



Knowledge and awareness of fluoride use in daily routine among Saudi Military personnel- A cross-sectional study

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ABSTRACT

Introduction: The usage of fluoride based mouth rinses is extensive as a caries-preventive intervention worldwide and its consistent usage leads to a significant reduction in caries in permanent teeth. However, knowledge and practice regarding this issue has been varying among different populations. **Materials and methods:** This is a cross sectional study conducted among the Saudi Military personnel using an online survey. An online questionnaire was designed using Google Forms with questions related to personal and demographic information followed by knowledge and practice related questions about fluoride use in daily routine. **Results:** 196 surveys were completed and results showed slight significant association of age and education on fluoride related knowledge and attitude. However, no association was found compared with monthly income. **Conclusion:** The level of personal dental care among Saudi military men was found to be low. There is a need of educating survey subjects regarding proper methods of maintaining oral hygiene.

Keywords: Fluoride use, knowledge, Saudi military, Attitude

1. INTRODUCTION

The usage of fluoride-based products to prevent and/or treat caries has been practiced by dentists for over 50 years now. If fluoride quantities are properly administered and systemically provided, it can be effective in controlling demineralization and thus lowering

the dental caries burden. The usage of fluoride based mouth rinses is extensive as a caries-preventive intervention worldwide and its consistent usage leads to a significant reduction in caries in permanent teeth (Aurlene, 2019). It is accepted worldwide that fluoride-based treatments are useful in reducing the prevalence of cavities specifically, when it is combined with dental sealants. However, a fluoride overdose which is generally known as fluorosis should be averted. As a disproportionate use of it may lead to tooth decay. It is pertinent to note that the benefits of fluoride usage on oral health have been studied thoroughly but, there are less studies on the adverse side effects where absorption of fluoride additional than the suggested limit leads to harmfulness (Lazarova et al., 2018).

Dental fluorosis arises as a result of extra fluoride intake especially during tooth formation. Enamel fluorosis and primary dentin fluorosis can only happen when teeth are just forming. In the permanent dentition, this would start with the lower incisors and end after mineralization of the third molars. One of the principal ways to reduce caries is the regular tooth brushing with fluoride toothpaste. It should be noted that the caries prevention effect differs according to different concentrations of fluoride in particular toothpaste. As mentioned above, toothpaste with higher strengths of fluoride increases the risk of fluorosis (enamel defects) in developing teeth during childhood (Walsh et al., 2019) (DenBesten and Li, 2011). Several studies have been done to assess the knowledge and awareness regarding fluoride, one of such study shows that, although, parents from urban and rural areas have the knowledge about the effect of good/poor oral hygiene and appropriate nutrition on the oral health but unfortunately that knowledge is not reflected in their practices. Parents exhibit about fluoride prophylaxis but never practice or never use tablets or solutions based on fluoride (Djordjevic, 2018).

The knowledge and awareness must not only restrict to the usage of fluoride in its association with dental health and caries reduction. The awareness should also be in terms of usage of fluoridated water and the different sources from where fluoride can enter into the body as a research done by Harvard University showed that children who live in areas that receive highly fluoridated water have "significantly lower" IQ scores than those children who live in areas with low amounts of fluoride in their daily water supply, suggesting that an inverse correlation exists between the level of fluoride exposure and overall intelligence (Doumit and Machmouchi, 2017). A revelation by another study shows that most individuals are neither familiar with the type of toothpaste they should use, nor mindful of the appropriate amount of dentifrice that should be applied on a toothbrush. There is a need to control their brushing habits in order to prevent the swallowing of large amounts of fluoride toothpaste as it can in turn be very harmful to their oral health (Turska-Szybka and Olczak-Kowalczyk, 2018).

Another study reveals that fluoride supplementation is a very important part of oral health care and those extra efforts are warranted to raise awareness on the status of fluoride supplementation in constant basis to essentially encourage upkeep of oral health of the society (Ly et al., 2018).

Study hypotheses

Knowledge of fluoride is on the lower side among Saudi Military personnel.

Aims of the study

To determine the knowledge and practice of Saudi Military personnel towards the use of fluoride

To compare the findings on the basis of age, previous dental history, educational level and socioeconomic status

2. MATERIALS AND METHODS

Study Design

This was a cross sectional study conducted among the Saudi Military personnel using an online survey. The study got approval from IRB, Riyadh Elm University with letter no. FRP/2020/223/123. The duration of the study was from 15th March 2020 to 15th November 2020.

Study Sample

Saudi military personnel willing to participate in this study were requested to fill up the survey. A total of 196 army men completely filled up the survey.

Study Instrument

An online questionnaire was designed using Google Forms with questions related to personal and demographic information followed by knowledge and practice related questions about fluoride use in daily routine.

Instrument Validity and Reliability

The questionnaire was self-designed and validity was tested by sending it to experienced researchers in REU but no changes were made. A pilot study was conducted by sending the survey to 20 participants and the data was inserted in SPSS version 22 to determine the reliability by using Cronbach's coefficient alpha (value: 0.744). Hence the survey was considered to be reliable (figure 1).

Statistical Analysis

Collected data was analyzed using SPSS version 22, where descriptive as well as inferential statistics were conducted. Comparisons between groups were made with the value of significance kept under 0.05.

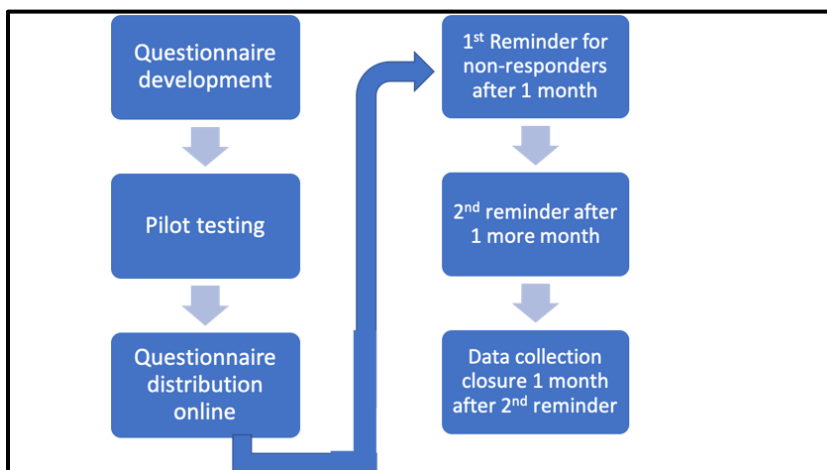


Figure 1 Flowchart of study methodology

3. RESULTS

We analyzed the data using SPSS version 22 and conducted descriptive as well as inferential statistics. A total of 538 participants had filled the survey but 517 responses were considered to be valid and complete as others had missing data. Descriptive statistics revealed that 27% of the participants belonged to 18-25 years age group, 18.9% from 26-35 years and 54.1% from 36+ years. As far as educational levels were concerned, 1.5% had Elementary education, 21.8% had high school and 76.7% went to university. Moreover, the study participants were also divided on the basis of their monthly income and it was observed, 31.6% had a monthly income between 1500-5000, 13.7% had 6000 to 10000, 54.59% had 10000 or more. Descriptive analysis of all survey questions can be noted in tables 1 and 2. Comparisons of survey responses can be observed in tables 3, 4 and 5 with their p-values mentioned in case of statistically significant using Chi-square test.

Table 1 Demographics of study participants

Variables		%
Age	18-25 Years	27.0%
	26-35 Years	18.9%
	≥36 years	54.1%
Educational status	Elementary	1.5%
	High School	21.8%
	≥ Graduate	76.7%
Income	1500-5000	31.6%
	6000-10000	13.7%
	> 10000	54.6%

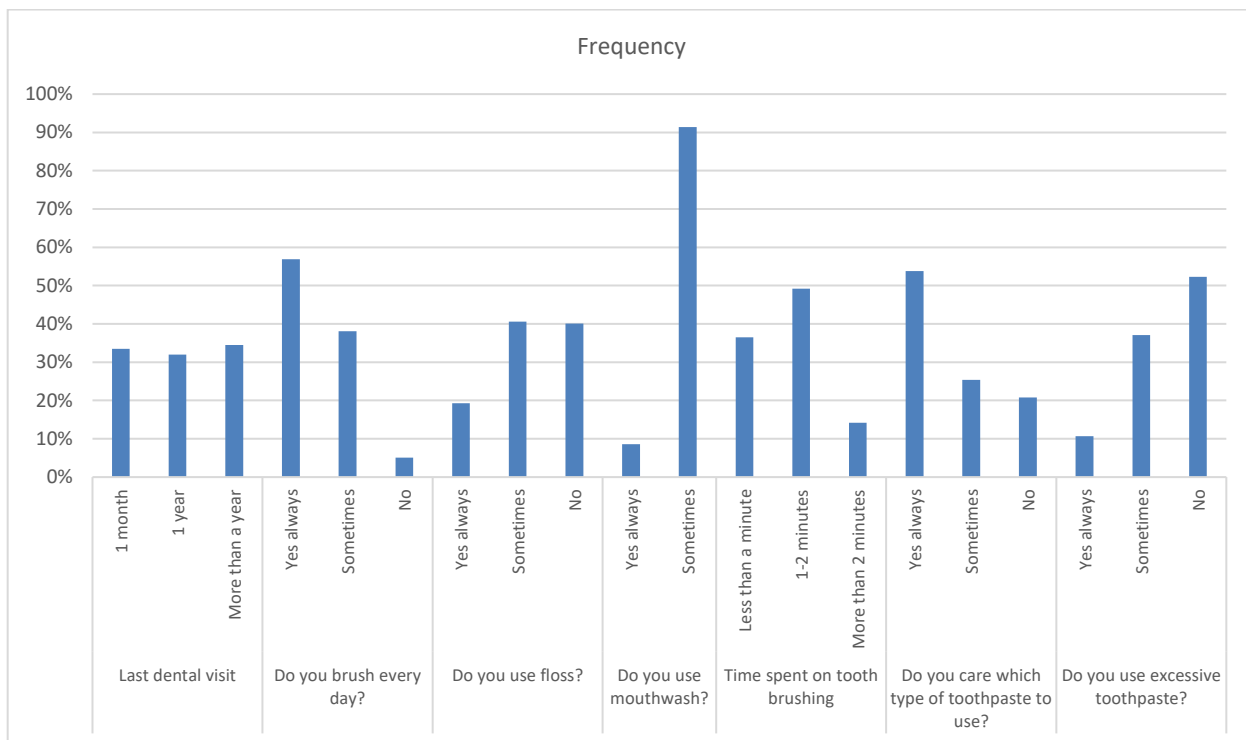


Figure 2 routine dental cares of study participants

Table 2 Knowledge and attitude towards fluoride use and their association with demographic variables

Fluoride related questions		Total	Age				Education			
			18-25	26-35	>36	p	Elementary	High School	>Graduate	p
Do you think brushing your teeth with fluoridated toothpaste is enough to protect from caries?	Yes	20.3%	30	27	32	0.057	34	29	30	0.071
	No	25.4%	38	36	39		36	35	37	
	Not sure	54.3%	32	37	29		30	36	33	
Do you know what fluoride is?	Yes	38.1%	35	32	42	0.033*	27	32	32	0.054
	No	32.5%	44	43	23		38	40	37	
	Not sure	29.4%	21	24	36		35	28	31	
Do you know where you can find fluoride?	Yes	22.3%	31	28	33	0.063	32	31	35	0.066
	No	51.3%	39	35	37		38	39	37	
	Not sure	26.4%	30	37	30		30	30	28	
Do you know that fluoride can help prevent tooth decay?	Yes	51%	39	43	59	0.002*	36	36	37	0.059
	No	24%	35	41	14		28	30	27	
	Not sure	25%	26	16	27		36	34	36	
Do you live in a community that provides fluoridated water?	Yes	15.3%	29	36	34	0.065	38	40	39	0.056
	No	32.7%	36	36	36		30	29	30	
	Not sure	52%	35	28	30		32	31	31	
Do you know that you are supposed to leave your tooth paste residue on your teeth after you are done brushing?	Yes	21.9%	27	31	28	0.052	0	18	23	0.016*
	No	68.9%	38	37	40		33	77	67	
	Not sure	9.2%	35	32	32		67	05	09	

*p<0.05;significant

4. DISCUSSION

This study was undertaken to assess the knowledge and awareness of fluoride use in daily routine among Saudi military personnel. 196 respondents from the Saudi military participated in this survey and provided the needed insight. Regarding the general oral hygiene, only 56.9% of the respondents said that they brush their teeth daily, the remaining 43.1% brush their teeth either sometimes or rarely in a week. In a comparable study it was found that the majority (93%) brushed their teeth every day (Nordström and Birkhed, 2017). 80.7% of the respondents also do not use a floss regularly and 91.4% do not use mouthwash on a regular basis. 36.5% of the respondents said that they brush for less than a minute, 49.2% for two minutes and 14.2% for more than two minutes. In a comparable study it was revealed that 49% brushed for less than two minutes, 41% brushed for two minutes and 10% for more than two minutes (Nordström and Birkhed, 2017).

20.3% of the respondents think that only brushing with fluoride-based toothpaste is enough for protection against caries. In one of the studies conducted 45.1% of the respondents felt that toothpaste alone is effective for protection (Ravichandran, Gayathri & Vishnu, 2018). It was also seen that 61.9% of the respondents either were not sure or did not know about fluoride itself. Also, only 22.3% of the military personnel knew where to find fluoride. In a comparable study it was shown that 31.66% of the respondents had knowledge about fluoride as a substance (Mw et al., 2020). However, 51% of them knew that fluoride could help protect tooth decay. This can be a result of TV advertisements of toothpaste that increased this awareness. 15.3% knew that they receive fluoridated water for general use and only 21.9% of the respondents knew that they have to leave the toothpaste residue for fluoride to take effect on the teeth.

These results were also compared against respondent's age, educational and income levels to assess if any statistically significant incidences exist for furtherance of this research. As far as age is concerned, statistically significant differences were found when inquired about regular usage of dental floss; the group of age 36+ were more inclined towards the regular usage of floss (p-value .002). This indicates as with age a person becomes more health conscious and therefore starts using things that suffices that goal. This falls in line with knowledge as well as statistically significant differences were found when the same group of age 36+ showed that they knew about fluoride is (p-value .033) and that they knew that fluoride can prevent tooth decay (p-value: .002).

When assessed against the educational level, statistically significant differences were found when inquired about whether care and attention is paid while selecting the toothpaste, and it was noted that the group of respondents who had acquired university education or higher are more careful in this regard (p-value: .000) and the same group had more inclination of using excessive toothpaste whilst brushing their teeth (p-value: .016). Higher education level group also showed statistically significant differences when inquired about their awareness about leaving the toothpaste residue on teeth after brushing. In a comparable study it was shown that knowledge and awareness of fluoride and its assessment with educational level was significantly different (Al-Darwish, 2016). There were no significant results when knowledge and awareness were assessed against the income levels of the respondents. In a comparable study it was shown that knowledge and awareness of fluoride and its assessment with income level was significantly different (Al-Darwish, 2016).

5. CONCLUSION

The level of personal dental care among Saudi military men was found to be low. Knowledge related to fluoride was average but the attitude towards its proper use was unsatisfactory. Age and educational level showed slight significant association with the knowledge and attitude. However, monthly income had no bearing on the knowledge and attitude. There is a need of educating survey subjects regarding proper methods of maintaining oral hygiene.

Author contribution

All authors contributed equally for the research.

Conflict of Interest

The authors declare no conflict of interest.

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Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

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General Note

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Data and materials Availability

All data associated with this study are present in the paper.

Peer-review

External peer-review was done through double-blind method.

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