

# “Education level” responsible for inequities in oral practices among 15–34-year-old individuals in Jizan, Saudi Arabia

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## Abstract

**Background:** Education plays an important role and is a second major (non-medical dimensional) factor influencing the health status. Individuals demonstrate oral practices that impact the oral health positively or negatively. This study analyzes how self-reported oral practices are influenced by different educational levels among young adults in Jizan. **Materials and Methods:** The survey was conducted in four areas around University of Jizan. The survey subjects, aged between 15 and 34 years, completed the self-administered, structured questionnaire. Inter-group comparison was done using Chi-square test. Level of significance was fixed at  $P < 0.05$ . **Results:** Exactly 1597 subjects completed the survey. Of these, 644 (40.3%) had attained higher education, 884 (55.4%) had lower education, and 69 (4.3%) were illiterate. Statistical comparisons showed significant differences among the three groups with respect to the use of toothbrushes ( $\chi^2 = 88.67$ ,  $P < 0.001$ ), use of interdental cleaning aids ( $\chi^2 = 15.04$ ,  $P < 0.001$ ), siwak use ( $\chi^2 = 16.31$ ,  $P < 0.001$ ), cigarette smoking ( $\chi^2 = 14.28$ ,  $P < 0.001$ ), and khat chewing ( $\chi^2 = 38.1$ ,  $P < 0.001$ ). Siwak use was more among those with low educational level and illiterates. Further, smoking and khat chewing were significantly more prevalent among illiterates. **Conclusion:** The subjects with low education and the illiterates exercise harmful oral practices. This study indicates that educational level is responsible for inequities in oral practices.

**Key words:** Education, education level, Jizan, oral hygiene, oral hygiene practices, self-reported, toothbrush, young adults

## INTRODUCTION

Education plays an important role and is a second major (non-medical dimensional) factor influencing the health status.<sup>[1]</sup> World illiteracy map closely coincides with the world poverty map, where malnutrition and other unhealthy conditions prevail. It was documented

that those subjects who are better educated, wealthier, and live in better circumstances have better health status, with a greater frequency of dental visits than those who are less educated.<sup>[2]</sup> From the view point of public health, education not only helps to create and spread awareness, but also supports the public health service providers to plan, formulate, implement, and promote oral health in the community.

Individuals demonstrate oral practices that impact the oral health positively or negatively. The use of toothbrushes, interdental cleaning aids, and siwak use can improve the oral health,<sup>[3-5]</sup> whereas cigarette smoking, pipe smoking, and khat chewing<sup>[6,7]</sup> can affect the oral health adversely. Research studies indicate that the existence of these behaviors among people varies

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with respect to age,<sup>[3,4,8,9]</sup> gender,<sup>[4,8,9]</sup> educational level,<sup>[3]</sup> and socio-economic status.<sup>[10]</sup>

Against this background, the present study was designed to assess the existing level of oral practices (use of toothbrushes, interdental cleaning aids, cigarettes, pipe smoking, and chewing siwak or khat) among selected, young adults of Jizan, in particular, to analyze how different educational levels influence the self-reported oral practices.

## MATERIALS AND METHODS

The survey was conducted among the subjects from a selected population of Jizan (aged 15–34 years). The total population in the age group 15–34 years in Jizan city was around 24,571, which was obtained from the governorate office of Jizan city. This study was conducted for 3 months (January–April 2013). A pilot study was conducted on 100 individuals in order to ensure the level of validity and reliability of the questionnaire (Cronbach's  $\alpha = 0.81$ ), and the data of the pilot study were not included in the main survey. The sample size for the study was obtained using the formula:

$$n = z^2 pq/d^2$$

Assumption: The values obtained are  $z = a$  point on normal distribution with 95% confidence, the value of  $P$  was considered as the prevalence of toothbrushing from an earlier study on urban Saudi Arabians ( $p = 73\%$ ),  $q = 100 - p$ ,  $d =$  admissible error = 10% of prevalence.

$$n = 4 \times 73 \times 27 = 147.9/(7.3)^2$$

$$n = 148$$

Four random zones and three areas per zone were selected. Thus, the total sample was calculated as:  $4 \times 3 \times 148 = 1766$ .

To collect realistic data, subjects were recruited from four survey areas around Jizan University. The areas were: Hay al matar, Mahata khams, Dara ut tawhid, and Suq ad dakhili. The data were collected using a self-administered, structured questionnaire. The survey was conducted by visiting the houses, colleges, and workplaces in these areas. All those people aged 15–34 years who were willing to participate in the study completed the questionnaire. The illiterates were interviewed by the investigator who also filled their information. Informed consent was obtained from

the subjects and permission to conduct the study was obtained from the ethics committee of the institution.

The data were transformed from the pre-coded survey form to the computer. A master file was created for the purpose of data analysis. SPSS version 17.0 (SPSS Pvt Ltd, Chicago, IL, USA) was used for statistical analyses. The Kolmogorov–Smirnov test showed values of educational level and oral practices to be normally distributed. Frequency analysis was carried out and Chi-square test was done for comparison between the groups. All tests were carried out with the significance level set at 0.05.

## RESULTS

Out of the 1766 recruited subjects, 179 subjects filled the questionnaire incompletely and were excluded. Therefore, the study was conducted with 1597 subjects. Of the total 1597 subjects, 1162 (72.8%) were males and 435 (27.2%) were females. Also, 644 (40.3%) had attained higher education (post-doctoral degree, post-graduate degree, and degree), 884 (55.4%) had attained lower education (completed elementary school or higher school), and 69 (4.3%) were illiterate.

Overall, it was observed that 1372 (85.9%) practiced toothbrushing, of which 1112 (69.6%) brushed once daily and 260 (30.4%) brushed twice or more. Only 323 (21.5%) were found to use interdental cleaning aids, of which only 50 used them regularly and the remaining used them intermittently. A total of 854 (53.5%) subjects chewed siwak, of which 20 subjects chewed only siwak while the majority ( $n = 834$ ) practiced toothbrushing in addition to siwak use. Also, 214 (13.4%) were regular smokers, of which 95 smoked less than a packet per day while the remaining were found to smoke two packets and more per day. Thirty-three subjects (2.1%) were ex-smokers and 71 (4.4%) were pipe smokers (hookah); however, only 13 of the pipe smokers were regular pipe users. Khat chewing was prevalent in 293 subjects (18.3%) and all were regular chewers with a varying frequency of 1–6 times per day.

Table 1 summarizes the distribution of the 1597 subjects according to their educational level and oral hygiene practices. There was a statistically significant difference observed between the groups with different educational levels and their toothbrushing behavior ( $\chi^2 = 88.67$ ,  $P < 0.001$ ), use of interdental aids ( $\chi^2 = 15.04$ ,  $P < 0.001$ ), and siwak use ( $\chi^2 = 16.31$ ,  $P < 0.001$ ).

Table 2 summarizes the distribution of study subjects according to their educational level and oral practices.

**Table 1: Distribution of the study subjects according to their educational level and oral hygiene practices**

Oral hygiene practices	Educational level n (%)			Chi-square test, P
	Higher level	Low level	Illiterate	
Toothbrushing behavior				
Toothbrush and paste	605 (37.8)	727 (45.5)	40 (2.5)	$\chi^2=88.67, P<0.001^*$
No brushing	39 (2.4)	157 (9.8)	29 (1.8)	
Frequency of toothbrushing				
Once	494 (36)	582 (42.4)	36 (2.6)	$\chi^2=2.69, P>0.05$
Twice	111 (8.09)	145 (10.5)	04 (0.29)	
Interdental aids used				
Yes	181 (11.33)	195 (12.2)	7 (0.4)	$\chi^2 15.04, P<0.001^*$
No	463 (28.9)	689 (43.1)	62 (3.88)	
Siwak use				
Yes	305 (19.9)	508 (31.8)	41 (2.5)	$\chi^2 =16.31, P<0.001^*$
No	339 (21.2)	376 (23.5)	28 (1.7)	

\*Statistically significant

**Table 2: Distribution of study subjects according to their educational level and oral practices**

Type of habits	Education level n (%)			Chi-square test, P
	Higher level	Low level	Illiterate	
Cigarette smoking				$\chi^2 =14.28, P<0.001^*$
Yes	69 (4.3)	127 (7.95)	18 (1.12)	
No	575 (36)	757 (47.4)	51 (3.19)	
Pipe smoking				$\chi^2=4.66, P>0.05$
Yes	20 (1.25)	43 (2.69)	5 (0.3)	
No	624 (39)	841 (52.6)	64 (4)	
Khat chewing				$\chi^2=38.1, P<0.001^*$
Yes	79 (4.9)	188 (11.7)	26 (1.6)	
No	565 (35.3)	696 (43.5)	43 (2.6)	

\*Statistically significant

A statistically significant difference was observed between the groups with different educational levels and cigarette smoking ( $\chi^2 = 14.28, P < 0.001$ ) and khat chewing ( $\chi^2 = 38.1, P < 0.001$ ).

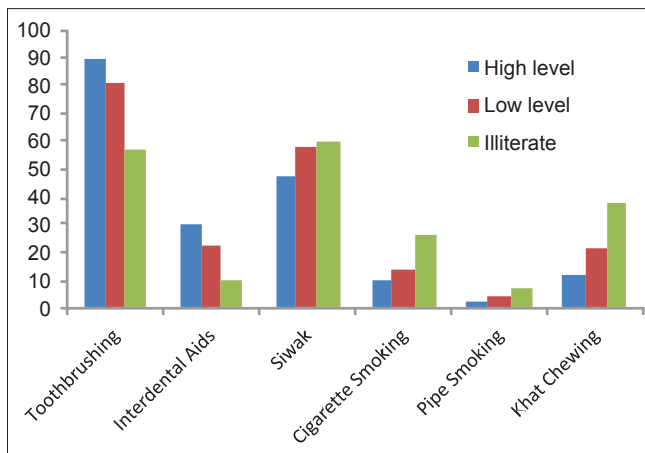
Graph 1 indicates the percentage distribution of subjects with different educational levels according to the oral practices followed by them. Percentage of subjects practicing toothbrushing and using interdental aids was greater among those with higher educational level. Siwak use was more among the subjects with low educational level and the illiterates. Harmful practices such as smoking and khat chewing were prevalent among the illiterates.

## DISCUSSION

The survey was conducted among the subjects (aged 15–34 years) from a selected population of Jizan, as individuals of this age are at potential risk for acquiring adverse habits under the external influences; proper oral health education may rectify such practices.

The study results showed that educational levels had a significant association with the oral practices being followed by the subjects. Oral practices, such as use of toothbrushes and interdental cleaning aids, were commonly followed by individuals with higher education. This finding matches with other study reports on urban Saudi Arabians<sup>[3,11]</sup> which indicate that for Saudi Arabians with higher education, toothbrushing behavior started earlier in life. Toothbrushes are the preferred cleansing aids<sup>[4]</sup> and are most commonly used. In this study, overall, 85.9% of the young adults of Jizan practiced toothbrushing. A study among urban Saudi Arabians<sup>[12]</sup> showed that 73% used a toothbrush daily, while a siwak was used daily by 65%. It is observed that young and educated population mainly uses modern aids like toothbrushes,<sup>[11]</sup> which may be attributed to awareness about newer aids and techniques.

In this study, the frequency of toothbrushing was not associated with educational levels, which is similar to that reported earlier.<sup>[13]</sup> On the contrary, a study among



**Graph 1:** Percentage distribution of subjects of different educational levels according to the oral practices

the Danish adult population showed that toothbrushing twice a day was related to high level of education.<sup>[9]</sup>

In Jizan, modern techniques of oral hygiene, such as toothbrushing and use of interdental aids, are prevalent, in addition to the traditional method of chewing siwak. The use of siwak is widespread in Saudi Arabia and many other Muslim countries.<sup>[3]</sup> It is made from the plant *Salvadora persica*. In this study, 53.5% of the subjects used siwak, in comparison to 65% of urban Saudi Arabians.<sup>[12]</sup> Majority of them ( $n = 834$ ) were toothbrush and siwak users. A mere 20 subjects used only siwaks. A study by Tubaishat *et al.*<sup>[14]</sup> reported that some toothbrush users believe that siwak chewing in addition to toothbrushing is the most effective way of reducing food debris. In the present study, statistically significant difference was observed between siwak use and educational level. This finding is in consensus with the study results of al-Otaibi,<sup>[3]</sup> who indicated that the siwak is preferred by less-educated Saudi Arabian people.

Educational level was found to be significantly associated with cigarette smoking and khat chewing in the present study. Chewing of khat leaves,<sup>[7]</sup> and tobacco<sup>[7,15]</sup> and pipe smoking<sup>[16]</sup> are becoming a major public health problem worldwide. Khat is a well-known natural stimulant obtained from the plant *Catha edulis* and is widely used in certain Red Sea countries, including Yemen and the province of Jizan in Saudi Arabia. Among the students of Jizan,<sup>[17]</sup> the percentage of khat chewing was found to be 20.5%. While among the Axum university (North Ethiopia) students,<sup>[7]</sup> the prevalence of khat chewing and cigarette smoking was 27.9% and 9.3%, respectively, and the commonest reasons for its use were to keep alert while reading (40.6%), for relaxation (65.5%), and to relieve

stress (37.7%); also, having peer friends who were khat chewers was strongly and positively associated with khat use. Ageely<sup>[6]</sup> reported that in comparison to the other determinants like age, gender, and residence, the use of khat was significantly associated with school and college education ( $P < 0.05$ ).

Smoking has been existing in Saudi Arabia for more than 50 years, with an overall dramatic increase in the import of cigarettes. In the present study, it was found that 13.4% young adults were regular smokers, in comparison to 17.3% of school children from Jizan.<sup>[18]</sup> The educational level showed an inverse relation with smoking, with high prevalence observed among the illiterates and people with low educational level. This finding is also supported by Jarallah *et al.*<sup>[15]</sup> Gaffar *et al.*<sup>[18]</sup> revealed that the three most important independent predictors of smoking were academic performance [odds ratio (OR): 5.32], having friends who used khat (OR: 3.23) and/or tobacco (OR: 2.88).

There are many ways to use tobacco and one of them is pipe smoking. The prevalence of pipe smoking in this study was 14.4% and no association was found between pipe smoking and the educational level. However, a report<sup>[16]</sup> reveals that this habit is linked to the social class (preferred by those from the upper, upper-middle, and middle class).

One drawback of this study was that there were not many subjects (4.3%) who represented the illiterate group. Conversely, this also indicates that the literacy level is good in Jizan. In a true sense, the results represented here seem to be a comparison between the subjects with high level and low level of education. However, this database serves as a good reference to plan a similar study in future.

## CONCLUSION

The overall results of this study indicate that educational level is accountable for inequities in oral practices. Earlier, Paulander *et al.*<sup>[13]</sup> had shown that educational level influences the oral conditions and also, the model proposed by Gupta<sup>[19]</sup> indicates that educational status is a marker of health inequities and suggests that good educational status can lead to appropriate health-related behaviors. The advantage for a public health service provider to have an educated patient is that he or she can be informed and motivated to understand the concept in a much superior manner, as compared to the person with low education and the illiterates. It can be hypothesized that when the health education session will be carried out for the study

subjects, it would be easier to motivate the people with high level of education when compared to the other groups.

Within the limitations of the study, the results indicate that the subjects with low education and the illiterates exercise harmful oral practices. They need to be educated to improve their hygiene practices and quit smoking and khat chewing.

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