

# Education-related Inequity in Access and Utilization of Oral Health Care in Iran

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## ABSTRACT

**Background:** Oral health affects peoples' lives physically and psychologically and is related to general health, quality of life, and feelings of social well-being. As the educational level is an important predictor of healthy life and can affect healthcare utilization, this study aims to estimate the inequity related to the educational level of parents on the access and utilization of oral health care (OHC) in Qom, Iran. **Study Design:** An analytical, cross-sectional study. **Materials and Methods:** Overall 281 children, six to seven years of age, were given a self-administrated questionnaire to fill. The sex, access to utilization of OHC, and educational level of the children's parents were questioned. The concentration (C) index was used as the inequity measure and statistical inference was conducted by chi square and the confidence interval of C. **Statistics:** The mean age of the children was  $6.48 \pm 0.5$  years. There was not statistically significant difference in the access and utilization rate of OHC between the two sexes ( $P > 0.05$ ). There was an increasing trend in the utilization rate of OHC, because of the increased educational level of the parents. The C for access and utilization rate, for different levels of fathers' education was 0.055(-0.095 to 0.205) and 0.097(-0.068 to 0.261) and for mothers' educational level was 0.086(-0.068 to 0.241) and 0.091(-0.81 to 0.263), respectively. **Conclusion:** Our results did not show evidence of sex disparity in the access and utilization of OHC in Iranian children. Also the inequity related to the educational level in access and utilization of OHC was low and not considerable.

**Keywords:** Access, disparity, educational level, inequity, inequality, oral health care, utilization

## Introduction

Oral health affects peoples' lives physically and psychologically. The relationship of oral health with general health, quality of life, and feelings of social well-being is demonstrated.<sup>[1]</sup> Historically dental caries and periodontal diseases have been considered as the most important global oral health burdens and the most prevalent oral diseases in several Asian and Latin American countries.<sup>[2]</sup> It is still a major oral health problem in most industrialized countries, affecting 60-90% of the schoolchildren and most of the adults.<sup>[2]</sup> Social inequalities in oral health have been well-documented in the dental scientific literature, showing plenty of evidence for poorer oral health in lower-socioeconomic status (SES) groups versus their higher-SES ones.<sup>[3]</sup>

On the basis of the literature, it can be seen that individuals with the greatest need for health care have the greatest difficulty accessing it.<sup>[4]</sup> Recent studies have shown that there is inequity in health care utilization based on the socioeconomic status of people.<sup>[4-9]</sup> People with a higher socioeconomic status use health care more than people from the lower-income groups, as also, specialist care is most used by rich people.<sup>[10,11]</sup>

Primary health care in Iran is free for all people and is provided by the public sector. This care is delivered by health workers in the first level of system, in Health Centers.<sup>[12]</sup> However, specialized care such as dental or surgical care is not free and is delivered by private sectors. People should pay a fee for dental care and the cost of this care is not covered by insurance.<sup>[13]</sup> Furthermore, the coverage of social insurance has been increased in Iran after the revolution, especially since 2005. It has caused improvement in both access and accessibility to health care services for over 90% of the population.<sup>[14]</sup>

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**Website:**  
www.jfmpc.com

**DOI:**  
10.4103/2249-4863.152248

On the basis of our recent studies and other literature, the educational level is an important predictor of healthy life and can also affect health care utilization.<sup>[11,15-17]</sup> Moreover, educational attainment is the greatest predictor of Socioeconomic Status (SES)<sup>[3]</sup> and it is common that inequity has been measured based on the different levels of socioeconomic status, but different studies have shown that there is an evidence of inequity in the different levels of education.<sup>[15,17,18]</sup> Therefore, the current study aims to determine the inequity in OHC with regard to the educational level of parents of six- to seven-year-old children in the Qom province of Iran.

## Materials and Methods

In a cross-sectional study, the access and utilization of OHC was evaluated in 281 children, six to seven years of age. The study participants were selected in a multistage sampling method. In the first stage, a stratified cluster sampling method was used to select 12 preschool disease screening centers according to the size of the people in each center. Next, convenience sampling was applied to recruit the eligible subjects. Data was gathered via a self-administrated standard questionnaire that was filled by the parents of the children. Two main questions asked from the participants' parents were, 'Have you had access to OHC in the past year?', which was used for evaluation of the access rate, and 'Have you used OHC in the past year?', which was used for evaluation of the utilization rate. Moreover, the education level of the children's parents was evaluated in four categories, including, illiterates or elementary education, guidance school education, high school education, and collegial education. The validity of the questionnaire was assessed by epidemiologists, dentists, and health education specialists. The study protocol was approved by The Ethics Committee of the Qom University of Medical Sciences, and informed consent was obtained from the study subjects.

The disparity in the different levels of education of the children's parents was assessed by the Concentration (C) Index. The C index is a common inequity measure in health care utilization and has been used continually in recent studies.<sup>[6,11,19,20]</sup> The C was calculated by the Kakwani *et al.* formula 1.<sup>[6]</sup>

$$C = \frac{2}{\mu} \sum_{t=1}^T f_t \mu_t R_t - 1,$$

In this formula,  $\mu$  is the mean of the OHC access or utilization in the population and  $\mu_t$  is that for the  $t^{\text{th}}$  group. In addition,  $f_p$  is the group share of population. Also,  $R_p$  is the relative rank of the  $t^{\text{th}}$  educational level of the participating parents, which was obtained through formula 2:

$$R_t = \sum_{r=1}^T f_r - \frac{1}{2} f_t,$$

Therefore,  $R_t$  indicates the cumulative proportion up to the midpoint of each education group interval. The correspondence confidence interval for C is calculated based on Wagstaff and

Van Doorslaer method.<sup>[5,6,21]</sup> This method has been used in other studies.<sup>[11]</sup> and is as given below.

$$\begin{aligned} Var(C) = & \frac{1}{n} \left[ \sum_{t=1}^T f_t a_t^2 - (1+C)^2 \right] \\ & + \frac{1}{n\mu^2} \sum_{t=1}^T f_t \sigma_t^2 (2R_t - 1 - C)^2 \end{aligned}$$

In this formula  $\sigma_t^2$  is the variance of  $\mu_p$ ,

$$a_t = \frac{\mu_t}{\mu} (2R_t - 1 - C) + 2 - q_{r-1} - q_t, \text{ and } q_t = \frac{1}{\mu} \sum_{r=1}^t f_r \mu_r f_r,$$

which is the ordinate of L (P),  $q_0 = 0$  and  $p_t = \sum_{r=1}^t f_r \mu_r$

## Results

A total of 281 children, of age six to seven years ( $6.48 \pm 0.5$  years), were evaluated, of whom 56.2% (158/281) were boys. The mean age of the children's mothers was  $32.14 \pm 6.2$  years. The access rate was 59.9% (167/281) and the calculated utilization rate as 61.2% (172/281). There was no statistical significance in the access rate to OHC between boys and girls (59.9 vs. 59.8%, respectively, and  $P = 0.546$ ). Also, the utilization rate in boys and girls was not statistically significant, 62 and 60.2%, respectively ( $P = 0.422$ ). The oral health providers for utilized children in 20.3% (35/172) were governmental health centers and in 67.4% were private centers.

Table 1 shows the access and utilization rate in participants by different level of father education. According to the results, the access rate was not statistically significant among the different levels of fathers' education ( $P = 0.113$ ). However, the utilization rate was statistically different among the participants based on the fathers' education, in a way that the people with higher education used more OHC than others. Moreover, the results of Table 2 show that the access rate ( $P = 0.018$ ) and utilization rate ( $P = 0.002$ ) in participants, based on the mothers' education levels was statistically different. According to the results, the participants whose mothers had a higher education had higher access and utilization of OHC.

The concentration index and confidence interval of C are presented in Table 3. It is shown that the C index as a

**Table 1: Distribution, access, and utilization rates in participants by different levels of fathers' education**

Education level	Father education distribution	Access rate	Utilization rate
Illiterate/elementary	79 (28.3)	43 (55.1)	42 (53.2)
Guidance school	82 (29.4)	42 (51.9)	41 (50)
High school	64 (22.9)	43 (67.2)	44 (68.8)
Collegial	54 (19.4)	37 (68.5)	44 (81.5)
Total/average	279 (100)	165 (59.6)	171 (61.3)
P value		0.113	0.001

**Table 2: Distribution, access, and utilization rates in participants by different levels of mothers' education**

Education level	Mother	Access rate	Utilization rate
Illiterate/elementary	77 (27.5)	36 (47.4)	39 (50.6)
Guidance school	77 (27.5)	43 (56.6)	44 (57.1)
High school	89 (31.7)	60 (67.4)	57 (64.0)
Collegial	37 (13.2)	27 (73)	32 (86.5)
Total/average	279 (100)	166 (59.7)	172 (61.4)
P value		0.018	0.002

disparity measure for access and utilization rates, at different levels of the fathers' education are 0.055(-0.095 to 0.205) and 0.097(-0.068 to 0.261), respectively. Moreover, the correspondence C index for the access and utilization rates at different levels of the mothers' education are 0.086(-0.068 to 0.241) and 0.091(-0.81 to 0.263).

### Discussion

Our results showed that although gender disparity was not observed in the usage of OHC between boys and girls, the utilization rate was different among children six to seven years of age, according to the educational level of their parents. It was concluded that children with parents having a higher education had a better opportunity to use OHC. Moreover, it was an important result, which showed that with an increasing level of education of the parents, the utilization of OHC increases. Also, there was the same increasing trend in access to this care. The same results showed in another study.<sup>[22]</sup> In a study by Tomar, it was perceived that fair or poor oral health, untreated tooth decay, and periodontitis had an increasing trend with a decreased level of education.<sup>[22]</sup> However, in our recent study that assessed the health care utilization, there was no increasing trend based on the educational level.<sup>[11]</sup> It seemed that due to the high cost of OHC, people with low education were less interested in using them. In addition, it was accepted that the awareness of health outcomes was higher in well-educated people, based on the other studies<sup>[16]</sup> and lower education was a predictor of a life of poor health.<sup>[11]</sup>

It is recommended that all people, especially children, visit the dentist twice a year, continually. On the basis of this assumption, at least 40% of the children would not have visited the dentist for six months. The average of access and utilization of OHC in our study was 60%. In another study 56.7% of the boys and 66% of the girls had visited once or more per year.<sup>[23]</sup> However, our results showed that there was no statistical significance in usage of OHC between the two sexes, but in the Jung study there was a gender disparity in usage between boys and girls, for visiting dental clinics.<sup>[23]</sup>

To assess the inequity in OHC, the C index and its confidence interval were calculated and estimated, from 0.055 to 0.097. As the confidence interval of C of access and utilization rate included zero, the value of inequity in the access and utilization of OHC is not statistically significant among different levels of education of children parents. In another study, in Iran,

**Table 3: Concentration index, standard error of C, and confidence interval of C, for different levels of education of the participants' parents**

	Concentration index (C)	SE of C	Lower limit of CI	Upper limit of CI
Educational C for fathers				
Access	0.0553	0.0765	-0.0946	0.2053
Utilization	0.0966	0.0838	-0.0677	0.2609
Educational C for mothers				
Access	0.0863	0.0788	-0.0681	0.2408
Utilization	0.0908	0.0879	-0.0815	0.263

SE: Standard error; CI: Confidence interval

the C index was 0.053 and was not statistically significant with zero.<sup>[11]</sup> It was similar to the current results. Other studies also evaluated the socioeconomic inequity in OHC. Thomson *et al.*'s study showed that having low socioeconomic was related with a higher mean of decayed, missing, and filled (DMF) teeth in adulthood.<sup>[3]</sup> It was very clear that educational attainment was the most important predictor of SES in that study.<sup>[3]</sup> In another study children in the low income group have poorer oral health outcomes, fewer dental visits, and fewer protective sealants.<sup>[24]</sup>

However, this study has some limitations, the access rate was evaluated by the questionnaire, and it was suggested that future studies had measured it by the geographic information system method. Also, as calculating the SES status in developing countries is problematic,<sup>[25]</sup> the educational level of parents was used as the SES status of the subjects. However, this was the first study in Iran that estimated the inequity of OHC among people, especially children.

### Conclusion

According to the results, the current study did not observe any evidence of sex disparity in the access or utilization of OHC in Iranian children. Also the inequity related to educational level in the access and utilization of OHC was low and not considerable. However, more educational programs are needed to educate less educated parents with regard to the obligatory visit to the dental care clinics.

### Acknowledgment

The authors are very grateful to the parents of the study subjects and to all the school staff who cooperated with the research team in data collection.

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**How to cite this article:** Mohammadbeigi A, Arsangjang S, Mohammadsalehi N, Anbari Z, Ghaderi E. Education-related inequity in access and utilization of oral health care in Iran. *J Fam Med Primary Care* 2015;4:35-8.

**Source of Support:** Nil. **Conflict of Interest:** None declared.