Oral Health-Related Quality of Life Appraised by OHIP-14 Between Urban and Rural Areas in Kutai Kartanegara Regency, Indonesia: Pilot Pathfinder Survey

Fuad Akbar Husain¹,* and Fransiske Tatengkeng²

¹Department of Dental Public Health, Faculty of Dentistry, Hasanuddin University, Makassar, Indonesia
²Faculty of Dentistry, Hasanuddin University, Makassar, Indonesia

Received: March 29, 2017   Revised: August 14, 2017   Accepted: September 15, 2017

Abstract:
Background: Health-Related Quality of Life (HRQoL) periphrastically has a significant impact on oral health. A recent study has shown the significant facts of the oral health-related quality of life based on many factors such as individual, social status, household management, daily habits, and local factors. The differences in the oral health status possibly occur in between countries, different regions, and topographical areas frequently and indirectly contributing to oral health status.

Objective: The objective is to evaluate the difference of Oral Health-Related Quality of Life (OHRQoL) and to assess the main affected dimension between rural and urban areas in Kutai Kartanegara Regency.

Methods: This study uses pilot pathfinder design. The respondents comprised of 214 adults who were elder than 18 years and were randomly selected from urban and rural areas in Kutai Kartanegara Regency, Indonesia. The data were collected by 103 samples from the rural area and 111 respondents from the urban area. Oral Health Impacts Profile (OHIP-14) has been translated to Bahasa (Indonesia version). OHIP-14 was used to assess the subjects’ oral health-related impact. Shapiro-Wilk and Mann Whitney tests were used to analyze the data, and p-value was set at P < 0.05.

Results: The mean OHIP scores in the urban and the rural areas were 25.4 and 28.8, respectively. The overall OHIP-14 score showed a significant statistical difference P= 0.009 (P < 0.05) between rural and urban area.

Conclusion: This study illustrates that oral health-related quality of life in the urban area is better than in the rural area. Physical pain components of the OHRQoL are the major oral problems associated with both the areas.

Keywords: Oral health-related quality of life, OHIP-14, OHRQoL in urban and rural, QoL in Indonesia, QoL in urban areas, QoL in rural areas.

1. INTRODUCTION

Oral health is the main component of individuals’ general health and it allows individuals to run their daily activities.

* Address correspondence to this author at the Department of Dental Public Health, Faculty of Dentistry, Hasanuddin University, Makassar, Indonesia, Tel: +62 812-4342-2362, Fax: +62 411 512012; E-mails: fuadgi2@gmail.com; fuad_gi2@yahoo.co.id
(mastication, articulation, socializing) without any illness, discomfort, and disability. Moreover, a systemic disease is somehow related to many oral manifestations and reflected by the individual quality of life (QoL) [1 - 3]. Oral health also has a main contribution to the quality of life, and it directly affects people at their physical, cognitive, emotional, and social level [4]. Based on Locker’s study on Zuccolo, it has been shown that oral health affects people physically and psychologically due to many aspects such as their way of life, interaction with each other, their social well-being etc. [3].

The key to improve QoL is by repatriating oral function, mastication, preventing oral disease, repairing oral tissue, and tackling the patient’s complaints [2 - 5]. To measure the Oral Health-Related Quality of Life (OHRQoL), Slade and Spencer in 1994 tested the performance to measure the functional, social, and psychological outcomes of oral conditions based on 49 questions known as OHIP-49. The OHRQoL’s measure (OHIP) is a suitable subjective indicator that provides information about the impacts of oral conditions on an individual’s life and perceived need for dental treatment. The Oral Health Impact Profile (OHIP) is a questionnaire that measures people’s perception of the social impact of oral disorders on their well-being. Slade in 1997 developed a short-form of it with 14 questions, named OHIP-14 which showed good reliability, validity and precision. Fourteen items of OHIP are divided into seven dimensions; functional limitation, physical discomfort, psychological discomfort, physical disability, psychological disability, social disability and handicaps. This OHIP-14 has been widely used across the world for various research purposes with modifications including language and regional concerns. Assessing the adult oral health-related quality of life is one of the primary needs [1, 4, 1 - 8].

One of the most crucial periods to prevent dental disease begins in adolescence which also affects the future of oral health. The World Health Organization in 2012 in Galloway suggests that the correlation between oral health-related quality of life (OHRQoL) and well-being was influenced by six factors; physical, environment, social relationships, physiological, independence stage and spiritual life. The result of the empirical analysis suggested that the impact of the quality of life relates to social demographic data (age and gender) along with economic and epidemiological aspects of culture [1, 9, 10].

An epidemiological survey in Greece in 2009 in Papaioannou showed the significant differences in quality of life found in each region as well as the differences in oral conditions between communities living in urban and rural areas [4]. A research by Spelberg in Goran (2006) in Germany discovered that the quality of life of people in rural areas was better as compared to urban setting due to fresh water, fresh air, and eco-friendly spaces in rural areas contrary to unhealthy atmosphere resulting from city’s infrastructure. However, there are several other factors that influence other than geographical location. By noticing those differences, the author also compared the impact of individual oral status on the OHRQoL by different regions [4, 11 - 13].

According to the statistical data of Kutai Regency obtained in 2006, Tenggarong subdistrict which is situated at the center of Kutai Kartanegara Regency has 114,307 inhabitants. This number is far above the inhabitants of Samboja subdistrict located in the coast which only has a population of 63,467 people. Therefore, by considering the population density, Tenggarong subdistrict is considered an urban area while Samboja subdistrict is considered as a rural area. On the other hand, 700 people (0.6% of the total population) living in Tenggarong subdistrict were observed to be farmers, 708 (0.6%) as fishermen, while the majority were found to be civil servants being 7965 people registered with the peak of the percentage 6.9%. In contrast, in Samboja subdistrict, majority were farmers, comprising 4358 people (6.8% of the total population), while 2926 (4.6%) people were fishermen where the civil servants were only 952 (1.4%). [14 - 16]

1.1. Statement of Problem

Remote area and geographical differences could not be denied showing the significant difference scores and quality of life in both communities as well as in each region. In terms of livelihoods, Tenggarong subdistrict was observed to be dominated by civil servants while Samboja subdistrict has the majority of farmers. This trend affected the economic growth of each region and their role in improving the quality of life. Based on the aforementioned situation, the researcher was interested in evaluating the differences in the oral health-related quality of life (OHRQoL) in different regions and in assessing the main affected dimension of rural and urban areas in Kutai Kartanegara Regency.

2. MATERIALS AND METHODS

This study used pilot pathfinder design. The study respondents comprised of 214 adults with age more than 18, and were randomly selected from urban and rural areas of Kutai Kartanegara Regency. The urban area refers to Tenggarong subdistrict while the rural area refers to Samboja subdistrict. The inclusion criteria was adults with of more than 18
years willing to fill the questionnaire, while the respondents who were unable to fill in all the general data as well as to return the questionnaire were excluded. The survey was conducted at three different health centers located in Tenggarong district (urban) and another three including one additional hospital in Samboja district (rural). Among 214 respondents in total, eventually there were only 202 valid respondents left with 96 respondents from urban areas and 106 from rural areas.

Determination of the respondents is based on the report by WHO which is according to the geographical area covering large populations and very complex health systems. The relevant and reliable information can be obtained by estimating the number of appropriate respondents based on the age category in urban and rural. The final result shows that both urban and rural areas at least had 100 respondents. The assessment of Quality of Life was carried out using OHIP-14 questionnaire that was simultaneously translated into Indonesia version. OHIP-14 questionnaire includes seven dimensions with 14 items to determine the quality of life. The higher the average value of the seven dimensions, the more negative the impact of oral health on the quality of life of an individual. The seven dimensions include functional limitations, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap. On the dimensions that influence the quality of life, the combination of alternative answers like “often” and “very often” was a reference to determine whether those dimensions have a negative impact on people's quality of life. Classification of a quality of life was made as good, moderate and severe. The survey data were organised and analysed by using SPSS ver.18 for Windows platform (SPSS Inc., Chicago, Illinois, USA) and MS. Excel (Microsoft Office, Windows 2007, USA). Differences were considered significant when \( p < 0.05 \).

3. RESULTS

A total of 202 respondents (96 from urban and 106 from rural) participated in the survey. The distribution of respondents according to demographic / characteristic respondent among rural and urban areas is presented in Table 1.

Table 1 illustrates that both the areas were dominated by women being 77.1% in the rural areas and 75.5% in the urban areas. In terms of age, the range of 18-44 years was the highest for both urban and rural areas with percentage of 38% and 61.5%. Two age-groups between 18 - 44 years and also over 44 years were considered based on WHO’s category of adult age. In particular categorisation, age between 18-44 years was categorised as the age of a young adult while 44 years was categorised as the age of an adult.

The education level of the respondents in urban and rural areas was high school graduates being 57.3% in urban areas and 42.1% in rural areas. However, the respondents living in rural areas who did not have any occupation accounted for 33% while in urban areas, the value was 27%.

Monthly income on revenue of USD 0-7.5 showed the highest number of respondents in rural areas with a percentage of 79.2% while being 52.1% with a monthly income for more than USD 75.

| Respondents Characteristic | Rural | Urban |
|---------------------------|-------|-------|
|                           | Frequency (n) | Percent (%) | Frequency (n) | Percent (%) |
| Sex                       |       |       |       |       |
| Male                      | 22    | 22.9  | 26    | 24.5  |
| Female                    | 74    | 77.1  | 80    | 75.5  |
| Age                       |       |       |       |       |
| 18-44 Years               | 59    | 61.5  | 68    | 38    |
| >44 Years                 | 37    | 38.5  | 64.2  | 35.8  |
| Educational Level         |       |       |       |       |
| No Education              | 6     | 6.3   | 19    | 12.4  |
| Elementary School         | 9     | 9.4   | 19    | 13.9  |
| Junior High School        | 8     | 8.3   | 16    | 11.9  |
| Senior High School        | 55    | 57.3  | 30    | 42.1  |
| Graduated                 | 18    | 18.8  | 22    | 19.8  |
| Occupation                |       |       |       |       |
| Jobless                   | 27    | 28.1  | 35    | 33    |
| Farmer                    | 6     | 6.3   | 8     | 7.5   |
| Plumbers                  | 0     | 0     | 4     | 3.8   |
Table 2 shows that 41 respondents (20.3%) responded to the question of “ever felt difficulty in pronouncing any words because of the problems with your teeth or mouth” as “often”, and very few people (7 (3.5%)) responded to the question “totally unable to function because of the problem with your teeth or mouth”. On the question “ever feel worried / anxious because of the problem in the oral cavity” the alternative answer “very often” was the least, with only a few numbers of respondents. The question of “felt totally unable to function because of the problem with your teeth or mouth” had the lowest mean value with a mean of 1.65, which means that almost all respondents answered rarely and the highest mean value correlated to the question “uncomfortable to eat any food because of the problem with your teeth or mouth” with a mean value of 2.25 which means the respondents answered in average sometimes feel uncomfortable while chewing due to the problem in the oral cavity.

Table 2. Distribution of responses for OHIP score among rural and urban citizen.

| Respondents Characteristic | Frequency (n) | Percent (%) | Frequency (n) | Percent (%) |
|---------------------------|---------------|-------------|---------------|-------------|
| Students                  | 2             | 2.1         | 0             | 0           |
| Entrepreneur              | 10            | 10.4        | 7             | 6.6         |
| Officer                   | 10            | 10.4        | 7             | 6.6         |
| Government Employees      | 14            | 14.6        | 23            | 21.7        |
| Etc.                      | 27            | 28.1        | 22            | 20.8        |
| **Monthly Income**        |               |             |               |             |
| USD 0-7.5 (Lower Class)   | 39            | 40.6        | 84            | 79.2        |
| USD 7.6-37.5 (Lower Middle)| 4             | 3.8         | 4             | 3.8         |
| USD 37.6-75 (Middle Class)| 3             | 3.1         | 0             | 0           |
| USD > 75 (Upper Class)    | 50            | 52.1        | 18            | 17          |
| Total                     | 96            | 100         | 106           | 100         |

Table 3 shows that the mean value in urban areas was the highest on the dimension of physical pain with mean value of 4.09, while the lowest value was in the dimension of disability with a mean value of 3.19. Moreover, the mean
value was the highest in rural area with the dimension of psychological discomfort with a mean value of 4.47 and the
lowest on the dimension of delay with a mean of 3.57.

Table 3 also shows a significant difference between the two regions with \( p = 0.009 \) \((p<0.005)\) with a higher total of
OHIP-14 score in urban areas. This shows that the quality of life in rural areas is worse.

**Table 3. Mean OHIP-14 scores according to urban and rural area.**

| Mean (SD)                  | Urban    | Rural    | \( P \) |
|----------------------------|----------|----------|---------|
| Functional Limitation      | 3.30 (1.66) | 3.85 (1.81) | 0.027*  |
| Physical Pain              | 4.09 (1.9)  | 4.58 (1.86) | 0.037*  |
| Psychological Discomfort   | 3.88 (1.87) | 4.47 (2.16) | 0.052   |
| Psychological Disability   | 3.96 (2.00) | 4.42 (2.07) | 0.094   |
| Physical Disability        | 3.71 (1.80) | 4.38 (2.04) | 0.018*  |
| Social Handicap            | 3.27 (1.76) | 3.60 (1.88) | 0.203   |
| Handicap                   | 3.19 (1.82) | 3.57 (1.96) | 0.150   |
| Total OHIP Score           | 25.4(10.84) | 28.8(10.67) | 0.009*  |

*Mann-Whitney test: \( p<0.05 \); significant

In addition, Table 3 illustrates the significant difference between urban and rural areas \((p<0.05)\) in the functional
dimension limitations with \( p = 0.027 \), dimension of ill physical condition with \( p = 0.037 \) and dimension of
psychic disability with \( p = 0.018 \) throughout higher than urban areas. Therefore, rural areas were observed to have a lower quality of life compared to urban areas.

Table 4 shows the differences in the value of the dimensions of the quality of life between urban and rural in which
the impact of low quality of life is classified when one item of question is answered with “often” and “very often”
alternative answers. On the question about the “trouble pronouncing” there were as many as 27.2% respondents whose
quality of life was affected. Moreover, the lowest percentage (5.4%) of respondents felt difficulty due to poor oral
cavity affecting their quality of life.

**Table 4. Prevalence of adverse impacts on quality of life prior to area*.**

| Impact Experienced due to Problems with Teeth, Mouth or Dentures | n of Patients Reporting Impact* | % of Patients Reporting impact* |
|----------------------------------------------------------------|---------------------------------|---------------------------------|
| Trouble Pronouncing                                           | 55                              | 27.2                            |
| Taste Affected                                                 | 12                              | 5.9                             |
| Painful Aching                                                 | 14                              | 6.9                             |
| Uncomfortable to Eat                                          | 23                              | 11.4                            |
| Been Self Conscious                                           | 26                              | 12.9                            |
| Felt Tense                                                    | 20                              | 9.9                             |
| Diet Unsatisfactory                                           | 20                              | 9.9                             |
| Interrupted Meals                                             | 24                              | 11.9                            |
| Difficult to Relax                                             | 18                              | 8.9                             |
| Been Embarrassed                                              | 30                              | 14.9                            |
| Been a Bit Irritable                                          | 17                              | 8.4                             |
| Difficult Doing Jobs                                           | 12                              | 5.9                             |
| Life Less Satisfying                                           | 16                              | 7.9                             |
| Unable to Function                                             | 11                              | 5.4                             |

n = 202 subjects in urban and rural area

Impact Profile questionnaire. *Impacts reported “fairly often” or “very often” in preceding three months.

4. DISCUSSION

The result presented in this study, show a significant difference between the rural and urban areas in terms of
affected oral health as well as the differences in the quality of life. The higher score of OHIP in rural areas indicates that
the quality of life in rural areas in the worst compared to urban areas. The same results shown in a recent study by
Carneiro in 2010 on rural areas of Brazil suggest that the more remote the area, the more it affects the quality of life. It suggests that the high score of OHIP will always be equal to the negative impact of the quality of life. This is in line with a research conducted by Papaioannou in 2015 in urban and rural areas showing that the rural areas had a higher mean value of OHIP-14 than urban areas, both of which are consistent with the survey results showing a higher mean value of OHIP-14 in rural areas. Dams indicate that rural areas have poor oral health and over all quality of life of the individual; this is attributed to the lack of facilities in the area, the very fewer medical personnel than the number of residents that poses problems in obtaining proper services to help maintain the quality of life [1, 17].

In terms of respondent’s education, it was discovered that the education level of a person influences his/her quality of life. A research conducted by Papaioannou showed the difference in OHIP value based on public education level. The research showed high school graduates with lower OHIP value compared to scholars. Those living in urban areas had lower OHIP scores than those in rural areas. [1].

Similarly, a study conducted by Marilia in 2014, analysing the highest OHIP score resulting in low quality of life of the respondents who received education in more than nine years depicted the number of such respondents to be lower as compared to those who had good quality of life with lower OHIP score which comprised of 196 respondents with 9-11 years of educational experience, equal to junior or senior high school graduates. Moreover, those respondents who studied over than 11 years being university or college graduates, showed the lowest number of OHIP score; this trend, leads to the very good quality of life [18].

The level of education related to oral health is very important, which is also justified by a research conducted by Ahmed, showing better oral health of people who have received education on oral health than those who did not. This implies that higher level of a person’s education helps in increasing the awareness about oral health [1, 2, 19, 20]. Respondents who were not qualified enough i.e. graduated from elementary and junior high school were 23 in urban areas and 54 in number in rural areas. Therefore, the quality of life in Tenggarong District was observed to be better than in Samboja District. This suggests that the education level also affects the quality of life.

Monthly income is an important factor in determining the quality of life. A study in Hudacova in 2010 showed that there exists a relationship between OHIP and a person's income. This was confirmed by a study in Biazevic showing that 71.2% of those with high incomes showed low OHIP scores, suggesting better quality of life than being 39.9% of those with low incomes and poor oral health [21, 22]. The results of this study showed that in rural areas, people have low income with livelihoods as farmers resulting in higher OHIP rates than those in urban areas with a profession dominated by office workers, being self-employed and private employees [14, 21, 22] The quality of life is also influenced by the location or area of origin of the community, therefore, rural and urban areas have differences in the quality of life. In this study, the quality of life associated with oral health showed a worst impact on rural areas represented by Samboja subdistrict compared to those living in urban areas represented by Tenggarong subdistrict due to several aspects such as education, availability of health services, income, livelihoods and age. Other aspects such as dental care, periodontal disease and tooth loss resulting in functional limitations in the oral cavity also contribute to this. However, the quality of one's life can possibly change to better if all the limitations are addressed and mastication function is restored as before [22 - 26].

CONCLUSION

For the representative respondents of Kutai Kartanegara Regency who took part in the present study, the quality of life associated with oral health showed good quality of life in urban areas represented by Tenggarong subdistrict being significantly different from the rural areas represented by Samboja subdistrict. Further investigation of the Oral Health Quality of Life of individuals with a significant sign of disease, current or past, must be undertaken. Another aspect that needs to be evaluated is the correlation between Oral Health Quality of Life and ages, sex, education level, income, and livelihood. The data from such studies aid in advocating the formation of a suitable profile for future dentists to handle an ageing population, and also to provide additional data for dental clinics as well as underline the need in providing the necessary resources and public funds for dentistry. It is important to place dental and oral health in the proper context.

LIST OF ABBREVIATIONS

| Abbreviation | Definition                        |
|--------------|----------------------------------|
| WHO          | World Health Organization        |
| QoL          | Quality of Life                  |
| OHRQoL       | Oral Health-Related Quality of Life |
HRQoL = Health-Related Quality of Life
OHIP = Oral Health Impact Profile

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the Faculty of Dentistry, Hasanuddin University.

HUMAN AND ANIMAL RIGHTS

The reported experiments in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2008 (http://www.wma.net/en/20activities/10ethics/10helsinki/).

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

FH and FT collected all the data from the respondents, participated in the writing of the manuscript including statistical analysis and all the tables. FH was the supervisor of this research. He is the principal investigator and participated in all phases of the manuscript including research concept and design, giving advice how to conduct the statistical analysis and interpretation. All authors read and approved the final manuscript. FH sent the final approval of article.

REFERENCES

[1] Papaioannou W, Oulis CJ, Yfantopoulos J. The oral health related quality of life in different groups of senior citizen as measured by the OHIP-14 questionnaire. Herbert Open Access J 2015; 3(1): 4-6.

[2] Ahamed S, Moyin S, Punathil S, Patil N. Evaluation of the oral health knowledge, attitude, and behavior of the preclinical and clinical dental students. J Int Oral Health 2015; 7(6): 65-8.

[3] Zucolo 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): 1-2. [PMID: 26745890]

[4] Manapot JP, Chava VK, Reddy BV. Evaluation of oral health-related quality of life among professional students: A cross-sectional Study. J Ind Assoc Public Health Dent 2015; 13(4): 465-6. [http://dx.doi.org/10.4103/2319-5932.171174]

[5] Hoeksema AR, Spoorenberg S, Peters LL, et al. Elderly with remaining teeth report less frailty and better quality of life than edentulous elderly: A cross-sectional study. Oral Dis 2017; 23(4): 526-36. [http://dx.doi.org/10.1111/odi.12644] [PMID: 28120363]

[6] Dhingra S, Rajesh G, Rao A, Pai UY, Shenoy R, Pai M. Impact of occlusal support and perceived chewing ability on oral health-related quality of life among patients attending a private dental institution in India. J Indian Prosthodont Soc 2017; 17(1): 15-21. [PMID: 28216840]

[7] Lopez R, Baelum V. Spanish version of the oral health impact profile (OHIP-Sp). BMC Oral Health 2006; 6(11): 11. [http://dx.doi.org/10.1186/1472-6831-6-11] [PMID: 16827940]

[8] Kohli R, Sehgal HS, Nelson S, Schwarz E. Oral health needs, dental care utilization, and quality of life perceptions among Oregonian seniors. Spec Care Dentist 2017; 37(2): 85-92. [http://dx.doi.org/10.1111/sed.12221] [PMID: 28181683]

[9] Masood M, Newton T, Bakri NN, Khalid T, Masood Y. The relationship between oral health and oral health related quality of life among elderly people in United Kingdom. J Dent 2017; 56: 78-83. [http://dx.doi.org/10.1016/j.jdent.2016.11.002] [PMID: 27825838]

[10] Galloway S, Bell D, Hamilton C, Scullion AC. Quality of life and well-being measuring the benefits of culture and sports: Literature review and think piece Enlighten: Publications. Edinburgh, UK: Scottish Government 2006. http://www.scotland.gov.uk/ Resource/Doc/89281/0021350.pdf

[11] Goran R. Theoretical approach to the study of quality of life in rural and urban settlements. Analele Universității din Oradea. Seria Geografie 2016; 26(1): 5-24.
[12] Gagliardi DI, Slade GD, Sanders AE. Impact of dental care on oral health-related quality of life and treatment goals among elderly adults. Aust Dent J 2008; 53(1): 26-33. [http://dx.doi.org/10.1111/j.1834-7819.2007.00005.x] [PMID: 18304238]

[13] Tan H, Peres KG, Peres MA. Retention of Teeth and Oral Health-Related Quality of Life. J Dent Res 2016; 95(12): 1350-7. [http://dx.doi.org/10.1177/0022034516657992] [PMID: 27466396]

[14] Statistical area Kutai Regency, 2016: Central Bureau of Statistics Kutai kartanegara. 2016. Tenggarong: Central Bureau of Statistics of Kutai kartanegara.

[15] Pusat studi pembangunan pertanian dan rural institut pertanian bogor. Pembangunan kawasan rural berbasis masyarakat kutai kartanegara. Available from: http://psp3.ipb.ac.id/web/wp-content/uploads/2014/09/701.pdf 2014.

[16] Badan Pusat Statistik Kabupaten Kutai Kartanegara. Statistik kesejahteraan rakyat kabupaten kutai kartanegara 2016. Kutai Kartanegara: Badan Pusat Statistik.

[17] Cohen-Carneiro F, Rebelo MA, Souza-Santos R, Ambrosano GM, Salino AV, Pontes DG. Psychometric properties of the OHIP-14 and prevalence and severity of oral health impacts in a rural riverine population in Amazonas State, Brazil. Cad Saude Publica 2010; 26(6): 1122-30. [http://dx.doi.org/10.1590/S0102-311X2010000600006].

[18] Wang W, Shi L, Yin A, et al. Primary care quality among different health care structures in Tibet, China. BioMed Res Int 2015; 2015: 206709. [PMID: 25861619]

[19] Batista MJ, Perianes LB, Hilgert JB, Hugo FN, Sousa MdaL. The impacts of oral health on quality of life in working adults. Braz Oral Res 2014; 28(1): 1-6. [PMID: 25166762].

[20] Santos CM, Oliveira BH, Nadanovsky P, Hilgert JB, Celeste RK, Hugo FN. The oral health impact profile-14: A uni-dimensional scale? Cad Saude Publica 2013; 29(4): 749-57. [PMID: 23568304].

[21] Batista MJ, Perianes LB, Hilgert JB, Hugo FN, Sousa MdaL. The impacts of oral health on quality of life in working adults. Braz Oral Res 2014; 28(1): 1-6. [PMID: 25166762].

[22] Biazevic MG, Rissotto RR, Michel-Crosato E, Mendes LA, Mendes MO. Relationship between oral health and its impact on quality of life among adolescents. Braz Oral Res 2008; 22(1): 36-42, 40-41. [http://dx.doi.org/10.1590/S1806-8324200800100007] [PMID: 18425243]

[23] Kotzer RD, Lawrence HP, Clovis JB, Matthews DC. Oral health-related quality of life in an aging Canadian population. Health Qual Life Outcomes 2012; 10(50): 50. [http://dx.doi.org/10.1186/1477-7525-10-50] [PMID: 22587387]

[24] Sáez-Prado B, Haya-Fernández MC, Sanz-García MT. Oral health and quality of life in the municipal senior citizen’s social clubs for people over 65 of Valencia, Spain. Med Oral Patol Oral Cir Bucal 2016; 21(6): e672-8. [PMID: 27694787]

[25] Yamane-Takeuchi M, Ekuni D, Mizutani S, et al. Associations among oral health-related quality of life, subjective symptoms, clinical status, and self-rated oral health in Japanese university students: A cross-sectional study. BMC Oral Health 2016; 16(1): 127. [http://dx.doi.org/10.1186/s12903-016-0322-9] [PMID: 27903265]

© 2017 Akbar and Tatengkeng. This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International Public License (CC-BY 4.0), a copy of which is available at: https://creativecommons.org/licenses/by/4.0/legalcode. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.