

## Prevalence of Soft-Tissue Lesions among Women in Sex Work in the Red Light Area of Pune, India: A Cross-Sectional Survey

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### INTRODUCTION

Professional sex workers are a vulnerable lot with respect to both systemic as well as oral health.<sup>[1,2]</sup> The need to prevent disease occurrences in case of the female sex workers is essential for their upliftment.<sup>[3]</sup> The women in sex work face hurdles as a part of their day-to-day life in social, psychological, physical, as well as economical aspects among the many. Many are pushed into the profession owing to the economic need or the lack of earning a living through any other source.<sup>[4]</sup> Research suggests that disproportionate poverty among women with dependent children diminishes women's ability to be safe and contributes to helplessness, which further debilitates the women in sex work and makes them an overall vulnerable lot. The social stigma associated with their profession, lead them

to a state of mental despair and eventually they fall for a number of addictions, like drugs.<sup>[5]</sup> This is their desperate attempt in coping up with stigma, psychological distress, and violence. Substance abuse in various forms, tobacco (smoking and smokeless), alcohol, and betel nut, is always a risk for life-threatening precancerous lesions and conditions such as leukoplakia and oral submucous fibrosis (OSMF). Strong internalized and external stigma related to sex work, harmful drinking or alcohol abuse, and incarceration further contribute to

### ABSTRACT

**Aim and Objective:** The women in sex work have no felt need for oral health and much of the stress has always been on sexually transmitted infections (STIs). There is a need for a baseline data for the oral lesions of these women to further assist in the policy formulations and training of personnel for the identification of the oral conditions which need treatment. The aim of the study was to evaluate the presence of oral lesions among female sex workers in the red light area of Pune, India.

**Materials and Methods:** The Community Periodontal Index and loss of attachment (LA) index was recorded along with the other soft-tissue lesions as per the WHO Oral Health Assessment from 1997. The calculated sample was 350. Systematic sampling technique was followed. The data collected were subjected to statistical analysis and analysis was done using SPSS package 16.0.

**Results:** A total of 110 (31.4%) women had leukoplakia, 6 women (1.7%) had ulceration, 41 (11.7%) women had candidiasis, and 1 woman (0.3%) had swollen gingiva. As the age increased, there was an increase in the number of pockets. The percentage of women above 60 years had higher LA.

**Conclusion:** The women in sex work are mainly spoken to about HIV and STIs. With almost all of these women requiring some or the other form of treatment, utilization of the available dental workforce with both government and public partnership could be the route.

**KEYWORDS:** *Community Periodontal Index, gingivitis, loss of attachment, leukoplakia, periodontitis*

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HIV/sexually transmitted infections (STI) risk. Estimates indicate 57% of all men and 11% of women between 15 and 49 years of age use some form of tobacco,<sup>[6]</sup> leading to morbidity as well as mortality and the women in sex work are more prone to these, either forcefully by the client or simply by peer pressure. The psychological impacts adversely affect these women, who tend to ignore their health and enter into risky behavior, some to the extent of ending their life painfully. The women in sex work have no felt need for oral health and much of the stress has always been on STIs. This also adds to the preexisting disease burden in one form or the other among these women. The socioeconomic disability also adds to the distress of these women. Studies have shown that low socioeconomic status, low monthly household income, and low educational level are associated with less access to dental services and oral hygiene products, poorer knowledge regarding oral health and oral hygiene, and consequently, a greater frequency and severity of dental caries. Paradoxically, many find autonomy within sex work as they increase their ability to support their families and themselves; with increased risks and exploitation simultaneously.<sup>[7]</sup> People with low income have the most limited access to education, prevention, and treatment. The disparities should be addressed to push for provision of easy, accessible, detection, and treatment services. Prevention through action against risk factors, especially tobacco will be a key to reducing the burden among these groups.<sup>[6]</sup> Felt need was the most important factor that affected the individual perception toward oral health. Overall factors that restrict regular dental care such as knowledge about dental care, dental fear, expense of dental care, unpleasant dental experiences, and socioeconomic factors, need to be addressed targeting such neglected communities, similar to the tailor-made programs existing for these women related to HIV.<sup>[8]</sup> Till now, very few studies have been carried out related to the complete oral health status among the women in sex work. Moreover, no study has been reported in the Indian context. Stress on the oral health of the female sex workers is of importance as the mouth is the reflection of the general health of the individuals, especially who are in such a risk group. Furthermore, the cases of those that neglect their oral health and also those who continue with addictions in any form can be identified and treatment can be provided for the same. There is a need for a baseline data for the oral lesions of these women to further assist in the policy formulations and training of personnel for the identification of the oral conditions which need treatment. This will help to study the pattern of the oral disease and their distribution and suggest the treatment needs for the same. This assessment will help

to formulate a comprehensive treatment plan to this community.

## MATERIALS AND METHODS

The study was cross-sectional in nature. Ethical clearance was obtained from the Institutional Ethical Committee of Navodaya Dental College and Hospital, Raichur, Karnataka, and from Saheli HIV/AIDS Karyakarta Sangh, Pune (ethical approval letter no. NDC/IEC/271216/ORALLESION). Women above 18 years in sex work in the red light district of Pune and who agreed to give a voluntary consent for participating in the study irrespective of their medical ailments like STI were included in the study. The underage girls/minors and those women who did not give a voluntary consent for participating in the study were excluded from the study. The Community Periodontal Index (CPI) and loss of attachment (LA) index was recorded along with the other soft-tissue lesions as per the WHO Oral Health Assessment from 1997.<sup>[9]</sup> The examination was preceded by collection of their demographic data, medical and dental history, addictions, oral hygiene habits, and sweet consumption. A pilot study was carried out on 30 women in sex work, to assess the feasibility of the study. Based on the findings of the pilot study, the final sample size was calculated using the formula:

$$n = \frac{z^2 pq}{d^2}$$

Where,  $n$  = sample,

$z$  = standard value at 95% confidence interval = 1.96

$p$  = prevalence

$q$  = 1 -  $p$

$d$  = precision, 0.05

$z = 1.96, P = 0.7, q = 0.3, d = 5\%$

The calculated sample was 323 which was rounded off to 350.

Systematic sampling technique was followed after line listing of the Brothels at Budhwar Peth, Pune, Maharashtra. Seven hundred brothels were identified and sampling frame was prepared.

We had planned to examine one woman from each house. To select the houses, a random number of 1 and 2 was selected using lottery method. The even numbers of brothels were included in the study using the formula:

$$N^2 = n/N = 350/700 = 1/2$$

Out of the 350 houses, 286 houses were covered. Others declined to cooperate due to their clients, police raids,

and other issues. For the remaining 64, the odd number of houses was also examined and the survey was completed. The time period of the study was from January 2017 to June 2017. A written consent was obtained from each of the participants, based on the Indian Council of Medical Research rules. The data collected were subjected to statistical analysis and analysis was done using SPSS 16.0 (Chicago, United States of America). Chi-square test was done and *P* value was decided at 0.05.

## RESULTS

The present study was carried out among 350 women in sex work in the red light district of Pune, Maharashtra. Table 1 shows the demographic data of the women in sex work.

### EXTRAORAL EXAMINATION

Among the 350 women in sex work, 325 (92.8%) had normal extraoral appearance; 4 (1.1%) had ulceration in the head, neck, and limbs; 13 (3.7%) had ulceration in the nose, cheek, and chin; 3 (0.9%) had ulceration in the commissures; 1 woman (0.3%) had ulceration in the vermilion border of the lips; and 1 woman (0.3%) had an enlarged lymph node in the neck. Three (0.9%) women had other swellings of the face and the jaws. There was no relation of age, socioeconomic status, and substance abuse in the form of alcohol and tobacco.

### ORAL MUCOSAL LESIONS

Among the 350 women, no one had any malignant condition, lichen planus, acute necrotizing gingivitis, or abscess. A total of 110 (31.4%) women had leukoplakia, 6 women (1.7%) had ulceration, 41 (11.7%) women had candidiasis, 1 woman (0.3%) had swollen gingiva, 1 woman (0.3%) had swollen gingiva, 11 women (3.1%) had OSMF, 12 women (3.4%) had melanin pigmentation, and 1 woman (0.3%) had bald tongue. No significant association was seen between the oral lesions and addictions, age or the socioeconomic status of these women.

### PERIODONTAL HEALTH

Table 2 shows the distribution of the study population based on their periodontal health (CPI). Negligible percentage of women had healthy periodontal tissue. As the age increased, there was an increase in the number of pockets (shallow and deep) ( $P < 0.05$ ). The percentage of women with calculus and deep pocket was higher among those with no adverse habits. Bleeding and shallow pockets were higher among those with adverse habits than those without and this was statistically significant ( $\chi^2 = 22.82$ ,  $df = 3$ ,  $P < 0.0001$ ). The percentage of women with shallow and deep pocket was higher among those with medical history than the others who did not, and this was statistically significant ( $\chi^2 = 8.36$ ,

**Table 1: Demographic data of the women in sex work**

	<i>n</i> (%)
Age (years)	
<20	2 (0.6)
20-29	148 (42.3)
30-39	94 (26.9)
40-49	65 (18.6)
50-59	30 (8.6)
≥60	11 (3.0)
Religion	
Hindu	267 (76.3)
Muslim	82 (23.4)
Christian	1 (0.3)
Education	
Illiterate	283 (80.9)
Educated	67 (19.1)
Socioeconomic status	
Middle class	13 (3.7)
Lower class	337 (96.3)
Marital status	
Married	282 (80.6)
Unmarried	68 (19.4)
Systemic illness	
Absent	266 (76.0)
Present	84 (24.0)
Addictions	
Absent	143 (40.9)
Present	207 (59.1)
Material used to clean the teeth	
Toothpaste	312 (89.1)
Tooth powder	7 (2.0)
Charcoal	2 (0.6)
Mishri	29 (8.3)
Total	350 (100.0)

**Table 2: Number and percentage of women in sex work with healthy periodontal tissues, bleeding only, calculus, shallow and deep pockets**

Condition	<i>n</i> (%)
Healthy	41 (11.7)
Bleeding	77 (22.0)
Calculus	107 (30.6)
Pocket 4-5 mm	121 (34.5)
Pocket 6 mm	2 (0.6)
Excluded	2 (0.6)
Total	350 (100.0)

$df = 3$ ,  $P = 0.04$ ). Shallow and deep pockets were higher among those who used finger to clean their teeth than those who used toothbrush ( $\chi^2 = 20.03$ ,  $df = 3$ ,  $P = 0.0002$ ). Furthermore, the percentage of women with shallow pockets was higher among those who cleaned their teeth with charcoal. Higher prevalence of deep pockets was also observed among this group ( $\chi^2 = 23.19$ ,  $df = 3$ ,  $P < 0.0001$ ).

When LA was measured as per the LA Index, 223 (63.7%) had 0–3 mm of LA, 113 (32.3%) had 4–5 mm of LA, 10 (2.8%) had 6–8 mm of LA, 1 (0.3%) had 9–11 mm and 12 mm or more of LA, respectively, and 2 women (0.6%) were excluded. The percentage of women above 60 years had higher LA (4–5 mm and 9–11 mm) than the others, and this was statistically significant ( $\chi^2 = 50.16$ ,  $df = 4$ ,  $P < 0.0001$ ). There was no relation between the socioeconomic status with the LA ( $\chi^2 = 1.02$ ,  $df = 1$ ,  $P = 0.31$ ). The percentage of women with 9–11 mm and  $\geq 12$  mm of LA was higher among those who used toothpaste to clean their teeth. Furthermore, the percentage of women with 4–5 mm of LA was higher among those who used mishri to clean their teeth, and this was statistically significant ( $\chi^2 = 25.79$ ,  $df = 2$ ,  $P < 0.0001$ ). Those females with deleterious habits such as nail biting and mouth breathing, and those dependent tobacco or alcohol showed a higher LA compared to the others.

## DISCUSSION

The present study consisted of 350 women in sex work form, Budhwar Peth, the red light district of Pune. These women had a number of addictions and also neglect toward maintaining their oral health. They suffered from oral precancerous lesions like leukoplakia and conditions like OSMF. Furthermore, there was a high prevalence of periodontitis among these females. The presence of soft-tissue lesions was related to their addiction habits, such as tobacco along with their oral hygiene habits like cleaning with charcoal and mishri (burnt tobacco).

All the women in sex work were establishment based or brothel based, unlike the study in Andhra Pradesh, India,<sup>[2]</sup> where 2.1% were brothel based, 22.5% were home based, and 75.4% were brothel based, in Sonagachi, West Bengal, India,<sup>[3]</sup> where 94.4% were brothel based and 5.6% were street based, in the four South Indian States in India,<sup>[4]</sup> where all the women were nonbrothel based, and in China,<sup>[10]</sup> where 74.3% were establishment or brothel based and 24.1% were street-based women in sex work. The sample size of the present study was much higher than the study carried out in Sonagachi, West Bengal (36 women in sex work), India,<sup>[3]</sup> in Mongolia (48 women in sex work),<sup>[6]</sup> in Peru (212 women in sex work), South America,<sup>[11]</sup> in China (320 women in sex work),<sup>[10]</sup> and in Chennai, India (100 women in sex work).<sup>[12]</sup> It was lesser than the study in Andhra Pradesh, India (6648 women in sex work),<sup>[2]</sup> the study in four South Indian states in India (5498 women in sex work),<sup>[4]</sup> and in Andhra Pradesh (2042 women in sex work), India.<sup>[13]</sup> The women were between 19 and 65 years of age higher than the study in China,<sup>[10]</sup> where the age ranged from 18 to 48 years. Although the nature of the cited studies was

different than the present study, they concentrated solely on the women in sex work. In the present study, 76.3% were Hindus, 23.4% were Muslims, and only 1 followed Christianity. Paucity of data limits comparison with respect to this parameter. Only a negligible (19.3%) were literate, while the rest majority (80.9%) was illiterate. This is much lower than the study in China,<sup>[10]</sup> where only 4.3% were illiterate. Furthermore, in the present study, 4.9% had primary school education, lesser than the study in China (34.0%).<sup>[10]</sup> Nine percent of the women had middle school education lesser than the study in China,<sup>[10]</sup> had 51.2% of the women who had middle school education. Only 4.9% had high school education in the present study, almost half of that in the study in China,<sup>[10]</sup> where 9.9% had high school education. The percentage of women with higher studies was 0.3% in the present study, lesser than that of the study in China,<sup>[10]</sup> where 0.5% had a high school education. Although the scales used to determine the level of education in the two studies were different, the data of the study carried out in China,<sup>[10]</sup> had more women who were literate and educated than the present study. The need for education as a medium of raising awareness and sensitizing these women in sex work not only for an optimum oral health but also to help them rehabilitate with the rest of the society is a felt need in itself and its negligence is a hindrance to any form of developmental activity carried out targeting this special and neglected population. Most of the women were married (80.6%) while the rest (19.4%) were unmarried which was higher than the study carried out in China,<sup>[10]</sup> where 59.1% were married and the rest were unmarried. Although data on multiple live-in partners and regular live-in partners were not recorded since the women were unresponsive toward certain sensitive issues regarding their personal lives, these women have unprotected sex with these partners, or lovers, which could be a reason for the spread of HIV and other STIs among these women. All of these women worked not only to feed themselves but also their family far away from the brothels or for the education and future of their children. This was in contrast to the findings of the study in China,<sup>[10]</sup> where only 82.6% were into this profession and supported their family. In the present study, only 11.7% had healthy periodontal tissue. Calculus and pocket of 4–5 mm were present in above 30.0% of the women. This was significant with age. Since as age advanced, the women could possibly neglect their oral health. It was also affected by the past medical history since systemic illness could have led to the neglect of oral health by these women. Adverse habits which were prevalent among 59.1% women, also contributed to pockets of 4–5 mm (42.5%). Oral hygiene measures affected periodontal health adversely. Those

using finger to clean their teeth had greater pockets of 4–5 mm (63.5%) than those using toothbrushes. The use of charcoal, mishri, and toothpowder had compromised periodontal health compared to toothpaste users. Furthermore, those with lesser frequency of cleaning had more pockets. The malocclusion could contribute to periodontitis since it is difficult to remove the debris and the calculus. Similar to periodontal health, LA was more prevalent as the age increased. Adverse habits contributed to further LA. Those who used finger to clean their teeth had greater 6–8 mm of LA (7.9%). This could be due to the lack of complete removal of plaque as a local factor for LA. Those women who used charcoal and mishri had greater 6–8 mm of LA (50.0% and 6.9%, respectively). Since these materials do not possess the ability of aiding in cleaning the teeth, they instead add on the local irritating factors and also help in plaque accumulation due to improper cleaning could have contributed to further LA. The prevalence of LA was more among those who cleaned horizontally. Inadequate and improper cleaning methods may have not helped complete removal of the local factors. At the same time, those who consumed sugar in between the meals for more than once had greater LA than those who did not. The presence of carbohydrate could as well serve as a source for the microorganisms to perpetuate and result in further destruction of the periodontal tissue. Due to severe or handicapping malocclusion, these women had higher LA than the rest and this could be attributed to the presence of calculus that accumulated due to difficulty in reaching areas of misaligned teeth. The presence of calculus serves best for further plaque microorganisms to grow. This could be due to accumulation of resultant debris and calculus that not removed due to negligence or improper oral hygiene practices contributed to the destruction of the periodontal tissue. Apart from these local factors, systemic illness such as HIV or other STIs could have also played a role in causing periodontitis among these women. These systemic illnesses not only have their oral manifestations but along with that result in negligence toward oral health, excess medications that alters the oral flora, and negligence on the part of the general physician insist on good oral health maintenance also contributes at large toward oral problems. Given the workplace, stress and the diet of these women coupled with lack of awareness, financial constraint, and disinterest toward oral health lead to such higher prevalence. In the present study, 31.4% had leukoplakia and 3.1% had OSMF, it was mainly due to use of smokeless tobacco. Although awareness was encountered regarding the ill effects of tobacco, it did not seem to make any solid contribution toward the improvement of these women's oral health. Furthermore, 11.7% had candidiasis, lesser than the

findings of the study in Nigeria,<sup>[14]</sup> where 40.0% reported of candidal infection.

#### LIMITATIONS OF THE STUDY

We could not get more details of the medical ailments of these women since we relied only on the information provided by them. There is a possibility of reporting bias from the participants' side. Furthermore, even though we tried hard, we could not complete the study following the systematic sampling technique. A more thorough investigation in the form of focused group discussions is essential for a clear understanding of the underlying probable causes. Also due to the lack of cooperation from the brothel owner as well as some of the women themselves, even though health education was provided to these women, a follow-up of the effectiveness could not be done. An intervention with more detailing could help find better solutions to the existing problems.

A few women reported of discrimination from dental practitioners. The lack of exposure to treat such special groups at the training level is essential to draw more confidence in treating these patients. This also highlights the need for special training and centers in areas dealing with discriminated and special group of people. Furthermore, this underlines the fact that there needs to be a focus beyond HIV and condoms for these women.

Overall 86.3% having pain due to oral problems, 68.1% had never been to a dentist and among those who had been 1.8% faced discrimination due to their professional background. Since in most of the countries, an anti-discriminatory law currently exists, literature data are not available for comparison. This implies as one of the reasons for increasing the oral disease prevalence among these women. This could lead to a negative impact on the already compromised immunological profile of the women in sex work and render them more vulnerable to rehabilitative forms rather than preventive and curative levels of prevention. Thus, a need arises for a separate policy formulation to concentrate on such key population with increased risks and assist them in whichever way possible. Overall, there was a neglect of the oral health among the women in sex work, with respect to dental visits and availing preventive treatments from time to time. An economic burden is an important factor that manipulates their attitude toward oral health and it subsequently inherited by their next generation alike.

#### CONCLUSION

The present study is the first of its kind to concentrate solely on women in sex work. The sample size of the study was 350 and women between 19 and 65 years were involved in the study. Most of these women were illiterate, and they belonged to the lower class. Since

economic constraint is a major factor, it contributes to the further deterioration of the health of these women. Less than half of the women had mucosal lesions in one or the other form. More than a quarter of the women had leukoplakia due to addictions such as chewing tobacco and pan with tobacco. Although these women wanted to quit their habits, still, peer pressure, workload, and mental stress are the barriers encountered. In the present study, more than 3/4<sup>th</sup> of the women had periodontitis. Calculus and shallow pockets (4–5 mm) were seen in more than a quarter of the women. The women in sex work are mainly spoken to about HIV and STIs. No awareness programs are conducted related to oral health. With almost all of these women requiring some or the other form of treatment, utilization of the available dental workforce with both government and public partnership could be the route. Since these women regularly undergo checkups for HIV and STIs, and even legal awareness programs, these could be joined along with oral screening and awareness programs also. Again, since women may fear going to the dentist due to fear of neglect, the fear of the treatment itself, and also the shame of revealing the professional background, it is essential that we make it imperative to treat all as potentially infectious and render unbiased treatment by following universal rules of sterilization.

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#### CONFLICTS OF INTEREST

There are no conflicts of interest.

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