

**ORAL HEALTH STATUS AND TREATMENT NEEDS OF DAIRY
WORKERS IN SALEM, TAMILNADU- A CROSS SECTIONAL STUDY**

Dissertation Submitted to

THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY

In Partial fulfillment for the Degree of

MASTER OF DENTAL SURGERY



BRANCH - VII
PUBLIC HEALTH DENTISTRY
2015-2018

CERTIFICATE BY THE GUIDE

This is to certify that the dissertation titled “**Oral Health Status and Treatment Needs of Dairy Workers in Salem, Tamilnadu- A Cross Sectional Study**” is a bonafide work done by **Dr. S. Santhakumari**, Postgraduate student, during the course of the study for the degree of **MASTER OF DENTAL SURGERY** in the speciality of **PUBLIC HEALTH DENTISTRY**, Vivekanandha Dental College for Women, Tiruchengode, during the period of 2015-2018.

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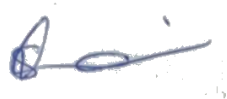
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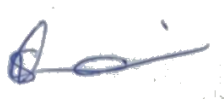
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Abstract

ABSTRACT

Aim: The present study was conducted to assess the oral health status and treatment needs of dairy plant workers of Salem District Co-operative Milk Producers Union Limited, Salem city, Tamilnadu. **Objectives:** 1) To assess the oral health status of dairy plant workers in Salem city, Tamil Nadu using modified WHO Oral Health Assessment Form-1997. 2) To assess the treatment needs of dairy plant workers in Salem city, Tamil Nadu using modified WHO Oral Health Assessment Form - 1997. 3) To gather baseline data regarding their demographic profile and oral hygiene practices. **Methodology:** A cross-sectional descriptive survey was conducted to assess the oral health status and treatment needs of 750 dairy plant workers in dairy plant, Salem, Tamilnadu. Convenient sampling technique was used to recruit the study subjects. Data was collected using World Health Organization (WHO) Oral Health Surveys – Basic Methods Proforma (1997). The collected data was subjected to statistical analysis using, Statistical Package for the Social Sciences (SPSS) software version 20. **Results:** Majority of the dairy plant workers are males 513(68.4%) and 237 (31.6%) were females. About 29.7% workers had dental fluorosis. About 25.06% workers had periodontal diseases based on CPI score 4 - 6 mm or more of pocket depth and 10% had loss of attachment. The prevalence of dental trauma was found to be 5.6%. The prevalence of dental caries among the study population was 75.2% and with the mean Decayed/ Missing / Filled Teeth (DMFT) was 5.19 ± 4.478 . Only 25 (3.3%) workers were using upper/lower partial dentures. **Conclusion:** The oral health status of dairy plant workers was poor with high prevalence of dental caries and periodontal disease. It was observed that there was a lack of awareness towards oral health which could be improved through health education and preventive measures by dental health professionals and primary health care workers for prompt and preventive measures.

Key words: Dairy plant workers, Oral health status, Treatment needs, WHO oral health Proforma, Caries prevalence.

Introduction

INTRODUCTION

Health is a prerequisite for human development and is an essential component for the well-being of the mankind. The health status of any community is influenced by the interplay of health conscience of the people, socio-cultural, environmental, demographic, economic, educational and political factors.

Oral health is a state of being free from chronic disease and disorders that affect the oral cavity. It is the port of entry for many diseases and presents several unique features that make it especially prone to occupational diseases. Occupational Health as defined by a Joint Committee of the WHO and the International Labor Organization involves the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations.¹ According to Davis (1989), the environment includes the surroundings, conditions or influences that affect an organism.² India contributes approximately 20% of global burden of occupational diseases. Occupational environment is the sum of external influences and conditions that prevail at the place of work and which also affects the health of the working populations.¹The occupational diseases are caused by a pathologic adaptation of the individual to his working environment.³ In the developing country dental caries is believed to be rapidly increasing, with the shift of ratio in the western countries due to the change in the pattern of diet.

Oral health care is a matter of continuing neglect by most people owing primarily to lack of awareness about its links with general health particularly in factory workers. Dairy factory is one such area where milk is processed and packed for daily consumption and the excess procured milk are converted into dairy products like milk cream, butter, ghee, flavored milk, milk powder, confectionary etc. Dairy technology has been defined as that branch of dairy science which deals with milk on an industrial

scale. Dairy plant has got many divisions where milk is collected, stored, processed and converted into different dairy products.

The health of workers at large will be influenced by conditions prevailing in their work place. They often go uncared due to their stressful working conditions, busy schedules, dietary habits and poor economic conditions. This population sector needs to be made aware of the ill-effects of their habits and approach towards oral health as a needful one.

Livestock farmers and workers, particularly those working on dairy farms, are at risk of various adverse health outcomes .They require further attention with regard to occupational health and safety risks.⁴ Dairy as one such occupation, workers with tasks in the milking parlor had more than five times risk of disease as compared to dairy workers with non-milking tasks, indicating that occupational risks and exposures vary greatly in the dairy industry, even with the same establishment.⁵

Dairy production is becoming increasingly concentrated and large-scale globally. The dairy industry is changing on a global scale with larger, more efficient operations. The impact of this change on worker health and safety, specifically, associations between occupational diseases and exposures, has yet to be reported in a comprehensive review in the scientific literature.⁶

Although epidemiological studies have highlighted the health conditions of industrial workers in general, oral health status in dairy workers has been sparsely reported. Hence this study is proposed to assess the oral health status and treatment needs of dairy workers in Salem city which will provide valuable information about the prevailing oral health conditions highly useful for oral health planning and to suggest suitable remedial measures.

Aim
&
Objectives

AIM:

To assess the oral health status and treatment needs of dairy plant workers of Salem District Co-operative Milk Producers Union Limited, Salem city, Tamilnadu.

OBJECTIVES:

1. To assess the oral health status of dairy plant workers in Salem city, Tamil Nadu, using modified WHO Oral Health Assessment Form 1997.
2. To assess the treatment needs of dairy plant workers in Salem city, Tamil Nadu, using modified WHO Oral Health Assessment Form 1997.
3. To gather the baseline data of dairy plant workers regarding their demographic profile and oral hygiene practices.

*Review
Of
Literature*

REVIEW OF LITERATURE

Peterson PE (1983)⁷ investigated the utilization of dental services, the distribution of dental diseases and treatment needs in a Danish industrial population. The study covered the male population at Danish shipyard and a sample of 988 workers and clerical and management staff were drawn by stratified random sampling. 841 persons were interviewed regarding dental visit and attitude towards the dental health services and the data on dental health and treatment needs were collected using WHO basic oral health survey 1977. 61% of the participants aged 15-64 years made regular dental visits at least once a year. The percentage of regular visitors varied according to age and occupation from 68 to 82% among clerical staff to 34 to 51% among workers. The mean DMFT increased from 16.6 in the age group of 15-24 years to 27 among 55-64 years age group. Untreated dental treatment was prominent among workers and persons never seeing a dentist, whereas there were more filled teeth and fewer missing teeth among staff and regular visitors. The periodontal status was less satisfactory in the older age groups and among workers. Most denture wearers were found in the age group of 35-64 years and among workers.

Maselin K, Murtomaa H et al (1990)⁸ conducted a study among the workers in the modern Finnish confectionery industry to find out the significance of airborne sugar and flour dust as an occupational hazard. The study was carried out by comparing the oral health status of workers exposed to such dust on production lines on which sweets, biscuits and other sugar containing products were made with the oral health status of workers in the same company not exposed to such dust. The study population was 700 workers in biscuit, sweet and bakery production lines in a modern Finnish confectionery factory. An internal control group was chosen from workers not

employed in production or not active in units directly associated with sugary environments. A total of 298 employees were studied. Clinical assessment was carried out using WHO criteria 1977. Dental caries were recorded using DMFS and periodontal status using CPITN. All subjects were given a questionnaire before clinical investigation for recording medical and dental examination. Highest DMFS means 73 were found in employees working in biscuit and confectionery production than controls with DMFS 60.4. Maximum CPITN sextant scores of 3 and 4 were most frequent in biscuit group. (45% had score 3 and 18% had score 4).

Petersen PE, Gormsen C (1991)⁹ conducted a study to evaluate the oral conditions among German battery factory workers. The study group consists of 61 dentate workers. At the time of investigation the concentration of airborne acids varied from 0.4 to 4.1 mg/cm³. Information about the dental health status was based on clinical observations. Dental caries was recorded as described by W.H.O. Periodontal registration included measurements of pocket depth in mm. dental erosion was measured using the criteria recommended by Ten Bruggen HJ. Dental attrition was assessed using the criteria recommended by W.H.O. Results showed that the mean DMFT was 25.5. Mean number of scored teeth with gingival pockets deeper than 5mm was 2.1. 40% of workers had crown or bridge restorations; mean number of teeth with crown restoration was 5.3. 31% of workers were affected by dental erosion and 92% by attrition.

Rekha et al (2002)¹⁰ studied 502 confectioners and found 60.36% of them exhibited higher DMFT score and periodontal diseases than the control group.

Rushabh J.D, Santhosh K, Chandrakant D, Prabhu D, and Suhas K (2008)¹¹ conducted a study among 513 green marble mine laborers to determine their oral health. The survey was carried out using WHO proforma 1997. Regular tobacco

and alcohol habits were among 40.3% and 15.8% laborers respectively. Higher prevalence (10.5%) of fracture of tooth was found among the study population. The DMFT and DMFS scores of the study population were 2.79 ± 2.44 and 5.47 ± 5.40 respectively. Only 5.2% of the 18-25 years age group had healthy gingiva. Multiple logistic regression analysis model of mean DMFT increased with increasing age, malnutrition, poor oral hygiene practice, stress and habits of tobacco and alcohol ($p < 0.01$). Multiple logistic regression analysis model for mean CPI increased with stress and alcohol habits ($p < 0.01$). The study population in the age group 26-35 years had significant higher mean difference for DMFT ($p < 0.05$). The study population in the age group 35-44 years had severe periodontal disease than all other three age groups.

Dagli R J, Kumar S, Dhanni C, Duraiswamy P and Kulkarni S (2008)¹² conducted a study to assess the dental health among green marble mine laborers in India. The study area was divided into 4 geographic zones and participants were selected by stratified cluster sampling technique. The study population was 513 workers, which were divided among the 4 age cohorts (18-25, 26-34, 35-44, 45-more respectively). Examination was carried out using WHO oral health Proforma 1997. Results showed that majority of the workers, 33.3% were in the age group of 18-24 years. 21.1% of laborers were not cleaning their teeth daily. Prevalence of fracture tooth was 10.5%. The mean DMFT and DMFS scores were 2.79 ± 2.44 and 5.47 ± 5.4 . The caries prevalence was 71.1% of all age groups with maximum in the 25-34 year group. None of the participants had filled teeth. Periodontal status among the study population shows a very high prevalence of periodontal disease. DMFT was increasing with increased age, malnutrition, poor oral hygiene practice, stress, and habits of tobacco and alcohol ($p < 0.01$). The findings highlighted the low caries prevalence, higher periodontal disease which requires primary anticipation. Prevention of tooth fracture and

improvement of overall nutritional status, with stress reduction protocol should also be given consideration.

Sakthi S S , John J, Saravanan S and Pradeep KR (2011)¹³ conducted a cross sectional study in constructions workers. Among 321 workers , 264 were males and 57 were females ,a subjects using cluster sampling methodology to assess dental caries experience and treatment needs showed that overall prevalence of dental caries among the study subjects was 63.5%. The mean decayed teeth (DT) was 1.97 ± 2.18 , missing teeth (MT) was 0.23 ± 0.75 , filled teeth (FT) was 0.03 ± 0.22 and the mean decayed, missing and filled teeth (DMFT) was 2.19 ± 2.42 . The mean DT showed a steady increase with age. Two and one surface fillings formed the majority of treatment needs, and it was found to decrease with increasing age. Need for extraction increased with increasing age and the missing component accounted for a major proportion in the oldest age group. Also the study reported the prevalence of periodontal disease among the study subjects was 95.4%. Bleeding and calculus was most frequently observed in the age groups 20 -29 years, whereas the percentage of individuals with shallow and deep pockets was greater in the age groups 35-54 years. Among the study subjects 53.6% required scaling, 23.4% required oral hygiene instructions and 18.7% required complex periodontal treatment.

Sood. M, Blaggana A, Vohra P and Saraf B (2011)¹⁴ conducted a study among 626 male ceramic factory workers to assess their periodontal status. Among the workers 28.27% had smoking habit. Among the nonsmokers, the percentage of subjects who had periodontal pockets up to 4 - 5mm were 24. 7%. Among the smokers, periodontal pocket depth of 4- 5mm was seen in 34.4% of the smokers. Four nonsmoking workers had CPI code of 0. Ten smoking workers had CPI code of 0. Total of 14 workers had CPI code of 0. Fifty two nonsmoking workers had CPI code of 1.

Thirteen smoking workers had CPI code of 0. Total of 65 workers had CPI code of 1. Three hundred and fifty two nonsmoking workers had CPI code of 2. Hundred and thirty seven smoking workers had CPI code of 2. Total of 489 workers had CPI code of 2. Twenty five nonsmoking workers had CPI code of 3. Eight smoking workers had CPI code of 3. Total of 33 \workers had CPI code of 3. Sixteen nonsmoking workers had CPI code of 4. Nine smoking workers had CPI code of 4. Total of 25 workers had CPI code of 4. The number of unrecorded sextants was approximately 3 for nonsmokers and up to 14 for smokers, suggestive of more number of missing teeth in the sextants under examination. In smokers the maxillary sextants were more involved whereas mandibular sextants were more involved in nonsmokers.

Bansal M, Veeresha K L (2013)¹⁵ conducted a study to assess the oral health status and treatment needs among factory employees in Baddi (Himachal Pradesh), India. The study was carried out among 1384 employees in 38 factories. Examination was carried out using WHO oral health Proforma 1997, WHO criteria and Pindborg's colored atlas were used for diagnosis of oro-mucosal lesions. Result showed that the mean age of the employee was 29.18 years. 84.3% (1167) were males and 15.7% (217) were females. 62.6% (866) were migrants and 37.4% (518) were resident of Himachal Pradesh. The migrant subjects mainly were from Uttar Pradesh 33.3% (288). Majority of the employees belonged to poor class 70% (969). The prevalence of lesions among males was higher than females. The prevalence of caries was found to be 18.5% of which males were 15.2% and females were 84.8%. The mean decayed filled missing teeth were 2.18 which increased with the increase in age. Females had a higher number of mean decayed teeth and missing due to caries, whereas higher number of mean teeth filled with no decay was present in males than females. Poor class exhibited more caries in comparison to upper high (1.41 and 0.6842 respectively). Need for one unit

prosthesis was required for both maxillary and mandibular arches (9.5% and 14.8% respectively). Community periodontal index score 2 was found more in males 58.4% than females 48.8%, which was significantly related to brushing frequency.

Sanadhya S, Nagarajappa R, Sharda AJ et al (2013)¹⁶ conducted a study to assess the oral health status and treatment needs among the workers of Sambhar Salts Limited at Sambhar Lake, Jaipur, India. A cross sectional, descriptive survey was conducted among 979 subjects (509 males; 470 females). An interview on the demographic and World Health Organization guidelines 1997 were used to assess the oral health status of salt workers. Result showed the mean age of the study population was 35.69 ± 9.04 . Severe fluorosis was the most prevalent (n=232; 23.7%) form of Dental fluorosis observed among the study subjects. Only 5.5% of the participants had questionable fluorosis. A significant relationship between dental fluorosis and gender was evident (p=0.001). Females had a significantly greater prevalence of dental fluorosis (71.7%) and periodontal disease (96.4%) as compared to males (p= 0.001). The mean number of healthy sextants (0.71 ± 0.09) and the mean DMFT (5.19 ± 4.11) were also significantly higher in females as compared to those in males (p=0.001). One surface filling (n= 766, 78.2%) was most prevalent treatment needs among the study population followed by pulp care and restoration (n=745, 76.1 %). and two surface filling (n=404; 41.3%). The best predictors in the descending order for the DMFTs were gender, oral hygiene practices, educational status, age and the adverse habits, with variances of 6.7%, 10.1%, 13.8%, 17.4% and 18.2% respectively. To conclude considerable percentages of salt workers have demonstrated a higher prevalence of oral diseases. Higher unmet treatment needs suggest a poor accessibility and availability of oral health care.

Ramandeep S. Gambhir et al in 2013¹⁷ studied the oral health status of transport workers and found that the Prevalence of dental caries was 63.4% and mean DMFT was 5.02. Regarding highest CPI (Community Periodontal Index) score, 8.13% of the subjects had healthy periodontium while maximum subjects (73.2%) had a score 2 (Calculus).

Sharma A et al (2014)¹⁸ conducted a cross sectional study among 90 subjects of cement factory workers, Rajasthan. The study says that the occupational diseases are caused by a pathologic adaptation of the individual to his working environment and the study done there found that 50% of the subjects had tooth wear most of the cement factory workers had dental caries and poor oral hygiene.

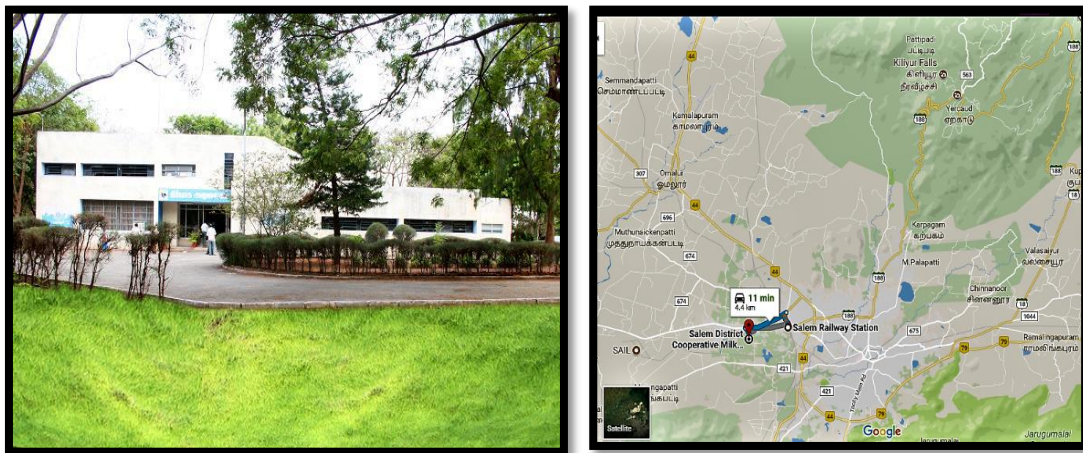
Vengal R B et al (2017)¹⁹ A descriptive study was conducted among 550 laborers of Gunj marketing yard of Raichur city. A specially designed questionnaire was used to assess the demographic variables and oral hygiene practices. Oral health status was assessed using the WHO assessment form 1997. Simplified oral hygiene index (1964) was used to assess the oral hygiene status. The mean age of the study participants was 35.1 (\pm 8.02) years and the mean decayed teeth, missing teeth, filled teeth, and decayed, missing, filled teeth was 2.06 (\pm 1.49), 0.76 (\pm 2.53), 0.13 (\pm 0.39), and 2.95 (\pm 3.02), respectively. The prevalence of dental caries and periodontal disease was 85.7% and 93.5%, respectively. The oral hygiene status was poor in 45.9% of the study participants.

Materials
&
Methods

MATERIALS AND METHODS

BRIEF PROFILE OF THE STUDY AREA AND POPULATION

Salem is a corporation town of Tamil Nadu state in South India. The prestigious Salem dairy plant is situated in about in 46 acres of land bound by Sithanur and Dhalavaipatty villages. It is located just 6 km away from Salem railway Junction on the way to Govt. Medical College and Salem Steel Plant which has around 1,500 workers working were paid on the basis of monthly salary.



The Salem District Co-op. Milk Producers' Union Ltd., has been registered on 10.07.1978 and started functioning from 07-10-1978. To begin with, the union started procuring 33,100 liters per day of milk from 227 affiliated primary milk co-operative societies. Then gradually expanded its activities and now reached a daily average procurement of more than 4.0 lakh liters per day from 1049 functional District Cooperative societies.

It is a Feeder Balancing dairy - converting surplus milk solids into products like butter, ghee and Skim milk powder. The commercial production of products viz. Butter,

Ghee and Skim Milk Powder started on 16-08-1983. All the Union activities are fully computerized. This union is specially featured with,

- Training Centre
- Progeny Testing Scheme
- Clean Milk Production at farmer level
- Aseptic packaging Station
- Milk Powder plant
- ISO9001:2000 Certification
- Export

SCHEDULE OF THE STUDY

A survey was systematically scheduled to cover estimated workers according to the convenience of the dairy plant authorities. The study was conducted from February 2016 to May 2016, among dairy workers to assess their oral health status, treatment needs in dairy Plant, Salem. A detailed schedule was prepared well in advance by informing and obtaining consent from authorities of respective dairy plant administration department.

PILOT STUDY:

A pilot study was carried out during January 2016 in the dairy Plant, Salem to determine the feasibility and practicability. Data was recorded using WHO Oral Health Assessment Proforma 1997. About 100 dairy workers whose age ranged between 18-65 years were included in the pilot study. It took an average of 15 – 20 minutes to complete the Proforma.

INCLUSION CRITERIA:

The study subjects of dairy plant workers were included on the following basis,

- ❖ The participants who were present on the day of examination
- ❖ Those who were willing to give the informed consent
- ❖ Presently working in dairy Plant in Salem city, Tamil Nadu.

EXCLUSION CRITERIA

Dairy workers who have not given consent and reluctant to participate in the study were excluded from the study.

STUDY DESIGN:

A cross sectional descriptive survey was conducted using a convenient sample of 750 dairy plant workers in dairy plant, Salem, Tamilnadu.

ETHICAL CLEARANCE AND INFORMED CONSENT:

A detailed protocol explaining the purpose and procedures of the study was submitted and approved by the Institution Review Board, Vivekanandha Dental College for Women, Tiruchengode (Annexure I & II). Permission to carry out the study was obtained from the concerned authorities of dairy Plant (Annexure III & IV). Informed consent was taken from individual study subjects of dairy plant workers prior to the examination. The subjects were explained about the purpose and procedure of the study. They were assured that their participation in the study was purely voluntary and that they can withdraw from the study at any stage. They were also informed that the data collected will be kept confidential and will be used only for research purpose. A written voluntary informed consent was then obtained from the subjects in a separate consent form prepared in English and Tamil language (Annexure V_a& V_b).

TRAINING AND CALIBRATION OF EXAMINER

The codes and criteria for the various diseases and conditions to be observed and recorded in the Proforma was used. The examiner was priorly calibrated and trained by examining and recording WHO 1997 Proforma¹ among the patients who came to the department of the Public Health Dentistry. The same subjects were examined again by other examiner for reliability of the examiner. The examiner calibration was done to ensure the uniform interpretation, understanding and application of the survey procedures by the examiner. . The intra examiner reliability was assessed by using the Cohens Kappa statistics which was found to be $\alpha = 0.86$ for Proforma.

ARMAMENTARIUM:

Examination was carried out with the help of the following instruments:

(Photograph-1)

1. Mouth mirror (Nos.20)
2. No.23 explorer (Nos.20)
3. WHO TRS 621-1978(CPI) probe
4. Sterile Gloves
5. Disposable Mouth masks
6. Disinfectants- Korsorex
7. Sterile cotton
8. Cotton holders
9. Tweezers
10. Gauze piece
11. Chip blower
12. Kidney trays

INFECTION CONTROL:

The pre sterilized instruments were properly packed and carried to the dairy plant in sufficient numbers to avoid the interruption during examination. During data collection, chemical method of disinfection and sterilization using Korsolex (Glutaraldehyde- 7gms; Polymethyl urea derivatives- 11.6 gms; 1, 6 dihydroxy 2, 5 dioxihexane - 8.2gm) diluted by adding 1 part to 9 parts portable water. Used instruments were washed and placed in the disinfectant solution (for 30 minutes), then re-washed and drained well. After each day of examination, the entire set of instruments was autoclaved.

DATA COLLECTION

PREPARATION OF THE PROFORMA:

Data for the present study was collected and recorded by cross-sectional survey by using the Survey Proforma of WHO Oral Health Assessment Form 1997 followed by clinical examination. Examiner collected the data during the convenient working hours of the study subjects (Annexure VI).

ORAL HEALTH ASSESSMENT FORM:

The WHO standard form for the oral health assessment was used to collect all the information needed for planning oral care services, thorough monitoring and reorientation of existing health care services. Standard codes were used for all sections of the form with each code were assigned for specific oral condition. There were 184 boxes in the form in which the data was entered .To minimize the number of errors, it was taken care to record all entries clearly and unambiguously.

The form included the following sections:

- Survey identification information (box number 1-15)

- General information (box number 17-28)
- Other data - dental trauma (box number 29)
- Other data - oral hygiene practices (box number 30)
- Extra – oral examination (box number 32)
- Temporomandibular joint assessment (box number 33-36)
- Oral mucosa (box number 37-42)
- Enamel opacities/hypoplasia (box number 43-52)
- Dental fluorosis (box number 53)
- CPI (community periodontal index) ;box number 54-59
- Loss of attachment; box number 60-65
- Dentition status and treatment needs (box number 66-81,98-113,114-129,146-161)
- Prosthetic status (box number 162-163)
- Prosthetic treatment need(box number (164-165)
- Dentofacial anomalies (box number 166-176)
- Need for immediate care and referral (box number 177-180)
- Notes

CLINICAL ASSESSMENT AND DATA COLLECTION:

An intra-oral examination was carried to assess the oral health status and treatment needs of dairy workers using WHO Oral Health Surveys – Basic Methods Proforma -1997. A single examiner assessed the oral health status of the study subjects using Type III oral examination as recommended by American Dental Association (ADA). The subjects were made to sit on an ordinary chair with a head rest facing natural daylight in an upright position. The examiner stood to the right of the subject while the trained data recorder was seated on the left side of the patient, so that data

recorder was able to hear the examiner's instructions and codes and also the examiner was able to see the data being entered. To ensure the accuracy each Form was checked at the end of the day by the examiner.

STATISTICAL ANALYSIS

The data obtained was subjected to statistical analysis with the consult of a statistician. A master table was prepared and data was compiled systematically. The total data was subdivided and distributed meaningfully and presented as individual tables and graphs. Statistical analysis was done using Statistical package of social sciences - SPSS version 20.0. Data comparison was done by applying specific statistical test to find out the statistical significance of comparisons. To compare the mean values between age groups one way ANOVA was applied. To compare mean values between genders independent sample student t-test was applied. To compare proportions between age groups and between genders Chi-square test was applied, if any expected cell frequency is less than five then Fisher's exact test was used. Significance level was fixed as 5% ($p \leq 0.05$). Both descriptive and inferential statistics were used.

CHI-SQUARE (χ^2) TEST:

Chi-Square (χ^2) test was used to find out the association of age and gender with oral health parameters.

t- TEST:

The t-test was used to test the significance of mean comparison of oral diseases in gender.

ANALYSIS OF VARIANCE (ANOVA)

ANOVA was used to test the significance of mean comparison of oral diseases among different age groups.

p - Value denotes level of significance:

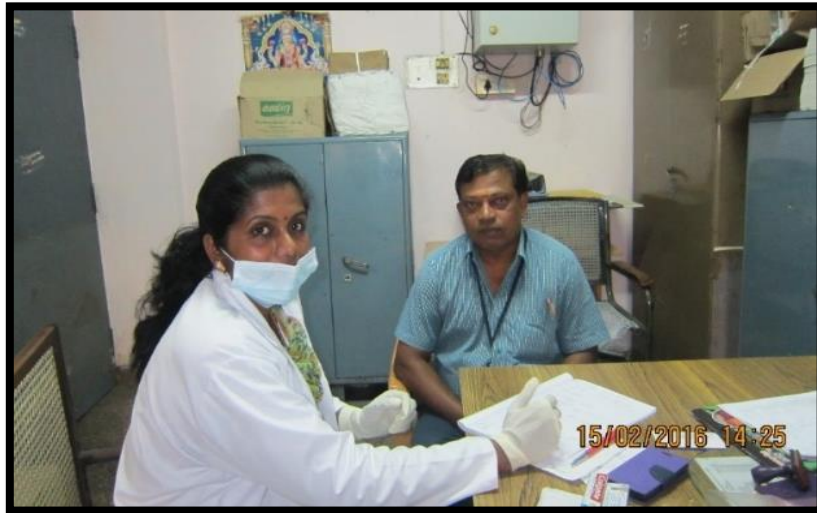
$p > 0.05$ Not significant

$p < 0.05^*$ Significant (significant at 95% confidence interval)

$p < 0.01^{**}$ Highly Significant (significant at 99% confidence interval)

$p < 0.001^{***}$ Very Highly significant (significant at 99.9% confidence interval)

Photographs



Results

RESULTS

The present study was done to assess the oral health status and treatment needs of dairy workers in Salem Dairy Plant, Salem District, Tamilnadu. The study population consisted of 750 workers, who were involved in various sectors of dairy plant work.

SOCIODEMOGRAPHIC DETAILS:

Table 1 and Graph 1 & shows the gender wise distribution of dairy workers in Salem dairy Plant. The study population consisted of 513 males (68.4%) and 237 (31.6 %) females and shows the mean age of the male dairy workers was 46.30[±10.272] years and female was 39.70 [±11.36]. Independent sample t-test is used to compare mean age.

Table 2 and Graph 2 shows age wise and gender wise distribution of dairy plant workers. Among 750 subjects, the majority of the study population 47.6 % were between 46 - 56 years, 24.5% were between 18-35 years, 16.1% were between 36-45 years, and 11.7% were between 56-65 years.

DENTAL FLUOROSIS:

Table 3 & Graph 3 shows the genderwise distribution of study population based on dental fluorosis. Among the study population of 513 males 100 (19.5%) had moderate fluorosis, 17 (3.3%) had severe fluorosis, 16 (3.1%) had mild fluorosis, 12 (2.3%) had very mild fluorosis, 13 (2.5%) had questionable fluorosis and remaining 351 (68.4%) were normal. Among the study population of 237 females 40 (16.9%) had moderate fluorosis, 6 (2.5%) had severe fluorosis, 12 (5.1%) had mild fluorosis, 7(3.0%) had questionable fluorosis and remaining 168 (70.9%) were normal. Statistical test shows no significant difference between dental fluorosis and gender. ($\chi^2=10.541$; $p = 0.095$).

PERIODONTAL STATUS

Table 4 shows the age wise & genderwise distribution (Graph 4a & Graph 4b) of study population based on CPI Index. Among the total study population of 750, subjects of 184 were in the age group of 18-35 years had 59(32.06%) of healthy periodontium, 12(6.52%) had bleeding gums, 76(41.30%) had calculus, 25(13.58%) had Pocket 4-5mm, 12(6.52%) had periodontal pocket of 6mm or more.

Among the age group of 36 - 45 years, subjects of 121, 19(15.70%) had healthy periodontium, 5(4.13%) had bleeding gums, 74(61.15%) had calculus, 11(9.09%) had Pocket 4-5mm, 12(9.91%) had periodontal pocket 6mm or more. Among the age group of 46 - 55 years, 357 subjects 42(11.76%) had healthy periodontium, 213(59.6%) had calculus, 61(17.08%) had Pocket 4-5mm, 41(11.48%) had periodontal pocket 6mm or more. Among the age group of 56 - 65 years, 88 subjects 8 (9.09%) had healthy periodontium, 4(4.54%) had bleeding, 50(56.8%) had calculus, 13(14.7%) had periodontal pocket 4-5mm, 13(14.7%) had periodontal pocket of 6mm or more.

Genderwise distribution of CPI Index among the total subjects of 513(68.4%) males, 76(14.81%) had healthy periodontium, 13(2.53%) had bleeding, 282(54.97%) had calculus, 91(17.73%) had periodontal pocket 4-5mm, 51(9.94%) had periodontal pocket of 6mm or more.

Among the total subjects of 237(31.6%) females, 52(21.94) had healthy periodontium, 8(3.37) had bleeding, 131(55.27) calculus, 19(8.01) had periodontal pocket of 4-5mm, 27(11.39) had Pocket 6mm or more. The ANOVA test results indicated that, based on age group and gender there was a statistically significant difference was found with periodontal status (ANOVA: 229.802 $p < 0.001$).

Table 5 shows age wise and genderwise distribution of study population based on mean number of sextant affected by periodontal disease. The table shows

that the mean number of sextants affected by periodontal disease were increasing with increase in age. It also shows that the mean number of sextant with calculus was greater than other three periodontal indicators (3.45 ± 2.078). Based on genderwise distribution the mean number of bleeding sextant were 0.974 ± 0.57 , calculus were 3.03 ± 2.212 , periodontal pocket of 4-5mm were 1.299 ± 0.47 , periodontal pocket of 6mm or more were 1.026 ± 0.28 and healthy were 2.297 ± 1.64 . Based on age group showed statistical significance ($p < 0.001$). Based on gender wise distribution there is statistically significant difference between pocket 4-5mm and gender < 0.001 .

LOSS OF ATTACHMENT

Table 6 and Graph 5 shows age wise & genderwise distribution of loss of attachment among 750 subjects, in the age group between 18 - 35 years, 173(94.02%) had 0 - 3mm of LOA, 3(1.63%) had 4 - 5mm of LOA, 8(4.34%) had 9 - 11mm of LOA. In the 36 - 45 years, 107(88.42%) had 0 - 3mm of LOA, 2(1.65%) had 4 - 5mm of LOA, 12(9.91%) had 9 - 11mm of LOA. In the 46 - 56 years, 317(88.79%) had 0 - 3mm of LOA, 12(3.36%) had 4 - 5mm of LOA, 28(7.84%) had 9 - 11mm of LOA. In the 56 - 65 years, 75(85.22%) had 0 - 3mm of LOA, 13(14.77%) had 9 - 11mm of LOA and none had a score of 4 (12mm of loss of attachment). Based on genderwise distribution, 513 (68.4%) of male showed 461(89.86%) of 0 - 3mm of LOA, 16(3.11%) had 4 - 5mm of LOA, 36(7.01%) had 9 - 11mm of LOA. Among 237(31.6%) of female population, 211(89.02%) had 0 - 3mm of LOA, 1(0.42%) had 4 - 5mm of LOA, 25(10.54%) had 9 - 11mm of LOA. Statistical significance was found between LOA based on age group and gender.

Table 7 shows age wise & genderwise distribution of mean number of sextant affected by loss of attachment. Study subjects in the age group 18- 35 years had mean number with 0-3mm of loss of attachment was 5.81 ± 0.824 , with 4-5mm of

loss of attachment was 0.192 ± 0.04 and with 9-11mm was 0.723 ± 0.15 . Age group between 36 -45 years had mean number with 0-3mm of loss of attachment was 5.57 ± 1.359 , with 4 -5mm was 0.128 ± 0.02 , with 9-11 mm was 1.358 ± 0.41 . Age group between 46 - 56 years had mean number with 0-3 mm of loss of attachment was 5.64 ± 1.187 , with 4 -5 mm was 0.617 ± 0.11 , with 9-11mm was 0.997 ± 0.24 . Age group between 56 - 65 years had mean number with 0-3mm of loss of attachment was 5.66 ± 1.144 , with 9-11mm was 1.144 ± 0.34 . Among the study subjects, mean number based on gender distribution male with 0-3mm was 5.71 ± 1.075 , with 4-5mm was 0.523 ± 0.09 , and with 9-11mm was 0.924 ± 0.20 . Among the gender distribution the mean number in female with 0-3mm was 5.59 ± 1.257 , with 4-5mm was 0.144 ± 0.02 , and with 9-11mm was 1.214 ± 0.38 .

DENTITION STATUS:

Table 8 & Graph 6 shows the genderwise distribution of study population based on dentition status. Among the subjects of 539(71.9%) about 358 (69.8%) males and 181 (76.4%) females had decayed teeth. Only 25 (3.3%) of dairy workers had filled teeth among which 11(2.1%) and 14(5.9%) were male and female respectively. Among 75 (10%) subjects 39 (7.6%) and 36 (15.2%) were male and female had filled teeth without decay. Among 251 (33.5%) subjects 166 (32.4%) males and 85 (35.9%) females had teeth missing due to caries. Among 364 (48.5%) workers 230 (44.8%) males and 134 (56.5%) females had teeth missing due to reason other than dental caries. Among 27 (3.6%) subjects 15 (2.9%) male and 12(5.1%) females had Bridge abutment/crown/ veneer/ implant respectively. Among 11 (1.5%) subjects, 5 (1%) male and 6 (2.5%) female had unerupted teeth.

DISTRIBUTION OF DECAYED TEETH

Table 9 & Graph 7 shows the age wise distribution of decayed teeth. Age group of 46-56 years showed the highest prevalence of decayed teeth 255(71.4%) followed by the age group 18-35 years showed 134(72.8%), 36 - 45 years showed 96(79.3%) and 56 - 65 years showed 54(61.4%).Results shows that there is no statistical significance between age and decayed teeth among the dairy workers .

Table 10 reveals age wise & genderwise mean distribution of decayed teeth, filled teeth , missing teeth and mean DMFT according to age group and gender. Mean dental caries experiences were increasing with increase in age. Mean DMFT was seen highest (6.19 ± 5.585) in 36-45 years age groups. Mean DMFT was 5.99 ± 4.349 in female as compared to 4.82 ± 4.493 in male. Among the study subjects highest mean number of filled teeth showed 1.309 ± 0.32 and highest mean number of missing teeth showed 5.006 ± 3.14 in the age group of 56-65 years. Total mean DT was 2.72 , mean MT was 2.32 , mean FT was 1.07 and total mean DMFT was 4.82 ± 4.493 in male and 5.99 ± 4.349 in female .Overall mean DMFT was 5.19 ± 4.478 . Mean dental caries experiences shows highly statistical significant difference between age group ($p < 0.001$) in relation to DT, MT. Based on total mean DMFT, gender and DT showed highly statistical significance. .

TREATMENT NEEDS:

Table 11 shows the genderwise distribution of the dairy workers based on their treatment needs. Graph 8 describes the distribution of study population based on treatment needs.

Majority of the study population of 400 (53.3%) of dairy workers among which 264 (51.5%) were males and 136 (57.4%) were females needed one surface restoration. Among 120(16.0%) subjects, males 83(16.2%) and 37(15.6%) females needed two

surface restoration. About 55(7.3%) of workers 34 (6.6%) male& female 21(8.9%) needed crown for any reason. Only 5 (0.7%) of study subjects needed Veneer/laminates. Total of 82(10.9 %) subjects 53 (10.3%) male workers and 29 (12.2%) female workers needed Pulp care treatment. Among 348(46.4%) subjects 239 (46.6%) male and 109 (46%) female are indicated for extraction. Among 271 (36.1%) workers male 175(34.1%) & female 96(40.5%) are need for other care.

Table 12 reveals age wise and genderwise distribution of mean number of overall treatment needs of the study. Overall one surface filling, two surface filling, crown for any reason, pulp care , restorations & extractions were most frequent treatment need. Among the age group distribution mean number of 2.359 ± 2.09 one surface restoration was needed high in the age group 18-35 years, two surface restoration of 0.811 ± 0.29 among 36 - 45 years, crown for any reason 0.967 ± 0.23 among 18-35 years, pulp care & restoration 1.097 ± 0.38 among 56 - 65 years and extraction 5.089 ± 2.08 among 36 - 45 years. Overall mean treatment needs shows statistical significance between age group and one surface restoration as well as the teeth extraction (<0.001 and 0.007).

In genderwise distribution of mean number of treatment needs, male had 1.902 ± 1.33 one surface restoration need, 0.641 ± 0.25 had two surface restoration need, 0.923 ± 0.18 had the need for crown, 0.679 ± 0.18 had pulp care & restoration need and 2.422 ± 1.25 had the need of extraction. In females 2.116 ± 1.67 had one surface restoration need, 0.795 ± 0.30 had two surface restoration need, 0.603 ± 0.16 had the need for crown, 1.637 ± 0.39 had pulp care & restoration need, 3.567 ± 1.49 had the need of extraction. When compared genderwise distribution of treatment needs female needed more one surface filling than males.

PROSTHETIC STATUS

Table 13 reveals the distribution of prosthetic status in upper and lower arch according to age group and gender. Graph 9 reveals the genderwise distribution of upper prosthetic status. Among male 487(94.9%) did not had any prosthesis as compared to female 213(89.9%). Only 16 (3.1%) and 8 (3.4%) had partial denture in male and female respectively. About 6 (1.2%) male and 7(3.0%) female had prosthetic bridge.

Graph 10 shows age wise distribution of upper prosthetic status. Among 18-35 years age group 175(23.33%) did not had any prosthesis, 1(0.1%) had bridge, 7(0.93%) had more than one bridge, 1(0.1%) had partial denture. Among 36-45 years age group 119(15.86%) did not had any prosthesis, 3(0.4%) had bridge. Among 46 - 56 years age group 324(43.26%) did not had any prosthesis, 8 (0.16%) had bridge, 6(0.8%) had more than one bridge, 18(2.4%) had partial denture. Among 56 - 65 years age group 83(11.06%) did not had any prosthesis, 5(0.7%) had partial denture.

Graph 11 shows age wise distribution of lower prosthetic status, in which 18- 35 years age group of 177(23.6%) did not had any prosthesis, 3(0.4%) had bridge, 4(0.53%) had more than one bridge. Among 36-45 years age group 123(16.4%) did not had any prosthesis, 1(0.1%) had bridge. In the age group of 46 - 56 years 338(45.06%) subjects did not had any prosthesis, 10(1.22%) had bridge. Among 56 - 65 years age group 85(11.8%) did not had any prosthesis, 2(0.26%) had bridge, 1(0.1%) had partial denture.

Graph 12 shows genderwise distribution of lower prosthetic status. Male subjects of 502(98.1%) did not had any prosthesis as compared to female 221(92.9%). Only 8 (3.4%) in female had more than one bridge. Male 9 (1.7%) and female 9 (3.7%) had bridge in lower arch. None of the age group between 36-45 years and 46- 56 years

had partial denture. Statistical significance difference present between gender and lower arch ($p=0.001$). Based on upper and lower prosthetic status statistical significance was found in relation to gender.

UPPER PROSTHETIC NEEDS:

Table 14 reveals age wise and genderwise distribution of upper & lower arch prosthetic needs.

Graph 13a and 13b describes the age wise and genderwise distribution of upper prosthetic needs. In the age group of 18- 35 years, 135(18.0%) no prosthesis was needed, 5(0.7%) needed one unit prosthesis, 2(0.26%) needed multi-unit prosthesis, 37(4.93%) needed a combination of prosthesis and 5(0.7%) needed full prosthesis.

Among the age group distribution between 36-45 years, 82(10.9%) needed no prosthesis, 7(0.93%) needed one unit prosthesis, 25(3.33%) needed a combination of prosthesis and 7(0.93%) needed full prosthesis.

Among the age group distribution, 46-56 years 221(29.4%) no prosthesis was needed, 10(1.3%) needed one unit prosthesis, 2(0.26%) needed multi-unit prosthesis, 114(15.2%) needed a combination of prosthesis and 10(1.3%) needed full prosthesis.

Among the age group distribution of 56-65 years, 37(4.9%) needed no prosthesis, 11(1.46%) needed one unit prosthesis, 37(4.93%) needed a combination of prosthesis and 3(0.4%) needed full prosthesis.

Based on genderwise distribution, 333(64.9%) of male do not need any prosthesis, 18(3.5%) needed one unit prosthesis, 3(0.6%) needed multi-unit prosthesis, 144(28.1%) needed for a combination and 15(2.9%) needed full prosthesis.

Among the female distribution 141(59.5%) subjects do not need any prosthesis, 15(6.3%) needed one unit prosthesis, 1(0.4%) needed multi-unit prosthesis, 69(29.1%)

needed for a combination and 11(4.6%) needed full prosthesis. Results shows statistical significance between age and upper prosthetic needs with p– value less than 0.001.

LOWER PROSTHETIC NEEDS:

Table 14, Graph 14a & Graph 14b shows in the lower arch based on the age group distribution, 18-35 years 152(20.26%) no prosthesis needed, 4(0.53%) needed one unit prosthesis, 25(3.33%) needed a combination of prosthesis and 5(0.7) needed full prosthesis.

Among the age group distribution of 36-45 years, 89(11.86%) no prosthesis needed, 1(0.13%) needed one unit prosthesis, 26(3.46%) needed a combination of prosthesis and 7(0.93%) needed full prosthesis.

Among the age group distribution, 46-56 years 252(33.6%) no prosthesis needed, 7(0.93%) needed one unit prosthesis, 3(0.4%) needed multi-unit prosthesis, 83(11.06%) needed a combination of prosthesis and 8(1.06%) needed full prosthesis.

Among the age group distribution of 56-65 years, 38(5.1%) no prosthesis needed, 3(0.4%) needed one unit prosthesis, 1(0.15%) needed multi-unit prosthesis, 43(5.73%) needed a combination of prosthesis and 3(0.4%) needed full prosthesis.

Based on genderwise distribution 367(71.5%) males do not need any prosthesis, 13(2.6%) needed one unit prosthesis, 4(0.8%) needed for multi-unit prosthesis, 116(22.6%) needed a combination prosthesis and 13(2.5%) needed full prosthesis.

Among females, 162(68.4%) do not need any prosthesis, 2(0.8%) needed one unit prosthesis, 62(26.2%) needed combination prosthesis and 11(4.6%) needed full prosthesis. Based on prosthetic needs of lower arch present study showed statistically significant ($p < 0.001$) with age.

DENTAL TRAUMA

Table 15, Graph 15a & Graph 15b shows age wise & genderwise distribution of dental trauma based on severity. Based on Ellis classification, age wise distribution shows among the total study population of 750 subjects, 184 were in the age group of 18- 35 years in which 173(94.02%) had no sign of injury, 7(3.8%) had enamel fracture only, and 4(2.17%) had other damages.

Among 121 (16.1%) subjects in the age group of 36 - 45 years, 114 (94.1%) had no sign of injury, 3(2.24%) had enamel fracture only, 2(1.53%) had enamel & dentine fracture, 2(1.53%) had pulp involvement and 1(0.6) had other damages.

Among 357(47.6%) subjects in the age group of 46 - 56 years, subjects 333(93.49%) had no sign of injury, 16(4.68%) had enamel fracture only, 1(0.32%) had enamel & dentine fracture, 1(0.32%) had missing tooth due to trauma and 4 (1.15%) had other damages.

Among 88(11.7%) subjects under the age group of 56 - 65 years, subjects 73(81.92%) had no sign of injury, 4(4.51%) had treated injury, 11(12.3%) enamel fracture only and 1(1.17%) had enamel & dentine fracture. The table shows statistically difference between age and dental trauma. ($p < 0.001$).

The genderwise distribution shows 513(68.4%) were males, in which 467 (91.03%) had no sign of dental injury, 4(0.77%) had treated dental injury, 26(5.06%) had enamel fracture only, 4(0.77%) had enamel & dentine fracture, 2(0.38%) had pulp involvement, 1(0.195%) had missing tooth due to trauma and 9(1.75%) had other damages. Among females only 11(4.64%) subjects had enamel fracture remaining 226 (95.36%) subjects had no sign of dental injury.

ORAL HYGIENE PRACTICES

Table 16 shows genderwise distribution of study population based on the oral hygiene materials they used for brushing their teeth. Majority of the study population of about 509 (67.9%) were using tooth brush and tooth paste for brushing their teeth among which 343 (66.9%) and 166 (70%) were male and female respectively. About 66 (8.8%) subjects were using toothbrush and tooth powder among which 49(9.6%) were males and 17 (7.2%) were females. Subjects of 35(4.7%) were using finger and paste to clean their teeth of which 29(5.7%) were males and 6 (2.5%) were females. Subjects of 40(5.3%) were using finger and powder to clean their teeth of which 25 (4.9%) were males and 15 (6.3%) were females. About 13.3% of subjects were using charcoal, salt, brick powder, neem stick as their other tooth cleaning materials among which 513 (13.1%) were males and 33(13.9%) were females.

Table 17 shows the genderwise distribution of study subjects based on methods, frequency and time of brushing. Majority of the study subjects of about 694(92.5%) were used horizontal method of cleaning, 46(6.1%) used vertical method, 8(1.1%) used circular method and 29(0.3%).

The study showed about 748(99.7%) of dairy workers brushed their teeth once a daily and only 2(0.3%) brushed twice daily.

Based on time of brushing, 748(99.7%) subjects brushed before meals and only 2 (0.3%) subjects brushed after meals.

Among the total population almost 733 (97.7%) subjects not used any oral hygiene aids other than the tooth brush and tooth paste. Only 15(2%) and 2 (0.3%) of subjects used tooth pick as their other oral hygiene aids.

Table 1: Genderwise distribution of study population

Gender	N (%)	Mean & Std. Deviation	t-Value	p-Value
Male	513 (68.4)	46.30 ± 10.272	7.616	< 0.001***
Female	237 (31.6)	39.70 ± 11.363		
Total	750 (100.0)			

Table 2: Age wise and genderwise distribution of study population

Age in years	Gender			Chi-Square test value	p-Value
	Male	Female	Total		
	N (%)	N (%)	N (%)		
18- 35	87 (17)	97(40.9)	184(24.5)	91.661	< 0.001***
36 - 45	62(12.1)	59(24.9)	121(16.1)		
46 - 55	294(57.3)	63(26.6)	357(47.6)		
56 - 65	70 (13.6)	18(7.6)	88(11.7)		
Total	513 (100)	237(100)	750(100)		

Table 3: Genderwise distribution of study population based on dental fluorosis

Dental Fluorosis	Gender			Chi-Square Test	p-Value
	Male	Female	Total	Fisher's Exact Test	
	N (%)	N (%)	N (%)		
Normal	355 (69.2)	172 (72.5)	527 (70.2)	10.541	0.095
Questionable	13 (2.5)	7 (3.0)	20 (2.7)		
Very Mild	12 (2.3)	0 (.0)	12 (1.6)		
Mild	16 (3.1)	12 (5.1)	28 (3.7)		
Moderate	100 (19.5)	40 (16.9)	140 (18.7)		
Severe	17 (3.3)	6 (2.5)	23 (3.1)		
Total	513 (100.0)	237 (100.0)	750 (100.0)		

Table 4: Age wise & genderwise distribution of study population based on CPI Index

		Healthy	Bleeding	Calculus	Pocket 4-5mm	Pocket 6mm or more	Total	p-Value
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
Age group in years	18 - 35	59 (32.06)	12 (6.52)	76 (41.30)	25 (13.58)	12 (6.52)	184 (24.5)	<0.001***
	36 - 45	19 (15.70)	5 (4.13)	74 (61.15)	11 (9.09)	12 (9.91)	121 (16.0)	
	46 - 55	42 (11.76)	0	213 (59.6)	61 (17.08)	41 (11.48)	357 (47.6)	
	56 - 65	8 (9.09)	4 (4.54)	50 (56.8)	13 (14.7)	13 (14.7)	88 (11.7)	
Gender	Male	76 (14.81)	13 (2.53)	282 (54.97)	91 (17.73)	51 (9.94)	513 (68.4)	0.003**
	Female	52 (21.94)	8 (3.37)	131 (55.27)	19 (8.01)	27 (11.39)	237 (31.6)	

Table 5: Age wise & genderwise distribution of mean number of sextant affected by periodontal disease

		CPI - Healthy	CPI - Bleeding	CPI - Calculus	CPI - Pocket 4-5mm	CPI - Pocket 6mm or more
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age group in years	18-35	2.69 ± 1.695	0.999±0.58	2.281±2.19	1.229±0.36	0.708±0.17
	36 - 45	2.341 ± 1.69	0.971±0.66	2.987±2.28	0.964±0.26	1.358±0.41
	46 - 56	1.946±1.17	0.956±0.52	3.38±2.064	1.499±0.64	1.001±0.29
	56 - 65	1.931±1.30	1.000±0.60	3.45±2.078	0.793±0.31	1.144±0.34
	p-Value	<0.001***	0.556	<0.001***	0.008**	0.210
Gender	Male	2.199±1.51	0.957±0.55	3.12±2.164	1.412±0.58	0.930±0.24
	Female	2.479±1.92	1.010±0.61	2.84±2.304	0.974±0.24	1.204±0.39
	Total	2.297±1.64	0.974±0.57	3.03±2.212	1.299±0.47	1.026±0.28
	p-Value	0.034*	0.449	0.122	<0.001***	0.086

Table 6: Age wise & genderwise distribution of study population based on loss of attachment

		Loss of Attachment				p value
		0 - 3mm	4 - 5mm	9 - 11mm	Total	
		N (%)	N (%)	N (%)	N (%)	
Age group in years	18-35	173(94.02)	3(1.63)	8(4.34)	184(24.5)	0.035*
	36 - 45	107(88.42)	2(1.65)	12(9.91)	121(16.1)	
	46 - 55	317(88.79)	12(3.36)	28(7.84)	357(47.6)	
	56 - 65	75(85.22)	0	13(14.77)	88(11.7)	
Gender	Male	461(89.86)	16(3.11%)	36(7.01)	513(68.4)	0.021*
	Female	211(89.02)	1(0.42)	25(10.54)	237(31.6)	

Table 7: Age wise & genderwise distribution of mean number of sextant affected by Loss of Attachment

		Loss of Attachment		
		0-3mm	4-5mm	9-11mm
		Mean ± SD	Mean ± SD	Mean ± SD
Age group in years	18-35	5.81±0.824	0.192±0.04	0.723±0.15
	36 - 45	5.57±1.359	0.128±0.02	1.358±0.41
	46 - 55	5.64±1.187	0.617±0.11	0.997±0.24
	56 - 65	5.66±1.144	0.00	1.144±0.34
	p-Value	0.273	0.043*	0.147
Gender	Male	5.71±1.075	0.523±0.09	0.924±0.20
	Female	5.59±1.257	0.144±0.02	1.214±0.38
	Total	5.67±1.136	0.441±0.07	1.027±0.26
	p-Value	0.218	0.010**	0.042*

Table 8: Genderwise distribution of study population based on dentition status

Dentition Status		Gender		
		Male	Female	Total
		N (%)	N (%)	N (%)
Decayed	Present	358(69.8)	181(76.4)	539(71.9)
	No	155(30.2)	56(23.6)	211(28.1)
	Total	513(100.0)	237(100.0)	750(100.0)
Filled with Decay	Yes	11(2.1)	14(5.9)	25(3.3)
	No	502(97.9)	223(94.1)	725(96.7)
	Total	513(100.0)	237(100.0)	750(100.0)
Filled without Decay	Yes	39(7.6)	36(15.2)	75(10.0)
	No	474(92.4)	201(84.8)	675(90.0)
	Total	513(100.0)	237(100.0)	750(100.0)
Missing due to caries	Yes	166(32.4)	85(35.9)	251(33.5)
	No	347(67.6)	152(64.1)	499(66.5)
	Total	513(100.0)	237(100.0)	750(100.0)
Missing other reason	Yes	230(44.8)	134(56.5)	364(48.5)
	No	283(55.2)	103(43.5)	386(51.5)
	Total	513(100.0)	237(100.0)	750(100.0)
Bridge abutment/ crown/veneer/implant	Yes	15(2.9)	12(5.1)	27(3.6)
	No	498(97.1)	225(94.9)	723(96.4)
	Total	513(100.0)	237(100.0)	750(100.0)
Un-erupted tooth	Yes	5(1.0)	6(2.5)	11(1.5)
	No	508(99.0)	231(97.5)	739(98.5)
	Total	513(100.0)	237(100.0)	750(100.0)

Table 9: Age wise distribution of decayed teeth

Age group in years	Decayed Teeth			Pearson Chi-Square Test	p-Value
	Present	Absent	Total		
	N (%)	N (%)	N (%)		
18- 35	134(72.8)	50(27.2)	184(100.0)	8.260	0.041*
36 - 45	96(79.3)	25(20.7)	121(100.0)		
46 - 55	255(71.4)	102(28.6)	357(100.0)		
56 - 65	54(61.4)	34(38.6)	88(100.0)		
Total	539(71.9)	211(28.1)	750(100.0)		

Table 10: Age wise & genderwise mean distribution of decayed, missing, and filled teeth

		DT (Decayed Teeth)	MT (Missing Teeth)	FT (Filled Teeth)	DMFT
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age group in years	18- 35	3.00±2.95	1.65±2.104	0.430±0.11	4.71±3.367
	36 - 45	3.763±3.71	2.23±2.774	0.767±0.25	6.19±5.585
	46 - 55	2.881±2.43	2.26±2.778	1.212±0.39	5.09±4.346
	56 - 65	1.989±1.80	5.006±3.14	1.309±0.32	5.25±5.156
	p-Value	<0.001***	0.002**	0.020*	0.038*
Gender	Male	2.934±2.48	3.225±2.12	0.983±0.23	4.82±4.493
	Female	3.187±3.15	2.483±2.41	1.101±0.43	5.99±4.349
	Total	3.030±2.69	3.012±2.21	1.025±0.29	5.19±4.478
	p-Value	0.006**	0.214	0.016**	0.001***

Table 11: Genderwise distribution of study population based on treatment needs

Treatment needs		Gender		
		Male	Female	Total
		N (%)	N (%)	N (%)
One surface restoration	Yes	264(51.5)	136(57.4)	400(53.3)
	No	249(48.5)	101(42.6)	350(46.7)
	Total	513(100.0)	237(100.0)	750(100.0)
Two surface restoration	Yes	83(16.2)	37(15.6)	120(16.0)
	No	430(83.8)	200(84.4)	630(84.0)
	Total	513(100.0)	237(100.0)	750(100.0)
Crown for any reason	Yes	34(6.6)	21(8.9)	55(7.30)
	No	479(93.4)	216(91.10)	695(92.7)
	Total	513(100.0)	237(100.0)	750(100.0)
Veneer/laminates	Yes	3(0.6)	2(0.8)	5(0.7)
	No	510(99.4)	235(99.2)	745(99.3)
	Total	513(100.0)	237(100.0)	750(100.0)
Pulp care	Yes	53(10.3)	29(12.20)	82(10.9)
	No	460(89.7)	208(87.8)	668(89.10)
	Total	513(100.0)	237(100.0)	750(100.0)
Extraction	Yes	239(46.6)	109(46.00)	348(46.4)
	No	274(53.4)	128(54.0)	402(53.6)
	Total	513(100.0)	237(100.0)	750(100.00)
Need for other care	Yes	175(34.1)	96(40.5)	271(36.1)
	No	338(65.9)	141(59.50)	479(63.9)
	Total	513(100.0)	237(100.0)	750(100.0)

Table 12: Age wise and genderwise distribution of mean treatment needs of the study population

		One surface restoration	Two surface restoration	Crown for any reason	Pulp care & restoration	Extraction
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age group in years	18-35	2.359±2.09	0.631±0.20	0.967±0.23	1.204±0.24	1.712±0.95
	36 - 45	2.277± 1.91	0.811±0.29	0.894± 0.21	0.572±0.15	5.089±2.08
	46 - 55	1.473±1.01	0.687± 0.29	0.836±0.16	1.141±0.25	2.375±1.29
	56 - 65	1.968±1.15	0.665±0.25	0.233±0.06	1.097±0.38	1.758±1.22
	p-Value	<0.001***	0.448	0.404	0.523	0.007**
Gender	Male	1.902±1.33	0.641±0.25	0.923±0.18	0.679± 0.18	2.422±1.25
	Female	2.116±1.67	0.795±0.30	0.603±0.16	1.637± 0.39	3.567± 1.49
	Total	1.977±1.44	0.693±0.26	0.835±0.17	1.081±0.25	2.834±1.33
	p-Value	0.038**	0.400	0.750	0.062	0.336

Table 13: Age wise & Gender wise distribution of upper & lower arch prosthetic status

		Prosthetic status							
		Prosthetic status upper				Prosthetic status lower			
		No prostheses	Bridge	More than one bridge	Partial denture	No prosthesis	Bridge	More than one bridge	Partial denture
		N(%)	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)
Age Group (Years)	18-35	175 (23.33)	1 (0.1)	7 (0.93)	1 (0.1)	177 (23.6)	3 (0.4)	4 (0.53)	0
	36 - 45	119 (15.86)	3 (0.4)	0	0	123 (16.4)	1 (0.1)	0	0
	46 - 55	324 (43.26)	8 (1.06)	6 (0.8)	18 (2.4)	338 (45.06)	10 (1.22)	4 (0.53)	0
	56 - 65	83 (11.06)	0	0	5 (0.7)	85 (11.8)	2 (0.26)	0	1 (0.1)
	p-value	0.002**				0.184			
Gender	Male	487 (94.9)	6 (1.2)	4 (0.8)	16 (3.1)	502 (98.1)	9 (1.7)	0	1 (0.2)
	Female	213 (89.9)	7 (3.0)	9 (3.8)	8 (3.4)	221 (92.9)	9 (3.7)	8 (3.4)	0
	p-value	0.007**				<0.001***			

Table 14: Age wise and genderwise distribution of upper & lower arch prosthetic needs

		Prosthetic needs									
		Upper Prosthetic needs					Lower Prosthetic needs				
		No prosthesis needed	Need for one unit prosthesis	Need for multi-unit prosthesis	Need for a combination	Need for full prosthesis	No prosthesis needed	Need for one unit prosthesis	Need for multi-unit prosthesis	Need for a combination	Need for full prosthesis
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Age Group (Years)	18-35	135 (18)	5 (0.7)	2 (0.26)	37 (4.93)	5 (0.7)	152 (20.26)	4 (0.53)	0	25 (3.33)	5 (0.7)
	36-45	82 (10.9)	7 (0.93)	0	25 (3.33)	7 (0.93)	89 (11.86)	1 (0.13)	0	26 (3.46)	7 (0.93)
	46-55	221 (29.4)	10 (1.3)	2 (0.26)	114 (15.2)	10 (1.3)	252 (33.6)	7 (0.93)	3 (0.4)	83 (11.06)	8 (1.06)
	56-65	37 (4.9)	11 (1.46)	0	37 (4.93)	3 (0.4)	38 (5.1)	3 (0.4)	1 (0.15)	43 (5.73)	3 (0.4)
	p-value	<0.001***					<0.001***				
Gender	Male	333 (64.9)	18 (3.5)	3 (0.6)	144 (28.1)	15 (2.9)	367 (71.5)	13 (2.6)	4 (0.8)	116 (22.6)	13 (2.5)
	Female	141 (59.5)	15 (6.3)	1 (0.4)	69 (29.1)	11 (4.6)	162 (68.4)	2 (0.8)	0	62 (26.2)	11 (4.6)
	p-value	0.258					0.159				

Table 15: Age wise & genderwise distribution of dental trauma based on severity

		Severity of Dental Trauma								p-Value
		No sign of injury	Treated injury	Enamel fracture only	Enamel & entire fracture	Pulp involvement	Missing tooth due to trauma	Other damage	Total	
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
Age group in years	18-35	173 (94.02)	0	7 (3.8)	0	0	0	4 (2.17)	184 (24.5)	<0.001***
	36 - 45	114 (94.1)	0	3 (2.24)	2 (1.53)	2 (1.53)	0	1 (0.6)	121 (16.1)	
	46 - 55	333 (93.49)	0	16 (4.68)	1 (0.32)	0	1 (0.32)	4 (1.15)	357 (47.6)	
	56 - 65	73 (81.92)	4 (4.51)	11 (12.3)	1 (1.17)	0	0	0	88 (11.7)	
Gender	Male	467 (91.03)	4 (0.77)	26 (5.06)	4 (0.77)	2 (0.38)	1 (0.19)	9 (1.75)	513 (68.4)	0.156
	Female	226 (95.36)	0	11 (4.64)	0	0	0	0	237 (31.6)	
	Total	693	4	37	4	2	1	9	750	

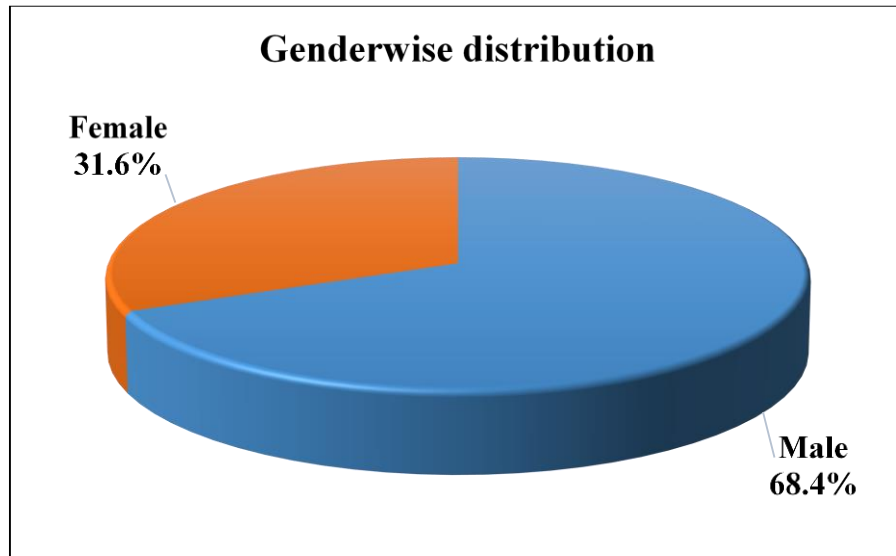
Table 16: Genderwise distribution of the study population based on oral hygiene materials

Oral hygiene materials	Gender		
	Male	Female	Total
	N (%)	N (%)	N (%)
Tooth brush + Tooth paste	343 (66.9)	166 (70.0)	509 (67.9)
Tooth brush + Tooth powder	49 (9.6)	17 (7.2)	66 (8.8)
Finger + Tooth paste	29 (5.7)	6 (2.5)	35 (4.7)
Finger + Tooth powder	25 (4.9)	15 (6.3)	40 (5.3)
Others	67 (13.1)	33 (13.9)	100 (13.3)
Total	513 (100)	237 (100)	750 (100)

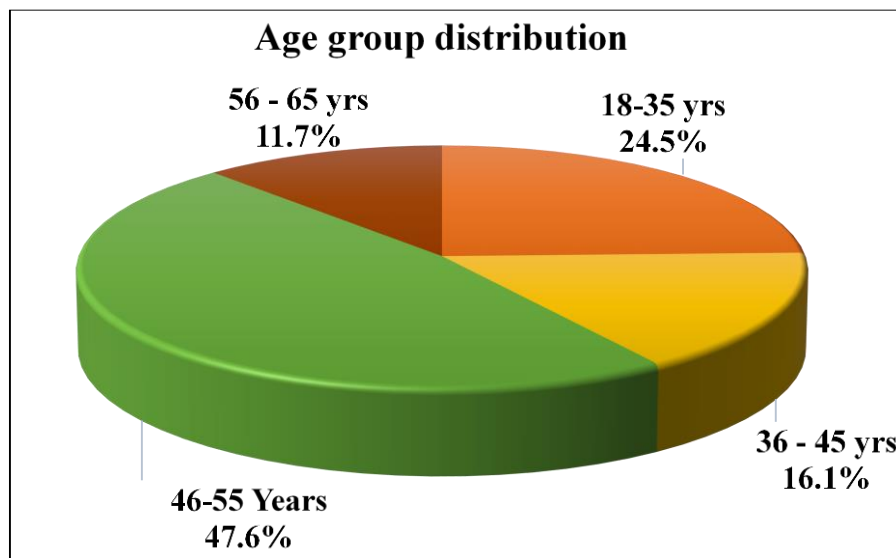
Table 17: Genderwise distribution of oral hygiene practices of study population based on method, frequency & time of brushing

		Method of brushing				Frequency of brushing			Time of brushing		
		Vertical (%)	Horizontal (%)	Circular (%)	Combination (%)	Once (%)	Twice (%)	In-between meals (%)	Before meal (%)	After meal (%)	In-between meals (%)
Gender	Male	33 (6.4)	474 (92.4)	4 (0.8)	2 (0.4)	511 (99.6)	0	2 (0.4)	511 (99.6)	0	2 (0.4)
	Female	13 (5.5)	220 (92.8)	4 (1.7)	0	237 (100)	0	0	237 (100)	0	0
	Total	46 (6.1)	694 (92.5)	8 (1.1)	29 (0.3)	748 (99.7)	2 (0.3)	0	748 (99.7)	0	2 (0.3)

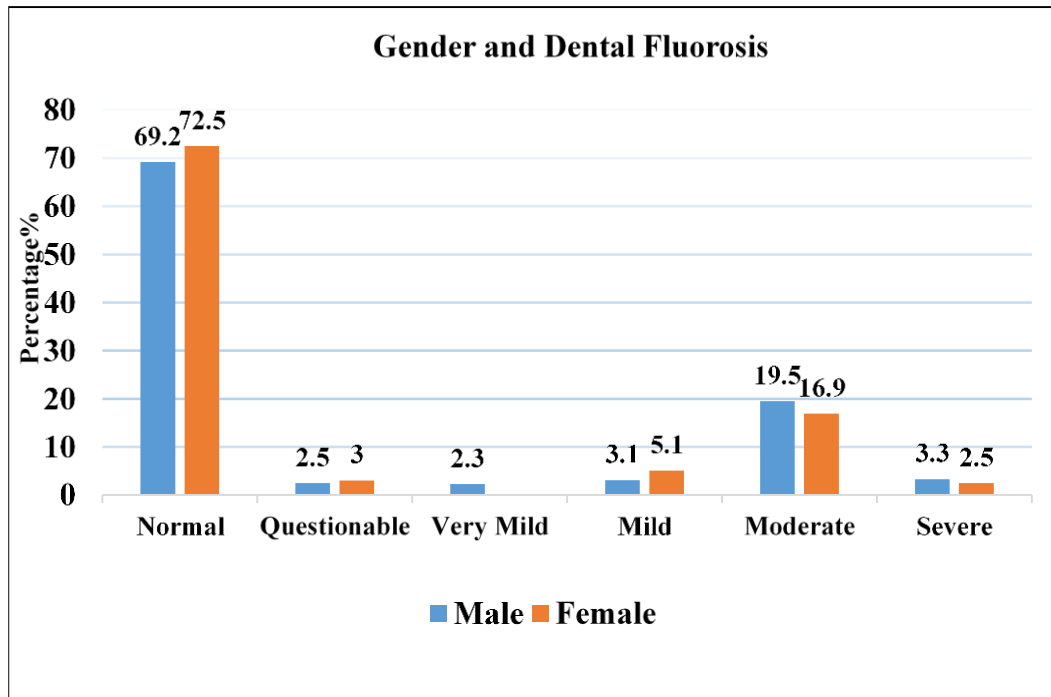
Graph 1: Genderwise distribution of study population



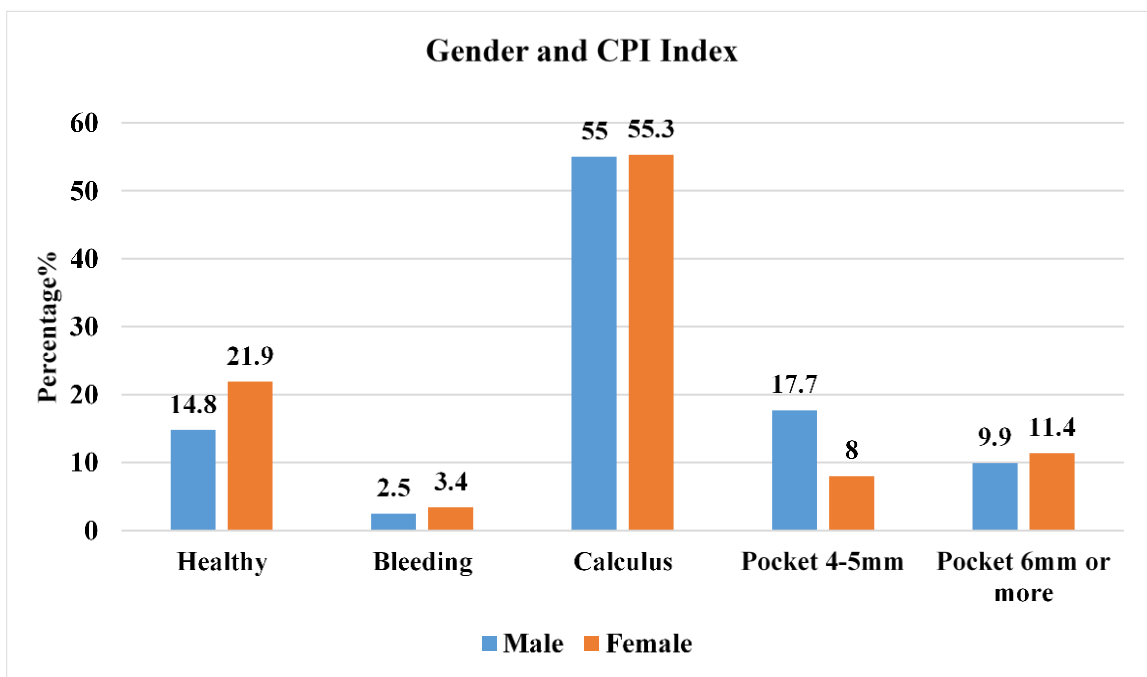
Graph 2: Age wise distribution of study population



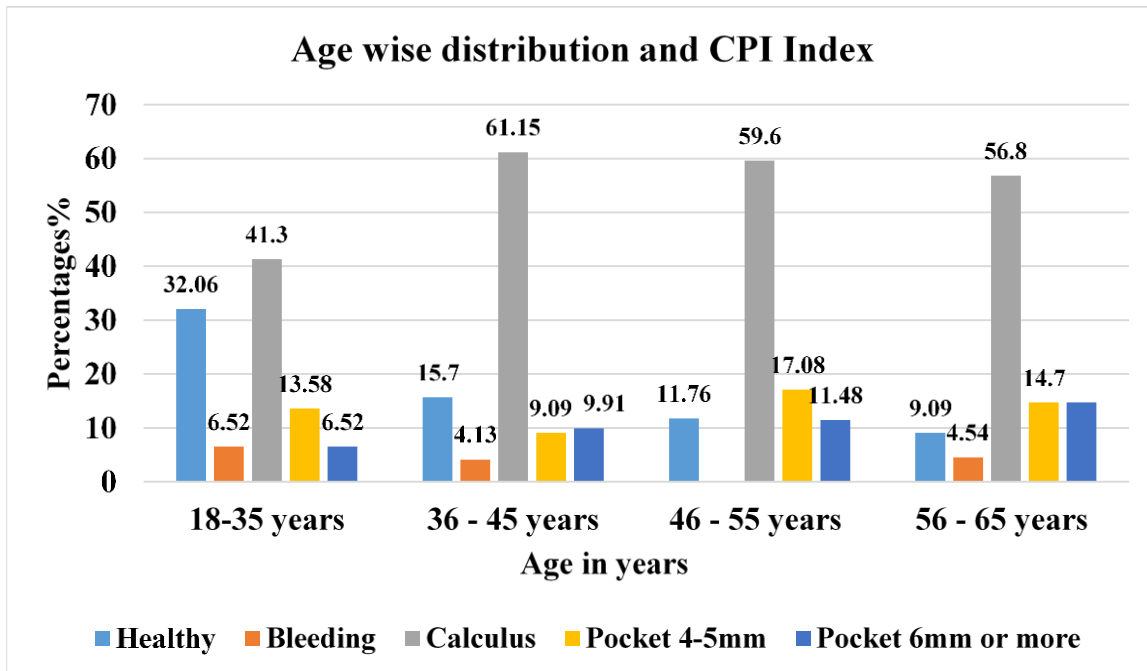
Graph 3: Genderwise distribution of study population based on dental fluorosis



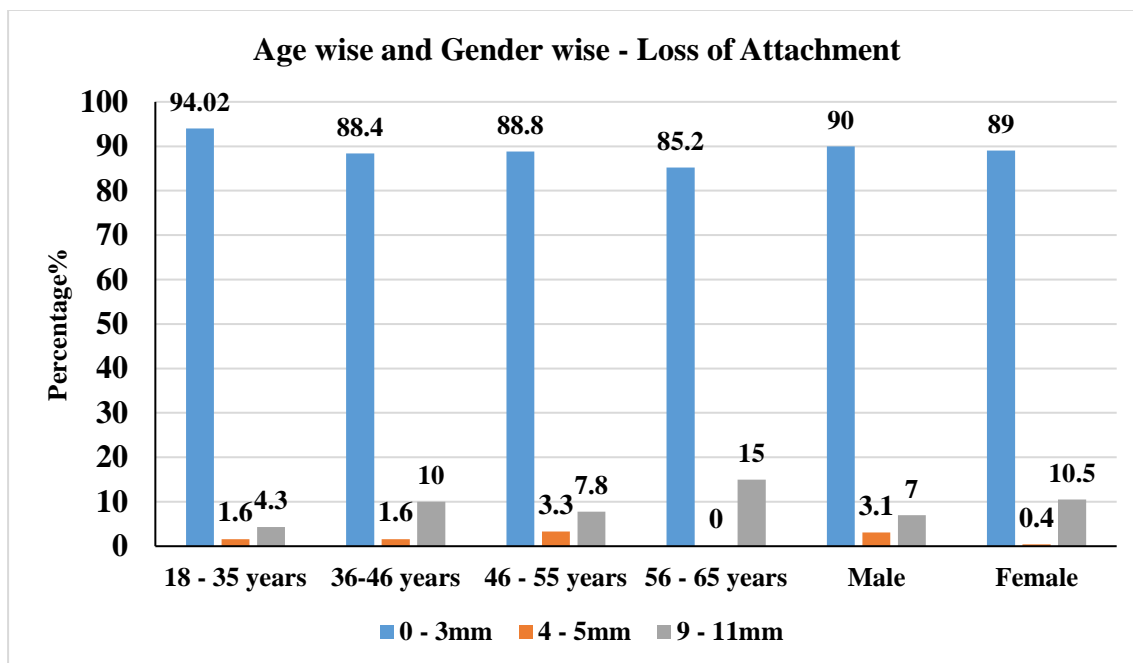
Graph 4a: Genderwise distribution of study population based on CPI Index



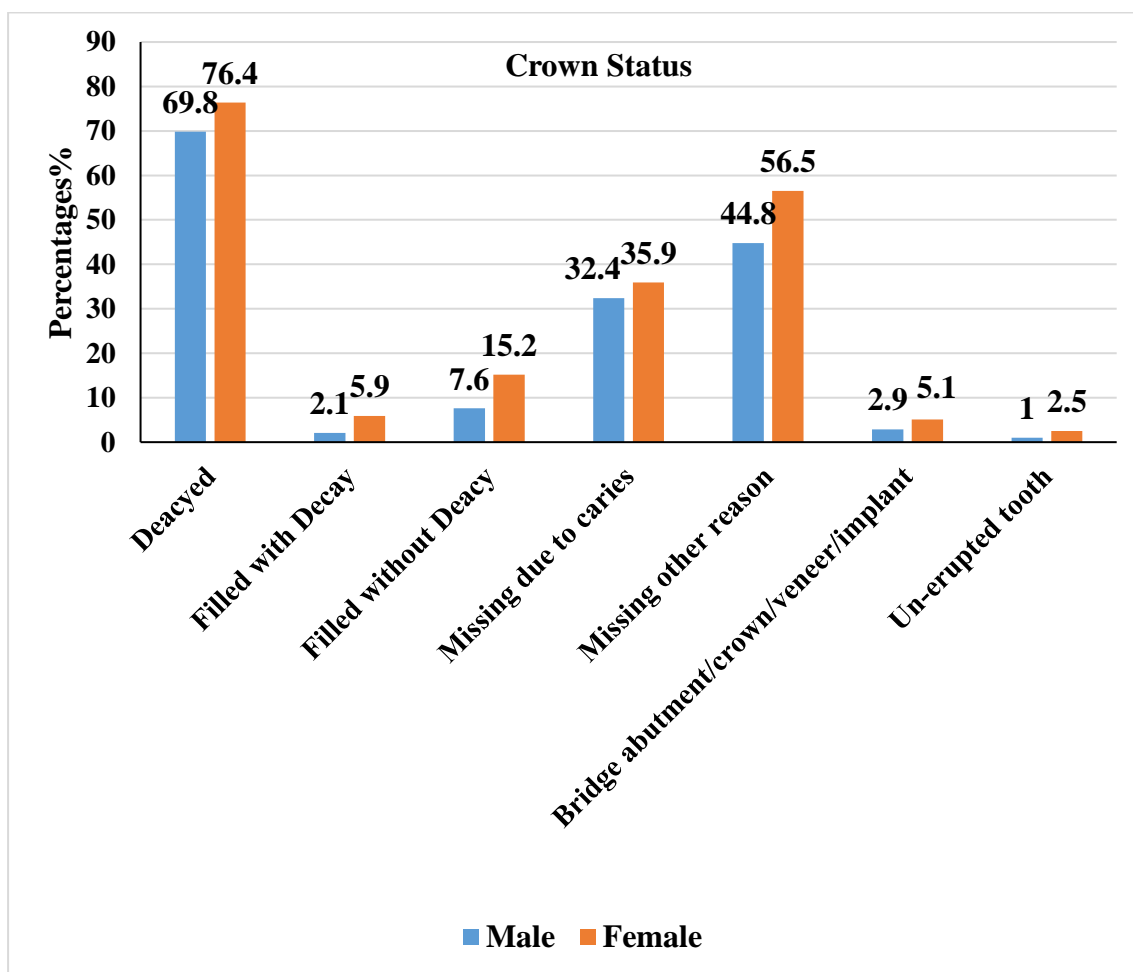
Graph 4b : Age wise distribution of study population based on CPI Index



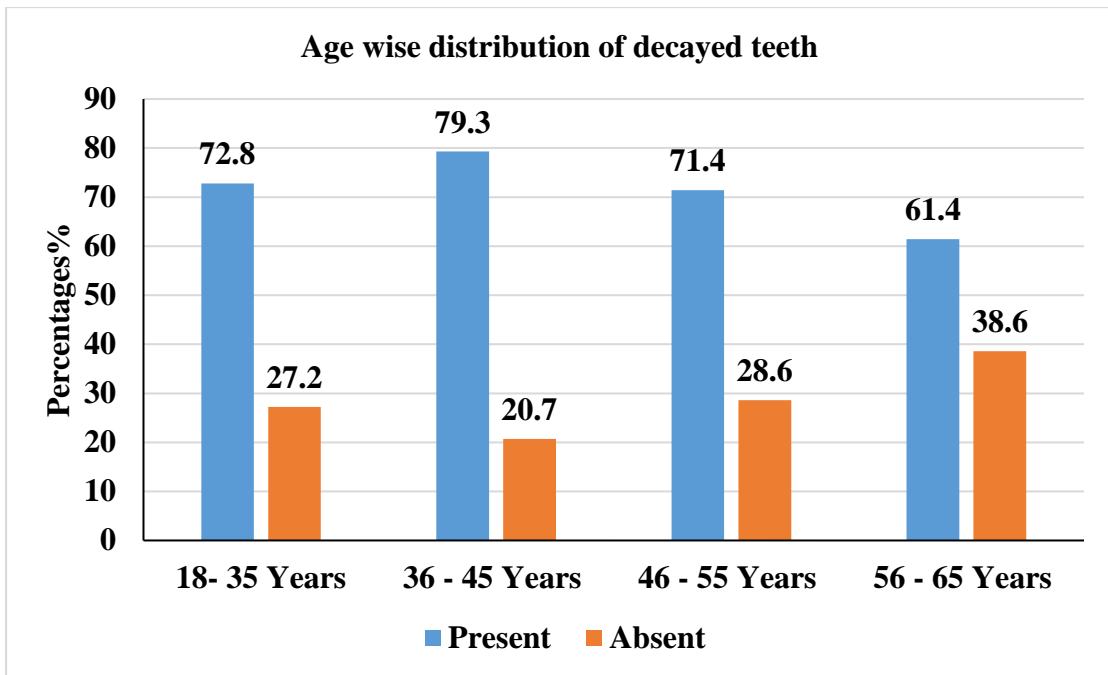
Graph 5: Age wise and genderwise distribution of loss of attachment



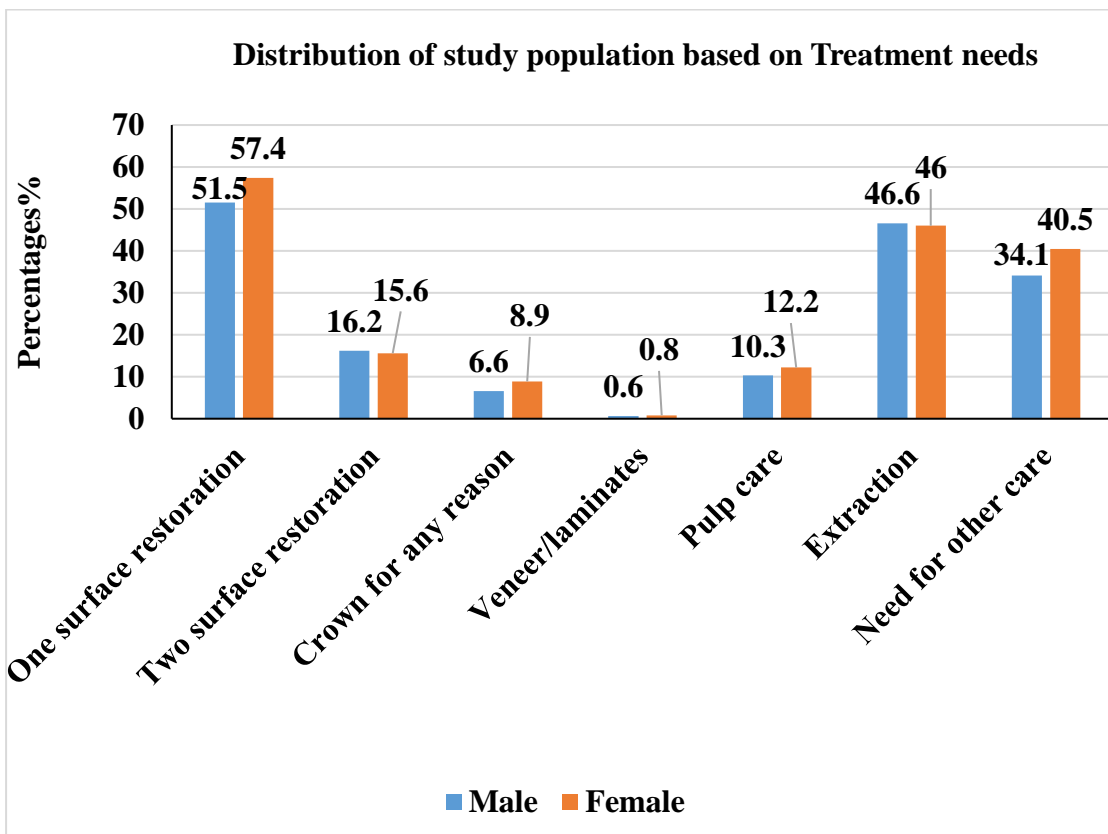
Graph 6: Distribution of study population based on dentition Status



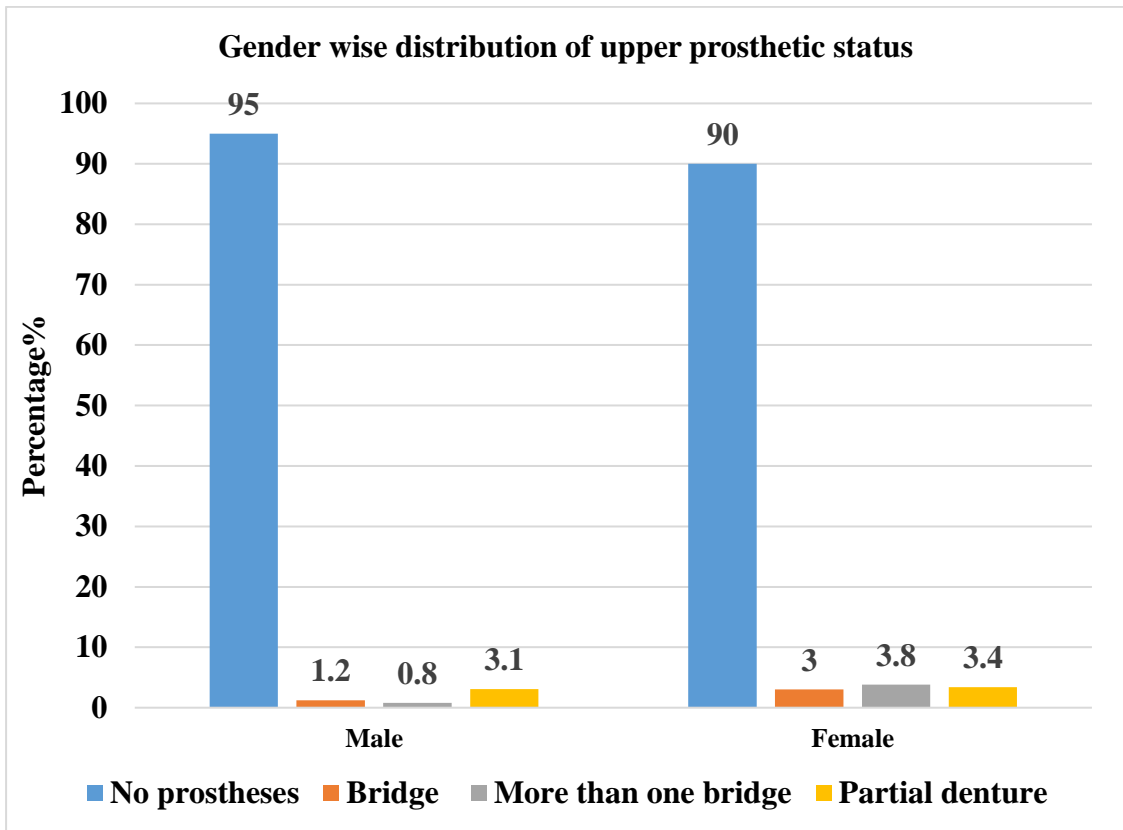
Graph 7: Age wise distribution of study population based on decayed teeth



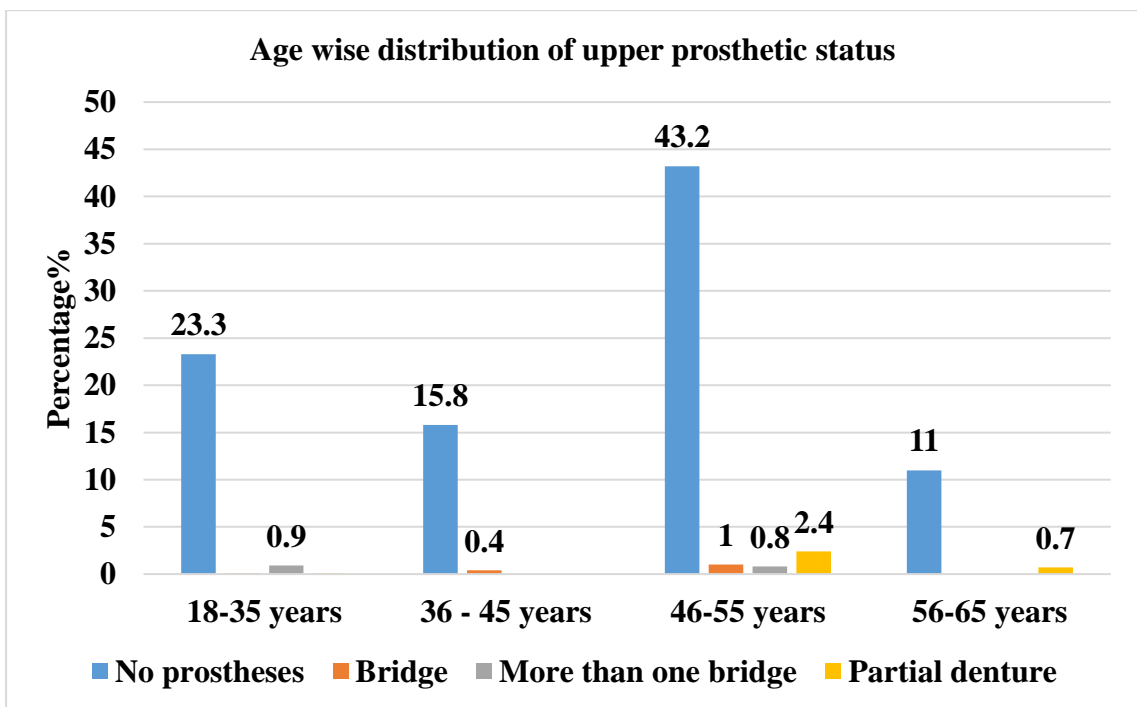
Graph 8: Distribution of study population based on treatment needs



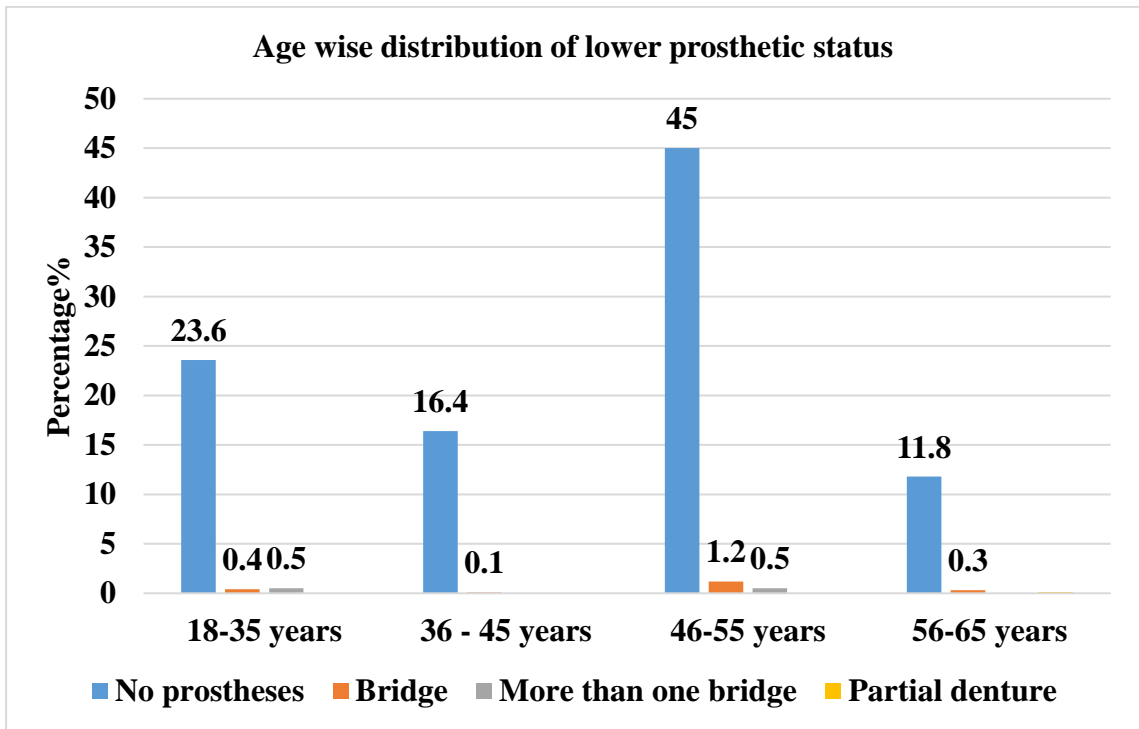
Graph 9: Gender wise distribution of study population based on upper prosthetic status



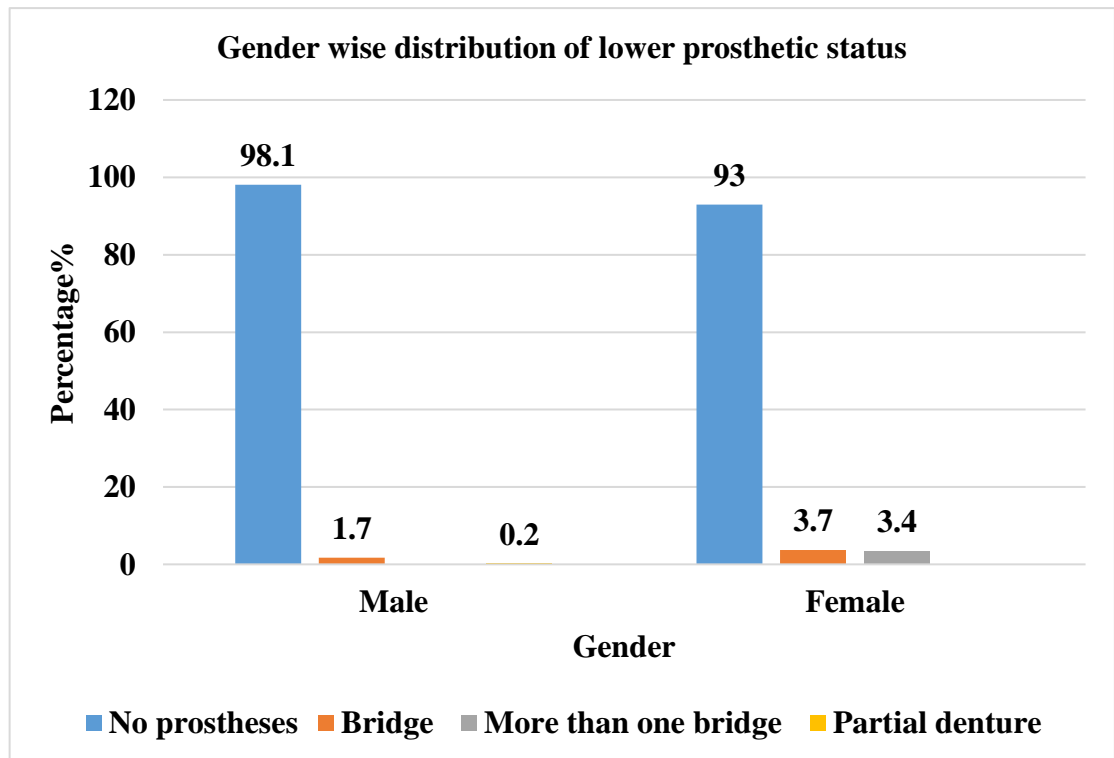
Graph 10: Age wise distribution of study population based on upper prosthetic status



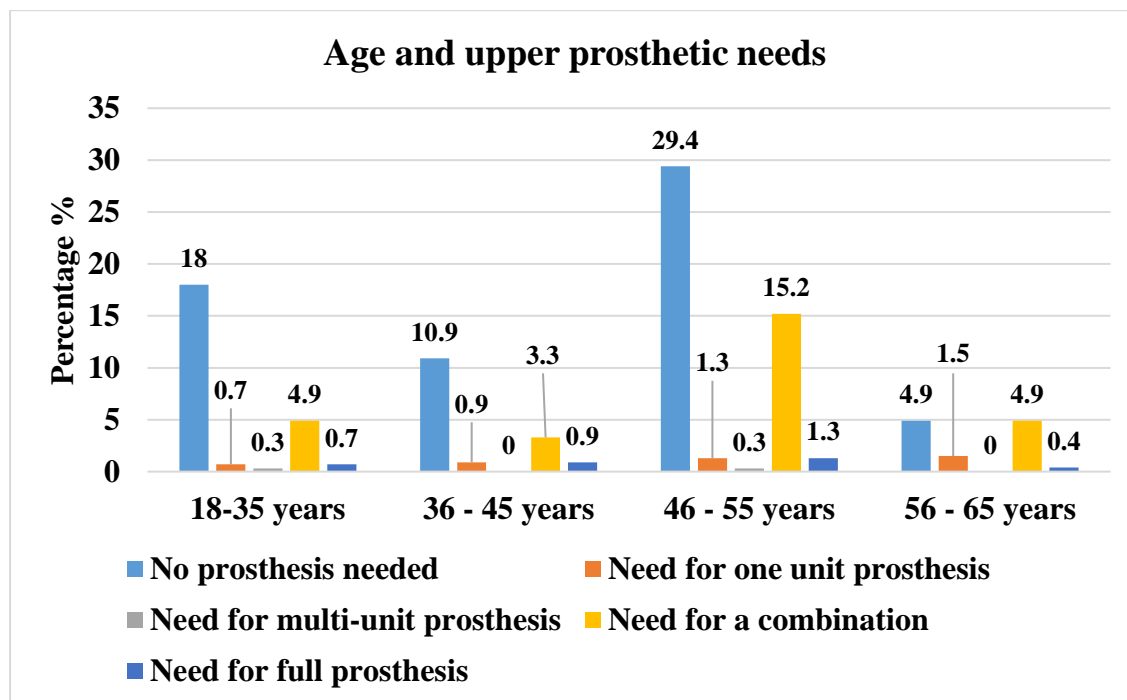
Graph 11: Age wise distribution of study population based on lower prosthetic status



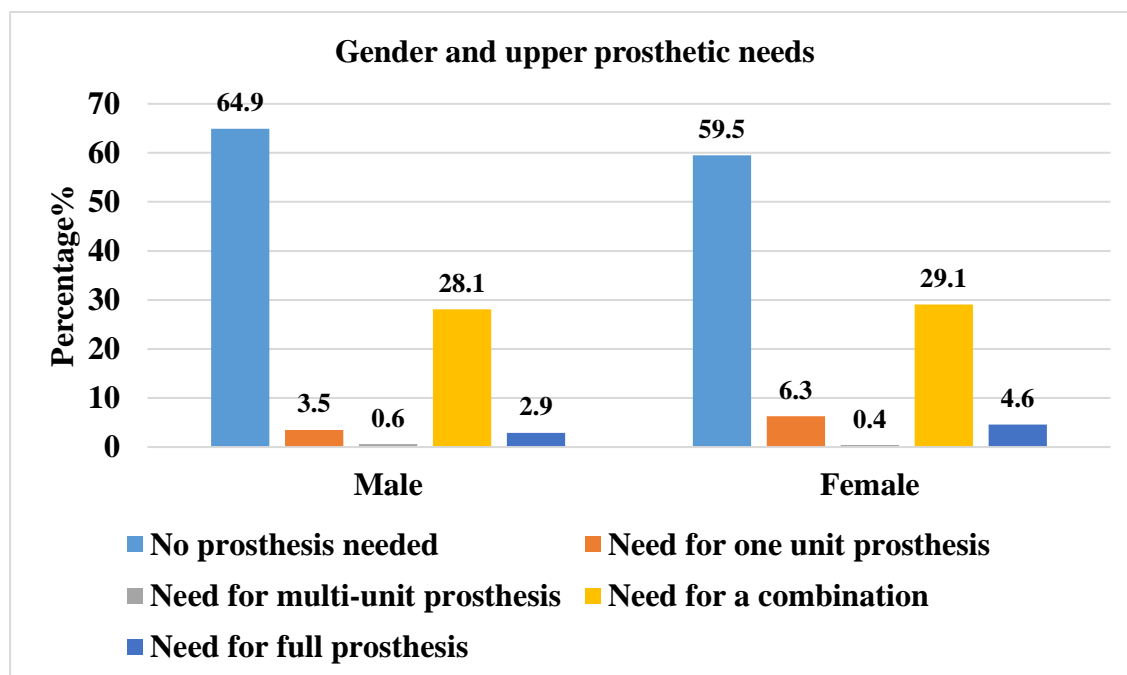
Graph 12: Gender wise distribution of lower prosthetic status



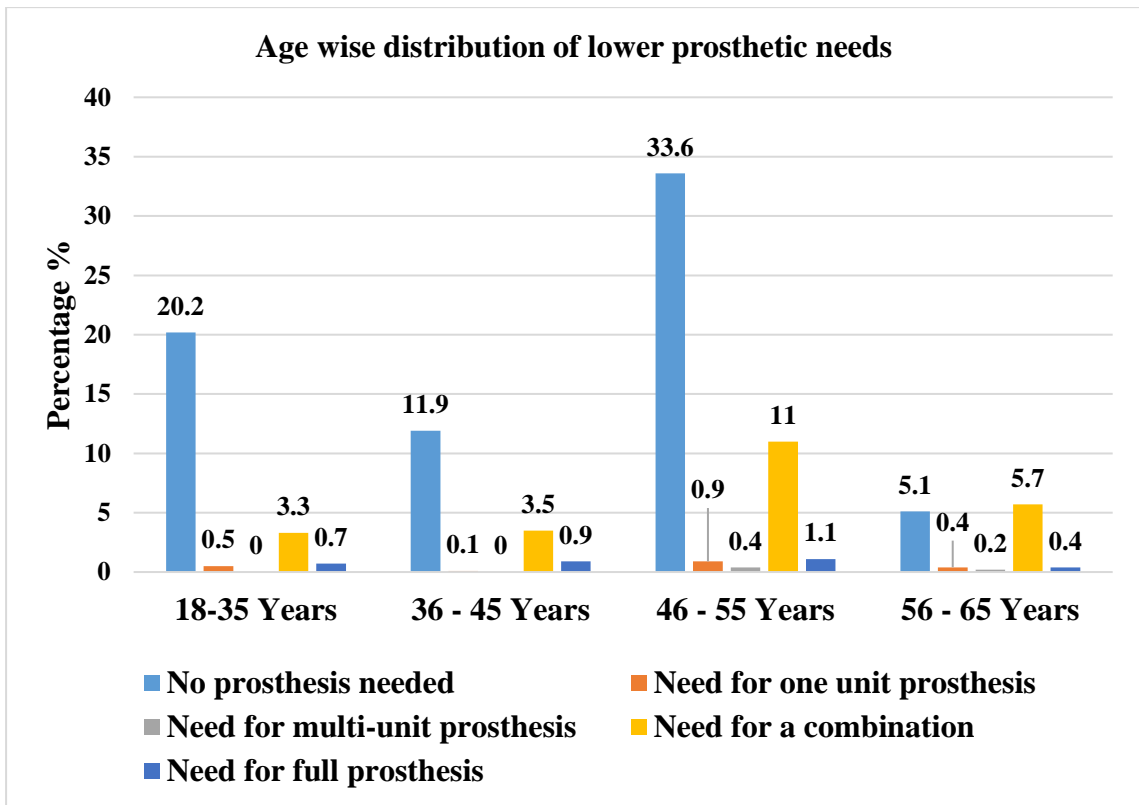
Graph 13a: Age wise distribution of upper prosthetic needs



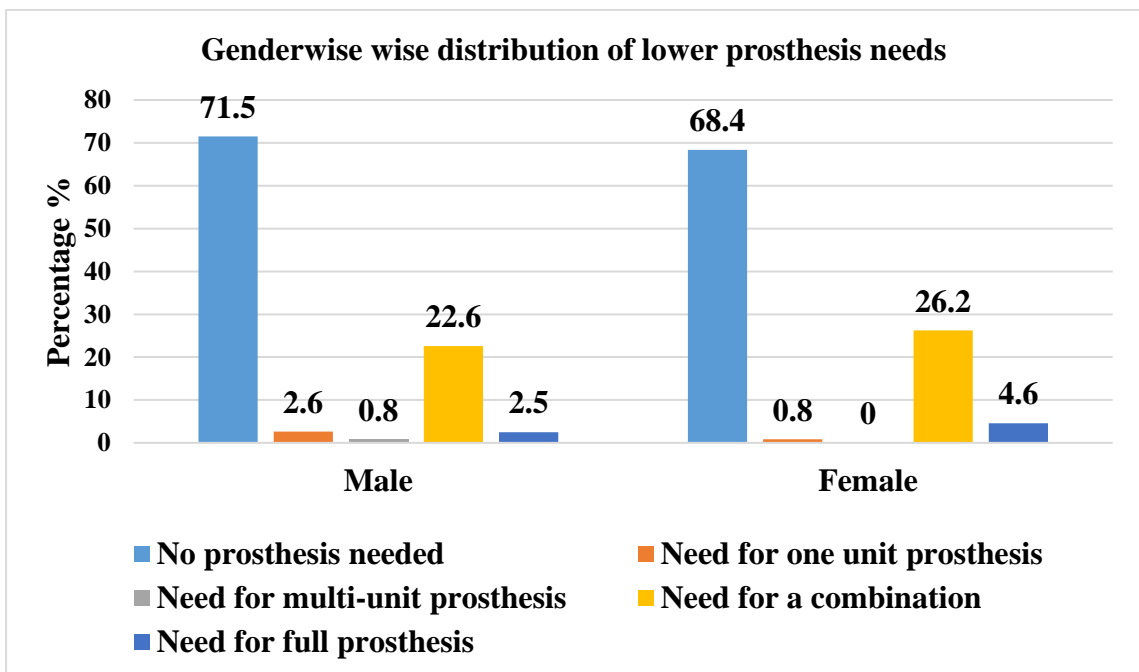
Graph 13b: Genderwise wise distribution of upper prosthetic needs



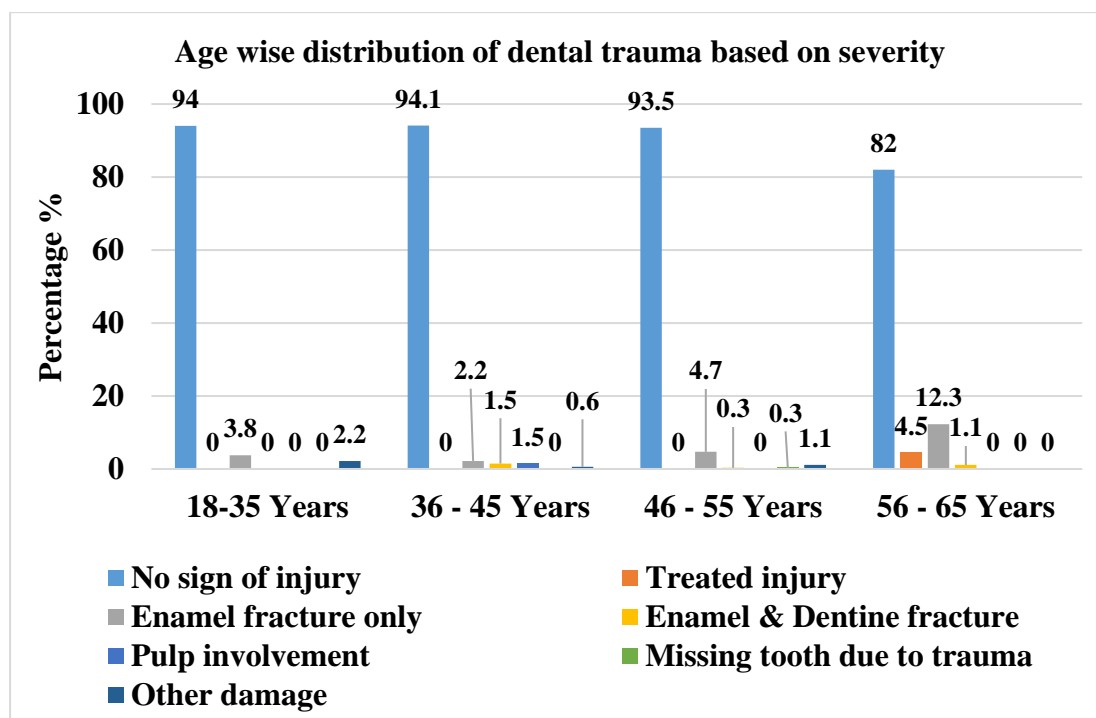
Graph14a: Age wise distribution of lower prosthetic needs



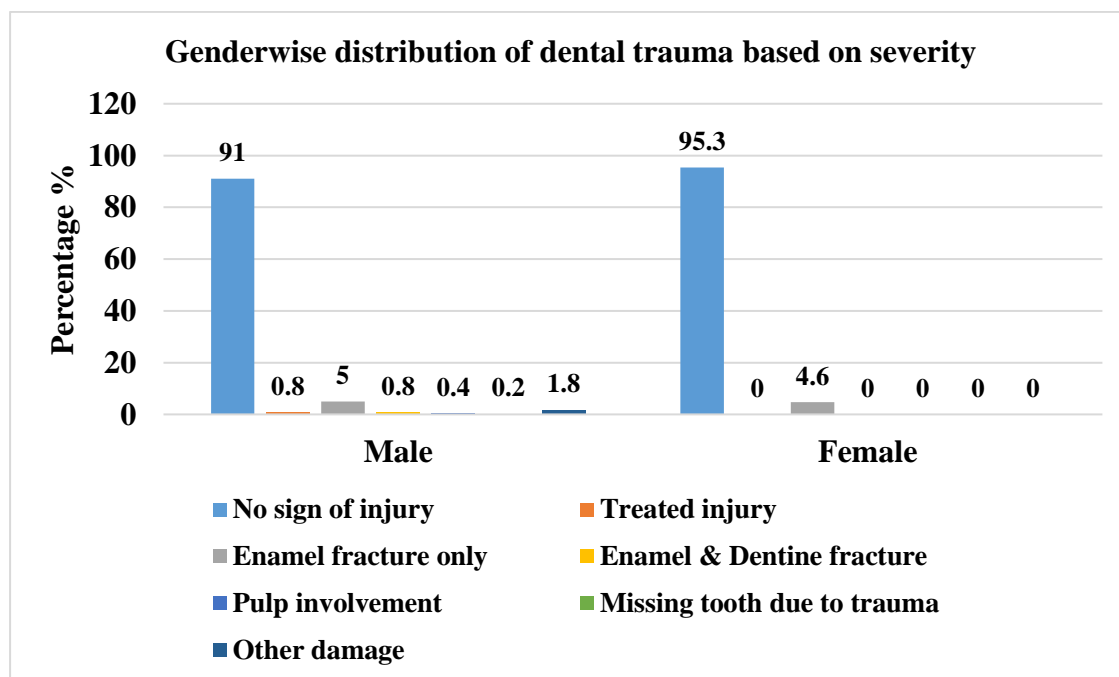
Graph 14b: Genderwise wise distribution of lower prosthesis needs



Graph 15a: Age wise distribution of dental trauma based on severity



Graph 15b: Genderwise distribution of dental trauma based on severity



Discussion

DISCUSSION

Among the industrial dairy workers factors more commonly held responsible for the impact of oral health diseases is less access and utilization of health care services with lesser awareness about the oral hygiene importance. Epidemiological studies are one of the most reliable tools in studying the prevalence of oral diseases in a group of specified population which helps to control the oral health related problems within the group of population. In number of studies, literacy has been shown to be a powerful predictor of health status, health-related behaviors and health related knowledge²⁰ but attempts are not directed to change the oral hygiene practices. Many preventive programs are needed to uplift the individual oral health status. Health education, a widely accepted approach in prevention of oral diseases, is a process of transmission of knowledge and skills necessary for improvement in quality of life.⁶

The intention of study was to provide systematic information on oral health of dairy workers in a region that would aid in the planning and evaluation of oral health promotion programs. Moreover, a comparable prevalence data have not been recorded previously; hence the study was conducted to gather this data to assess their dental health. The comparison of present study can be done with other workers like factory and industrial workers and general adult population as no previous comparable data is available.

In this study the WHO Oral Health Assessment Proforma (Basic Oral Health Survey 1997)¹ was used to assess the oral health status and treatment needs of the study population as it is a standardized and most valid measure of oral examination which can be compared with that of any other groups. The oral health status was assessed by a single examiner to avoid any inter examiner bias. All the oral examinations were

conducted in the dairy Plant premises and its various sectors in order to make every worker feasible to participate in the study.

SOCIO DEMOGRAPHIC FACTORS:

In the present study the mean age of the subjects was 44.5 (46.30 years in males and 39.70 years in females). This implies that most of the dairy workers were in the range of age group between 46-55 years. This finding is similar to the study conducted by Gambhir, et al. 2013¹⁷ in which the subjects' mean age was 45.3 ± 7.8 years. Also this finding is not similar to the study conducted by Irma Gavaldon et al (2008)²¹ in U.S.A among migrant farm workers whose mean age was 37.58 years.

DENTAL FLUOROSIS

India is among the 23 nations around the globe, where health problems occur due to the consumption of fluoride contaminated water. An estimated 62 million people in India in 17 out of the 32 states are affected with dental, skeletal and /or non- skeletal fluorosis. The extent of fluoride contamination of water varies from 1.0 to 48.0 mg/l.²² **Hari Kumar. R (2007)** ²³reported that the prevalence of dental mottling (DM) was high among the total population in the districts of Dharmapuri (36%), Krishnagiri (24%) and Salem (33%).

The study conducted by **Ramesh M (2016)**²⁴ reported that no correlation was found between DF, dental caries, consumption of milk, or consumption of foods cooked in aluminum vessels. There was a correlation between DF and factors such as male gender, bore well water consumption, black tea consumption and the duration of residence in a place with high water fluoride content.

The prevalence of dental fluorosis in the present study was 223(29.7%) among which 2.7% had questionable fluorosis, 1.6 % had very mild fluorosis, 28(3.7 %) had mild fluorosis, 140(18.7 %) had moderate fluorosis and 239(3.1%) had severe

fluorosis. In a similar study conducted by Manish Bhalla, et al (2015)²⁵ to assess the oral health status and treatment needs among the Police Personnel in Mathura City reported that, enamel fluorosis was present in 116 (24.4%) study subjects.

In a study conducted by Sanadhya S et al (2013)¹⁶, to assess the oral health status and treatment needs among the workers of Sambhar Salts Limited at Sambhar Lake, Jaipur, reported that, severe fluorosis was the most prevalent (23.7%) form of dental fluorosis observed among the study subjects and only 5.5% of the participants had questionable fluorosis.

PERIODONTAL DISEASE:

The present study showed 128 (17.1 %) workers had healthy gingiva, 21 (2.8%) had bleeding gums, 413 (55.1 %) workers had calculus, 110 (14.7 %) workers had pocket 4-5mm and 78 (10.4 %) worker had pocket 6mm or more. In the present study the increase in prevalence of periodontal disease might be due to lack of proper oral hygiene practices, lack of awareness about oral health and lack of visit to the dentist.

While the study conducted by **Khushboo singh et al (2015)**²⁶ in sugar mill workers found that none of them had healthy gingiva , 4.45% had bleeding gums, 80.17% had calculus ,7.79% had shallow pocket and 0.8% had deep pocket which is lesser than the present study.

Shaikh. H et al conducted a study in (2011)²⁷ among the beedi factory workers. He reported that 69.9% of the beedi factory workers had calculus, 22% of the workers had pocket of 4 - 5mm and 6.7% had pocket of 6mm or more.

A study conducted by **Sood M et al**¹⁴ among ceramic factory workers reported that 78.1 % of the workers had calculus, 5.35% of the workers had periodontal pocket of 4 - 5mm and 4% of the workers had periodontal pocket of 6mm or more.

In a study conducted by **Sakthi S et al (2011)**¹³, among construction worker reported that prevalence of pathological pockets among 45-54 years age group was 68.2% while in 35-44 years age group it was 9.4% which is not similar to the present study. According to National Oral Health Survey and Fluoride Mapping 2002 – 2003, the prevalence of periodontitis among 35 – 44 years old was 89.2%.²⁸

In the present study the high prevalence of periodontal disease might be due to the low dental attendance and lower percentage of the workers getting their teeth cleaned by the dentists. In the present study calculus was most widespread among 46-55 years of age group of about 213(59.6%) subjects which was similar to the study done by **Lie et al (1988)**²⁹ on aluminum factory workers.

The study done by **Mishra P et al (2016)**³⁰ found prevalence of periodontal pocket of 4-5mm was highest among the age group between 31-40 years of age whereas the present study showed highest 61(17.08%) among the 46-55 years age group.

The present study showed about 25.06% workers had periodontal diseases based on CPI score 4 - 6 mm or more of pocket depth.

A study done by **Dagli. R, et al (2008)**¹² among Green marble mine laborers of Rajasthan showed that the overall prevalence of periodontal disease was 98.25%.

Another study done by **Kumar. A, et al (2010)**³¹ among the rural population of Ambala District, Haryana reported the overall prevalence of periodontal disease was 92.7%.

LOSS OF ATTACHMENT:

In the present study, 672 (89.6 %) had score between 0-3mm, 17(2.3 %) subjects had 4-5mm, 61(8.1 %) had 9-11 mm of loss of attachment (LOA).

While a study conducted by **Khushboo singh et al (2015)**²⁶ found loss of attachment of 0-3 mm was 55.01%, 4-5mm of LOA was 35.6%, and none of them had

9-11 mm LOA which is not similar to the present study. Based on genderwise distribution of LOA showed higher among male when compared to female which is similar to the study conducted by **Umesh et al (2016)**.³²

Based on age wise distribution LOA was more prevalent among the age group of 46-56 years which is similar to the study done by **Mishra P et al (2016)**.³⁰ However the present study showed the periodontal status percentages increases with increasing age which is similar to the study conducted by **Srikandi and Clarke et al**.³³

The present study findings was in agreement with a study conducted by **Tatiana.F**³⁴ among metal processing workers in Brazil in the year 2002 - 2003 which showed that 25.3% showed periodontal attachment loss.

According to National Oral Health Survey and Fluoride Mapping, the prevalence of attachment loss among 35 - 44 years old was 42.2%.²⁸ The present study findings was comparatively less. The reason may be attributed due to improper oral hygiene practices. Better dental attendance and the efforts has to be taken by the workers to undergo regular preventive oral prophylaxis.

DENTAL CARIES PREVALENCE AND DMFT STATUS

In this study population, the dental caries prevalence was 75.2 % among dairy workers. According to National Oral Health Survey and Fluoride Mapping 2002 – 2003,²⁸ the caries prevalence was 79.3% in the age group of 35 - 44 years which is almost similar to the present study. The caries experience was 60.36% in the study done by **Rekha et al (2002)**¹⁰ among confectionery workers is approximately similar to the present study.

In the previous study conducted by **Kumar. A, et al (2010)**³¹ among the rural population of Ambala District, Haryana where majority of the people were either farmers or laborers, the prevalence of dental caries was found to be 69.5%.A study

conducted by **Solanki J et al (2014)**³⁵ found prevalence of dental caries was 74% .The reasons may be due to level of educational status, poor oral hygiene practices, low socio economic status, lack of awareness regarding oral health and poor access to oral health care. In the present study the mean decay teeth was 2.72 among the dairy workers. In a study conducted by **Rushabh J.D et al**³⁶ among green marble mine workers the mean decay teeth was 2.44 which is similar to the present study. **Frencken J.E.** et al³⁷ reported the effect of sugar cane chewing in the development of dental caries in which Sugar cane cutters had significantly higher mean DMT/S scores than sisal plant workers.

Z Tohidast akrad³⁸, conducted a study to compare DMFT index in the workers of sweets and cable factories. Mean and standard deviation of DMFT in sweets factory: 12.59 ± 6.5 ; in cable factory: 9.7 ± 5.4 ; and caries free in both factories was less than 1% which was neglectable. Mean and SD of DMFT in 35- 44 year age group in sweet and cable factory was 11.6 ± 6.05 , and 10.8 ± 6.5 , respectively. **Eduardo Pizzatto et al**³⁹ showed highest DMFT of about 6.66 which is higher than the present study. In his study he concluded that there was no statistically significant relationship between presence of dental caries and the fact that the workers are in contact with sugar because they work on candy food industry, but new studies are needed for more precise research.

In the present study the mean missing teeth was 2.32 among the dairy workers. The findings in the present study were in agreement with a study conducted by **Peterson P E (1983)**⁹ among Danish Industrial population which concluded that untreated dental caries and missing teeth were predominant among workers than the filled teeth. This is may be due less frequent visit to dentist and decay may be severe requiring extraction of teeth than restoring the teeth.

In the present study the mean filled teeth was 1.07 among the dairy workers. In a study conducted by **Rushabh J.D et al**¹¹ among green marble mine workers showed that the mean FT was 0 among the workers. In the present study the increase in the mean FT maybe attributed to relative number of the dairy workers visiting the dentist for undergoing restorations.

In the present study the mean DMFT of dairy workers was 5.19 ± 4.478 which is not similar to the study conducted by **Shingo Fukayo et al (2001)**⁴⁰ among smelter workers in Japan, the mean DMFT was 14.7 ± 1.1 . ⁹Another study conducted by **Tomita N E et al (2005)**⁴¹ among building construction workers in Sao Paula, Brazil showed a mean DMFT of 16.9 and this was attributed due to low level of education and hence they preferred dental extractions as a therapeutic measure owing to dental caries in populations of lower socioeconomic status. While the study conducted by **Vanishree.N et al (2013)**⁴² on female beedi factory workers found that mean DMFT was 5.97 ± 5.78 which is similar to the present study. **Dagli et al (2008)**¹² conducted a study among green marble laborers, India, which showed a mean DMFT score of 2.79 ± 2.44 which is lesser to the present study.

The present study showed the mean DMFT was 5.99 ± 4.349 in female as compared to 4.82 ± 4.493 in male. While a study conducted by **Umesh et al (2016)**³² found mean DMFT was higher of about 6.49 ± 4.15 in female as compared to 4.46 ± 2.53 in male which is higher as compared to the present study.

Due to stressful and continuous working hours in the factory there would be inverse role of oral hygiene would have been existed. Also the etiological factors like poor diet pattern, inappropriate oral hygiene practices and lack of awareness over dental health plays an important role in the present scenario which exists among the dairy workers.

TREATMENT NEEDS:

In the present study 400 (53.3%) of dairy workers needed one surface restoration, 120(16.0%) workers needed two surface restoration, 55(7.30%) needed crown for any reason, 5 (0.7%) needed veneer / laminates, 82(10.9%) needed pulp care, 348(46.4%) needed extraction of one or several teeth and remaining 271 (36.1%) of dairy workers needed for other care. These figures of treatment needs indicates that workers less frequent visit to dentist, high treatment cost, lack of awareness in maintaining oral hygiene. Many workers felt there was no need or no problem for them to visit a dentist. The present study showed 69.3% of the total subjects needed restoration of teeth and 46.4% needed extractions of teeth, which is higher than the study done by **Nawell P L (2002)**⁴³ among a rural highland community in New South Wales, Australia, showed 60% of the total sample needed restoration of teeth and 36% needed extractions of teeth, which is lower than the present study. **Prabu Duraiswamy et al (2008)**⁴⁴ based on dental caries treatment needs one surface filling was needed for 44% of the 513 individuals examined, while 12% needed two surface filings approximately similar to the present study.

Mean number of teeth requiring one surface filling, two or more surface filling, pulp therapy & extraction was 1.27, 0.42, 0.27 & 2.14, respectively in the study done by **Kumar.A, et al (2010)**³¹ among the rural population of Ambala District, Haryana.

In a study conducted by **Chinmaya B R et al (2011)**⁴⁵ on oral health status and treatment needs in Chitradurga, showed that 35.7% needed fillings, 5.2% need crowns and veneers, 6.5% needed Pulp care, 16% needed extraction and 6.5% needed other treatments such as prosthesis and inlays.

DENTAL TRAUMA:

In this study, the male and female dairy workers 26(5.06%) and 11 (4.64%) had enamel fracture respectively. Only 4(0.77%) subjects of male showed enamel and dentinal fracture, 2(0.38%) & 1(0.19%) subjects had pulp involvement and missing tooth due to trauma and 9 (1.75%) subjects had other damages. As the present study showed only 4 (0.77%) subjects had treated the dental trauma, the reason could be due to the low dental attendance, high treatment cost and less awareness about the oral health. Present study showed overall dental trauma was 5.46% which is higher when compared with the study done by **Vengal R et al (2017)**⁴⁶.

PROSTHETIC STATUS AND TREATMENT NEEDS:

The present study showed 265 (35.3%) dairy workers needed upper prosthesis but only 24(3.2%) workers had upper partial denture and 276 (36.8%) workers needed lower partial denture but only 1 (0.2%) workers had lower partial denture. This could be due to the lack of visit to dentists, high cost for replacement of teeth and lack of awareness about the need to replace their lost teeth timely.

The study done by **Kumar A et al (2010)**³¹ was found that partial dentures in maxillary arch & mandibular arch were 4% & 1.4% respectively. When prosthetic needs of the subjects was estimated it was found to be that of 440 (35.2 %) of subjects needed prosthesis in maxillary arch & 566(45.3%) needed prosthesis in mandibular arch which is similar to the present study. While the study conducted by **Amith et al (2013)**⁴⁷ found that only 16.5% needed prostheses in lower and upper arch which is lesser as compared to the present study.

The present study showed one unit prosthesis need for both upper and lower arch was 4.4 % and 2 % respectively. The study conducted by **Bansal M et al. (2013)**¹⁵ found that one unit prosthesis was required for both upper and lower arch was 9.5%

and 14.8% respectively which is higher as compared to the present study. This may be due to low socio economic status, lack of visit to dentists and lack of awareness about the need to replace their lost teeth.

In a study conducted by **Visha P et al**⁴⁸ among industrial workers, 100% and 99.6% of the workers did not have any prosthesis in maxillary arch and mandibular arch respectively. Only 0.4% of the worker had fixed partial denture in mandibular arch. About 38.4% and 38.3% required prosthesis in maxillary and mandibular arch respectively. 26.3% and 36.2% of the workers required a multiunit prosthesis in maxillary and mandibular arch respectively. About 1.3% and 1.7% of the workers required a combination of prosthesis in maxillary and mandibular arches respectively. About 1.3% and 0.8% of the workers required a full prosthesis in maxillary and mandibular arches respectively. Another study by **Doughan B et al (2000)**⁴⁹ due to low socio economic conditions the study subjects were in greater need of dentures.

ORAL HYGIENE PRACTICES:

In this present study, 99.7% of workers reported that they cleaned their teeth once daily and 0.3% of workers have reported they have cleaned their teeth twice daily. In another study conducted by **Vellappally S et al (2008)**⁵⁰ on 805 selected adult Indian patients in the age group from 30 to 69 years, results showed that, most of them brushed their teeth once a day (82.4 %), similar to the present study.

Similarly, a study conducted by **Amith K et al (2013)**⁴⁷ in Moradabad among brass industry workers the results showed that 93% of them stated that they brush their teeth once daily, 6.6% brush their teeth twice daily. Cleaning the teeth is considered to be a part of the personal hygiene. It is a common behavior to brush at least once daily among the Indians. The present study subjects seem to be similar to general population with frequency of brushing their teeth at least once daily.

This was not similar to the findings in the study done by **Sakthi et al**¹³ where 76.9% of construction worker cleaned their teeth once daily. Also in a survey conducted by **Mohire et al (2009)**⁵¹ on patient with oro-dental conditions in South Maharashtra, which had reported that brushing frequency for once a day was 59.99%, twice a day was 19.99% and never brushed in a day was 19.98%. In a study conducted by **Rajkumar et al (2011)**⁵² among match factory workers in Gudiyatham, the results showed 82% reported that they brushed their teeth once daily, 5% brushed their teeth twice daily and 13% never brushed their teeth daily.

In a study conducted by **De Macedo CG et al (2009)**⁵³ among 170 furniture industry workers, to assess the quality of life and self-perceived oral health, the result showed that mean frequency of tooth brushing was 3.19 and higher OHIP values were most frequently associated with workers who always had gingival bleeding.

Another study conducted by **Peterson P E**⁹ et al on Danish granite industry workers showed that 70% of them reported to brush twice daily and 5% of them at least once daily.

Another study conducted by **Rushabh J.D et al**¹¹ among green marble mine workers showed that 78.9% of the workers cleaned their teeth at least once daily and 21.1% of the workers do not clean their teeth regularly.

Materials used for cleaning their teeth:

In this present study, only 509(67.9%) subjects used tooth brush and toothpaste, 66(8.8%) used tooth brush and powder, 35(4.7%) used finger and paste, 40(5.3%) used finger and powder, while 13.3% used other (indigenous) type of materials for brushing their teeth. The reason for this may be due to the fact that, most of them belongs to the rural area and it is assumed that they have poor awareness towards oral hygiene practice, invariably neglecting oral health. Material deprivation and affordability might

be reasons for them to use finger and paste or other indigenous type of material rather than tooth brush and paste.

These findings were agreeable to the study conducted by **Amith.K et al (2013)**⁴⁸ in Moradabad among brass industry workers, where 5.8% cleaned their teeth using finger.

The study conducted by **Sakthi S.S et al**¹² among building construction workers showed that 74.5% of the workers used toothbrush and toothpaste, 5.3% of the workers used finger and tooth powder, 1.5% of the workers used finger and toothpaste and 1.4% of the workers used toothbrush and toothpowder to clean their teeth.

Similarly, in a study conducted by **Vellappally S et al (2008)**⁵¹ the results showed, 90.9% of them used toothbrush and toothpaste to clean their teeth.

In a study conducted by **Rajkumar et al (2011)**⁵³ among match factory workers in Gudiyatham, the results showed 89.6% use toothbrush as their oral cleaning aids and 8.7% use finger as their oral cleaning aids. Among those who used toothbrush and finger as oral hygiene aids, 94% use toothpaste and 6% use toothpowder as the material for brushing.

Method of Brushing:

The present study showed 694(92.5%) of workers used horizontal strokes for cleaning their teeth, 46(6.1%) of workers used vertical strokes, 8(1.1%) used circular stroke for cleaning their teeth, while 2(0.3%) used combination of stroke.

In contrast to the present results, a study conducted by **Ganss. C et al (2011)**⁵⁴, on tooth brushing habits in uninstructed adults, the results showed that, only 8.7% used horizontal motion. 73.8% brushed with circular motion, 13.6% with horizontal and circular motion and 3.9% with vertical motion. This difference in present study may be due to the lack of knowledge about the appropriate brushing techniques to be used. The

present cross sectional study has certain limitations, though the study provides information about prevalence of various oral diseases, but it failed to provide information about the natural history of disease, the sampling technique used in the study was convenient sampling method, the subjects with different socioeconomic status were not categorized in the study and the study subjects with different occupational status and educational status were not included in the study.

Summary

SUMMARY

The present descriptive cross-sectional study was conducted to assess the oral health status and treatment needs among dairy Plant workers in Salem District, Tamil Nadu. Ethical clearance was obtained from the Institution Review Board of Vivekanandha Dental College for Women & permission was obtained from concerned authority of dairy Plant – Salem, to conduct the study. Informed consent was obtained from dairy plant workers for obtaining data and performing oral examination.

Dairy plant workers who were present on the day of examination were included. Workers who were not willing to give informed consent were excluded. Data was collected using Proforma which consisted of WHO basic oral health assessment form (1997). The collected data was subjected to statistical analysis using SPSS 20 version (IBM, United States of America).

The findings of the current study were as follows:

- Of the 750 dairy Plant workers examined, majority 513 (68.4%) workers were males and 237 (31.6%) were females.
- About 140 (18.7%) had moderate dental fluorosis, 28 (3.7%) had mild fluorosis, 23 (3.1%) had severe fluorosis, 20 (2.7%) workers had questionable dental fluorosis, and 12 (1.6%) workers had very mild dental fluorosis.
- The present study showed 128 (17.1%) workers had healthy gingiva, 21(2.8%) had bleeding gums, 413 (55.1%) workers had calculus, 110 (14.7%) workers had shallow pocket of 4-5mm and 78 (10.4 %) worker had deep pocket of 6mm or more.
- Subjects of 17 (2.3 %) had 4-5mm & 61 (8.1 %) had 9-11 mm of loss of attachment.

- Totally 564 (75.2%) workers had decayed crown, 251 (33.5%) had teeth missing due to caries, 75(10.0%) had filled crown, 27(3.6%) had abutment, 364 (48.5%) had teeth missing due to other reason.
- The dental caries prevalence among study subjects was 75.2 %.
- The mean decayed/ missing / filled Teeth (DMFT) was 5.19 ± 4.478 .
- Among the workers, 440 (53.3%) required one surface restoration, 120 (16.0%) required two surface restoration, 82 (10.9%) required pulp care and 348 (46.4%) required extraction.
- Totally 25 (3.3%) of the dairy workers had removable prosthesis.
- Among the workers, 36.8% were partially edentulous in the upper arch and 29.4% were partially edentulous in the lower arch.
- Totally 24 (3.2%) dairy workers had upper partial denture and 1 (0.1%) workers had a lower partial denture.
- Totally 474 (63.2%) do not need any prosthesis and remaining 276 (36.8%) dairy workers need prosthesis.
- About 37 (4.9%) had enamel fracture, 4 (0.77%) had enamel and dentinal fracture, 1 (0.19%) of dairy workers had missing tooth due to trauma.
- About 509 (67.9%) of the dairy workers used tooth brush and tooth paste for maintaining oral hygiene while nearly 100 (13.3%) of workers were using other indigenous materials for cleaning their teeth.

Conclusion

CONCLUSION

Population based surveys are very useful in identifying the health related events and also for generating the etiological hypothesis for the same, which subsequently provides the base for future research. Among the oral diseases, dental caries and periodontal diseases have historically been considered the most important global oral health burdens. Despite various steps taken to improve the oral health of people, oral health problems still remain as a burden in many communities, particularly among low socioeconomic status people.

The present study revealed that the oral health status of these workers are with high caries prevalence and periodontal disease. The maximum need was restoration of untreated decayed teeth in both the age groups (69.3%) as only 10% of total participants had filled teeth. Further research is suggested in order to explore and identify the prevailing etiological factors responsible for the current scenario. This study also highlighted the contribution attributed to oral health services, lack of awareness and utilization of dental services.

The dairy plant is an organized sector and hence the subjects can be adopted by health care professionals or nearby dental colleges for oral health promotion. This might be a chance for the workers to obtain health counseling and general oral health information in their premises with which dental health education programs can be given to motivate the workers to receive regular dental check-up in order to maintain better oral health, so that initiation and progression of oral disease is intercepted at the earliest for the achievement of optimum oral health. Also health promoting activities are easy to formulate among the workers. Combined efforts has to be taken by the health care professionals, Salem Aavin Dairy Plant administrators, policy makers and dairy workers which is essential to improve the health of their workers.

Recommendations

RECOMMENDATIONS

1. Regular oral examinations by dental professionals will help these workers to maintain good oral health and oral health promotion help to control oral disease and promote good health.
2. Nearby Dental colleges and Indian Dental Association (Local Branch) may adopt these dairy workers which may help to reduce the unmet back log of dental treatment needs of these workers who are poor socio economically.
3. Government and local NGO's like Rotary Club, Lions Club etc. can organize free medical and dental camps periodically so that the workers can get free treatment.
4. To request the management to include screening for oral diseases as a part of routine medical screening, which is mandatory for all the workers.
5. To request the dairy Plant to include dental insurance for the benefit of the workers and their families. Group insurance scheme can be setup so that the workers can avail dental treatment at a reasonable cost.
6. Dental health education emphasizing the appropriate oral hygiene aids and practices including the correct brushing technique should be disseminated through dental camps and dental health programs and provide them with accessible and affordable dental health care services.
7. Dietary advice should be made within the context of healthy eating policies. It is important to provide simple, realistic, practical guidance for selecting a balanced diet.
8. All preventive activities like fluoride application, preventive resin restorations and use of fluoridated toothpaste should be promoted for appropriate subjects and oral health assessment should be included as a part of general health assessment.

9. An establishment of dental health care center within the premises of factory for their routine dental checkup, treatment and emergency care.
10. The basic emergency oral health care services needs to be provided at nearby primary health centers with provision of preventive care at the core. This center should be located preferably with in the reach of the employee near the dairy plant.
11. Regular community based programme to create awareness amongst dairy plant workers to enhance their knowledge, attitude and their oral health practices should be conducted.

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Annexures

ANNEXURE- I

INSTITUTIONAL REVIEW BOARD APPROVAL



**INSTITUTIONAL ETHICS COMMITTEE
VIVEKANANDHA DENTAL COLLEGE FOR WOMEN**

SPONSORED BY : ANGAMMAL EDUCATIONAL TRUST
Ethics Committee Registration No. ECR/784/Inv/TN/2015 issued under Rule 122 DD of the Drugs & Cosmetics Rule 1945.

Dr. J. Baby John Mr. K. Jayaraman Dr. R. Jagan Mohan Dr. B.T. Suresh Dr. Sachu Philip	Chair Person Social Scientist Clinician Scientific Member Scientific Member	Dr. (Capt.) S. Gokulanathan Mr. A. Thirumoorthy Dr. N. Meenakshiammal Dr. R. Natarajan Mr. Kamaraj	Member Secretary Legal Consultant Medical Scientist Scientific Member Lay Person
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No: VDCW/IEC/14/2015 Date: 14.12.2015


TO WHOMSOEVER IT MAY CONCERN


Principal Investigator: Dr S.Santhakumari


Title: Oral health status and treatment needs of dairy workers in Salem, Tamil Nadu-A cross sectional study.

Institutional ethics committee thank you for your submission for approval of above proposal. It has been taken for discussion in the meeting held on 08 .12.15.The committee approves the project and it has no objection on the study being carried out in Vivekanandha Dental College For Women.



You are requested to submit the final report on completion of project.Any case of adverse reaction should be informed to the institutional ethics committee and action will be taken thereafter.


CHAIRMAN
INSTITUTIONAL ETHICS COMMITTEE
VIVEKANANDHA
DENTAL COLLEGE FOR WOMEN
Elayampalayam-637 205
Tiruchengode (Tk) Namakkal (Dt),
Tamilnadu.




SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
VIVEKANANDHA
DENTAL COLLEGE FOR WOMEN
Elayampalayam-637 205.
Tiruchengode (Tk) Namakkal (Dt),
Tamilnadu.

ANNEXURES – II

	VIVEKANANDHA DENTAL COLLEGE FOR WOMEN
	SPONSORED BY : ANGAMMAL EDUCATIONAL TRUST. Approved by DCI and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University Elayampalayam, Tiruchengode T.k., Namakkal Dt., Tamil Nadu - 637 205. Phone : 04288 - 234891, FAX : 04288 - 234891.
VIVEKANANDHA EDUCATIONAL INSTITUTIONS	
Ref. 872/VDCW/2015	Date :09.10.2015
Dr. (Capt) S.Gokulanathan, B.Sc., M.D.S., Principal	
To	
The General Manager, Salem Dairy Plant, Steel Plant Road, Salem	
Respected Sir,	
Sub: Requisition for seeking permission to conduct a study in Dairy Plant – Reg.	
We wish to conduct a study titled “Oral health status and treatment needs of dairy workers in Salem Dairy Plant – A Cross sectional survey” as per the Ministry of Health and University norms. I will be thankful to you if you could permit Dr. S. Santhakumari to conduct a study in your Dairy Plant.	
Thanking you,	
Place: Elayampalayam	Yours sincerely,  PRINCIPAL VIVEKANANDHA DENTAL COLLEGE FOR WOMEN Elayampalayam - 637 205. Tiruchengode (Tk) Namakkal (Dt) Tamilnadu

ANNEXURE - III

THE SALEM DISTRICT CO-OP.
MILK PRODUCERS' UNION LTD., SALEM

Ref. No.77/Estt.2/2012

Dated : 02.11.2015

To
The Principal,
Vivekanandha Dental College for Women
✓ Elamyampalayam
Tiruchengode
Namakkal Dt

Sir,

Sub : SDCMPU Ltd., Salem – Personnel - Establishment - Grant
of permission to student to undergo *Project work* in
Salem Dairy – intimated.

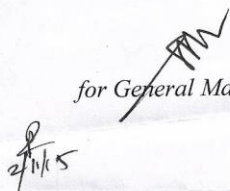
Ref : Your letter No.No nil dated 29.10.2015

As requested by you, permission is hereby accorded to
Dr.S.Santhakumari, Post Graduate student of Public Health Dentistry of your
College to undergo *Project work / Thesis work* in Salem Dairy during the
months from February 2016 to May 2016.

We request you to instruct the student to undergo *Project work /*
Thesis work in Salem Dairy without affecting the routine works. Also instruct the
student to keep the data collected as Confidential and use the same for academic
purpose only and to submit his report on completion of the *Project work*.

for Salem District Co-op.
Milk Producers' Union Ltd.,
Sd/-K.SANTHI
GENERAL MANAGER

Copy to:
The Deputy General Manager (Prodn)
The Asst. General Manager (Mkg)
The Manager (Accts)


for General Manager

ANNEXURE - IV



The Salem District Co-operative
Milk Producers' Union Ltd., E.D.912,

Sithanur, Thalavaipatti P.O., Salem - 636 302, Tamilnadu.

Phone : 0427-6540201 / 2 / 3 Fax : 0427-2386871

E-mail: aavinslm@rediffmail.com / aavinslm@gmail.com

TIN : 33212700262 / 01-01-2007 CST. No. : 408995 / 1-4-84

TO WHOMSOEVER IT MAY CONCERN


We are pleased to inform you that Dr.S.Santhakumari, Post graduate, Public Health Dentistry, Vivekanandha Dental College for Women has conducted her study on the title "**Oral health status and treatment needs of dairy workers in Salem, Tamilnadu- A cross sectional study**" at our Salem dairy plant. We appreciate her motivation and focus on delivering services to the dairy workers.

While conducting the study, her positive attitude and health talk delivered to the workers have improved their psychological state towards the dental health, those who are in need.

We wish her all the very best in her future endeavor.

Thanks / Regards



Authorized signature

**GENERAL MANAGER
THE SALEM DISTRICT CO-OPERATIVE
MILK PRODUCERS UNION LTD.,
THALAVAIPATTY (POST),
SALEM 636 302.**

ANNEXURE – V_a

S.NO:

VIVEKANANDHA DENTAL COLLEGE FOR WOMEN
DEPARTMENT OF PUBLIC HEALTH DENTISTRY
TIRUCHENGODE-637 205
TAMILNADU

Investigator: Dr. .S. Santhakumari

Guide: Dr. Girish R. Shavi

INFORMED CONSENT FORM

**STUDY TITLE: ORAL HEALTH STATUS AND TREATMENT NEEDS OF DAIRY
WORKERS IN SALEM, TAMILNADU - A CROSS-SECTIONAL STUDY**

Name: Mr/Ms _____

Address: _____

SEX : Male / Female

AGE : Yrs

I, _____, give my consent voluntarily to participate as a participant in this study. I agree to the following:

1. I have been informed to my satisfaction about the purpose of the study and study procedures.
2. I understand that the study involves questions which may sometimes be personal.
3. I agree to co-operate fully for complete examination.
4. I am told that the investigating doctor and the institution will keep my identity confidential.
5. I understand that I have rights to withdraw myself from the study and also that the investigator has the right to exclude me from the research at any point of time.

Name

Signature/ Thumb impression of
Participant/Parent/Guardian

Date:

Investigator

Signature of investigator

Date:

ANNEXURE – V_b

ANNEXURE –Ia

S.NO:

விவேகானந்தா மகளிர் பல் மருத்துவக்கல்லூரி
சமூக நல பல் மருத்துவத் துறை
திருச்செங்கொடு-637205
தமிழ்நாடு

ஆய்வாளர்: Dr. S. Santhakumari

துறை தலைவர்: Dr. Girish R Shavi

தலைப்பு: பால் தொழிற்சாலை ஊழியர்களின் வாய் நலம், நோய் மற்றும்
அவற்றிற்கான சிகிச்சைகள்- குறுக்குப் பரிவில் ஆய்வு.

ஒப்புதல் படிவம்

பெயர் : திரு/திருமதி
முகவரி:
இனம்: ஆண்/பெண்
வயது : வருடம்.

இந்த ஆராய்ச்சியில் என் சுயவிருப்பத்துடன் பங்கெடுப்பதற்கு ஒப்புதல்
அளிக்கிறேன்.மேலும் கீழே கொடுக்கப்பட்டுள்ளவற்றிற்கும் ஒப்புதல் அளிக்கிறேன்.

1. எனக்கு இந்த ஆராய்ச்சி பற்றியதான முழு தகவலும் அளிக்கப்பட்டுள்ளது.
2. இந்த ஆராய்ச்சியில் கேட்கப்பட உள்ள கேள்விகள் என் சுயம் சார்ந்ததாக இருக்கலாம் என்பது எனக்கு அறிவிக்கப்பட்டுள்ளது.
3. இந்த ஆராய்ச்சியில் செய்யப்படும் பரிசோதனைகளுக்கு முழு ஒத்துழைப்பு அளிப்பேன்.
4. என்னை பற்றிய விபரங்களை, பரிசோதனை செய்யும் மருத்துவரோ, மருத்துவமனையோ வெளியிடாது என்பது அறிவிக்கப்பட்டுள்ளது.
5. இந்த ஆராய்ச்சியில் இருந்து என்னை நானோ அல்லது மருத்துவரோ எப்பொழுது வேண்டுமானாலும் விடுவித்துக்கொள்ளலாம் என்பதும் அறிவிக்கப்பட்டுள்ளது.

பெயர் : கையொப்பம்/ கைவிரல் ரேகை

ஆய்வாளர்:
தேதி:

DENTITION STATUS AND TREATMENT NEED

Identification number

	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28	
Crown (96)																	(81)
Root (82)																	(97)
Treatment (98)																	(113)

	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38	
Crown (114)																	(129)
Root (130)																	(145)
Treatment (146)																	(161)

Primary teeth	Permanent teeth	STATUS	TREATMENT
Crown	Crown/Root		
A	0 0	Sound	0 = None
B	1 1	Decayed	P = Preventive, caries-arresting care
C	2 2	Filled, with decay	F = Fissure sealant
D	3 3	Filled, no decay	1 = One surface filling
E	4 —	Missing, as a result of caries	2 = Two or more surface fillings
—	5 —	Missing, any other reason	3 = Crown for any reason
F	6 —	Fissure sealant	4 = Veneer or laminate
G	7 7	Bridge abutment, special crown or veneer/implant	5 = Pulp care and restoration
—	8 8	Unerupted tooth, (crown)/unexposed root	6 = Extraction
T	T —	Trauma (fracture)	7 = Need for other care (specify).....
—	9 9	Not recorded	8 = Need for other care (specify).....
			9 = Not recorded

PROSTHETIC STATUS	PROSTHETIC NEED
0 = No prosthesis 1 = Bridge 2 = More than one bridge 3 = Partial denture 4 = Both bridge(s) and partial denture(s) 5 = Full removable denture 9 = Not recorded	0 = No prosthesis needed 1 = Need for one-unit prosthesis 2 = Need for multi-unit prosthesis 3 = Need for a combination of one- and/or multi-unit prostheses 4 = Need for full prosthesis (replacement of all teeth) 9 = Not recorded

DENTOFACIAL ANOMALIES

DENTITION

(166) (167) Missing incisor, canine and premolar teeth—maxillary and mandibular—enter number of teeth

SPACE

(168) Crowding in the incisal segments:
 0 = No crowding
 1 = One segment crowded
 2 = Two segments crowded

(169) Spacing in the incisal segments:
 0 = No spacing
 1 = One segment spaced
 2 = Two segments spaced

(170) Diastema in mm

(171) Largest anterior maxillary irregularity in mm

(172) Largest anterior mandibular irregularity in mm

OCCUSION

(173) Anterior maxillary overjet in mm

(174) Anterior mandibular overjet in mm

(175) Vertical anterior openbite in mm

(176) Antero-posterior molar relation:
 0 = Normal
 1 = Half cusp
 2 = Full cusp

NEED FOR IMMEDIATE CARE AND REFERRAL	
Life-threatening condition <input type="text"/> (177)	0 = Absent
Pain or infection <input type="text"/> (178)	1 = Present
Other condition (specify)..... <input type="text"/> (179)	9 = Not recorded

Referral (180)
 0 = No
 1 = Yes
 9 = Not recorded

NOTES

29. Dental trauma A- Severity

B-Number of teeth effected

0 = No sign of injury, 1 = Treated injury, 2 = Enamel fracture only, 3 = Enamel and Dentine fracture
4 = pulp involvement, 5 = Missing tooth due to trauma, 6 = other damage 7 = Excluded tooth.

30. Oral hygiene practices

A - Type of cleaning

1-Tooth brush, 2-finger, 3-stick, 4-others

B- Method of cleaning

1- Vertical, 2-Horizontal, 3-circular

C- Materials used

1-Tooth paste, 2- Tooth powder, 3- Sand, 4- Charcoal 5- Brick

D- Frequency of cleaning/brushing

1- Once, 2-Twice, 3-Thrice

E- Type of brushing

1-Before meal, 2- After meal

G -Any other oral hygiene aids

0=None 1-Flossing, 2- Inferential, 3-Brushing, 4- Oral mouth rinses