




A Comparative Evaluation of the Knowledge and Attitude of Healthcare Professionals and General Population in Maharashtra regarding Oral Hygiene: A Questionnaire Study

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Abstract

Keywords

- oral health awareness
- healthcare workers
- nonhealthcare workers
- dental caries
- oral hygiene

Introduction Oral health maintenance is very important for one's overall well-being. It is very important for not only the general population but also the healthcare professionals who provide for their well-being to be aware of the same.

Materials and Methods An online questionnaire survey consisting of nine questions related to oral hygiene practices were sent to 130 healthcare workers (HCWs) and 130 nonhealthcare workers (NHCWs) all over Maharashtra. The data obtained was statistically analyzed.

Results Out of the total subjects, 36.9% of the HCWs reported that they brush their teeth twice a day as compared to 12.30% of NHCWs, whereas 21.5% of the HCWs reported that they brush their teeth once a day as compared to 53.8% of NHCWs. About 53.8% of the HCWs reported that they brush their teeth for 1 minute as compared to 38.4% of NHCWs; whereas 40% of the HCWs as well as NHCWs reported that they brush their teeth for 2 minutes.

Conclusion It can be concluded that, although HCWs generally exhibit better oral hygiene awareness compared to NHCWs, it is crucial to provide comprehensive oral health knowledge to both groups. This approach aims to foster heightened awareness, improve knowledge, and enhance practices related to oral health.

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Introduction

Oral health is a critical aspect of an individual's overall well-being. Research till date indicates a high prevalence of oral diseases, posing a significant public health concern. There is widespread lack of awareness about oral hygiene among the general public and healthcare practitioners. Unhealthy habits like tobacco use and a lack of access to dental specialists further compromise oral health.^{1,2}

Dental caries and periodontal disease affect 50 to 60% and 95 to 100% of the adult population in India, respectively.³ These conditions not only cause pain but also disrupt daily activities, leading to the loss of working hours, income, education, and social engagement. Consequently, oral diseases impact an individual's quality of life, overall productivity, and impose an economic burden on society.¹

Embracing the theme "Oral health for a healthy life" as given by the World Health Organization (WHO) is crucial for our nation's well-being, urging all its citizens to incorporate good oral hygiene practices into their daily lives.^{2,4}

Healthcare professionals play a crucial role in educating patients, families, and communities about oral health; hence, it is important for them to understand and assess their own oral health behavior as well. Additionally, gaining insights into the oral health habits of the general population aids in evaluating disparities in self-care practices.

There are a number of studies carried across India and abroad with regard to oral hygiene practices and awareness.⁵⁻⁷ But limited research has been conducted to comparatively evaluate the oral hygiene awareness among healthcare workers (HCWs) and the general population. This study seeks to create a database focusing on oral health among individuals. It aims to pinpoint areas that require improvement, not only within HCWs but also in the general population. The findings from this research will offer valuable insights for shaping policies that aim to enhance the overall well-being of both the public and healthcare professionals.

Materials and Methods

The electronic questionnaire was sent to the general population and healthcare professionals in Maharashtra who consented to participate in the survey. The questionnaire consisted of nine questions framed according to WHO guidelines, divided into two parts. The first part comprised questions relating to demographic data, including age, gender, and education. The second part included questions about oral health knowledge and practices.

Inclusion Criteria

Following individuals were included in this study:

1. Individuals aged between 25 and 40 years.
2. Individuals residing in Maharashtra.

Exclusion Criteria

Following individuals were excluded from this study:

1. Individuals aged between less than 25 and more than 40 years.
2. Individuals residing outside Maharashtra.

Sample Size Estimation

The sample size calculator used the following formulas to compute sample size:

$$nA = k \cdot nB$$

$$nB = [pA(1 - pA) + pB(1 - pB)] [(z1 - \alpha/2 + z1 - \beta)/pA - pB]^2$$

(Ref: Chow S, Shao J, Wang H. 2008. Sample Size Calculations in Clinical Research. 2nd Ed. Chapman & Hall/CRC Biostatistics Series. page 89)

where,

$\kappa = nA/nB$ is the sampling ratio = 1 α is type I error = 0.05 β is type II error, meaning $1 - \beta$ is power = 80% pA = proportion in group A = 0.519

pB = Proportion in group B = 0.689

Substituting the values, the sample size calculated was $n = 126$

A total of 130 samples were selected per group.

Part 1: Demographic data

Age-

Gender-

Occupation-

The questionnaire was as follows:

Part 2: Questionnaire

1. How many times a day do you brush your teeth?
 1. Once daily
 2. Twice daily
 3. After every meal
 4. >2 times a day
2. How much time do you take for each brushing session?
 1. 1 minute
 2. 2 minutes
 3. >2 minutes
3. Do you clean your tongue?
 1. Yes
 2. No
4. Do you use dental floss?
 1. Yes
 2. No
5. Do you use mouthwash?
 1. Yes
 2. No

6. How would you grade your dental health?
 1. Very good
 2. Good
 3. Bad
 4. I don't know
7. How often do you visit your dentist?
 1. Once a year
 2. Twice a year
 3. When I have a dental problem
8. According to you, a regular dental checkup must be:
 1. Every 6 months
 2. Once a year
 3. When necessary
9. What would you do if you come across initial dental caries in any of your tooth?
 1. Seek preventive measures
 2. Wait and watch
 3. Treat as soon as possible

Among HCWs, there was a significant difference in the time reported for brushing with 67.10% of the females and 39.30% of the males brushing for 2 minutes, whereas 28.60% of the females and 52.50% of the males reported brushing for more than 2 minutes.

There was also a significant difference in the reported use of mouthwash with 41.40% of the females and 67.20% of the males reporting using the mouthwash.

Among HCWs, there was a significant difference in the visits to a dentist with 30.00% of the females and 37.70% of the males visiting a dentist once a year, whereas 24.30% of the females and 37.70% of the males visiting a dentist twice a year and 45.70% of the females and 24.60% of the males reported visiting a dentist when they have a dental problem.

Among nonhealthcare workers (NHCW), there was a significant difference in the time of regular dental checkup with 41.90% of the females and only 22.00% of the males reported that regular dental checkup should be every 6 months.

Among HCWs, there was a significant difference in the reported measures for initial dental caries with 37.80% of the females and only 18.60% of the males reported that preventive measures should be taken for initial caries. Among NHCWs, there was a significant difference in the reported measures for initial dental caries with only 38.60% of the

Results

The data obtained was tabulated in the following manner as given in ►Table 1.

Table 1 Evaluation of responses among male and female subjects

Question		HCWs (n = 130)			NCHWs (n = 130)		
		Female n = 70	Male n = 60	p-Value	Female n = 74	Male n = 56	p-Value
How many times a day do you brush your teeth?							
Once daily	n	11	17	0.155	36	34	0.325
	%	8.60%	19.70%		48.60%	57.60%	
Twice daily	n	23	25		10	6	
	%	32.90%	41.00%		10.80%	5.10%	
After every meal	n	10	4		17	7	
	%	14.30%	6.60%		23.00%	13.60%	
>2times a day	n	25	15		11	9	
	%	35.70%	24.60%		14.90%	16.90%	
How much time do you take for each brushing session?							
1 minute	n	3	4	0.006 ^a	12	14	0.304
	%	4.30%	8.20%		16.20%	27.10%	
2 minutes	n	47	24		30	20	
	%	67.10%	39.30%		40.50%	33.90%	
>2 minutes	n	20	32		32	22	
	%	28.60%	52.50%		43.20%	39.00%	
Do you clean your tongue?							
No	n	2	1	1.000	4	6	0.338
	%	2.90%	1.60%		5.40%	10.20%	
Yes	n	68	59		70	50	

Table 1 (Continued)

Question		HCWs (n = 130)			NCHWs (n = 130)		
		Female n = 70	Male n = 60	p-Value	Female n = 74	Male n = 56	p-Value
	%	97.10%	98.40%		94.60%	89.80%	
Do you use floss?							
No	n	53	50	0.403	61	45	0.395
	%	75.70%	82.00%		82.40%	76.30%	
Yes	n	17	11		13	14	
	%	24.30%	18.00%		17.60%	23.70%	
Do you use mouth wash?							
No	n	41	20	0.005 ^a	45	37	0.859
	%	58.60%	32.80%		60.80%	62.70%	
Yes	n	29	41		29	22	
	%	41.40%	67.20%		39.20%	37.30%	
How would you rate your dental health?							
Very good	n	1	3	0.325	4	5	0.101
	%	1.40%	4.90%		5.40%	8.50%	
Good	n	11	5		10	14	
	%	15.70%	8.20%		13.50%	28.80%	
Bad	n	37	29		46	26	
	%	52.90%	49.20%		62.20%	44.10%	
Don't know	n	21	23		14	11	
	%	30.00%	37.70%		18.90%	18.60%	
How often do you visit your dentist?							
Once a year	n	21	22	0.038 ^a	21	11	0.378
	%	30.00%	37.70%		28.40%	18.60%	
Twice a year	n	17	23		6	7	
	%	24.30%	37.70%		8.10%	11.90%	
When I have a dental problem	n	32	15		47	38	
	%	45.70%	24.60%		63.50%	69.50%	
According to you, a regular dental checkup must be:							
Every 6 months	n	42	41	0.058	31	10	0.028 ^a
	%	60.00%	68.90%		41.90%	22.00%	
Once a year	n	15	16		18	14	
	%	21.40%	26.20%		24.30%	23.70%	
When necessary	n	13	3		25	32	
	%	18.60%	4.90%		33.80%	54.20%	
What would you do if you come across initial dental caries in any of your tooth?							
Seek preventive measures	n	27	38	0.001 ^a	28	11	0.050 ^a
	%	38.60%	63.90%		37.80%	18.60%	
Treat as soon as possible	n	18	17		19	15	
	%	25.70%	27.90%		25.70%	30.50%	
Wait and watch	n	25	5		27	30	
	%	35.70%	8.20%		36.50%	50.80%	

Abbreviations: HCWs, healthcare workers; NHCWs, nonhealthcare workers.

Chi-squared test; ^aIndicates a significant difference at $p \leq 0.05$.

Table 2 Comparison of responses among healthcare (HCW) and nonhealthcare workers (NHCWs)

Question		HCW (n = 130)	NHCW (n = 130)	p-Value
How many times a day do you brush your teeth?				
Once daily	n	28	70	0.003 ^a
	%	21.5%	53.8%	
Twice daily	n	48	16	
	%	36.9%	12.30%	
After every meal	n	14	24	
	%	10.7%	18.4%	
>2times a day	n	40	20	
	%	30.7%	15.3%	
How much time do you take for each brushing session?				
1 minute	n	70	50	0.001 ^a
	%	53.80%	38.4%	
2 minutes	n	52	52	
	%	40%	40%	
>2 minutes	n	8	28	
	%	6.10%	21.5%	
Do you clean your tongue?				
No	n	3	10	0.084
	%	2.30%	7.6%	
Yes	n	127	120	
	%	97.70%	92.30%	
Do you use dental floss?				
No	n	102	103	0.880
	%	78.40%	79.2%	
Yes	n	28	27	
	%	21.5%	20.7%	
Do you use mouth wash?				
No	n	60	82	0.019 ^a
	%	46.60%	61.70%	
Yes	n	70	48	
	%	53.40%	38.30%	
How much would you rate your dental health?				
Very good	n	43	25	0.017 ^a
	%	33.60%	18.80%	
Good	n	67	71	
	%	51.10%	54.10%	
Bad	n	4	8	
	%	3.10%	6.80%	
Don't know	n	16	26	
	%	12.20%	20.30%	

Table 2 (Continued)

Question		HCW (n = 130)	NHCW (n = 130)	p-Value
How often do you visit your dentist?				
Once a year	n	43	31	<0.001 ^a
	%	33.60%	24.10%	
Twice a year	n	40	12	
	%	30.50%	9.80%	
When I have a dental problem	n	47	87	
	%	35.90%	66.20%	
According to you, a regular dental checkup must be:				
Every 6 months	n	83	43	<0.001 ^a
	%	64.10%	33.10%	
Once a year	n	31	31	
	%	23.70%	24.10%	
When necessary	n	16	56	
	%	12.20%	42.90%	
What would you do if you come across initial dental caries in any of your teeth?				
Take preventive measures	n	65	37	<0.001 ^a
	%	50.40%	29.30%	
Treat as soon as possible	n	35	36	
	%	26.70%	27.80%	
Wait and watch	n	30	57	
	%	22.90%	42.90%	

Chi-squared test; Fisher's exact test; ^aindicates a significant difference at $p \leq 0.05$.

females and 63.90% of the males reported that preventive measures should be taken for initial caries.

► **Table 2** demonstrates a comparison of the responses obtained among HCW and NHCW.

Out of the total subjects, 36.9% of the HCWs reported that they brush their teeth twice a day as compared to 12.30% of NHCWs, whereas 21.5% of the HCWs reported that they brush their teeth once a day as compared to 53.8% of NHCWs. This difference in brushing frequency among HCWs and NHCWs was statistically significant.

Out of the total subjects, 53.8% of the HCWs reported that they brush their teeth for 1 minute as compared to 38.4% of NHCWs; whereas 40% of the HCWs as well as NHCWs reported that they brush their teeth for 2 minutes. This difference in brushing time among HCWs and NHCWs was statistically significant.

There was no statistically significant difference in the tongue cleaning frequency and flossing frequency among both the groups.

Out of the total subjects, 53.4% of the HCWs reported that they use mouthwash as compared to 38.3% of NHCWs. This difference in use of mouthwash among HCWs and NHCWs was statistically significant.

Out of the total subjects, 33.6% of the HCWs reported that they value their oral hygiene as "very good" as compared to

18.80% of NHCWs, whereas 51.1% of the HCWs reported that they value their oral hygiene as "good" as compared to 54.1% of NHCWs. This difference among HCWs and NHCWs was statistically significant.

Out of the total subjects, 30.5% of the HCWs reported that they visit their dentist twice a year as compared to only 9.8% of NHCWs, whereas 33.6% of the HCWs reported that they visit their dentist once a year as compared to 24.1% of NHCWs. This difference in dentist visits among HCWs and NHCWs was statistically significant.

Out of the total subjects, 64.1% of the HCWs reported that regular dental checkup should be done every 6 months as compared to only 33.1% of NHCWs, whereas 23.7% of the HCWs reported that they visit their dentist once a year as compared to 24.1% of NHCWs.

Out of the total subjects, 50.4% of the HCWs reported that they would seek preventive measures for dental caries as compared to only 29.3% of NHCWs, whereas 26.7% of the HCWs reported that they would treat caries as soon as possible as compared to 27.8% of NHCWs. About 22.9% of the HCWs reported that they would wait and watch for caries as compared to 42.9% of NHCWs. This difference in brushing time among HCWs and NHCWs was statistically significant.

Discussion

The recognition of the relationship between oral health and overall well-being dates back to 1989. Subsequently, the oral cavity has been characterized as a gateway providing insights into the overall health of individuals.⁸ Diseases affecting the oral cavity pose a considerable health risk, affecting both systemic health and overall quality of life. It is crucial to incorporate routine oral hygiene practices to prevent and address various oral conditions. Despite the concerning global prevalence of oral diseases, many of these issues can be prevented or treated, emphasizing the significance of promoting awareness, knowledge, positive attitudes, and proper practices related to oral health.

In addition to their crucial role in monitoring health issues and disease patterns, HCWs, encompassing various professionals such as physicians, surgeons, nurses, physiotherapists, speech-language pathologists, and ASHA workers also serves as vital advocates for promoting oral hygiene awareness.⁹ Recognizing the profound correlation between oral health and systemic well-being, these healthcare professionals stand as beacons of awareness within the general population. It is imperative for HCWs to maintain their own oral hygiene, not only as a testament to their commitment to overall health but also as a means to inspire and educate others on the importance of oral care in fostering a holistic approach to well-being.

A study conducted by Kumar et al on the oral health awareness among dental and medical professionals in Eastern India stated that although more emphasis has to be placed on oral hygiene awareness, female participants had better oral health knowledge and practices compared to males.¹⁰

Our study with 130 HCW (70 females, 60 males) and 130 NHCW (74 females, 56 males), reveals gender differences with women generally exhibiting more positive dental health attitudes and behaviors. It was alarming to note that only 12% of the general population that participated in this study was aware of the need to brush their teeth twice a day. This denotes the lack of awareness regarding basic oral health practices and the need for improvement on this front. Our study is in comparison with a survey conducted by Poudel et al where it was noted that most individuals brushed their teeth once daily and toothbrushing twice daily was low.¹¹

It was noted in our study as well as in others that there is a widespread tendency of individuals typically seeking dental care only when faced with symptomatic problems rather than proactively for routine checkups. This inclination is evident even in developed countries.¹² A study conducted in Australia by Armfield and Ketting indicated that factors contributing to dental avoidance encompassed financial difficulties in covering dental expenses, a lack or minimal level of trust in the most recent dentist visited, perceived treatment needs, and dental anxiety.¹³

It was noted that 64% of the HCWs who participated in our study were aware of the need for regular 6 monthly checkups with dentists, while only 33% of the NHCWs were aware of the same assuming that visits to the dentist are needed only when necessary. Notably, when faced with initial caries, HCW tended

to prioritize preventive measures, contrasting with NHCW who leaned toward a “wait and watch” approach.

It was alarming to note in our study that both the HCWs and NHCWs at large did not use dental floss with only 22% and 21% of them routinely using it, respectively. Among the participants, the percentage of females using dental floss was higher than males. A number of studies also showcase the similar lack of awareness among individuals regarding the use of interdental cleaning aids.^{14–17} Given that periodontal disease stands as a significant public health concern in India, an urgent requirement arises to enhance the use preventive strategies such as interdental cleaning aids aimed at alleviating the burden associated with this condition.

To enhance oral health practices, it is crucial for HCW to possess comprehensive knowledge by conducting awareness activities, including continuing medical/dental education programs to improve their understanding and positively impact oral health attitudes and practices. It is also important for dental professionals to conduct regular oral screening camps in various urban and rural settings to increase awareness among the general population with regard to their oral hygiene status and seek treatment when necessary.

Acknowledging the study limitations, that is its cross-sectional design, limited sample size, and reliance on self-reported data, this research aimed at increasing awareness about oral health among not just the general population but also the healthcare professionals who play a pivotal role in educating them.

Conclusion

In this study, disparities in oral health knowledge were evident among various HCW and NHCWs. All participants exhibited a favorable attitude toward professional dental care. It is crucial to impart comprehensive oral health knowledge to both HCWs and NHCWs, fostering heightened awareness, knowledge, and improved practices. Integrating the importance of oral health into the curriculum of HCWs is essential. This ensures that they not only enhance their own understanding but also play a pivotal role in educating the general population about cultivating good oral hygiene practices.

Authors' Contribution

A.S. conceptualized and supervised the study. P.D.J. was involved in analysis and data interpretation, W.M.V.L. wrote the manuscript, M.R. helped in literature search, S.J. was involved in data collection and processing, and D.C.B. helped in critical review.

Conflict of Interest

None declared.

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