

**Assessment of oral health among carpet weavers in Kashmir region – Jammu and Kashmir**

<sup>1</sup>Dr. Mir Shayan Shakeel, Former MDS Resident, Dept. Of Public Health Dentistry, Surendera Dental College & Research Institute

<sup>2</sup>Dr. Sumaiya Sajad, Former Junior Resident, Dept. of Dentistry / Community Medicine, SKIMS, Soura

<sup>3</sup>Sheza Shakeel, PG Student, Dept. of Biochemistry, Kashmir University

<sup>4</sup>Dr. Shakeel A Mir, Former Rehab Officer, Head. Dept. of PMR, KIMS

<sup>5</sup>Dr. Abid MD GP, Kazan, Russia

<sup>6</sup>Dr. Aqib Hamid, MD Physician Medical Officer, J&K Health services

**Corresponding Author:** Dr. Mir Shayan Shakeel, Former MDS Resident, Dept. Of Public Health Dentistry, Surendera Dental College & Research Institute

**How to citation this article:** Dr. Mir Shayan Shakeel, Dr. Sumaiya Sajad, Sheza Shakeel, Dr. Shakeel A Mir, Dr. Abid, Dr. Aqib Hamid, “Assessment of oral health among carpet weavers in Kashmir region – Jammu and Kashmir”, IJMACR- March - 2023, Volume – 6, Issue - 2, P. No. 473 – 485.

**Open Access Article:** © 2023, Dr. Mir Shayan Shakeel, et al. This is an open access journal and article distributed under the terms of the creative commons attribution license (<http://creativecommons.org/licenses/by/4.0>). Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**Type of Publication:** Original Research Article

**Conflicts of Interest:** Nil

**Abstract**

**Background:** Oral health varies over the life course from early life to old age, is integral to general health and supports individuals in participating in society and achieving their potential. The present study was carried out to assess the oral health status among carpet weavers in Kashmir region, Jammu & Kashmir

**Materials & Methods:** The cross-sectional study was conducted among the carpet weavers in Kashmir region, Jammu and Kashmir. For this study we included 20 such factories who were ready to participate in the study. Final sample constituted of 200 workers, purpose was explained to all the participants; informed consent was obtained prior to the collection of data. Oral health status

was examined using Simplified Oral Hygiene Index (OHI-S), [19] Decayed, Missing, Filled Tooth Index (DMFT), [20] and Community Periodontal Index (CPI). The means and standard deviations of the measurements per group were used for statistical analysis (SPSS 22.00 for windows; SPSS inc, Chicago, USA). ANOVA, chi-square & student t test were used for necessary calculations and the level of significance was set at  $p < 0.05$ .

**Result:** out of total subjects 64.5 % were male & 35.5 % were female. Prevalence of use of tobacco was among male subjects which was 32 %. More than 82% of the subjects, irrespective of age group, clean their teeth with brush. Mean DMFT was found to be slightly higher in

females 4.82% as compared to male subjects 4.65%. CPI score of 2 or above was found among approximately 65% of the subjects. CPI score 0 was found in 11.62% and 12.67% of the male and female respectively. maximum OHI-S score was found among  $\geq 51$  year (3.29) subjects followed by 41-50 (2.72) year

**Conclusion:** The study's documenting of oral hygiene habits, status, and oral health care seeking behaviours indicates the areas that need to be addressed in order to enhance carpet weavers' oral health and related quality of life.

**Keywords:** oral health, oral hygiene, oral habits, quality of life.

### **Introduction**

Carpet weaving is an age-old tradition and widely dispersed in many countries. The heritage of the handmade carpet traced since an earlier civilization. The carpet has shown in each civilization a very precise degree of evolution. The Russian archaeologists Rudenko discovered the first earliest carpet in 1949 from a frozen underground burial chamber at Pazyryk royal tomb in the Altai Mountains on the border of Siberia and Outer Mongolia date from about 500- 400 B.C, measuring approximately five by six feet with 230 knots per square inch. Most of the researchers argue that the Pazyryk carpet perhaps comes from western or southern Persia or the Caucasus in Persia. The archaeological evidence of Western Asia revealed that there is a commercial exchange of textile products including carpets among the eastern Mediterranean and Asia from Egypt and Anatolia across Mesopotamia to Persia since 3000 B.C [1]. By the 6th century Persia became the real native land of silk or wool carpet weaving and then spread across Asia; Turkey, Afghanistan, India, Pakistan, and China [2].

The carpet industry of India is one of the oldest industries and its roots traced in the 16th century during Mughal period. The Mughal period was a golden historical era for Indian arts, craft and culture. Indian Carpet Industry is dominated by the unorganized sector of skilled and semi-skilled artisans. The carpet industry in India flourished in different parts of the country, especially in the northern states of India. Presently the major carpet belts in India are Jaipur in Rajasthan, Mirzapur, Agra, Bhadohi in Uttar Pradesh and Kashmir. The Indian hand-made carpet industry is an export-oriented industry and is a significant contributor to the country's rural economy, which helps in providing employment. The strength of the industry is the small and medium sized exporters with tremendous export potential and the highly talented crafts persons who have been weaving intricate designs of exclusive floor coverings [3]. The carpet industry of Kashmir occupies an important place in handicrafts and provides employment opportunities to lakhs of people in the rural and urban areas of Kashmir. Carpet weaving in Kashmir is largely practiced in the informal sector. The Kashmir is known as castle of Indian oriental carpets and rugs. The Kashmiri silk and woolen carpets are symbols of quality and artistic expertise. They have their own original style in respect of colour, quality, design and durability. These exquisite creations are hand knotted on wrap threads, one at a time, in accordance with a strict code of colour. Silk carpets are very rich traditionally and highly refined in terms of designs. The major designs found in Kashmir are divided into three types such as Persian design, Oriental design and Local Kashmiri design. The fundamental local designs of Kashmiri carpet called Chotta (small) design in which only 1/4th of the total design is represented and then

repeated to complete the whole. Other common designs of Kashmiri carpet are Tree of life, which is covered with flowers, birds, and animals in some cases. As the numbers of knots are more per square inch, the greater is the value and durability. They are unique carpets weaved in Kashmir.

The tradition of carpet manufacture in Kashmir goes back the time of Zain-Ul-Abidin 1420-1470 A.D brought carpet weavers from Persia and Central Asia into Kashmir & to train local Inhabitants. The famous carpet industry has its origin in Persia. Kashmir had historical contact with Persia and ancient trade routes passed through it. The influence of Persia on the art and craft of Kashmir has always been influential. Since then carpet heritages continued and got encouragement and patronage of different rulers, visitors to the valley, thus the skill passes from generation to generation. A great deal of minute, delicate and intricate work is involved in creating the fabulous carpets, which reflects not only Indo Persian culture but also, artistic skills. The hand knotted Kashmiri carpets are woven by all locales of Kashmir, specifically - Srinagar, Anantnag, Bandipora, Ganderbal, Budgam, Pulwama, Kulgam, and Baramulla. Carpets are well known in Kashmir and are locally known as 'kalin'. 'Talim' is actually a weaver's alphabet for carpet weaving. The design is organised in a graphical manner with every square standing for a knot and the whole design based on it. The important feature of the Kashmiri carpet is that they are always hand knotted. The knots are of two types, single and double, the former called Persian or Sehna, and the later Turkish or Ghiordes. The Persian knot is an asymmetrical while Turkish knot is a symmetrical. The yarn used normally is silk and wool. The loom used in Kashmiri carpet weaving is composed of two horizontal wooden beams,

between which the wrap threads are stretched, one beam in front of the weaver and the second behind the first. Very simple tools are used to thread the knots, a wood or metal comb to push knots and weft tightly together and a pair of short scissors to cut the pile of the carpet once it is finished. For making carpet it has to go through various processes like determination of size and quality, designing, taleem writing, dyeing and procuring raw material, wrap formation, weaving, washing and drying, finishing and packing [4].

The Carpet industry in Kashmir has made a great contribution towards production, employment, and export of handicraft products and contributes to the economic development of Jammu and Kashmir. The production and export of carpet handicraft since 1990-91 to 2016-17 has been quite encouraging. The production of carpet handicraft in 1990-91 is Rs. 84.55 crores and in 2016-17 is Rs. 821.50 crores. The export of carpet in 1990-91 is Rs. 26.41 crores and in 2016-17 is 369.81crores and the total employment in Carpet industry in 1990-91 is 0.74 lakh and in 2016-17 is 1.11 lakh. The main export markets for Kashmiri carpets are USA, UK, Germany, Canada and Australia. There is fluctuation in the growth rate of production and export of carpet handicrafts in Kashmir from 1990 to 2017 [4].

Workers comprise a huge and valuable population. In 2007,WHO estimated that the global labor volume would be about half of the global population. 60%–70% of males and less than half of females across the globe are officially registered working labor. According to the joint committee of WHO and International Labor Organization (ILO), occupational health is defined as the promotion and maintenance of the highest degree of physical, mental, and social well-being of workers in all occupations [5]. Occupational environment constitutes

the extraneous states and drivers existing at the workplace which would have an influence on the health of the workers. The incidence of occupational diseases in India is a matter of concern with India contributing 20% to the world's occupational disease burden [6]. Working environments are often regarded as important risk factors for oral health problems and in light of the established negative influence of oral health problems on the quality of life of people, poor working environments frame a vicious cycle where the quality of life of the stakeholders keeps compromising with time.

Though the oral health status of workers from different industries like cement,[7] marble,[8] battery,[9] fireworks,[10] bakery,[11] etc., was reported in literature, there is little information on the oral health status of carpet weavers. With this background, the aim of this study was to document the oral health status among carpet weavers in Kashmir region, Jammu and Kashmir.

#### **Material And Method**

The present cross-sectional study was conducted among the carpet weavers in Kashmir region, Jammu and Kashmir. In Kashmir region there are many small scale factories of carpet weavers. For this study we included 20 such factories who were ready to participate in the study after explaining the purpose of the study to the owner of factory as well as workers. Final sample constituted of 200 workers, purpose was explained to all the participants; informed consent was obtained prior to the collection of data.

#### **Inclusion Criteria**

1. Workers who give consent to participate in study and present on day of study.

#### **Exclusion Criteria**

1. Workers employed on contractual/temporary basis.

2. Workers who did not give consent and not present on the day of study.

#### **Data Collection**

Data on gender, age, education, income, tobacco and alcohol habits, oral hygiene practices, self-reported dental problems, past dental visits, type and place of availed treatments, and barriers for utilizing dental services were recorded. Oral health status was examined using Simplified Oral Hygiene Index (OHI-S), [19] Decayed, Missing, Filled Tooth Index (DMFT), [20] and Community Periodontal Index (CPI). [20] Two investigators took part in the data collection process after demonstrating good inter-examiner reliability [intra-class correlation coefficient ranged from 0.84–0.87; weighted Kappa for CPI was 0.91 (95% CI 0.84–0.97)].

**Statistical Analysis:** Data so collected was tabulated in an excel sheet, under the guidance of a statistician. The means and standard deviations of the measurements per group were used for statistical analysis (SPSS 22.00 for windows; SPSS inc, Chicago, USA). For each assessment point, data were statistically analyzed using one-way ANOVA. Difference between two groups was determined using student t-test as well as chi-square test and the level of significance was set at  $p < 0.05$ .

**Results:** Of the final sample of 200, 129 (64.5%) were males and 71 (35.5%) were females. Majority of the participants (39%) belonged to the age group of 31–40 years.

44.5% of the study subjects were illiterate, while 27.5% did not complete primary school education.

The prevalence of tobacco use in any form was 32% and such use was reported only among males, which implies that 49.61% of male carpet weavers have the habit of tobacco consumption.

More than 2/3<sup>rd</sup> of the subjects, irrespective of the sex, were cleaning their teeth with brush and used paste as cleaning material. More than 50% of the subjects change their toothbrush after one year. When cleaning aid, cleaning material and change of toothbrush was compared among male and female, insignificant difference was found. More than 82% of the subjects, irrespective of age group, clean their teeth with brush. Only 57.14% of the subjects having >51 year were using paste as cleaning material.

Past dental visit was revealed by 40.31% and 43.66% of the male and female respectively with statistically insignificant difference. Maximum dental care was sought from private dental college followed by private clinic and government hospital. Maximum past dental visits was revealed by subjects having age 18-30 years (60%) followed by 31-40 year (38.46%). When dental visit was compared according to different age groups, significant difference was found.

Mean OHI-S among the study subjects was 2.38 with comparable values in male and female. Mean OHI-S score increases with increase in age group i.e. maximum OHI-S score was found among  $\geq 51$  year (3.29) subjects followed by 41-50 (2.72) year. Minimum mean OHI-S score was revealed in 18-30 year age group. When mean OHI-S score was compared according to different age group, significant difference was found

Mean DMFT was found to be slightly higher in females as compared to males, though no significant difference was found. Mean DMFT score increases with increase in age group i.e. maximum DMFT score was found among  $\geq 51$  year (6.18) subjects followed by 41-50 (4.62) year. Minimum mean DMFT score was revealed in 18-30 year age group. When mean DMFT score was compared

according to different age group, significant difference was found.

In this study, CPI score of 2 or above was found among approximately 65% of the subjects. CPI score 0 was found in 11.62% and 12.67% of the male and female respectively. When CPI score was compared according to male and female, insignificant difference was found. CPI score 3 was found among 35.71%, 14.49%, 15.38% and 8% of the  $\geq 51$  year, 41-50 year, 31-40 year and 18-30 year respectively. When CPI score was compared according to different age group, significant difference was found. **DISCUSSION:** Working environments are frequently regarded as important risk factors for oral health problems, and given the well-established negative impact of oral health problems on people's quality of life, poor working environments create a vicious cycle in which stakeholder quality of life deteriorates over time. Although the dental health of workers in many industries such as cement, marble, batteries, and bakery has been documented in the literature, nothing is known about the oral health of carpet weavers. In light of this, the goal of this study was to document the oral health of carpet weavers in Kashmir, Jammu and Kashmir.

Due to lack of similar study, we were not able to compare the findings of the present study in exploratory manner.

### **Conclusion**

The present cross-sectional study was conducted among the carpet weavers in Kashmir region, Jammu and Kashmir. In Kashmir region there are many small scale factories of carpet weavers. For this study we included 20 such factories who were ready to participate in the study after explaining the purpose of the study to the owner of factory as well as workers. The aim of the



study was to assess oral health among carpet weavers in Kashmir region, Jammu & Kashmir.

## References

1. Ford PR. Oriental carpet design: A guide to traditional motifs, patterns and symbols. United Kingdom: Thames and Hudson; 1981.
2. Seyf A. The carpet trade and the economy of Iran. Taylor & Francis, Ltd. 1992;30:99–105.
3. Bowonder B, Swamy J, Mastakar N. Regaining competitiveness using an ICT platform in a traditional industry: Adoption of computer aided design for carpet weaving; 2005.
4. Majeed I. Carpet handicraft industry in Kashmir: An overview. International Journal of Research and Analytical Reviews. 2018;5(4):976-989.
5. Detels R, Beaglehole R, Lansang MA, Gulliford M. Oxford's Textbook of Public Health. 5th ed, Vol. 2. The Method of Public Health. Oxford; 2009. p. 894.
6. Sood M, Bhaggana A, Bhaggana V, Sharma N. Occupational dental wear among ceramic factory workers. An observational study. J Indian Dent Assoc 2011;5:472-3.
7. Sharma A, Thomas S, Dagli RJ, Solanki J, Arora G, Singh A. Oral health status of cement factory workers, Sirohi, Rajasthan, India. J Health Res Rev 2014;1:15-9.
8. Duraiswamy P, Kumar TS, Dagli RJ, Chandrakant, Kulkarni S. Dental caries experience and treatment needs of green marble mine laborers in Udaipur district, Rajasthan, India. Indian J Dent Res 2008;19:331-4.
9. Raj JB, Gokulraj S, Sulochana K, Tripathi V, Ronanki S, Sharma P. A cross-sectional study on oral health status of battery factory workers in Chennai city. J Int Soc Prev Community Dent 2016;6:149-53.
10. Sherley MM, Nivetha A, Ganesh R. Oral health status of cracker workers in Sivakasi, Tamil Nadu, India – A cross-sectional study. J Indian Assoc Public Health Dent 2015;13:384-8.
11. Dileep CL, Basavaraj P, Jayaprakash K, Gupta BD. Dental caries experience and oral hygiene status of biscuit factory workers in Kanpur city. J Indian Assoc Public Health Dent 2007;9:54-9.
12. Subedi, R.K. and Banamala, S. Occupational Safety and Health among Carpet Factory Workers in a District of Nepal. Open Access Library Journal 2015; 2: e1527.
13. Mishra P, Solanki J, Yadav OP et al. Oral Health Status and Treatment Needs among Handicraft Factory Workers in Jaipur City, Rajasthan. International Journal of Preventive and Clinical Dental Research, April-June 2016;1(2):1-6.
14. Khare A, Saxena V, Jain M, Sharva V. Periodontal stipulation inference of industrial recruits of Bhopal city, India: A cross-sectional study. SRM J Res Dent Sci 2018;9:17-20.
15. Janapareddy K, Parlapalli V, Pydi S, Pottam N, Chatti P, Pallekonda AT. Oral Health Status and Oral Health-Related Quality of Life (OHRQoL) among steel factory workers of Visakhapatnam-A cross-sectional study. J Family Med Prim Care 2020;9:5309-15.
16. Bommireddy VS, Gayathri Naidu SS, Kondapalli TP, Kommineni HC, Madem R, Padagala GM. Oral hygiene habits, oral health status, and oral health care seeking behaviors among spinning mill workers in Guntur district: A cross-sectional study. J Family Med Prim Care 2020;9:3025-9.

17. Halappa M. Oral health status and treatment needs among multiple factory workers, Tumkur City – A cross sectional study. J Indian Assoc Public Health Dent 2020;18:232-5.

18. Prabu D, Sindhu R, Raj Mohan M, Bharathwaj V V, Savitha S. Prevalence Of Dental Caries And Oral Hygiene Status Of Biscuit Factory Workers In Madurai City. International Journal of Dental and Clinical Studies 2022;3(1)13-18.

**Legend Tables & Graphs**

Table 1: Gender and age distribution among the study population

VARIABLE	CATEGORY	NUMBER (N=200)	PERCENTAGE (%)
GENDER	Male	129	64.5
	Female	71	35.5
AGE GROUP	18-30 Years	25	12.5
	31-40 Years	78	39
	41-50 Years	69	34.5
	51 Years And Above	28	14

Graph 1: Gender and age distribution among the study population

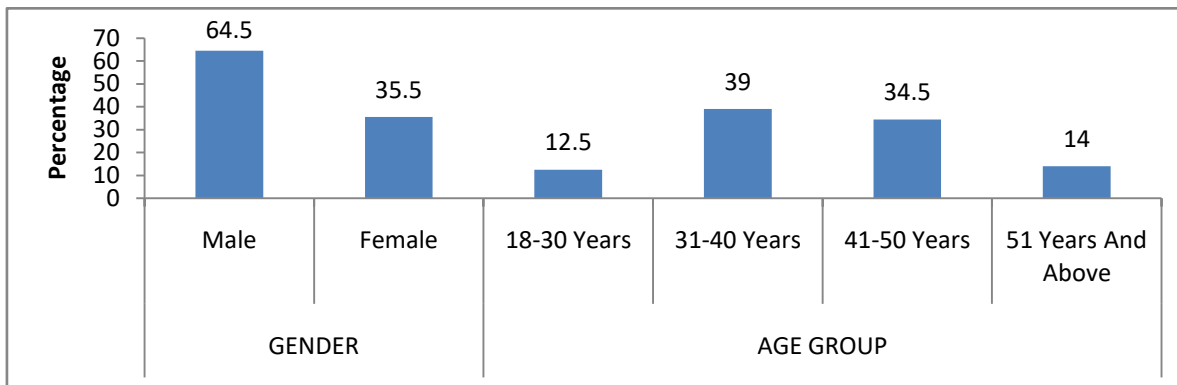


Table 2: Education status of study population

EDUCATION	NUMBER (N=200)	PERCENTAGE (%)
Illiterate	89	44.5
Not Completed Primary Education	55	27.5
Primary Education	38	19
Secondary Education	18	9

Graph 2: Education status of study population

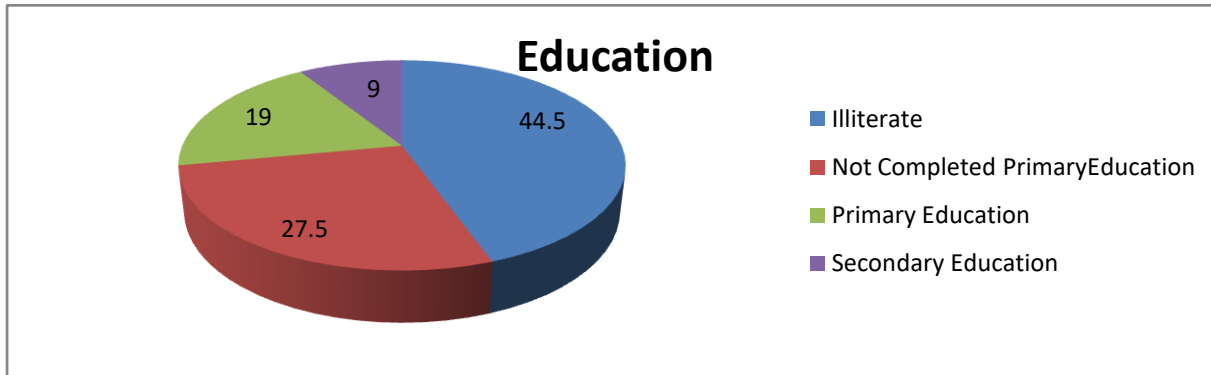


Table 3: Deleterious habits among the study population

VARIABLE	CATEGORY	NUMBER (N=200)	PERCENTAGE (%)
TOBACCO HABIT	Yes	64	32
	No	136	68

Table 4: Gender wise differences in oral hygiene habits among the study subjects

Variable	Category	Male n (%)	Female n (%)	P value
Cleaning aid	Brush	98(75.96)	59(83.09)	0.33
	Finger	25(19.37)	8(11.26)	
	Twig	6(4.65)	4(5.63)	
Cleaning material	Paste	112(86.82)	63(88.73)	0.24
	Powder	15(11.62)	14(19.71)	
	Other	2(1.55)	4(5.63)	
Frequency of changing tooth brush	3 months	19(19.38)	9(15.25)	0.47
	6 months	27(27.55)	18(30.50)	
	1 year	52(53.06)	32(54.23)	



Graph 4: Gender wise differences in oral hygiene habits among the study subjects

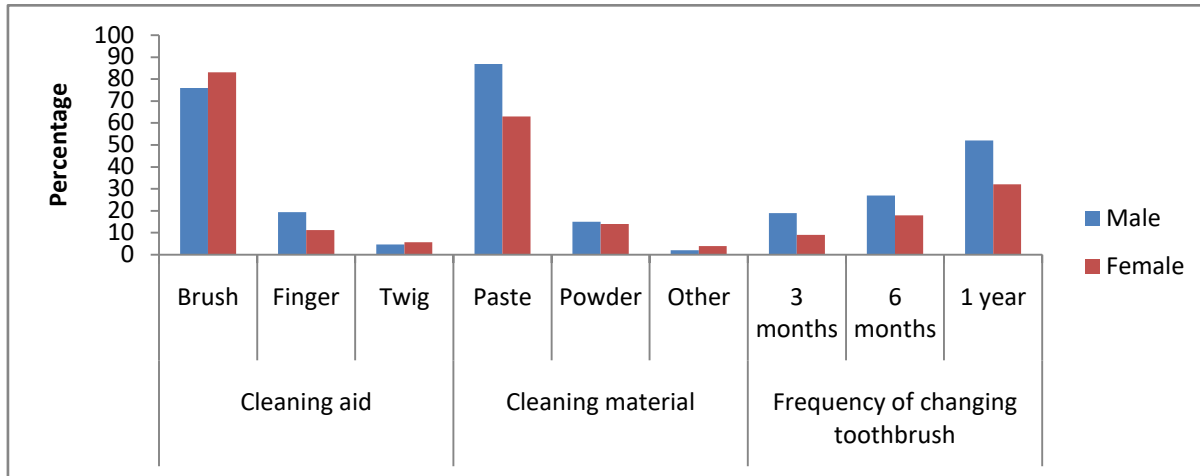


Table 5: Age wise differences in oral hygiene habits and oral health care service utilization among the study subjects

Variable	Category	18-30yr n (%)	31-40yr n (%)	41-50yr n (%)	≥51yr n(%)	P value
Cleaning aid	Brush	23(92)	72(92.30)	59(85.50)	23(82.14)	0.14
	Finger	2(8)	6(7.69)	7(10.14)	4(14.28)	
	Twig	0	0	3(4.34)	1(3.57)	
Cleaning material	Paste	25(100)	74(94.87)	61(88.40)	16(57.14)	0.046*
	Powder	0	4(5.12)	6(8.69)	9(32.14)	
	Other	0	0	2(2.89)	3(10.71)	
Frequency of changing toothbrush	3 months	6(24)	22(28.20)	19(27.53)	5(17.85)	0.11
	6 months	7(28)	19(24.35)	22(31.88)	9(32.14)	
	1 year	12(48)	37(47.43)	28(40.57)	14(50)	

Graph 5: Age wise differences in oral hygiene habits and oral health care service utilization among the study subjects

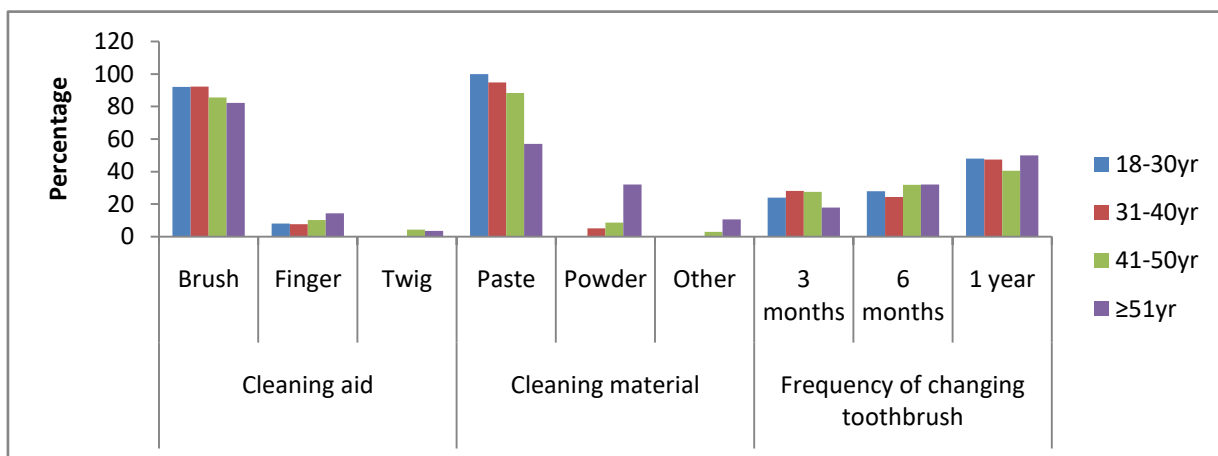


Table 6: Gender wise differences in oral health care service utilization among the study subjects

Variable	Category	Male n (%)	Female n (%)	P value
Past dental visit	Yes	52(40.31)	31(43.66)	0.42
	No	77(59.68)	40(56.33)	
Facility where dental care was sought	Government Hospital	11(21.15)	5(16.12)	0.36
	Private clinic	15(28.84)	10(32.25)	
	Dental college	22(42.30)	14(45.16)	
	Quacks	4(7.69)	2(6.45)	

Graph 6: Gender wise differences in oral health care service utilization among the study subjects

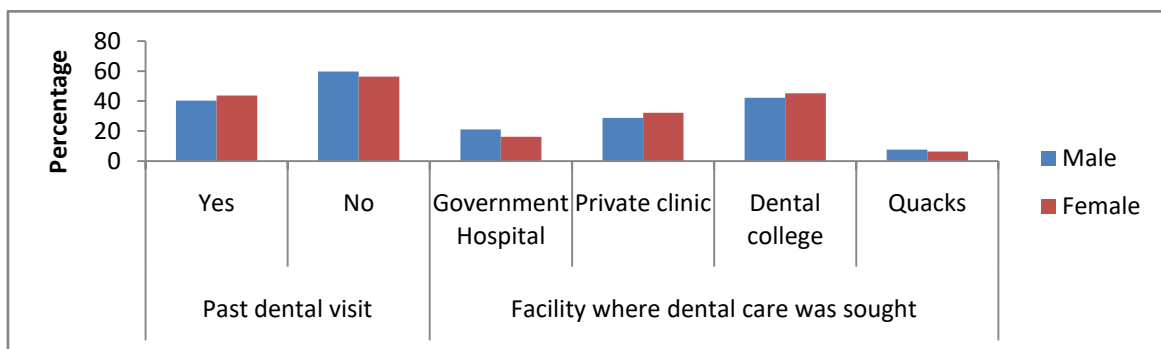


Table 7: Age wise differences in oral health care service utilization among the study subjects

Variable	Category	18-30yr n (%)	31-40yr n (%)	41-50yr n (%)	≥51yrn(%)	P value
Past dental visit	Yes	15(60)	30(38.46)	25(36.23)	10(35.71)	0.033*
	No	10(40)	48(61.53)	44(63.76)	18(64.28)	
Facility where dental care was sought	Government hospital	5(33.33)	11(36.66)	9(36)	3(30)	0.07
	Private clinic	6(40)	7(23.33)	3(12)	2(20)	
	Dental college	4(26.66)	8(26.66)	10(40)	4(40)	
	Quacks	0	4(13.33)	3(12)	1(10)	

Graph 7: Age wise differences in oral health care service utilization among the study subjects

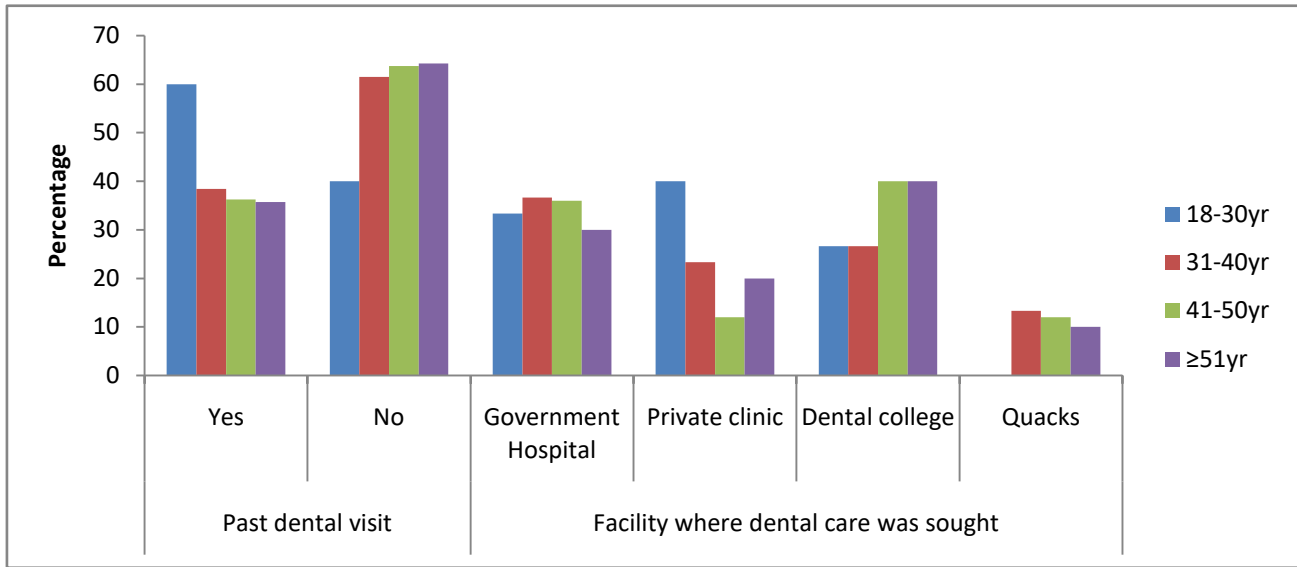


Table 8: Gender wise differences in mean OHI-S of the study participants

Gender	Mean OHI-S	SD	p value
Male	2.38	0.91	0.83
Female	2.37	0.74	

Graph 8: Gender wise differences in mean OHI-S of the study participants

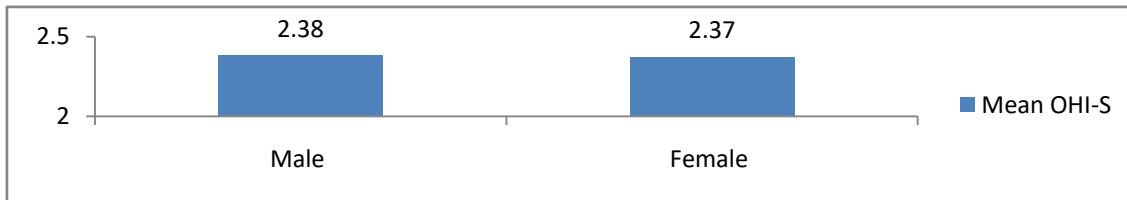


Table 9: Gender wise differences in mean DMFT of the study participants

Gender	Mean DMFT	SD	p value
Male	4.65	1.98	0.21
Female	4.82	2.15	

Graph 9: Gender wise differences in mean DMFT of the study participants

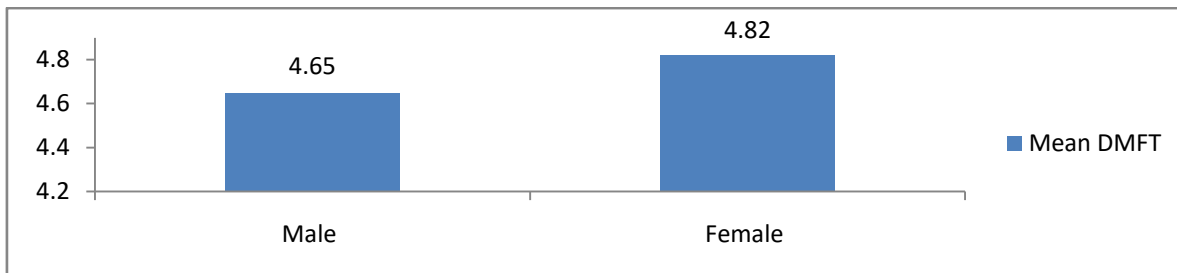


Table 10: Gender wise differences in CPI score of the study participants

CPI Score	Gender		P value
	Male n(%)	Female n(%)	

0	15(11.62)	9(12.67)	0.081
1	23(17.82)	16(22.53)	
2	64(49.61)	25(35.21)	
3	27(20.93)	21(29.57)	

Graph 10: Gender wise differences in CPI score of the study participants

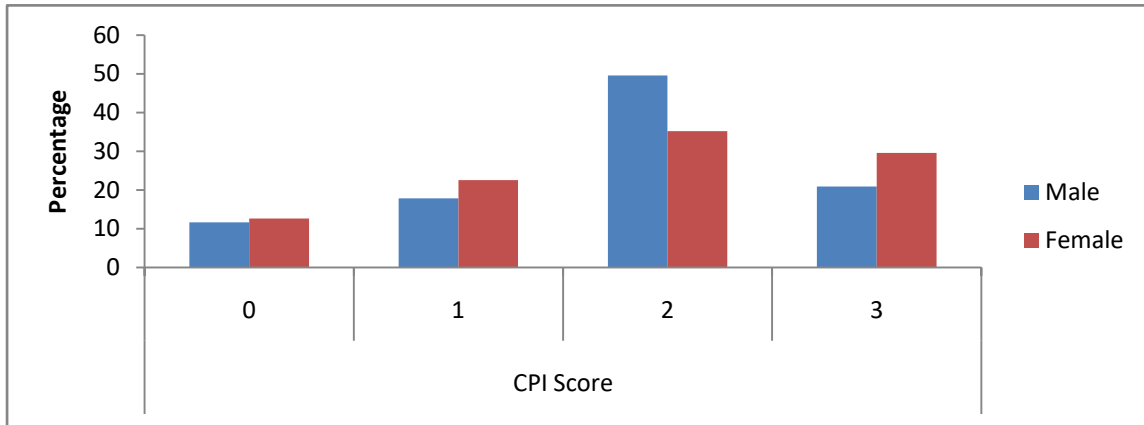


Table 11: Age wise differences in mean OHI-S of the study participants

Age	Mean OHI-S	SD	p value
18-30 yr	1.81	0.29	<0.01*
31-40 yr	1.89	0.61	
41-50 yr	2.72	1.12	
≥51 yr	3.29	1.84	

Graph 11: Age wise differences in mean OHI-S of the study participants

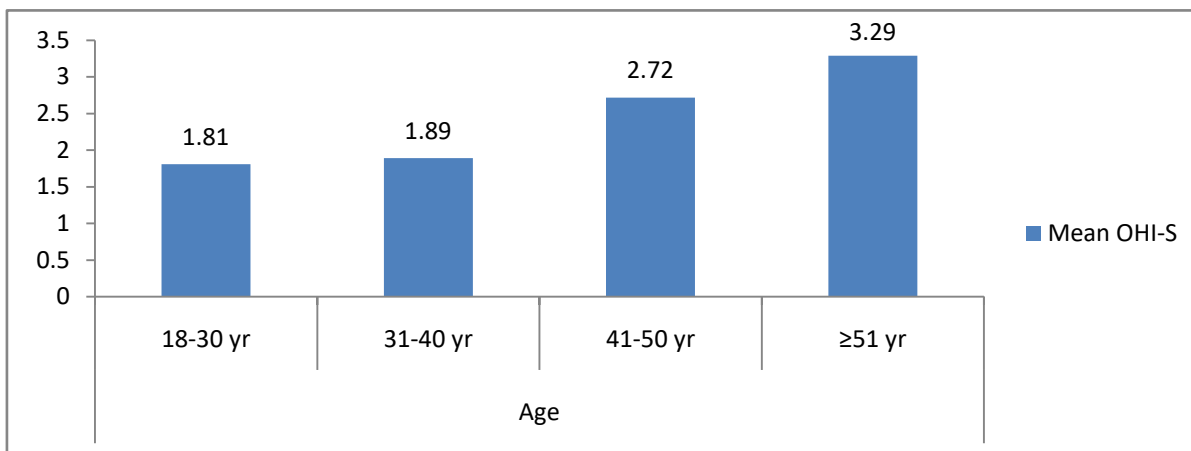


Table 12: Age wise differences in mean DMFT of the study participants

Age	Mean DMFT	SD	p value
18-30 yr	3.04	1.98	<0.01*
31-40 yr	3.79	2.15	
41-50 yr	4.62	2.19	

≥51 yr	6.18	2.68	
--------	------	------	--

Graph 12: Age wise differences in mean DMFT of the study participants

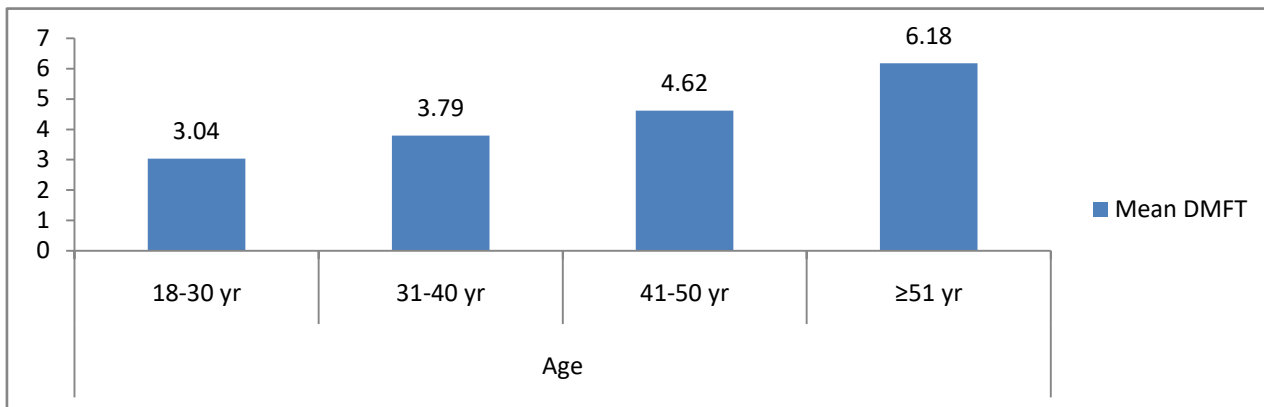


Table 13: Age wise differences in CPI score of the study participants

CPI Score	18-30yr n (%)	31-40yr n (%)	41-50yr n (%)	≥51yrn(%)	P value
0	5(20)	10(12.82)	7(10.14)	2(7.14)	0.027*
1	12(48)	15(19.23)	14(20.28)	7(25)	
2	6(24)	41(52.56)	38(55.07)	9(32.14)	
3	2(8)	12(15.38)	10(14.49)	10(35.71)	

Graph 13: Age wise differences in CPI score of the study participants

