

# Assessment of Oral Health-related Quality of Life among Expatriate Working Population, Saudi Arabia: A Cross-sectional Study

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**ABSTRACT** **Background:** The expatriate workers (foreign workers) come from various countries having different languages, cultures, and tradition to work in Kingdom of Saudi Arabia (KSA); here they adopt to local customs, traditions, and work ethics in this new environment. How they perceive their oral health-related quality of life (OHRQoL) is important for health-care provider for understanding and planning in patient management. The data of expat workers and their OHRQoL in KSA are meager; hence, assessment of OHRQoL among expatriate working population in Al Zulfi, Saudi Arabia was planned. **Materials and Methods:** A cross-sectional study was conducted on adult expat working population of various nationalities who were working in Al Zulfi, KSA. The study sample comprised 600 adult expats. OHRQoL was analyzed by using 14-Item Oral Health Impact Profile (OHIP-14) questionnaire as instrument. Clinical examination for oral health status was carried out using decayed, missing, and filled teeth (DMFT) index and Oral Hygiene Index simplified (OHI-S). Student's *t* test and analysis of variance (ANOVA) were used to compare data using Statistical Package for the Social Sciences (SPSS) software program, version 20.0 with significance at  $P \leq 0.05$ . **Results:** The age of the sample population ranged from 19 to 60 years. No significant difference was observed in oral health status among expats of different nationalities. Age and education were significantly related to OHRQoL as well as oral health status. The mean cumulative scores of OHIP-14 showed that expats from different nationalities had statistically significant differences. **Conclusion:** Overall the impact of OHRQoL was less among working expat population in Al Zulfi. Physical pain was the common dimension seen among all nationalities. Psychological discomfort and handicap dimensions of OHIP-14 were significant among the study sample.

**KEYWORDS:** Expatriates, KSA, OHIP-14, OHRQoL, oral health

## INTRODUCTION

Any disease will definitely have an effect on the individual's quality of life and oral diseases are one among them. The oral diseases considerably affect

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the physical, functional, psychological, and social aspects of life. Therefore, the terminology “oral health-related quality of life (OHRQoL)” is derived from many investigations.<sup>[1]</sup>

The health assessments related to oral cavity and its outcomes are very important in designing programs related to oral health care; hence, oral health researchers and policymakers considered OHRQoL as prime importance.<sup>[2]</sup> Along with this, the various measures of OHRQoL have also been used in the assessment of recovery from an illness or medical treatment undergone by the patients.<sup>[3]</sup>

OHRQoL is defined as “the absence of negative impacts of oral conditions on social life and a positive sense of dentofacial self-confidence.”<sup>[4]</sup> There are many factors that can affect oral health status such as personal, social, economic, cultural, and local, even different regions within a country will have differences in the oral health status.<sup>[5]</sup>

The data obtained from these measures are significant when planning health care for different groups. The Oral Health Impact Profile (OHIP-14) is a 14-item measure developed by Slade and Spencer, derived from Locker D, and suggested by the World Health Organization (WHO) to assess OHRQoL.<sup>[6]</sup>

The influence of oral conditions on one’s quality of life must be a part of assessment of oral health,<sup>[7]</sup> as only the clinical checkup will not completely answer the symptoms, requirements, and abilities of patients to do their daily activities.<sup>[8-11]</sup>

According to Saudi Arabia’s Central Department of Statistics & Information, Saudi Arabia’s total population as of January 2016 was approximately 30 million, in which the expatriate (foreign) population accounts for one-third of the total population, that is, approximately 10 million. Majority of the expatriates (foreign workers) are from countries such as India, Pakistan, Egypt, Yemen, Bangladesh, Philippines, Afghanistan, Jordan/Palestine, Indonesia, Sri Lanka, Sudan, Syria, Nepal, Turkey, and some Westerners.<sup>[12]</sup>

Saudi Arabia has become an important destination for many expatriate workers from many different nations and data regarding their OHRQoL are meager; hence, a research is planned to assess their OHRQoL.

## MATERIALS AND METHODS

A descriptive cross-sectional study was conducted in the Al Zulfi town of Saudi Arabia among the different expatriate working population. Samples of 600 were

collected depending on their availability. Ethical clearance (ERC/COD/MU/014) was obtained from the Ethics and Review Committee, College of Dentistry, Majmaah University, Al Zulfi.

All the subjects were informed about the purpose of the study and signed informed consent was obtained from all the participants who agreed to participate in the study.

The study was conducted to assess the OHRQoL among the expatriate population in Al Zulfi from November 2017 to April 2018 in the clinic of Dental College, Majmaah University, community centers, malls, and workplaces of subjects in Al Zulfi town. The study had questionnaire and the clinical examination. The questionnaire used OHIP-14 as an instrument along with demographic details. In this study, the Arabic version<sup>[13]</sup> of OHIP-14 and English version<sup>[14]</sup> of OHIP-14 were used; both the versions were reliable and validated before commencing the study.

The OHIP-14 is a self-filled questionnaire and has seven dimensions of impact, that is, functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. The subjects were asked to answer based on the frequency of impact on a 5-point Likert scale (0: never; 1: hardly ever; 2: occasionally; 3: fairly often; and 4: very often) with the scores ranging from 0 to 56, with 0 being no problem to higher scores being impaired oral health; the participants who were illiterate were interviewed by the investigator.

Clinical examination of all subjects was carried out by a single trained investigator. The subjects were clinically examined for dental caries by using decayed, missing, filled teeth (DMFT) index<sup>[15]</sup> and oral hygiene status by Oral Hygiene Index simplified (OHI-S).<sup>[16]</sup> Analysis of variance (ANOVA) was used to compare mean scores of oral health status (DMFT and OHI-S) and different impacts of OHIP-14. Student’s *t* test was used to compare the mean of different variables to OHIP-14. Data were analyzed using Statistical Package for the Social Sciences (SPSS Chicago, IL, USA) software program, version 20.0 with significance at  $P \leq 0.05$ .

## RESULTS

This study comprised 600 adult expatriates population. The age ranges from 19 years to 60 years in which 19–28 years’ age group were 24.3%, 29–38 years were 47.5%, 39–49 years were 18.5%, 49–58 years were 9.2%, and above 58 years old were 0.5%. The gender distribution was 575 males (95.8%) and 25 females (4.2%).

The education status of subjects showed that the sample had 6.3% illiterates, 19.5% with primary-school education, 26.7% with middle-school education, 24.7% with high-school education, 9% with college-level education, 12% were graduates, and 1.8% were postgraduates.

The country-wise distribution of expatriates is shown in Table 1. The majority of our study population comprised Indian population with 26.2%.

Table 2 shows the mean OHI-S and mean DMFT values as compared with different age groups. Both the OHI-S and DMFT values were statistically significant as compared to different age groups. The mean values of OHI-S and DMFT increased with the increase in the age group.

Table 3 shows the mean OHI-S and mean DMFT values as compared with the subjects of different nationalities. The result showed that there is no statistically significant difference in the oral health status (OHI-S and DMFT values) and expats of different nationalities.

Table 4 shows the mean OHI-S and mean DMFT values against various education levels. Various levels of education were found to be statistically significant

with the scores of OHI-S and DMFT values. The oral health status of graduates was found to be good as compared to the other groups. Postgraduate group had second worse oral health status within the group, whereas illiterates had the highest mean scores of OHI-S. The findings of DMFT were similar to the findings of OHI-S with the highest mean scores in illiterates and the lowest mean scores in the graduate group.

Table 5 shows the comparison between expats of various nationalities and different impacts of OHIP-14. As discussed earlier, OHIP-14 instrument measures seven dimensions of OHRQoL, that is, functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. We found statistically significant results in the dimensions of psychological disability and handicap. In psychological disability expats from Nepal showed the least mean scores, whereas expats from Bangladesh showed the highest mean scores, and for the handicap dimension expats from Turkey showed the highest mean scores and again expats from Nepal showed the least mean scores.

Table 6 shows the mean of cumulative scores of OHIP-14 compared with expats of different nationalities. The result showed statistically significant results of OHIP-14 scores and various nationalities. Expats from Nepal had the least mean OHIP-14 scores, whereas expats from Bangladesh had the highest mean OHIP-14 scores indicating the best and the worst OHRQoL with in this group. Although the mean scores of expats from Turkey, Pakistan, Afghanistan, India, and Indonesia were also high, the Bangladeshi expat group had the highest mean OHIP-14 scores.

## DISCUSSION

OHRQoL is a multidimensional measure that shows the case of an individual when engaged in the daily activities of the life.<sup>[17]</sup> Evaluation of OHRQoL allows to understand the choices of the people related to their emotional, social, psychological, and functional requirements, which can help the health-care providers

**Table 1: Country-wise distribution of expatriates**

Nationality	Frequency	Percent
India	157	26.2
Pakistan	79	13.2
Bangladesh	75	12.5
Egypt	151	25.2
Yamen	31	5.2
Syria	14	2.3
Sudan	32	5.3
Nepal	2	.3
Turkey	2	.3
Philippines	18	3.0
Morocco	5	.8
Indonesia	12	2.0
Jordan	3	.5
Afghanistan	19	3.2
Total	600	100.0

**Table 2: Comparison of oral health status with different age groups**

Parameters	Age (years)					Total
	19–28 (n = 146)	29–38 (n = 285)	39–48 (n = 111)	49–58 (n = 55)	>58 (n = 3)	
OHI-S						
Mean ± SD	1.12 ± 1.01	1.16 ± 0.61	1.30 ± 0.62	1.41 ± 0.59	2.00 ± 0.00	1.19 ± 0.73
P Value	0.006 (Sig.)					
DMFT						
Mean ± SD	5.30 ± 3.95	7.52 ± 4.24	8.40 ± 4.44	9.94 ± 5.87	11.33 ± 6.65	7.39 ± 4.59
P Value	0.001 (Sig.)					

OHI-S = Oral Hygiene Index simplified, SD = standard deviation, DMFT = decayed, missing, and filled teeth index

to plan suitable treatment and have the desired goals in patient management.<sup>[18]</sup>

Hence keeping in mind a study was designed to assess the OHRQoL of expatriate population in Al Zulfi, Kingdom of Saudi Arabia (KSA), as the expatriates come to work in Saudi Arabia from various countries with different languages, traditions and culture, and then adapting to local customs and working environment in Saudi Arabia, how they perceive their quality of life related to oral health is of prime importance for health care providers.

**Table 3: Mean comparison of Oral hygiene index simplified (OHI-S) and decayed, missing, and filled teeth index (DMFT) among expats of different nationalities**

Nationality	N	OHI-S	DMFT
		Mean ± SD	Mean ± SD
India	157	1.26 ± 0.58	7.29 ± 4.96
Pakistan	79	1.15 ± 0.60	6.87 ± 3.64
Bangladesh	75	1.37 ± 0.95	7.72 ± 4.68
Egypt	151	1.1 ± 0.85	7.78 ± 4.77
Yamen	31	1.22 ± 0.61	6.51 ± 4.53
Syria	14	0.78 ± 0.80	7.00 ± 4.05
Sudan	32	1.25 ± 0.50	8.87 ± 4.64
Nepal	2	1.50 ± 0.70	15.00 ± 2.82
Turkey	2	1.00 ± 0.41	11.00 ± 2.82
Philippines	18	0.83 ± 0.78	5.27 ± 3.75
Morocco	5	1.00 ± 1.00	7.60 ± 3.91
Indonesia	12	0.83 ± 0.16	4.66 ± 3.49
Jordan	3	1.33 ± 0.33	11.33 ± 4.05
Afghanistan	19	1.15 ± 0.13	6.94 ± 3.58
Total	600	1.19 ± 0.03	7.39 ± 4.59
P Value		0.112 (NS)	0.08(NS)

OHI-S = Oral Hygiene Index simplified, SD = standard deviation, DMFT = decayed, missing, and filled teeth index

In this study, there was a big difference in the male and female ratio, where female expat workers representing only 4.2%, the reason being nonavailability of abundant female expat workers in this particular region, although the available sample showed good OHRQoL which was similar to the study by Lindawati *et al.*,<sup>[8]</sup> who showed good OHRQoL in their female sample.

The study<sup>[19,20]</sup> showed that the demographic details such as age and education had a negligible effect on OHRQoL. On the contrary, our study had significant effects of demographic variables on OHRQoL. The study<sup>[21]</sup> presented that approximately 57% of his study population felt tensed in the last 1 year for their oral problems, 89.2% reported that they were unable to function, 37% reported with pain aching, 32.3% had uncomfortable eating, and 48.8% felt self-conscious. Our study showed that 41% of expat population felt tensed, 81% reported that they were never unable to function, 61.2% reported with pain aching, 53.7% had uncomfortable eating, and 41.5% felt self-conscious.

We observed in our study that the severity of oral diseases had a negative impact on OHRQoL; these results were similar to the results presented in the study.<sup>[13]</sup> Among the seven dimensions of OHIP-14, the highest impact of dimension we got in our study population was Physical pain. The studies<sup>[22-26]</sup> also showed the similar findings where their study population had Physical pain as the highest affected dimension in OHIP-14.

The study<sup>[24]</sup> also proved education having an impact on OHRQoL with the primary-level education holders having the highest impact. This finding was in accordance with our study having primary-level education expats with the highest impact on OHRQoL with statistically significant differences for physical

**Table 4: Mean comparison of Oral hygiene index simplified (OHI-S) and decayed, missing, and filled teeth index (DMFT) against various education levels**

Parameters		N	Mean	Std. deviation	P Value
OHI-S	Illiterate	38	1.4211	.64228	0.014 (Sig.)
	Primary	117	1.2650	.57824	
	Middle	160	1.2563	.99841	
	High	148	1.1757	.54356	
	College	54	1.0926	.62249	
	Graduate	72	.9444	.68974	
	Postgraduate	11	1.3636	.67420	
DMFT	Illiterate	38	10.5789	6.14083	0.001 (Sig.)
	Primary	117	7.6838	4.31047	
	Middle	160	6.9750	4.33205	
	High	148	7.3716	4.60446	
	College	54	7.2407	4.74216	
	Graduate	72	6.2083	4.05226	
	Postgraduate	11	8.0000	3.52136	

OHI-S = Oral Hygiene Index simplified, DMFT = decayed, missing, and filled teeth index

**Table 5: Comparison between expats of various nationalities and different impacts of 14-Item Oral Health Impact Profile (OHIP-14)**

OHQL	Nationality	India	Pakistan	Bangladesh	Egypt	Yemen	Syria	Sudan	Nepal	Turkey	Philippines	Morocco	Indonesia	Jordan	Afghanistan
Functional limitation	N	157	79	75	151	31	14	32	2	2	18	5	12	3	19
	Mean	.6433	.5063	.5733	.5695	.5484	.0714	.3438	.5000	1.0000	.3333	.0000	.4167	.0000	.5789
	Std. deviation	.92690	.88973	.90305	.97646	.62390	.26726	.78738	.70711	1.41421	.68599	.00000	.51493	.00000	.69248
	P Value							0.452 (NS)							
Physical pain	Mean	1.4841	1.5190	1.7067	1.2914	1.4839	.3571	1.5625	1.0000	1.5000	.8889	1.0000	1.5000	2.0000	1.5789
	Std. deviation	1.31366	1.36683	1.35341	1.27849	1.17958	.63332	1.21649	1.41421	2.12132	.90025	.70711	.67420	1.73205	1.16980
	P Value							0.069 (NS)							
Psychological discomfort	Mean	.9554	1.1013	1.2800	.8940	.6452	.5000	.9688	.5000	1.0000	.3333	.2000	.9167	.6667	1.1579
	Std. deviation	1.11139	1.12768	1.10966	1.21190	.83859	.75955	1.03127	.70711	1.41421	.59409	.44721	.90034	.57735	1.30227
	P Value							0.062 (NS)							
Physical disability	Mean	1.0581	1.2658	1.0000	.9272	.7742	.4286	1.0313	.0000	1.0000	.3333	.8000	.9167	.6667	.8421
	Std. deviation	1.27023	1.28810	1.16248	1.13196	1.25724	.75593	1.28225	.00000	1.41421	.48507	1.09545	.99620	.57735	1.16729
	P Value							0.208 (NS)							
Psychological disability	Mean	1.0892	.9747	1.3200	.9338	.7097	.3571	.8438	.0000	1.0000	.4444	.4000	1.1667	.6667	1.0526
	Std. deviation	1.17874	1.07387	1.26448	1.09951	.97275	.63332	.91966	.00000	1.41421	.70479	.54772	.93744	.57735	1.12909
	P Value							0.037 (Sig.)							
Social disability	Mean	.8408	.9114	1.0133	.7682	.4516	.2857	.5938	.0000	1.0000	.3333	.4000	.8333	.6667	1.0526
	Std. deviation	1.15197	1.06446	1.27865	1.02920	.76762	.61125	1.07341	.00000	1.41421	.68599	.54772	.93744	.57735	1.07877
	P Value							0.156 (NS)							
Handicapped	Mean	.7261	.6835	.6800	.5563	.2581	.1429	.3125	.0000	1.0000	.0000	.2000	.4167	.0000	.5789
	Std. deviation	1.14697	1.05666	1.12898	.92113	.57548	.53452	.59229	.00000	1.41421	.00000	.44721	.51493	.00000	.76853
	P Value							0.038 (Sig.)							

NS = not significant

**Table 6: Mean comparison of cumulative scores with expats of different nationalities**

Nationality	N	Mean	Std. deviation	P Value
India	155	6.6516	6.17767	0.029 (Sig.)
Pakistan	79	6.9620	6.20472	
Bangladesh	75	7.5733	6.80257	
Egypt	151	5.9404	5.80716	
Yemen	31	4.8710	4.69569	
Syria	14	2.1429	3.50510	
Sudan	32	5.6563	5.50431	
Nepal	2	2.0000	2.82843	
Turkey	2	7.5000	10.60660	
Philippines	18	2.6667	2.14202	
Morocco	5	3.0000	2.64575	
Indonesia	12	6.1667	4.72582	
Jordan	3	4.6667	4.04145	
Afghanistan	19	6.8421	6.10340	
Total	598	6.2007	5.95234	

pain, psychological discomfort, physical disability, social disability, and handicap. We found postgraduates to have second worse oral health status in the group; we attribute this finding to the lesser number of people representing postgraduate group with only 1.8% which is our limitation if we had more representation of people in this group than we had justified it properly.

The impact of age on OHRQoL in our study showed that increasing age will adversely affect OHRQoL which were in accordance with the study.<sup>[27,28]</sup> There are many variables such as age, gender, education, and income which can have an impact on OHRQoL. The study<sup>[29]</sup> proved that area can also have an impact on OHRQoL; the study showed that rural areas have more adverse impacts on OHRQoL than the urban areas.

The expat samples in this study were from many different countries involved in various jobs and we did not find any statistically significant results pertaining to the oral health status between expats of different nationalities, but of course the age and education has a significant role; the age was also responsible for having an impact on OHRQoL dimensions resulting in younger age group in lesser impact and older age group with higher impact on OHRQoL.

When we correlated different nationalities and various dimensions of OHIP-14, it was only the psychological disability and handicap dimensions, which were statistically significant between expats of different nationalities. There was an unequal distribution of expats representing their countries. Expats from some countries were more and some countries very less, and there was a big difference in the gender ratio as well, which could be our

limitations, but this was the expat sample available in that particular region. The nonprobabilistic sampling could be another limitation, because many expat workers such as personal drivers, maids masons, electricians, salesmen's, and many more likewise were available during holidays and only for a limited period of time. This was our initial step toward analyzing the quality of life related to oral health of expatriate population in Al Zulfi. We recommend further investigations in this field.

## CONCLUSION

Overall the expatriate working population in this study showed a lesser impact on OHRQoL. The oral health status was not significantly different among expat workers of various nationalities, but some of the dimensions of OHIP-14 such as psychological discomfort and handicap showed significant differences among them; Physical pain was the most common dimension seen across the sample. The cumulative mean scores of OHIP-14 also had a significant difference among expat workers of different nationalities. The parameters such as age and education had a significant influence on both the oral health status and OHRQoL.

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Nil.

## CONFLICTS OF INTEREST

There are no conflicts of interest.

## AUTHORS CONTRIBUTIONS

Author 1 - study conception, data collection, data acquisition, Author 2 - analysis, Author 3 - data

interpretation, Authors 1 and 4 - manuscript writing, Author 5 - study conception, Author 6 – revised it critically, and all authors approved the final version of manuscript.

#### ETHICAL POLICY AND INSTITUTIONAL REVIEW BOARD STATEMENT

Ethical permission was granted from the Ethics and Review Committee, College of Dentistry, Majmaah University, Al Zulfi with ref no. ERC/COD/MU/014.

#### PATIENT DECLARATION OF CONSENT

All the study participants gave voluntary consent.

#### DATA AVAILABILITY STATEMENT

Available from [hidayathdr@gmail.com](mailto:hidayathdr@gmail.com).

#### REFERENCES

- Al Shamrany M. Oral health-related quality of life: A broader perspective. *East Mediterr Health J* 2006;12:894-901.
- Finbarr Allen P. Assessment of oral health related quality of life. *Health Qual Life Outcomes* 2003;1:1-8.
- Pelo S, Gasparini G, Garagiola U, Cordaro M, Di Nardo F, Staderini E, *et al.* The surgery-first orthognathic approach vs traditional orthognathic approach: Oral health-related quality of life assessed with 2 questionnaires. *Am J Orthod Dentofac Orthop* 2017;152:250-4.
- Camila S, Branca O, Paulo N, Juliana H, Roger C, Fernando H. The Oral Health Impact Profile-14: A unidimensional scale? *Cad Saud Pub* 2013;29:749-57.
- William P, Constantine JO, John Y. The oral health related quality of life in different groups of senior citizens as measured by OHIP-14 questionnaire. *Oral Biol Dent* 2015;3:1-7.
- Javier M, Manuel P, Alberto M, Luis M, Eva G. Validation the Oral Health Impact Profile (OHIP-14sp) for adults in Spain. *J Clin Exp Dent* 2009;1:e1-7.
- Batra M, Aggarwal V, Shah A, Gupta M. Validation of Hindi version of oral health impact profile-14 for adults. *J Indian Assoc Public Health Dent* 2015;13:469-74.
- Lindawati K, Sundjaja Y, Sitti F, Raden I. Oral health related quality of life in Indonesian middle aged and elderly women. *Med J Indones* 2011;20:62-5.
- Ingle N, Chaly P, Zohara C. Oral health related quality of life in adult population attending the outpatient department of hospital in Chennai, India. *J Int Oral Health* 2010;2:45-55.
- Vikram M, Singh VP. Translation and validation of the Nepalese version of Oral Health Impact Profile (OHIP-14) questionnaire. *Oral Biol Dent* 2014;2:1-4.
- Gerritsen A, Nguyen T, Witter D, Bronkhorst E, Creugers N. A Vietnamese version of the 14 – item Oral Health Impact Profile (OHIP-14VN). *Open J Epidemiol* 2012;2:28-32.
- Available from: [https://www.stats.gov.sa/sites/default/files/en-demographic-research-2016\\_6.pdf](https://www.stats.gov.sa/sites/default/files/en-demographic-research-2016_6.pdf). [Last accessed on 2018 Jan 21].
- Al Habashneh R, Khader YS, Salameh S. Use of the Arabic version of oral health impact profile-14 to evaluate the impact of periodontal disease on oral health-related quality of life among Jordanian adults. *J Oral Sci* 2012;54:113-20.
- Slade GD. Derivation and validation of a short-form oral health impact profile. *Community Dent Oral Epidemiol* 1997;25:284-90.
- Klein H, Palmer CE, Knutson JW. Studies on dental caries. *Public Health Rep* 1938;53:1685-732.
- Greene JC, Vermillion JR. The simplified oral hygiene index. *J Am Dent Assoc* 1964;68:7-13.
- Bennadi D, Reddy CV. Oral health related quality of life. *J Int Soc Prev Community Dent* 2013;3:1-6.
- Sischo L, Broder HL. Oral health-related quality of life: What, why, how, and future implications. *J Dent Res* 2011;90:1264-70.
- Walter MH, Woronuk JI, Tan HK, Lenz U, Koch R, Boening KW, *et al.* Oral health related quality of life and its association with sociodemographic and clinical findings in 3 northern outreach clinics. *J Can Dent Assoc* 2007;73:153.
- Maja L, Irena M, Ema A, Milica G, Katarina K, Anika C. Oral Health Related Quality of life and dental status of adult patients. *Balk J Dent Med* 2017:93-9.
- Brennan DS, Spencer AJ. Dimensions of oral health related quality of life measured by EQ-5D+ and OHIP-14. *Health Qual Life Outcomes* 2004;2:35.
- Osman SM, Khalifa N, Alhajib MN. Validation and comparison of the Arabic versions of GOHAI and OHIP-14 in patients with and without denture experience. *BMC Oral Health* 2018;18:157.
- Zhou Y, Zhang M, Jiang H, Wu B, Du M. Oral health related quality of life among older adults in central china. *Community Dent Health* 2012;29:219-23.
- Braimoh O, Alade G. Oral health related quality of life and associated factors of elderly population in Port Harcourt, Nigeria. *Saudi J Oral Sci* 2019;6:18-24.
- Manapoti J, Chava V, Reddy R. Evaluation of oral health-related quality of life among professional students: A cross-sectional study. *J Indian Assoc Public Health Dent* 2015;13:465-8.
- Yadav T, Chopra P, Kapoor S. Association between chronic periodontitis and oral health-related quality of life in Indian adults. *J Int Oral Health* 2019;11:280-6.
- Zucoloto ML, Maroco J, Campos JA. Impact of oral health on health-related quality of life: A cross-sectional study. *BMC Oral Health* 2016;16:55.
- Bastos LF, Hugo FN, Hilgert JB, Cardozo DD, Bulgarelli AF, Santos CMD. Access to dental services and oral health-related quality of life in the context of primary health care. *Braz Oral Res* 2019;33:e018.
- Husain FA, Tatengkeng F. Oral health-related quality of life appraised by OHIP-14 between urban and rural areas in Kutai Kartanegara Regency, Indonesia: Pilot pathfinder survey. *Open Dent J* 2017;11:557-64.