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Prevalence of patients requiring full mouth rehabilitation classified based on turner and missirlian classification and choice of treatment outcome

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ABSTRACT

To assess the prevalence of patients requiring full mouth rehabilitation based on the turner and missirlian classification and assess the choice of the treatment plan. The study was done in the institutional hospital setting of Saveetha Dental College, Chennai. Patients requiring Full mouth rehabilitation were assessed, data was obtained from filtering the college database to obtain 65 patients. The patients were classified by the Turner and Missirlian classification based on their extent of rehabilitation required and the treatment protocol used for them was also assessed. The obtained data was tabulated using an Excel sheet and statistical analysis was performed using Pearson correlation. Prevalence of Category 1 Of turner and missirlian classification was among patients above 60 years (36.8%), For category 2 it's among patients between 50-60 years (33.3%), and category III (36.4%) showed similar results as class I in terms of prevalence. The treatment preferred was mostly tooth supported FMR, Category 1 (52.6%), Category II (47.2%), Category III (54.5%). Full mouth rehabilitation involves extensive rehabilitation of oral structures requiring a meticulous interdisciplinary approach. The study shows the increased requirement of full mouth rehabilitation among elderly patients. Research analysing the prevalence of patients in need for such rehabilitation could give us a ground report on the oral health status of a population, and could prove to be valuable literature which could become the forerunner for research in analysing the treatment protocols.

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INTRODUCTION

The wear of teeth over the years in a gradual pace has been accepted as a part of physiologic wear. However, excessive wear can result in pulpal pathology (Ramamoorthi *et al.*, 2015), occlusal disharmony, loss of functional occlusion and esthetic handicap (Smith, 1989; Turner and Missirlian, 1984). Patients presenting with such levels of loss of mineralized structure of the teeth require extensive rehabilitation (Song *et al.*, 2010). The etiology for such rapid progression of wear could be because of,

1. Congenital abnormalities; such as hypoplastic, hypocalcified and hypo mineralized enamel

2. Parafunctional occlusal habits; such as bruxism
3. Abrasion; toothbrush abrasion, environmental factors
4. Erosion; patients with gastric reflexes, dietary habits
5. Loss of posterior teeth support; leading to increased attrition of the anterior teeth due to malposition of the teeth.

For the success of any treatment, it is important to understand the etiopathogenesis and eliminate the root cause (Rivera-Morales and Mohl, 1992). This is important to enhance the prognosis and to preserve as much tooth structure as possible (Jyothi *et al.*, 2017; Smith, 1989). Once the etiology is established, it is important to understand what all needs to be replaced and if there is restorative space available for this. This involves the measurement of the vertical dimension, giving a better understanding of the amount of rehabilitation required (Atwood, 1958; Silverman, 1953). In the current study, we have used Turner and Missirlian classification to understand better the amount of rehabilitation required and the restorative space available.

Turner and Missirlian Classification

1. Category-1: Excessive wear with loss of VDO.
2. Category-2: Excessive wear without loss of VDO but with space available.
3. Category-3: Excessive wear without loss of VDO but with limited space.

In a typical category-1 patient, the closest speaking space is more than 1 mm and the interocclusal space is more than 4 mm and associated with loss of facial contour. Patients belonging to category-2 usually have a long history of gradual wear caused by bruxism, oral habits, or environmental factors. Category -3 is characterized by closest speaking space of 1 mm and an available interocclusal distance of 2–3 mm. Orthodontic or surgical interventions may be required to establish the restorative space in such cases.

Primarily the existing literature on full mouth rehabilitation are protocols and case reports. Studies by Krishna MG (Krishna *et al.*, 2005), Moslehifard E (Moslehifard *et al.*, 2012), Alqahtani F (Alqahtani, 2014) and the likes of others have explained their workflow for rehabilitation in the form of case reports. Literature by Binkley TK, (Binkley and Binkley, 1987; Palekar, 2016) Palekar et al., and Jacob S (Jacob *et al.*, 2009) deal mostly with the different protocols and philosophies in the diagnosis and occlusal rehabilitation

Occlusal rehabilitation involves the restoration of functional and aesthetic integrity of the arch through adhesive restorations, crowns, bridges, implant supported the restoration and various kinds of the removable prosthesis (Ashok *et al.*, 2014; Venugopalan *et al.*, 2014). The selection of the treatment plan depends on the clinical scenario and can vary from patient to patient. There is very limited literature on the prevalence of patients in need for full mouth rehabilitation, which could give us an insight on dental awareness, general oral health and maintenance. Classifying them allows us to interpret the amount of rehabilitation required.

Thus, this study aims to analyse the prevalence of patients requiring Full Mouth Rehabilitation, assess the extent of rehabilitation required using Turner and Missirlian classification and to assess the choice of treatment protocol used.

MATERIALS AND METHODS

The study was designed to assess the prevalence of patients requiring full mouth rehabilitation and the treatment protocol used in their correction. The study was designed to be a retrospective cross-sectional study done in Saveetha Dental College, Chennai. The study was performed during the months of March-April 2020. The study was approved by the ethical committee and all the guidelines pertaining to confidentiality was maintained. 65 case sheets were filtered from the database of the college, which meticulously maintained the patient records, based on the need for full mouth rehabilitation. The patients were classified into three based on the Turner and Missirlian classification and the treatment plans for each of these patients were assessed. The obtained results were tabulated using Excel sheets. Descriptive statistics were performed to analyse the frequency and percentages.

RESULTS AND DISCUSSION

The study revealed that of all the patients requiring full mouth rehabilitation, most patients belonged to category 2 of Turner and Missirlian Classification (Figure 1). The graph shows that maximum patients were associated with category 2 of Turner and Missirlian classification.

It was also observed that the majority of the patients in each of the categories of Turner and Missirlian Classification belonged to the age group of 60 and above (Table 1). In terms of treatment options,

Table 1: The frequency distribution of patients based onTurner and Missirlian classification and their age Group

Turner And Missirlian	Age Group					Chi-square value	P value
	20-30yrs	30-40yrs	40-50yrs	50-60yrs	Above 60 yrs		
Category 1	2(10.5%)	0(0%)	4(21.1%)	6(31.6%)	7(36.8%)		
Category 2	3(8.3%)	6(16.7%)	4(11.1%)	12(33.3)	11(30.6%)	5.043	0.75
Category 3	1(9.1%)	2(18.2%)	2(18.2%)	2(18.2%)	4(36.4%)		

Majority of the patients in each of the categories of Turner and Missirlian Classification belonged to the age group of 60 and above. The association was not statistically significant

Table 2: The frequency of distribution of the patients based on the treatment plans chosen for them with respect to the amount of rehabilitation

Turner And Missirlian Classification	Type of treatment provided					Chi-square value	P value
	Tooth supported	Tooth-Tissue supported	Implant supported	Implant tissue supported	Tooth implant supported		
Category 1	10(52.6%)	5(26.3%)	3(15.8%)	1(5.3%)	0(0%)		
Category 2	17(47.2%)	6(16.7%)	4(11.1%)	5(13.9%)	4(11.1%)	5.365	0.718
Category 3	6(54.5%)	2(18.2%)	2(18.2%)	1(9.1%)	0(0%)		

The treatment preferred was mostly tooth supported FMR, in all the three categories, followed by ToothTissue supported rehabilitations. The association was not statistically significant

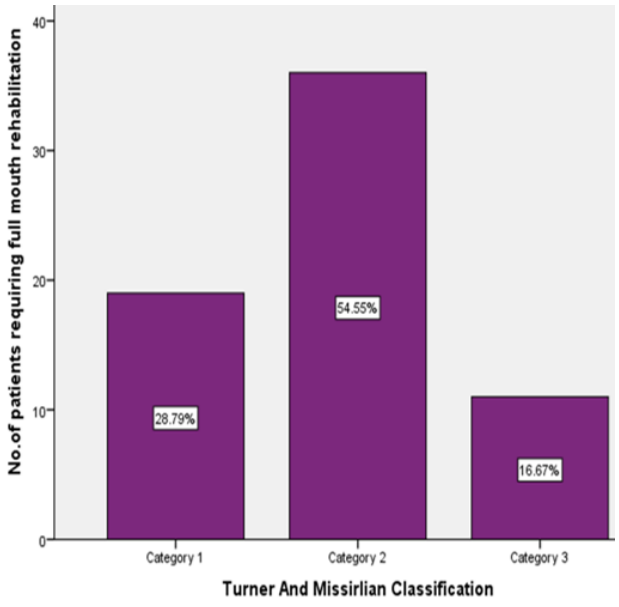

Figure 1: The frequency distribution of patients requiring full mouth rehabilitation based on Turner and Missirlian classification

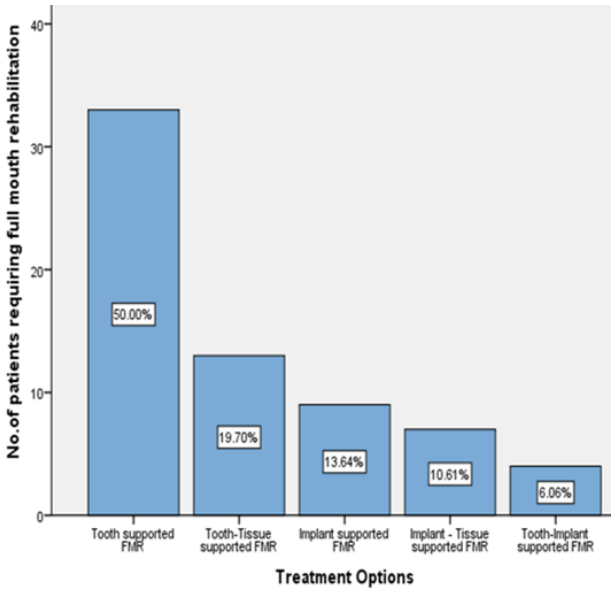

Figure 2: The frequency distribution of various treatment options for full mouth rehabilitation

Tooth supported rehabilitation was the most common (50%) (Figure 2). Tooth supported FMR was most commonly done. The association between the extent of rehabilitation assessed using the Turner and Missirlian classification and age group of the patients did not show any statistical significance ($p>0.05$). Similarly, there was no statistically significant association between the treatment provided and the extent of rehabilitation($p>0.05$) (Table 2).

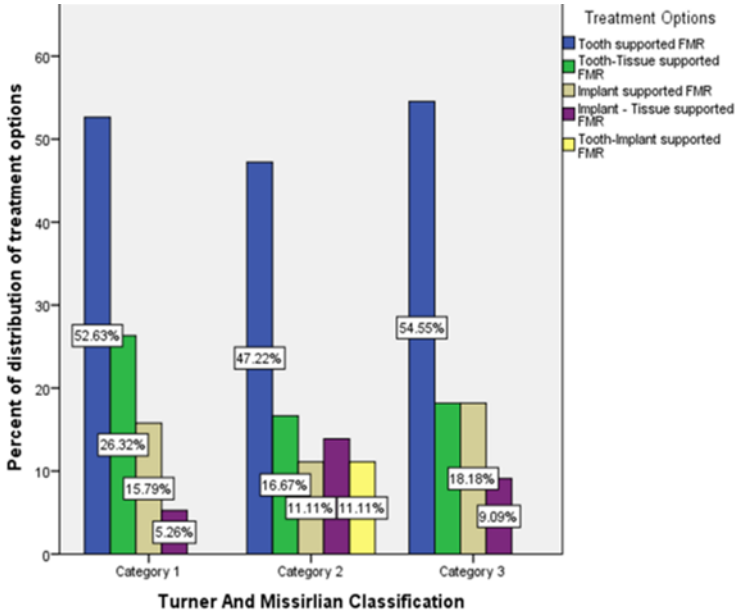

Figure 3: The association between the different categories of the classification with the possible treatment plans used for them

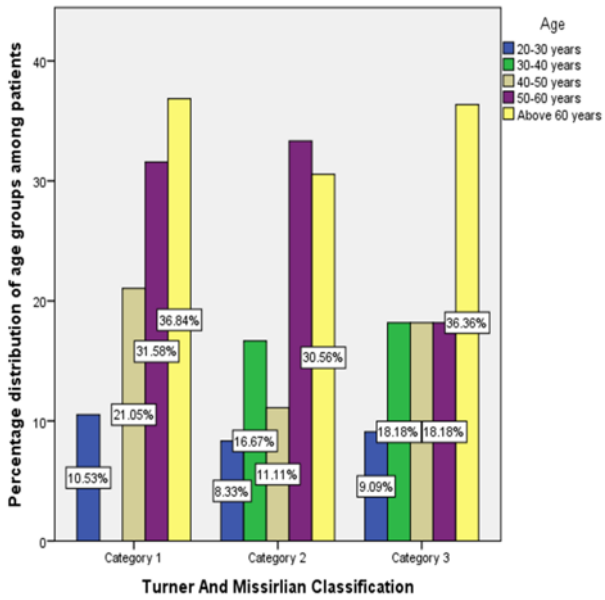

Figure 4: The association between the turner and missirlian classification and the different age groups

From Figure 3, The X axis represents the different categories of the Turner and Missirlian classification and Y axis represents the percentage distribution of different treatment options. It is inferred from the graph that tooth supported FMR (blue) was the most preferred treatment option in all the three categories, highest among category 3. (Chi square-5.365; p value-0.718, hence statistically not significant).

The primary goal of dentistry is to increase the lifespan and efficiency of functioning of the human dentition. Occlusal rehabilitation involves restoring the esthetics and function of the entire dentition with the help of a combination of crowns, bridges, implant supported restorations and removable prosthesis (Dawson, 2007). In earlier times, patients requiring such extensive rehabilitation were tagged 'dental cripples' and underwent full mouth extraction followed by fabrication of complete denture (Goldman, 1952).

With the current advances in techniques and materials available, dentists are able to preserve as many

teeth as possible(Figure 4). X axis represents the categories of turner and missirlian classification, and Y axis represents the percentage distribution of different age groups. It is inferred from the graph that among category 1 and category 3, most patients belonged to the age group of above 60 years(yellow). Among category 2, most patients belonged to the age group of 50-60 years(purple). Chi-square - 5.043; p value-0.75, hence statistically not significant

The primary goals of full mouth rehabilitation include

1. Stable occlusion and temporomandibular joints
2. Freedom from the disease in the masticatory structures
3. Maintain the health of the periodontium
4. And to achieve optimum aesthetics.

The current study evaluated the prevalence of patients requiring full mouth rehabilitation and classified them based on Turner and Miller classification. Of the total patients presenting with severe attrition and 36.4% belonged to category III, the worst affected. There have always been apprehensions surrounding the reconstruction of such debilitating dentitions due to the different views on the planning for a successful restoration (Schweitzer, 1981; Bronstein, 1954). The popular philosophies of treatment include those suggested by McCollum et al. (Kurth, 1954) proposing the bilateral balance, followed by Stuart and Stellard proposing the mutually protected occlusal scheme (Stuart and Stallard, 1960). The studies revealed that the patients above 50 were most commonly affected. This could be owing to the buildup of physiologic wear in addition to the loss of tooth structure due to deleterious habits, trauma or simply caries (Preston and Coale, 1982). The results of the study showed that category II showed the highest number of cases, which is slightly reassuring as they have better prognosis due to available interarch space (Lewis and Smith, 1973; Turner and Missirlian, 1984). Cases Reports by Song et al. (Brecker, 1959; Song *et al.*, 2010), Bencharit S et al. (Bencharit *et al.*, 2010), Ameri N, (Ameri *et al.*, 2017), Kumar AV et al. (Kumar *et al.*, 2012) showed various permutations and combinations of protocols and treatment options for full mouth rehabilitation.

The current study had the limitation that only the distribution of different grades of rehabilitation under the Turner -Missirlian classification and the frequency of the treatment option chosen was discussed (Brecker, 1959). No correlation was drawn between the choice of a particular treatment for a particular category due to the limited sample size.

Full mouth rehabilitation is a meticulous process of rehabilitation and further studies to assess the apt treatment plan for a particular grade of wear can make the process of treatment planning standardized and easier.

CONCLUSION

Full mouth rehabilitation involves a complex and meticulous rehabilitation of the human dentition requiring a variety of protocols and interdisciplinary interventions. The current study revealed an increasing prevalence of greater need of rehabilitation among the older age population, and the preference of tooth-supported rehabilitations to be more common. Presence of a set protocol for treatment planning based on the grades of rehabilitation required under a classification would ensure ease of communication, understanding and efficiency of treatment planning. Hence further research with larger sample size is encouraged to best derive this relation.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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