ORIGINAL ARTICLE

Impact of Sociodemographic Factors on the Access to Oral Healthcare Facilities among Adults of High- and Low-Income Families

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ABSTRACT

Objective: To gauge factors determining good access to dental clinics for oral health care and to assess the impact of sociodemographic factors on access to oral healthcare facilities among adults of high- and low-income families.

Methodology: This cross-sectional study included 602 mixed discipline students enrolled in the public and private academic institutes in Lahore using a simple random sampling method. A structured questionnaire with a few open-ended questions was distributed among study participants. The information was collected regarding sociodemographic attributes and factors determining good access to dental clinics for oral health care. The data were analyzed using frequencies, percentages, mean and standard deviation. Also, the multiple linear regression was used to determine the relationship between sociodemographic attributes (i.e., age, gender, education, etc.) and access to oral healthcare facilities.

Results: Of 650 questionnaires, a total of 602 were returned, giving a response rate of 92.62 %. The results showed that the majority of the participants from low-income families (87.0%) had a lot of trouble paying a US$100 or equivalent dental bill. The participants from high-income families (64.90%) visit a dentist for a check-up at least once a year and 89.20% of the participant had visited the dental clinic last year. The multiple linear regression showed that access to dental clinics for oral health care was significantly affected by family head education, and the number of family members among low-income families while gender, family head age and number of family members were main predictors among high-income families.

Conclusion: The study concludes that socio-demographic factors including gender, family size, family head age and family head education influence the good access to oral healthcare facilities among people belonging to low- and high-income families.

Key Words: oral health, socioeconomic status, health services accessibility, developing countries

INTRODUCTION

Oral health conditions despite being largely preventable, remain a serious public health concern, globally.[1] The highly prevalent chronic dental diseases are dental caries, tooth loss, periodontal diseases and oral cancers of the oral cavity and lips.[2] Oral diseases affect nearly 3.5 billion people across the world.[3] According to an estimate, 530 million children and 2.3 billion adults suffer from caries of primary and permanent teeth, respectively.[3] Rapid changes in living conditions and increasing urbanization have elevated the prevalence of oral health conditions in low- and middle-income countries (LMICs).[3]

Socio-demographic inequalities and access to oral healthcare facilities as measured by gender, education, household size, income and geographical location or by indices acquired by combining factors formulate one of the serious challenges of public health.[4] Contemporary evidence suggest that the health status either clinically assessed or self-reported is directly related to the standard of living.[4] Recognizing oral health to be an integral part of general health, recent studies suggest a social gradient in oral health, with the magnitude of inequality being larger in some countries than in others.[4] Universal Health Coverage (UHC) doesn't cover services for oral health conditions even though such conditions contribute significantly to the total health expenditure (5%) and out of pocket health expenditure (20%) in high-income countries.[5] Conversely, the arrangements for establishing oral health facilities are beyond the capacities of the health care systems in LMICs.[6]

When comparing developed with developing countries regarding choices to access oral healthcare facilities, 57.6% of the Australian adult population visited the dental clinics last year concerning their emergency treatments or dental pain.[7] Moreover, 53% of the population visited the dentists for just routine check-ups.[7] People in the older age group, having a good income, and females were most likely to visit oral healthcare facilities.[8] On the other hand, a local study showed that a meagre number of Pakistani adult population (10.7%) visited orals healthcare facilities during the last year.[8]

Easy access to dentists with affordability and addressing the barriers to this basic human right is of great importance for the overall well-being of the adult population.[9] In Pakistan, there is a dearth of public dental

Received on 16-07-2020
Accepted on 03-12-2020

clinics serving the population as only one dentist is available for 1,305,811 population.[10] Oral health conditions vary substantially among the general population based on living conditions i.e., oral hygiene practices and poor diet quality.[4] Also, availability of dental services, easy access to dental facilities, socioeconomic status, level of education and oral hygiene awareness regarding appropriate care practices affect oral health conditions. Therefore, the effects of multitude factors on oral health indicate that the analysis of social and economic inequalities covering a set of indicators is crucial. So, the objectives of this study were to gauge factors determining good access to dental clinics for oral health care and to assess the impact of sociodemographic factors on access to oral healthcare facilities among adults of high- and low-income families.

METHODS

Ethical Approval: This study was duly approved by the Ethical Review Committee, Hussain College of Health Sciences/Hussain Memorial Hospital, Lahore.

Study Design: This cross-sectional study was conducted for four months between November 2019 and March 2020, with mixed discipline students enrolled in public and private academic institutes of Lahore including Government College University, Forman Christian College University and COMSATS University Islamabad, Lahore Campus.

Inclusion and Exclusion Criteria: Students were included in this study only if they were (i) male or female; (ii) 18 years of age or older; (iii) enrolled in any of the graduate or postgraduate degree programs. However, those students who did not provide written informed consent were disqualified from the study.

Sampling Technique and Sample Size: The minimum sample size needed to maintain a 5 % margin of error; 95 % confidence interval was calculated as 380 using an online sample size calculator.[11] However, by using a simple random sampling method, 650 questionnaires were distributed among study participants.

Questionnaire Development: A structured questionnaire with a few open-ended questions was developed by a multidisciplinary team based on the reliable and validated scales available in the literature.[12,13,14,15] The questionnaire was pre-tested on two groups of 15 students each belonging to different academic institutes to assess several aspects such as presentation of the questionnaire, ease of understanding and acceptability of the questions. The questionnaire was consisted of fifteen (15) questions and was further sub-divided into two sections.

The section-wise distribution of variables information is as follows:

i. Demographic indicators included eight questions i.e., age (years), gender (female = 0, male = 1), education (years), family head age (years), family head education (years), number of family members living in a house, monthly household income (in PKR) and rural background (no = 0, yes = 1).
ii. Good Access to Dental Care Facilities consisted of six closed-ended questions which are measured as dichotomous variables (yes, no) including not being eligible for zakat/other charity funds, not having a lot of trouble paying a US$100 dental bill (estimated PKR 16,300 using the average exchange rate of data collection time duration i.e. US$ 1 = PKR 163), not delaying or avoiding dental care due to cost factor, visit a dentist for a check-up at least once a year, visited a dentist in the last one year, and have private or public dental insurance facility.[16]

Also, an open-ended question assessed the information regarding the other reasons that may affect access to dental clinics.

Study Measures: Dependent variable i.e., good access to dental clinics for oral health care was measured by calculating the scores of different factors. Each factor was assigned with one score including not being eligible for zakat/other charity funds (yes = 1 score, No = 0 score), not having a lot of trouble paying a US$100 dental bill (yes = 1 score, No = 0 score), not delaying or avoiding dental care due to cost factor (yes = 1 score, No = 0 score), visit a dentist for a check-up at least once a year (yes = 1 score, No = 0 score), visited a dentist in the last one year (yes = 1 score, No = 0 score), and have private or public dental insurance facility (yes = 1 score, No = 0 score). If the open-ended question regarding other reasons that may affect access to dental clinics was responded with some reason than no score was assigned otherwise 1 score was granted. The total score of each respondent was calculated out of 7.

According to the Asian Development Bank, purchasing power parity (PPP) is US$ 1.90 per person per day.[17] Families having monthly household income double the PPP i.e., US$ 3.80 a day per person or high (that is equivalent to monthly PKR 18,582) were considered as high-income families.[18] Monthly household income was divided by the number of family members to categorize high- and low-income families.

Statistical Analysis: Collected data were analyzed using Statistical Package for Social Sciences software [version 26.00 (IBM Corp., Armonk, NY, USA)]. Descriptive statistics were calculated for the collected data.

Based on the distribution of the data, multiple linear regression was used to determine the relationship between demographic factors of high- and low-income families (i.e., age, gender, education, family head age, family head education, number of family numbers, and rural background) and good access to dental clinics for oral health care. The significance level (p-value) was taken as <0.05.

RESULTS

Table 1 shows the demographic attributes of the participants belonging to low-income (53.65%) and high-income families (46.35%). The average age was calculated as 27.97±3.26 years and 29.11±3.58 years for low-income and high-income families, respectively. On average, family head education of low-income families was 10.88±4.14 years which was low as compared to the high-income families i.e., 14.96±2.34 years.

Table 2 delineates that the majority of the participants from low-income families (87.0%) had a lot of trouble paying a US$100 dental bill while the meagre number of participants (17.60%) reported this issue belonging to high-income families. Most of the participants from high-income

families (64.90%) visiting a dentist for a check-up at least once a year and 89.20% of the participant had visited the dental clinic last year. On the other hand, 7.70% and 40.60% of the participants belonging to low-income families visiting a dentist for a check-up at least once a year and had visited a dentist during the last year, respectively.

Table 3 shows the relationship between the outcome variable (i.e., good access to dental clinics for oral health care) and several predictor variables in low-income and high-income families. Both econometric models were statistically significant for low- (p = 0.013) and high-income families (p = 0.001). The results for low-income families delineate that good access to dental clinics for oral health care had a positive relationship with family head education while it had a negative relationship with the number of family members. On the contrary, good access to dental clinics for oral health care in high-income families were significantly affected by gender, family head age and number of family members which showed a negative relationship.

Table 1. Demographic Profile (n= 602)

Demographic Factors		**Low-income families (n=323)**	**High-income families (n=279)**
		Mean±SD	Mean±SD
Age (in years)		27.97±3.26	29.11±3.58
Education (in years)		15.27±1.23	15.89±1.17
Family head age (in years)		52.16±11.53	47.22±13.84
Family head education (in years)		10.88±4.14	14.96±2.34
Number of family members		9.22±2.92	6.52±1.67
Monthly household income (PKR)		53974.54±16523.62	219114.70±69519.17
		Frequency(%)	**Frequency(%)**
Gender	Female	131(40.60)	138(49.50)
	Male	192(59.40)	141(50.50)
Rural background	No	151(46.70)	153(54.80)
	Yes	172(53.30)	126(45.20)

Table 2: Factors Determining Good Access to Dental Clinics for Oral Health Care (n=602)

Variables	**Low-income families (n = 323)**	**High-income families (n= 279)**
	Yes, n (%)	Yes, n (%)
Not being eligible for zakat/other charity funds	186(57.60)	0(0.00)
Not having a lot of trouble paying a US$100 dental bill	42(13.00)	230(82.40)
Not delaying or avoiding dental care due to cost factor	58(18.00)	256(91.80)
Visit a dentist for a check-up at least once a year	25(7.70)	181(64.90)
Visited a dentist in the last year	131(40.60)	249(89.20)
Have private or public dental insurance facility	68(21.10)	95(34.10)
Other reason that may affect access to dental clinics	50(15.50)	36(12.90)

Table 3. Predictors of Good Access to Dental Clinics for Oral Health Care (N = 602)

Variables	**Low-income families (n = 323)**			**High-income families (n= 279)**		
	Parameter Estimate	**Standard Error**	**Pr > | t |**	**Parameter Estimate**	**Standard Error**	**Pr > | t |**
Age (years)	0.025	0.024	0.292	0.004	0.029	0.905
Gender	0.052	0.146	0.720	-0.401	0.136	**0.003**
Education (years)	0.001	0.059	0.999	-0.058	0.076	0.447
Family head age (years)	0.006	0.008	0.055	-0.017	0.007	**0.015**
Family head education (years)	0.056	0.020	**0.006**	0.015	0.035	0.656
Number of family members	-0.051	0.024	**0.036**	-0.116	0.045	**0.010**
Rural background	-0.163	0.137	0.234	-0.138	0.137	0.315
F Value	2.606			4.395		
Adjusted R^2	0.034			0.079		
Model Pr > | t |	**0.013**			**0.001**		

DISCUSSION

The results showed that the majority of the participants from low-income families had a lot of trouble paying a US$100 or equivalent dental bill. The participants from high-income families visit a dentist for a check-up at least once a year and most of the participants had visited the dental clinic last year. Moreover, good access to dental clinics for oral health care was significantly affected by family head education, and the number of family members among low-income families while gender, family head age and number of family members were main predictors among high-income families. Overall public and private dental insurance trend were low among the participants.

Dentistry is one of the most expensive specialized healthcare fields across the globe while socio-demographics are of prime importance that determines patients' level of accessibility to oral healthcare facilities.[19] Results of our study are consistent with the study conducted in the same setting that showed people belonging to low-income families were less likely to visit oral healthcare facilities owing to a perceived financial burden.[20,21] It might be owing to either unaffordable dental care or patients' preference to visit the public oral healthcare facilities to attain subsidized dental services.[21,22]

Monthly income is a key contributing factor and a determinant to access oral healthcare services among lower- and higher-class adults.[23] A study conducted in the United States (US) of America also endorsed the above-

stated facts regarding access to oral healthcare facilities and suggested that the access to healthcare services can be improved by modifications in the insurance coverage plans rendering the oral healthcare services more approachable for population belonging to lower socio-economic strata.[24] The role of sociodemographic factors is not limited to accessibility but also affect oral healthcare utilization, frequency of visits and the choice of dentist.[25]

People belonging to low-income families but with a high level of education have a better approach to cope with the health-related problems which may be owing to their improved level of awareness.[26] Generally, Pakistani families live in the joint family system where family heads are more likely to make decisions about their family health issues.[27] So, there is a strong likelihood that educated people despite having low-income avail proper oral health services especially when decisions are influenced by family elders based on their beliefs and experiences.[27] These results were also consistent with the previous studies conducted in China and Brazil.[28,29]

Family size impacts good access to oral healthcare services with some associated financial implications.[30] A community-based Canadian study showed a positive relationship between family size and dental healthcare utilization.[31] Affluent families with larger family size might be able to have good access to oral healthcare facilities without encountering any acute financial strain owing to their economic condition.[31] Concurrently, poor families with larger family size may find it difficult to access oral healthcare facilities due to their limited income which compel them to alter their normal consumption pattern of the family.[32] Similar to our study results, a previous study showed that families having 1 – 3 family members had good access to healthcare facilities as compared to those having 4 – 6 and 7 – 6 family members.[30]

Contrary to our study results, a study conducted in Saudi Arabia reported that males are more prone to dental diseases as compared to females and hence their tendency to visit dental healthcare facilities is greater as compared to their female counterparts.[33] Similarly, US-based study showed that males were more likely to visit the dental facilities as compared to females.[34] Also, contradictory results were obtained from the study showing a positive relationship between age and good access to dental services among people belonging to high-income families.[35] Last but not least, the proportion of the general population having health insurance is, unfortunately, meagre in number in Pakistan that left underprivileged families with a few possible choices either by paying health expenditure out of pocket or to visit subsidized health facilities.[36]

Although this study provides valuable insights into the impact of sociodemographic factors on access to oral healthcare facilities, it does have some limitations. First, the sociodemographic attributes of the population in other settings may differ. Second, larger-scale community-based surveys could supplement the present findings to strengthen the conclusions.

CONCLUSION

The study concludes that socio-demographic factors including gender, family size, family head age and family head education influence the good access to oral healthcare facilities among people belonging to low- and high-income families.

REFERENCES

1. Peres M, Heilmann A. Social inequalities in oral health: from evidence to action.
2. Peres MA, Macpherson LM, Weyant RJ, Daly B, Venturelli R, Mathur MR, Listl S, Celeste RK, Guarnizo-Herreño CC, Kearns C, Benzian H. Oral diseases: a global public health challenge. The Lancet. 2019 Jul 20;394(10194):249-60.
3. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet 2018; 392: 1789–8583
4. Mashoto KO, Astrom AN, Skeie MS, Masalu JR. Socio-demographic disparity in oral health among the poor: a cross sectional study of early adolescents in Kilwa district, Tanzania. BMC Oral health. 2010 Dec 1;10(1):7.
5. Bastos TF, Medina LD, Sousa NF, Lima MG, Malta DC, Barros MB. Income inequalities in oral health and access to dental services in the Brazilian population: National Health Survey, 2013. Revista Brasileira de Epidemiologia. 2019 Oct 7;22:E190015-SUPL.
6. World Health Organization, 2020. Available from: https://www.who.int/news-room/fact-sheets/detail/oral-health
7. Harford J, Ellershaw A, Stewart J. Access to dental care in Australia. Aust Dent J 2004; 49: 206‐8.
8. Chaudhary FA, Ahmad B, Bashir U. Dental health status and oral health behaviours of patients with facial burn in Pakistan. BMC Oral Health. 2019; 19(1): 127.
9. Naseem M, Shah AH, Khiyani MF, Khurshid Z, Zafar MS, Gulzar S, et al. Access to oral health care services among adults with learning disabilities: A scoping review. Ann Stomatol (Roma). 2016; 7: 52‐9.
10. Akram SJ, Yasmin R, Atif S, Rathore A, Anjum O, Arshad MB, et al. Barriers to the access of oral health care facilities among adults: an exploratory study from Lahore. J Fatima Jinnah Med Univ. 2020; 14(3): 105-109.
11. Raosoft Calculator, 2020. Available from: http://www.raosoft.com/samplesize.html
12. Almutlaqah MA, Baseer MA, Ingle NA, Assery MK, Al Khadhari MA. Factors affecting access to oral health care among adults in Abha City, Saudi Arabia. J Int Soc Prev Community Dent. 2018;8(5):431-38.
13. Khaliq IH, Mahmood HZ, Manzoor N, Khaliq FH, Asim K, Abdullah Y, et al. Self-care Practices of Type 2 Diabetes Patients by Socio-demographic and Clinical Factors: An Ordered Probit Model. Sudan J Med Sci. 2019;14(4):210-24.
14. Bhatti ZI, Manzoor N, Korai NA, Khaliq IH. Impact of sociodemographic factors on self-care practices among patients with type 2 diabetes in Lahore, Pakistan: an exploratory study. J Fatima Jinnah Med Univ. 2018;12(4):166-71.
15. Syed M, Saleem T, Syeda UR, Habib M, Zahid R, Bashir A, Rabbani M, Khalid M, Iqbal A, Rao EZ, Saleem S. Knowledge, attitudes and practices regarding dengue fever among adults of high and low socioeconomic groups. Journal of the Pakistan Medical Association. 2010;60(3):243.
16. Forex Pakistan. 2020. Available online: https://www.forex.pk/open_market_rates.asp
17. Asian Development Bank. 2020. Available online: https://www.adb.org/countries/pakistan/poverty
18. Durr-e-Nayab. Estimating the middle class in Pakistan. The Pakistan Development Review. 2011 Apr 1:1-28.
19. Almeida AP, Nunes BP, Duro SM, Facchini LA. Socioeconomic determinants of access to health services

among older adults: a systematic review. Revista de saude publica. 2017 May 15;51:50.
20. Bof de Andrade F, Drumond Andrade FC, Noronha K. Measuring socioeconomic inequalities in the use of dental care services among older adults in Brazil. Community Dentistry and Oral Epidemiology. 2017 Dec;45(6):559-66.
21. Hemani A, Rauf F, Noori MY, Faisal A. Barriers to the access of oral health care in individuals from lower socioeconomic communities in Karachi. Journal of the Liaquat University of Medical and Health Sciences. 2017 Oct 1;16(4):218-21.
22. Nishide A, Fujita M, Sato Y, Nagashima K, Takahashi S, Hata A. Income-related inequalities in access to dental care services in Japan. International journal of environmental research and public health. 2017 May;14(5):524.
23. Suominen AL, Helminen S, Lahti S, Vehkalahti MM, Knuuttila M, Varsio S, Nordblad A. Use of oral health care services in Finnish adults–results from the cross-sectional health 2000 and 2011 surveys. BMC Oral Health. 2017 Dec 1;17(1):78.
24. Singhal A, Damiano P, Sabik L. Medicaid adult dental benefits increase use of dental care, but impact of expansion on dental services use was mixed. Health Affairs. 2017 Apr 1;36(4):723-32.
25. Rocha-Madruga RC, de Souza Coelho-Soares R, Cardoso AM, Góes PS, Cavalcanti AL. Access to oral health services in areas covered by the Family Health Strategy, Paraíba, Brazil. Pesquisa Brasileira em Odontopediatria e Clínica Integrada. 2017 Feb 22;17(1):3006.
26. Harford J, Ellershaw A, Stewart J. Access to dental care in Australia. Aust Dent J 2004; 49: 206‐8.
27. Khaliq IH, Khaliq FH, Abdullah Y, Mahmood HZ, Sarfraz MD, Ahmad S, Zaman S. Students' perceptions of the role of pharmacists in the healthcare system in Lahore, Pakistan. Tropical Journal of Pharmaceutical Research. 2018;17(4):687-93.
28. Cheng ML, Xu MR, Xie YY, Gao XL, Wu HJ, Wang X, Feng XP, Tai BJ, Hu Y, Lin HC, Wang B. Utilisation of oral health services and economic burden of oral diseases in China. Chin J Dent Res. 2018;21(4):275-84.
29. Batista MJ, Lawrence HP, de Sousa MD. Oral health literacy and oral health outcomes in an adult population in Brazil. BMC Public Health. 2018;18(1):60.
30. Arthur JL. Family size and it" s socio-economic implications in the Sunyani municipality of the Brong Ahafo region of Ghana. West-Africa. Ghana: Centre for Development Studies, Faculty of Social Science, University of Cape Coast. 2005 Nov.
31. Zangiabadi S, Costanian C, Tamim H. Dental care use in Ontario: the Canadian community health survey (CCHS). BMC oral health. 2017;17(1):165.
32. Lazar M, Davenport L. Barriers to health care access for low income families: a review of literature. Journal of community health nursing. 2018;35(1):28-37.
33. Bahannan SA, Eltelety SM, Hassan MH, Ibrahim SS, Amer HA, El Meligy OA, Al-Johani KA, Kayal RA, Mokeem AA, Qutob AF, Mira AI. Oral and dental health status among adolescents with limited access to dental care services in Jeddah. Dentistry journal. 2018 Jun;6(2):15.
34. Reisine S. A path analysis of the utilization of dental services. Community dentistry and oral epidemiology. 1987 Jun;15(3):119-24.
35. Holtzman JM, Berkey DB, Mann J. Predicting utilization of dental services by the aged. Journal of public health dentistry. 1990 Mar;50(3):164-71.
36. Mahmood HZ, Khaliq IH, Iqbal Bhatti Z, J Wilson K, Gondal KM, Malik S, Zaman S. Household costs of breast cancer morbidity: An empirical assessment from Pakistan. JBUON. 2018 Jun 29;23(Suppl 1):S28-33.