gingival margin of the band;

3) Greater likelihood of food impaction in the posterior areas of the mouth due to proximity of the archwire to the soft tissue;

4) The tendency for more effective and thorough brushing of anterior than posterior teeth.

In considering the distributional pattern of gingival hyperplasia, a four to one ratio exists between gingival hyperplasia occurring inter-proximally and gingival hyperplasia occurring at the middle of the crown, the greater incidence occurring inter-proximally. The proximity of the band and hence mechanical irritation of the band and the chemical irritation of the cement are greater at the interproximal areas than at the middle of the crown. The difficulty in brushing the interproximal areas is also an important factor.

In general while placing the orthodontic appliances onto the teeth, the percentage of patients who were able to maintain a "0" periodontal index dropped from 20 to 6.5%. This is not surprising since those patients who maintained excellent oral hygiene could not escape the irritation caused by the appliances themselves. Therefore, some gingival inflammation is inevitable when orthodontic appliances are placed on teeth.

Hence when compared to patients having the tendency of increased mindless eating the overall gingival and periodontal health also seemed to have been compromised as shown by an increase in the OHIS scale. Inflammatory and hyperplastic changes occur in the gingiva which occurred during the treatment were reversible upon appliances removal and the periodontium was in better health following the treatment. Thus the status of unhealthy gums, bleeding gums and inflamed gums was reduced after the removal of the orthodontic appliance for a minimum of at least for 48 hours for it to resolve. If not it hampers the overall treatment time and mechanics and causes poor results.

CONCLUSIONS:

Decalcification of the enamel surface adjacent to fixed orthodontic appliances is an important and prevalent iatrogenic effect of orthodontic therapy. In general the banding and bonding of orthodontic appliances to teeth increases the number of plaque accumulation onto the retention sites. Also due to increase tendency of mindless eating and neglecting the oral hygiene, optimal oral hygiene becomes more difficult.

In general, treatment of WSLs and periodontal diseases which occur during the orthodontic treatment should be managed with the most conservative approaches; namely:-

1) Good oral hygiene which includes regular tooth brushing and cleaning

between teeth (e.g. by flossing) can usually prevent gum disease, and treat mild-to-moderate gum disease.

2) Regular Oral Prophylaxis for patients having the tendency to increased mindless eating along with increased plaque accumulation.

3) The application of topical fluoride to the WSL.

4) If time and fluoride do not improve or correct the esthetic concerns of the patient and clinician, tooth whitening should be considered as the next step.

If such approaches do not resolve the problem to the clinician's satisfaction, more aggressive treatment modalities can be pursued if the patient desires it namely:-

5) If whitening teeth is unsuccessful, the clinician may consider the use of micro abrasion on the enamel surface in an effort to eliminate localized WSLs.

6) The last resort to meet the esthetic objective of the patient and the clinician is having composite restorations or porcelain veneers placed.

A regular detailed follow up regarding the information related to increase tendency of mindless eating is very important to be obtained by the orthodontist in order to prevent further complications. Also if the patient is confirmed with such tendencies then further counseling is required regarding the orthodontic implication of mindless eating and various approaches should be considered either to reduce the tendency or having the last resort of having working towards reducing the complications.

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TABLES AND GRAPHS:

Age_N

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 20	236	72.6	72.6	72.6
	20 - 24	64	19.7	19.7	92.3
	25 - 29	6	1.8	1.8	94.2
	>= 30	19	5.8	5.8	100.0
	Total	325	100.0	100.0	

Table 1:- Age related changes and cumulative Percentage

DMFT_N

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Without Caries	59	18.2	18.2	18.2
	With Caries	266	81.8	81.8	100.0
	Total	325	100.0	100.0	

Table 2 :- Grading of DMFT Index

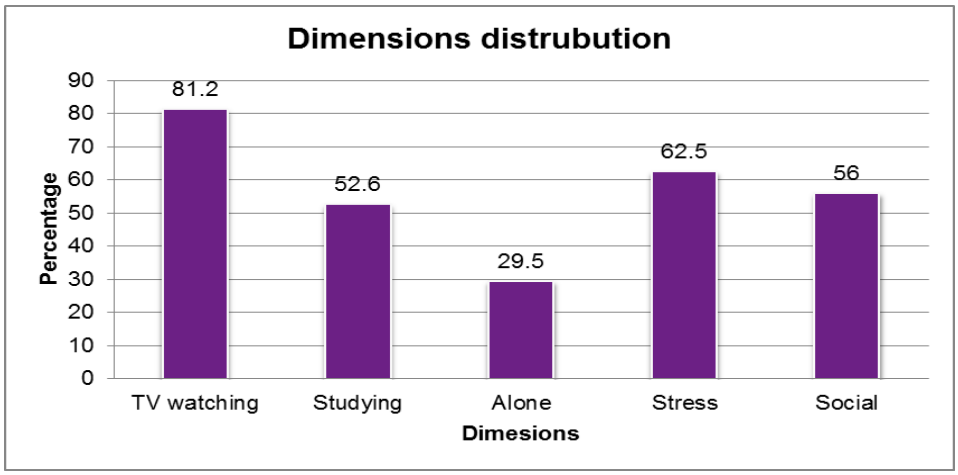
OHIS_N

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Good	49	15.1	15.1	15.1
	Fair	115	35.4	35.4	50.5
	Poor	161	49.5	49.5	100.0
	Total	325	100.0	100.0	

Table 3:- Grading of OHIS Index

Dimensions	Frequency	Percentage
TV watching	264	81.2
Studying	171	52.6
Alone	96	29.5
Stress	203	62.5
Social	182	56.0

Table 4 :- Various Mindless Eating Dimensions



Graph 1 :- Various Mindless Eating Dimensions

Correlate DMFT to Dimension

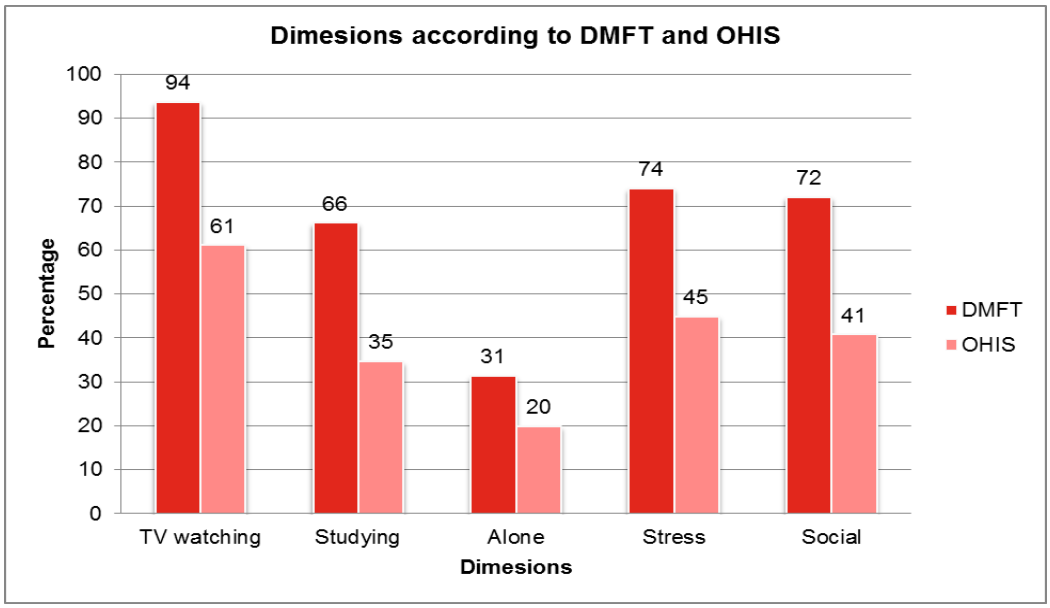
Dimension	DMFT		
	r-value	p-value	Remarks
TV	0.685	p<0.005	Highly significant
Studying	-0.105	p<0.05	Significant
Alone	-0.155	p>0.05	Not significant
Stress	0.055	p<0.05	Significant
Social	0.098	p<0.05	Significant

Table 5 :- Correlation of DMFT index to various Mindless eating Dimensions

Correlate OHI to Dimension

Dimension	OHI		
	r-value	p-value	Remarks
TV	0.712	p<0.05	Significant
Studying	-0.118	p>0.05	Not significant
Alone	-0.218	p>0.05	Not significant
Stress	0.064	p<0.05	Significant
Social	0.015	p<0.05	Significant

Table 6 :- Correlation of OHIS index to various Mindless eating Dimensions



Graph 2 :- Correlation of DMFT & OHIS index to various Mindless eating Dimensions