



## Oral Health Status In Hospitalized Patients a cross sectional study

Arpita Rai<sup>1\*</sup>, Venkatesh Naikmasur<sup>2</sup>, Ansul Kumar<sup>3</sup>,

<sup>1\*</sup>Department of Oral Medicine and Radiology, Faculty of Dentistry, Jamia Millia Islamia, New Delhi- 110025. India.

<sup>2</sup>Department of Oral Medicine and Radiology, SDM college of dental Sciences, Dharwad, Karnataka, India.

<sup>3</sup> Department of Cardio-thoracic and vascular surgery, PGIMER Dr RML hospital, New Delhi, India.

\*Corresponding author: Arpita Rai, Ph: 08802536376 E-mail: arpitadoc@gmail.com

Received: July 5, 2015, Accepted: September 2, 2015, Published: September 2, 2015.

### ABSTRACT

The present study was designed with the aim to determine oral health status of hospitalized patients, to assess oral symptoms and to ascertain percentage of oral lesions/symptoms noticed and treated by the attending physician. The study was conducted on 300 patients admitted in a medical college. All patients were interviewed for presence of oral symptoms using a structured questionnaire. Systematic oral examination was conducted focusing on presence/absence of oral mucosal lesions, caries and periodontal status of the patient. Oral lesions/symptoms noticed and treated, by the attending physician/surgeon were recorded. The results showed that 49% of hospitalized patients had one or more oral symptoms and at least one symptom was present in every hospitalized patient. About 43.3% of patients showed the presence of one or more oral mucosal lesions and one out of every 2 hospitalized patients showed presence of oral mucosal lesions. In the present study it was found that 70.3% patients had experience of dental caries and the mean DMFT score was 6.18. Thirty-nine percent of the patients were suffering from gingivitis whereas 52% patients had periodontitis. To provide proper health care, dental professionals should work closely with the rest of the health care team to detect and treat co existing oral diseases, to ensure patient's oral comfort during his hospital stay, to negate the impact of oral health on poor nutritional status and delayed recovery & to prevent any systemic complications.

**Keyword:** Oral Health, hospitalized patients, oral lesions, Systematic oral examination .

### INTRODUCTION:

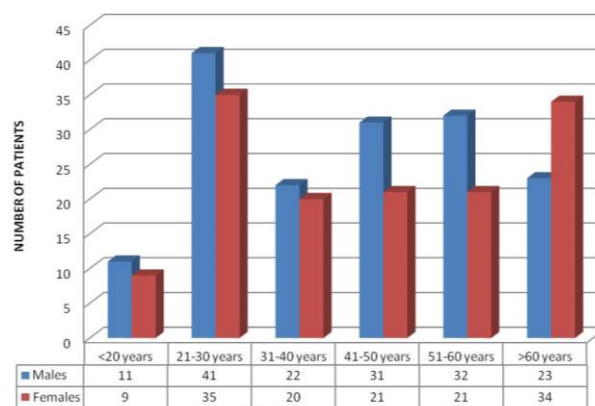
Cohort of hospitalized patients is diverse and heterogeneous, and their health and health-related behaviors vary greatly. Many of these patients have a variety of systemic diseases that may have oral manifestation. For example, some of the oral manifestations of diabetes mellitus, having been described as early as 1862, such as xerostomia, altered taste, burning mouth syndrome, increased incidence of periodontal disease, higher incidence of dental caries, erythematous candidiasis and diabetic sialadenosis. [1] Conversely, many of the hospitalized patients have oral diseases that have profound effect on their systemic illness and associated recovery from it. Several systemic diseases and conditions can result from infectious oral microbes, especially in patients with immunological and nutritional deficiencies, where oral microbes are granted systemic access. For example, dental and other surgical procedures predispose susceptible patients to infective endocarditis. [2]

It is now known that oral diseases have an effect on, and are affected by, other chronic diseases as the determinants or risk factors that cause oral diseases are the same ones that affect a number of other chronic diseases, like diet and nutrition, hygiene, smoking, alcohol, and lack of access to care.[3] But this knowledge continues to be absent or overlooked in many policy spheres, despite being a powerful argument towards the important role of oral health to general health. The present study was conducted to study the oral health status in hospitalized patients. The study aimed to assess oral symptoms and signs in patients with systemic diseases and to ascertain the percentage of these

lesions/symptoms noticed by the attending physician/surgeon and whether proper treatment was initiated.

### MATERIAL AND METHODS

This cross-sectional study was conducted at SDM College of Medical Sciences situated at Dharwad, Karnataka, with prior permission from the management of the institution during August 2008 to December 2011. Clearance from ethical committee of the institution to carry out the study was taken. The study sample consisted of 300 patients 15 to 93-year-old with an age distribution as shown in figure 1.



Patients were distributed almost equally among both the sexes, i.e. there were 160(53%) males and 140 (47%) females

## Inclusion and Exclusion Criteria

The inclusion criteria for the study was the patients admitted to the hospital for any of the medical or surgical complaints, other than oral diseases who are willing to participate in the study, while pediatric patients, patients admitted in Intensive care unit (ICU) and known cases of Acquired immunodeficiency syndrome (AIDS) were excluded. The reason for exclusion of pediatric patients were increased awareness observed among pediatricians regarding oral health and difference in spectrum of oral complaints and lesions seen in the pediatric age group as compared to the adults. It was considered that oral lesions in AIDS patients are frequent and varied, therefore, this could account for false high results in this generalized study of oral health status of hospitalized patients and thus excluded from the study. The decision to exclude patients on life support admitted in ICU was made with the foresight of difficulty in obtaining informed consent and interference in their health care. The distribution of the patients enrolled in various wards of the hospital is shown in table 1.

NAME OF THE WARD	MALES	FEMALES	TOTAL
Diabetes ward	39	10	49
Surgery ward	32	21	53
Medicine ward	53	20	73
Orthopaedics ward	26	19	45
Gynae and obs ward	26	68	68
Haematological ward	10	2	12
TOTAL	160	140	300

## Study Protocol

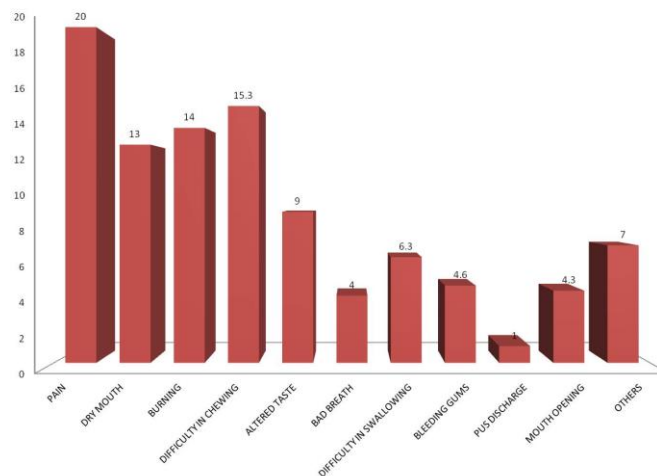
As the initial procedure, demographic data and relevant information, such as medical diagnosis, time of stay in the hospital, treatment received, were obtained for every patient from hospital records. Written informed consent was obtained for each patient to participate in the study. All patients were interviewed for the presence of oral symptoms by trained interviewers using a structured questionnaire consisting of 11 questions. Two interviewers with five and ten years of experience in Oral Medicine and Radiology collaborated in this study. The interviewers were calibrated to apply the questionnaire and perform the oral examinations prior to start of the study. In case of any conflict in the diagnosis the interviewers had to reach a consensus. The patients were examined in their rooms at their bedside. An Oral Symptom Score (OSS) was calculated for each patient, in which presence of a symptom was scored as 1 and absence as 0. OSS for a patient could range from 0 to 11. After the interview, clinical assessment was done. An examination form was designed for recording the clinical findings. The clinical parameters charted included oral mucosal lesions, caries experience and periodontal health. A portable overhead light, mouth mirror, straight probe (for caries assessment) and periodontal probe (for periodontal status assessment) was used. Cotton swabs were used either to remove evident debris or to test scrapability of a lesion.

Systematic procedures for examination of oral mucosa were performed according to WHO (1997) guidelines. Clinical diagnoses were based on pertinent criteria used by Axell (1976). [4] The oral mucosal lesions and their locations were recorded according to the coding system adopted by WHO in 1997. [5] Later, Oral Mucosal Lesion Score (OMS) was calculated for every patient following the same criteria as OSS. Caries experience of the patient was recorded using DMFT index following WHO 1997

guidelines. Also, periodontal status of the patient was assessed by checking the mobility of teeth, gingival recession and presence/absence of periodontal pocket was assessed. Accordingly, diagnosis of gingivitis and periodontitis was made. The data were coded and analyzed using the statistical package SPSS. Frequency distribution of oral symptoms, oral mucosal lesions, DMFT and periodontal status was produced. Mean Oral symptom score (OSS), Mean Oral mucosal lesion score (OMS) & Mean DMFT was calculated. Variation in oral health status was assessed where the dependent variables were Mean OSS, OMS and DMFT. In case where the independent variable was a binary category, a t test for two independent samples was conducted. In case, where the independent variable consisted of more than two categories, One-Way ANOVA was used. Oral symptoms reported by the patient to the attending physician/surgeon were noted. Also, percentage of oral symptoms and lesions noticed and treated by the attending physician/surgeon was calculated.

## RESULTS

In the present study it was found that, 147 (49%) of hospitalized patients had one or more oral symptoms when interviewed by us. The frequency distribution of oral symptoms is shown in Figure 2.

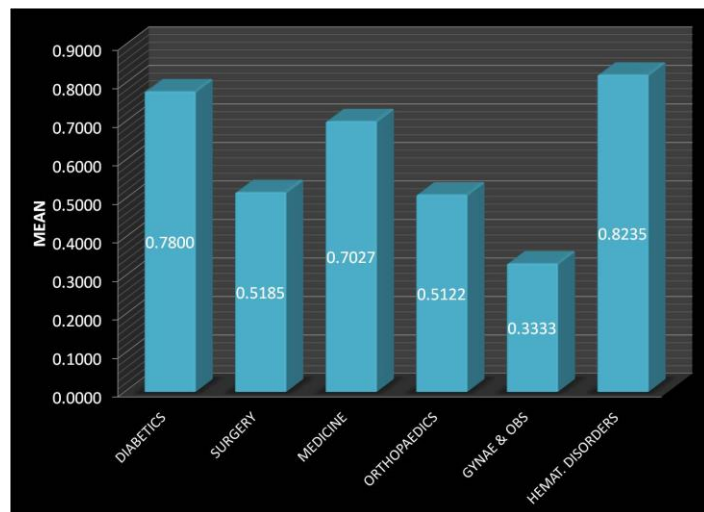
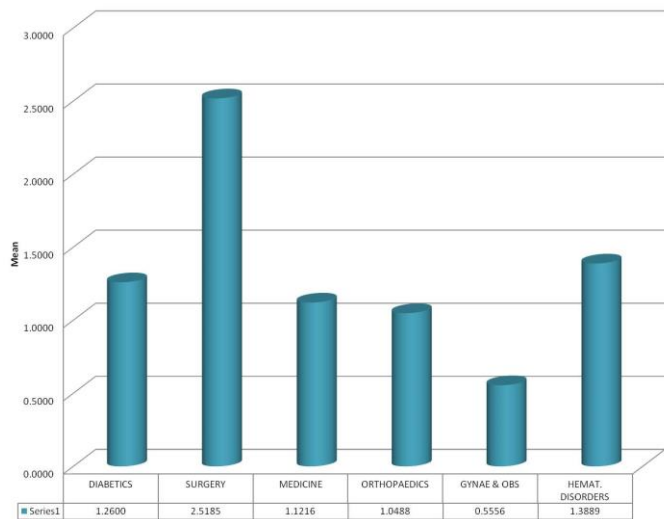


Dental /Oro-facial pain was the most commonly reported symptom, present in 58 (19.3%) patients, followed by difficulty in chewing in 46 (15.3%), burning sensation in 42 (14%) and dry mouth in 39 (13%) patients. Pus discharge from any part of oral cavity was the least common symptom through the cross section of the sample, present only 3(1%) patients.

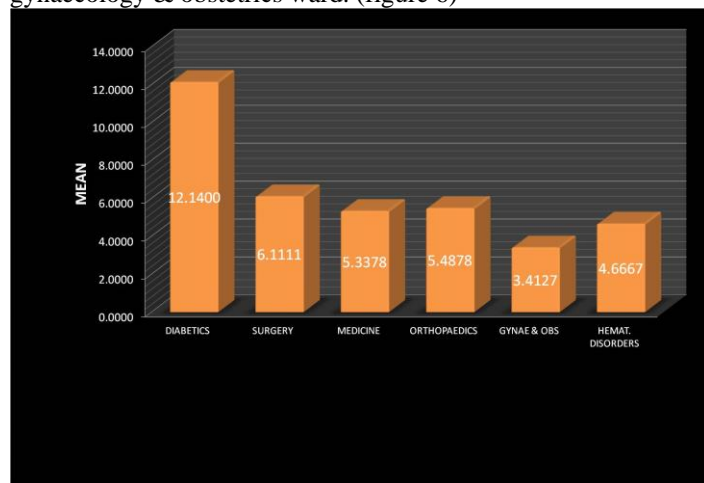
The Mean OSS for the entire sample was 1.28 (SD=5.89), meaning thereby that, on an average, at least one symptom was present in every hospitalized patient included in the study. Mean OSS for various subcategories, divided on the basis of medical diagnosis of the patient, ranged from 2.51(SD=13.5) to 0.55 (SD=1.02) as depicted in figure 3.

Patients admitted in surgical ward were found to have highest mean OSS, whereas patients in gynecology & obstetrics ward have lowest mean OSS.

A total of 130 (43.3%) of patients had presence of oral mucosal lesions. Frequency distribution of oral mucosal lesions through the cross section of the study sample is provided in figure 4.

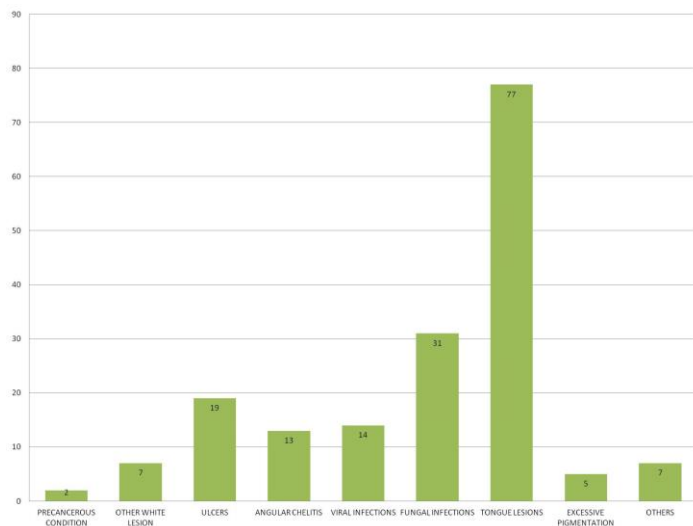


Over 211 (70.3%) patients had experience of dental caries in the form of missing teeth, decayed teeth and filled teeth. Approximately 131 (43.6%) of them had one or more decayed teeth. More than half of the patients (53%) had missing teeth due to caries and 18 (6%) of them possessed a filling. The mean DMFT score was 6.18(SD=9.15), and missing and decayed components dominated the DMFT, being M=5.12 (SD=10.36) and D=1.91 (SD=8.53), respectively. The mean number of filled teeth per person was only 0.16 (SD=9.15). Among the various subcategories, mean DMFT ranged from 12.14 (SD=12.02) among diabetics to 3.41 (SD=5.73) among patients admitted in gynaecology & obstetrics ward. (figure 6)



The results of periodontal status assessment showed that 119(39.6%) of the patients were suffering from gingivitis whereas 157 (52.3%) patients had periodontitis. Rest 8% of the patients were completely edentulous.

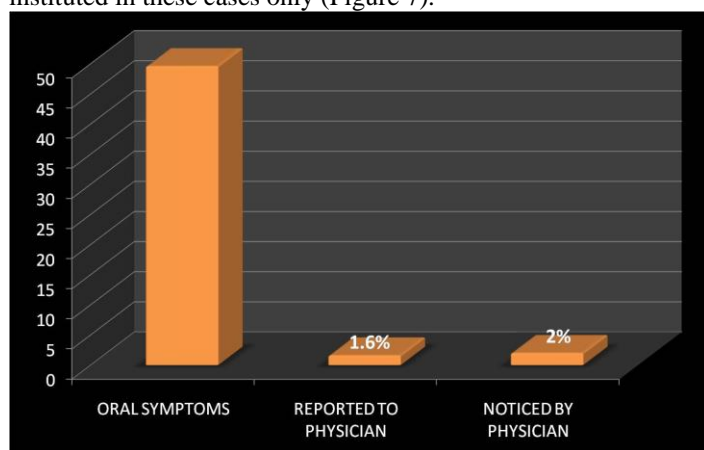
When variation in oral health status was studied, it was found that oral health status was associated with age, sex, past dental history and systemic diagnosis. The difference in OML Score and mean DMFT was found to be statistically significant among patients above 40 years and those below 40 years. Also, mean DMFT showed statistically significant difference among both sexes as well as among patients who never had undergone dental treatment, as compared to those who had previous dental experience. OML score and mean DMFT also showed statistically significant difference among various categories of systemic diagnosis suffered by the patient. (Table 2)



Tongue lesions, mainly atrophic glossitis, bald tongue & fissured tongue, were observed with maximum frequency, present in 77 (25.6%) patients. Among the tongue lesions 21 patients had bald tongue, 22 had atrophic glossitis, 6 patients had fissured tongue, 1 patient also presented with partial ankyloglossia. Seven patients presented with geographic tongue, 18 with hairy tongue and two with macroglossia. Among the fungal infections opportunistic infection Candida, either presenting as acute pseudomembranous candidiasis or central depapillation of tongue in 31 (10.3%) patients was observed in the present study. Least commonly observed mucosal condition was oral submucous fibrosis, present in 2 patients only. Other white lesions seen in hospitalized patients were frictional keratosis (4 patients), smoker's palate in 2 patients and leukoedema in 1 patient. Among the ulcerative conditions, out of 19 patients 7 patients presented with recurrent aphthous ulcers, 1 had chronic ulcers and was diagnosed as pemphigus and other 11 patients had traumatic ulcers. All cases of viral infections presented with herpetic lesions mainly herpes labialis, except one patient who presented with squamous papilloma. The mean OML score for the entire sample was 0.58(SD=0.80). Thus, on an average, one out of every 2 hospitalized patients showed presence of oral mucosal lesions. Variation in mean OMS among various subcategories ranged from 0.33 (SD=0.56) among patients in gynecology & obstetrics ward to 0.82 (SD= 0.72) among those reporting with hematological disorders mainly anaemia (figure 5).

VARIABLES	ORAL SYMPTOM SCORE	ORAL MUCOSAL LESION SCORE	MEAN DMFT
<b>AGE GROUP COMPARISON</b>			
▪ < 40 YEARS	0.7000	0.4173	1.800
▪ > 40 YEARS	1.7938	0.7313	10.0250
	P = 0.1090	P = 0.0007	P = 0.0000
<b>SEX COMPARISON</b>			
▪ MALES	1.5714	0.6522	7.2112
▪ FEMALES	0.9497	0.5072	5.0000
	P = 0.3632	P = 0.1203	P = 0.0368
<b>PAST DENTAL HISTORY COMPARISON</b>			
▪ YES	1.4872	0.5897	10.6154
▪ NO	1.2529	0.5846	5.5249
	P = 0.8174	P = 0.9704	P = 0.0011
<b>SYSTEMIC DIAGNOSIS COMPARISON</b>			
▪ DIABETICS	1.2600	0.7800	12.1400
▪ SURGERY	2.5185	0.5185	6.1111
▪ MEDICINE	1.1216	0.7027	5.3378
▪ ORTHOPAEDICS	1.0488	0.5122	5.4878
▪ GYNAE & OBS	0.5556	0.3333	3.4127
▪ HEMATOLOGICAL DISORDERS	1.3889	0.8235	4.6667
	P = 0.6329	P = 0.0230	P = 0.0000

An important observation made in this study was that, when interviewed for presence of oral symptoms, 49% of patients admitted of having one or more oral symptoms whereas only 1.6% of these symptoms were reported by the patient themselves to the attending physician/surgeon. Also, only 2% of these oral symptoms and lesions were noticed by the attending physician/surgeon and proper treatment for oral condition was instituted in these cases only (Figure 7).



## DISCUSSION

The interplay between oral health and systemic health is well recognized. [6] It is acknowledged that oral health status is important to life quality and plays an important role in overall patient care, even among patients with life threatening and terminal conditions. [7-9 ] The World Health Organization (WHO) Global Oral Health Program has emphasized the importance of increasing the awareness of oral health worldwide as a major component of general health and quality of life. [3] Among hospitalized patients it is agreed that oral health care is often neglected amidst the burden of other health care-related duties and the priority of medical care.

A number of studies related to oral health status have been done in selected cohort of patients such as those with cerebral palsy, in ICU patients, hematological malignancies etc.[10-12] but very

few studies have evaluated the oral health of cross-section of patients admitted to different wards of a hospital. [13] There is a lack of in-depth information regarding oral health state of the adult patients admitted to hospitals. The purpose of this study was to evaluate the oral health condition of the cross section of patients hospitalized in various wards of the hospital. The results of the study showed that 49% of hospitalized patients had one or more oral symptoms and the Mean OSS for study sample was 1.28 (SD=5.89), meaning thereby that, on an average, at least one symptom was present in every hospitalized patient. Dental /Oro-facial pain was the most commonly reported symptom, present in 58 (19.3%) patients, followed by difficulty in chewing in 46 (15.3%), burning sensation in 42 (14%) and dry mouth in 39 (13%) patients. Kiyak et al<sup>13</sup> have reported dry mouth in 10% of the study population. Avcu et al [14] have reported Xerostomia (58.6%) as the most frequently encountered oral finding in their study.

About 43.3% of patients showed the presence of one or more oral mucosal lesions. The mean OML score for the study population was 0.58(SD=0.80). Thus, on an average, one out of every 2 hospitalized patients showed presence of oral mucosal lesions. Previous literature has showed similar high prevalence of oral mucosal lesions among hospitalized patients (45.9% in the study by Avcu N et al[14], 36.5 % by Carrilho et al [15], 59% in hospitalized children by Nicopoulos et al [16]). Contrary to this, Bilder et al [17] have reported prevalence of oral mucosal lesions in only 12% of the study population which has been attributed to daily treatment of 0.12% chlorhexidine solutions received by the patients for cleaning oral cavity.

The prevalence rate of angular cheilitis in this study is 4.3% (13 patients) compared to 14% in a study by Bilder et al [17] on long term hospitalized adults. Peltola et al [18] have reported similar higher prevalence of angular cheilitis (19%) in their study but in the general elderly population, prevalence of angular cheilitis occur in a range of 1–5%.

In the present study it was found that 70.3% patients had experience of dental caries in the form of missing teeth, decayed teeth and filled teeth and the mean DMFT score was 6.18. Similar findings have been reported by Rekha R et al [19] in which 75.5% of the psychiatric patients exhibited caries experience with significantly higher DMFT and DMFS compared to the 66% in controls. In the study by Bilder et al [17] the mean number of residual teeth was 11.35±10.77 and age was found to be significantly correlated in a decreasing relationship with number of residual teeth. Mean number of caries cavitation was 4.17 ± 4.50. Arpin et al [20] found only 1.62 decayed teeth in their study. In the present study the mean decayed teeth score was 1.91 (SD=8.53) which is comparable to Arpin et al. [20] The present study found that the mean DMFT was found to be statistically significant among patients above 40 years and those below 40 years. Also, mean DMFT showed statistically significant difference among both sexes as well as among patients who never had undergone dental treatment, as compared to those who had previous dental experience. Bilder et al [17] also have reported in their study significantly higher number of caries cavitation in females than males. A similar finding was observed among elderly in other study which found that males had more intact teeth and lower DMFT scores than women. [21]

The results of periodontal status assessment showed that 39.6% of the patients were suffering from gingivitis whereas 52.3% patients had periodontitis.

The most important observation made in this study was that, when interviewed for presence of oral symptoms, 49% of patients admitted of having one or more oral symptoms whereas only 1.6% of these symptoms were reported by the patient themselves to the attending physician/surgeon and only 2% of these oral symptoms and lesions were noticed by the attending physician/surgeon. This situation calls for immediate attention, because not only are the patients unaware of the oral conditions which could complicate their systemic health, but the attending physicians whose attention is mainly focused on the general body condition tend to overlook the oral symptoms as well.

This study has some limitations that must be taken into consideration while interpreting the results, this study is a single centre study and therefore the sample size may not be representative of all the hospitalized patients. We recommend a multi-centre study to eliminate this bias. The oral examination was conducted in the hospital beds with limited access to the oral cavity, while the patients were not always fully cooperative. As a result, it is recommended to use caution when interpreting the results.

This study highlights the importance of greater interaction among all health professionals to integrate oral health as part of comprehensive health care of hospitalized patients. The need of the hour is to add an oral physician in the team of healthcare providers for hospitalized patients for diagnosing oral lesions & symptoms, and consulting & interacting on a professional basis with medical practitioners to plan and carry out oral treatment of hospitalized patients.

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**Citation:** Arpita Rai et al. (2015). Oral Health Status In Hospitalized Patients a cross sectional study. . J. of Advancement in Medical and Life Sciences. V3I3. DOI: 10.15297/JALS.V3I3.01

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