ACTA ODONTOLOGICA SCANDINAVICA, 2016
VOL. 74, NO. 8, 620–625
http://dx.doi.org/10.1080/00016357.2016.1229022

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ORIGINAL ARTICLE

Oral health-related quality of life in socially endangered persons in Copenhagen, Denmark

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ABSTRACT

Objective: The aims of this study were to investigate and describe the Oral Health Related Quality of Life (OHRQoL) in a socially endangered group of people and to compare the OHRQoL to other patient groups.

Material and methods: About 294 socially endangered persons attending a volunteer clinic in Copenhagen Denmark filled in the OHIP-14 questionnaire. The group was compared in mean score and reported problems to a group of patients with tooth loss and about to have a removable dental prosthesis (RDP), a group with tooth loss about to have a fixed dental prosthesis (FDP) and a control group without tooth loss.

Results: Significantly higher OHIP-14 score was seen in the socially endangered group (15.5 (SD 12.6)) compared with the control (1.9 (SD 2.7)) and the FDP group (9.4 (SD 8.2)) but not the RDP group (13.1 (SD 10.5)). This difference was not changed after stratifying in age groups. Problems related to psychological disability, social disability, and handicap were more frequent in the social endangered group than for the other groups. The items pain, tense, diet, relax, life, and function stand out as problems in the socially endangered group compared to the other groups.

Conclusion: The OHRQoL is highly impaired in the socially endangered persons and at least to the level of persons with great tooth loss about to have an RDP. The problems seem to be more handicapping in the socially endangered compared with other patient groups known to have high impairment.

ARTICLE HISTORY
Received 13 May 2016
Revised 8 July 2016
Accepted 18 August 2016
Published online 6 September 2016

KEYWORDS
Economy; impairment; OHIP; OHRQoL; social

Introduction

A general rise in the number of socially endangered persons in Denmark has been seen in the last 7 years, where a doubling in the number of socially endangered persons less than 25 years have been registered.[1] As the Danish system for adult dentistry is mainly private and to a large degree based on user payment, these persons have limited possibility to receive dental treatment. However, the government has decided that the local municipality can give subsidies to dental treatment for persons with a physical or psychological handicap or elderly and other persons without a job who do not have any financial assets.[2,3] Although this helps a number of people, there is still a group of people who do not fit in to the private system, because they fail to show up for appointments or simply cannot pay even the reduced costs. There is, therefore, a high risk that these people will be somewhat lost in the system and dental treatment therefore will not be an option for them.[4] These people are socially endangered persons, who are unemployed with massive problems and barriers towards employment including abusers, persons with psychological disorders, physical impairment, family and network difficulties, learning disabilities, and poor educational background.

To overcome the problems regarding dental treatment for the socially endangered persons, a public dental clinic with volunteering dentists was established in Copenhagen, which offers free, basic dental treatments to their users, including pain relief and restoration of oral functions by means of fillings and removable prostheses. The target group for the clinic consists of primarily young, not homeless persons, with difficulties in functioning in the surrounding society for a shorter or longer period. The overall aim is to perform oral rehabilitation and thereby help to get the users ready to re-enter the labour market. The funding for the clinic was granted by the Danish Ministry of Health, who further requested a quality evaluation of the clinic.

For this quality evaluation, it was considered most relevant to evaluate the impact of oral impairments on the quality of life, and oral health related quality of life (OHRQoL) was chosen as the main outcome variable. It was not possible to do a follow-up study as the users did not have routine controls performed both as a result of capacity, and further because the idea was that the users should be included in the private dental care system after the immediate basic treatment at the public clinic. Thus, it was decided

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to do a cross-sectional study measuring the OHRQoL in the users of the clinic and compare it with patient groups known to have impairments as a result of poor oral status. The OHRQoL tool needed to be a simple one, and the Oral Health Impact Profile 14 (OHIP-14) [5] was chosen. This measure indicates how often the oral health impairs the quality of life and has been used in other studies on socially endangered groups.[6–8]

Other studies investigating the OHRQoL in socially endangered persons have primarily focused on homeless people,[6–8] thus not much is known about the oral health and wellbeing of the type of socially endangered persons described in this study. The other studies all reported a high impairment of the oral functions influencing the quality of life, but did not compare the OHRQoL to other groups known to have impairments to investigate if the homeless persons were more or less impaired than other persons with poor oral status.

In a prior study, it was found that patients in need of both fixed and removable prostheses had more impaired OHRQoL in comparison with a control group with no treatment need.[9] It is not known how impaired the socially endangered group is in comparison.

The aims of this study were to investigate and describe the OHRQoL in a socially endangered group of people and to compare the OHRQoL to other patient groups.

Material and methods

Participants

Socially endangered group

Users of a public dental clinic, with volunteering dentist at a rehabilitating school for socially endangered persons in Copenhagen, Denmark, were the main target population of the study. Data collection was performed in the fall of 2010 and 2011. In the two periods, 294 participants were enrolled and filled in the OHIP-14 questionnaire. Of these, 227 stated their gender, 122 their age, and 118 stated both gender and age. The reason for the high level of missing data regarding age is that the socially endangered had some scepticism regarding the registration of their date of birth/social security number.

Fixed dental prosthesis patients (FDP group)

A group of 273 patients in need of a minor single FDP signed in for student treatment at the Section of Oral Rehabilitation, Department of Odontology Copenhagen filled in the OHIP-49 questionnaire and the 14 questions recurring in the OHIP-14 was extracted.

Removable dental prosthesis patients (RDP group)

A group of 137 patients in need of an RDP signed in for student treatment at the Section of Oral Rehabilitation, Department of Odontology Copenhagen also filled in the OHIP-49 questionnaire and the 14 questions recurring in the OHIP-14 was extracted.

Control patients

A control group of 116 patients attending routine controls in two private practices in the Copenhagen area with no need of dental treatment also filled in the OHIP-49 questionnaire and the 14 questions recurring in the OHIP-14 was extracted.

Age groups

As the socially endangered group in general was younger than the FDP and RDP group, four age groups were created to analyze the effect of age on the difference in OHIP-14 score between the patient groups. Participants with an age of 16–29 were in group 1, participants with an age of 30–49 were in group 2, participants with an age of 50–69 were in group 3 and participants with an age of 70–90 were in group 4.

OHRQoL

The OHRQoL was measured by use of the OHIP-14, which consists of 14 questions related to problems in the oral region collected in the seven domains: functional limitation, pain, discomfort, physical disability, psychological disability, social disability, and handicap.[5] The participants answered how often each problem had occurred during the past month on a scale with six choices and corresponding scores: very often (4), fairly often (3), occasionally (2), hardly ever (1), never (0) or don't know (missing value). To calculate an overall OHIP-14 score for each patient, the scores from the 14 answers were added, thereby giving a score between 0 and 56, a higher score indicating a higher impairment. The participants filled in the questionnaire before any treatment was performed.

The reasons for choosing the OHIP-14 as the measure of OHRQoL were that the method has been validated in several studies,[5,10,11] is highly feasible in larger population, and has been used in other studies on socially endangered persons.[6–8]

To investigate the type of oral problems experienced by the participants, the frequency of answers to the OHIP-14 questions with scores 3 and 4 was calculated and divided by the number of participants in each group.

Teeth

The number of teeth, frequency of missing teeth, and the zone of missing teeth (aesthetic/masticatory) were registered. The aesthetic zone was defined as incisors, canines and 1st premolar in the upper jaw and incisors and canines in the lower. The masticatory zone was defined as the 2nd premolar and the 1st and the 2nd molar in the upper jaw and both premolars and the 1st and the 2nd molar in the lower jaw.[12] The number of teeth and the zone of missing teeth were in the FDP and the RDP group registered by a clinical examination. The number of teeth and the zone of missing teeth in the socially endangered were registered from panoramic X-rays in a group of 208 socially endangered persons not necessarily the same as the ones who filled in the OHIP-14.

Analyses

Descriptive statistics were used to calculate mean age, number of teeth and OHIP-14 scores, and the age and zone distribution.

As the OHIP-14 data shown to be not normally distributed, Kruskal–Wallis one-way ANOVA and Mann–Whitney U tests were used to test differences in OHIP-14 score between the socially endangered who reported their age and those who did not report their age, the patient groups, and patient groups stratified on age groups. The internal reliability of the OHIP-14 in our sample was tested by use of Cronbach's alpha.

The number of experienced problems in the groups was calculated using descriptive statistics. The number was divided by the number of participants in the group to indicate how frequent a problem occurred on average in a member of the group. Eight participants had more than two missing values and were excluded from the analyses.

Results

Background and clinical variables

Means and distribution of the background variables are shown in Table 1. It is seen that the mean age of the socially endangered group was less than the groups with missing teeth, but comparable to the control group. A high percentage of the socially endangered persons had missing teeth and the number of teeth was significantly lower than in the control and FDP group but higher than in the RDP group. The socially endangered more frequent than the RDP group and less frequent than the FDP group had missing teeth in the masticatory region only and vice versa concerning the frequency of missing teeth in both zones.

OHRQoL

The mean OHIP-14 score for the socially endangered who reported their age was significantly higher than for those who did not report their age ($p < .01$). The mean OHIP-14 score for the entire socially endangered group was 15.5 (SD 12.6), for the control group 1.9 (SD 2.7), for the FDP group 9.4 (SD 8.2) and for the RDP group 13.1 (SD 10.5). The means are illustrated in Figure 1; significantly higher OHIP-14 score was seen in the socially endangered group compared with the control and the FDP group.

The mean OHIP-14 scores of the patient groups stratified on the age groups are shown in Table 2. A significantly lower score was found for the control group compared to the socially endangered group within all age groups. Within the socially endangered group, a significantly higher score was found in age group 2 compared with age groups 1 and 3. Compared with the FDP group, the socially endangered group had a higher score in all age groups. Compared with the RDP group, the score was quite similar in the age groups. All groups except the control group had the highest score in age group 2. Especially the RDP and socially endangered group had high scores in this age group. The internal reliability (Cronbach's alpha) of the OHIP-14 in our sample was 0.93.

Experienced problems

The frequency of experienced problems for the groups is shown in Figure 2. For all groups, it is seen that items related to functional limitation, pain, discomfort, and physical disability are more frequent reported as a problem than items related to psychological disability, social disability, and handicap. It is also seen that the frequency in problems related to psychological disability, social disability, and handicap for the social endangered group, is higher than for the other groups and that especially the items pain, tense, diet, relax, life, and function stands out as problems in the socially endangered group compared with the other groups.

Discussion

The main results from this study indicate that socially endangered persons have highly impaired oral functions. The impairment seems to be at the same level as elderly people with multiple tooth loss.

The fact that tooth status in the socially endangered group was not necessarily obtained from the ones who filled in the OHIP-14 limits the possibilities of relating tooth status and OHRQoL in this study. It is, therefore, difficult from our

Table 1. Characteristic of the four groups.

	Socially endangered group[a]	Control group ($n = 116$)	FDP group ($n = 273$)	RDP group ($n = 137$)
Mean age (SD)	42 (11.3)	43 (14.5)	56* (13.1)	64* (11.1)
Mean no. of teeth (SD)	21.5 (6.1)	29.5* (2.7)	25.4* (3.1)	16.2* (5.2)
Women (%)	47	50	60*	50
No. participants missing teeth (%)	90	0*	100	100
Age group				
Group 1 (16–29)	22	18	4	1
Group 2 (30–49)	62	68	82	18
Group 3 (50–69)	38	25	149	78
Group 4 (70–90)	0	5	38	40
Zone				
Aesthetic	2 (1.0%)	–	18 (6.7%)	0
Masticatory	61 (32.5%)	–	152 (56.7%)*	27 (19.7%)*
Both	125 (66.5%)	–	98 (36.6%)*	110 (80.3%)*

*Significant difference compared to the socially endangered group ($p < .05$).

[a]Mean age was calculated in the 122 participants stating their age, mean no. of teeth, no. of participants with missing teeth and zone distribution was calculated in the 208 participants having panoramic X-ray taken and percent women were calculated in the 227 participants stating their gender.

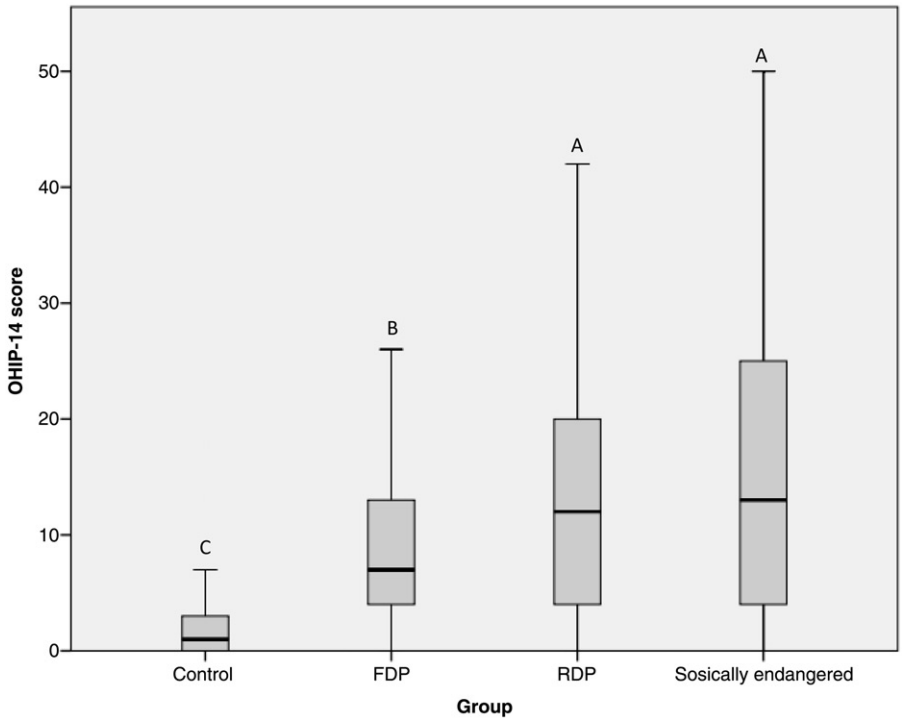

Figure 1. Comparison of the mean OHIP-14 score between the groups. Different letters indicates significant difference between groups ($P < .05$).

Table 2. Mean OHIP-14 scores of the patient groups stratified on the age groups.

Age group	OHIP-14 score (SD)
Group 1	
Socially endangered	13.5 (13.8)
Control	2.6 (3.5)*
FDP	10.0 (6.9)
RDP	16.0 (–)
Group 2	
Socially endangered	20.1 (13.3)[a]
Control	1.5 (1.9)*
FDP	10.9 (8.5)
RDP	23.5 (10.0)
Group 3	
Socially endangered	17.1 (11.0)
Control	2.3 (4.0)*
FDP	9.1 (8.3)
RDP	13.5 (9.6)
Group 4	
Socially endangered	–
Control	2.0 (2.5)
FDP	7.3 (6.4)
RDP	7.4 (8.7)

*Significant difference compared with the socially endangered group within the age group.
[a]Significant difference between age group 2 and both age groups 1 and 3 within the socially endangered group.

results to investigate how much the tooth status affected the OHRQoL in comparison with being in the socially endangered group. Further, all patients should ideally have been sampled from the same location, but this was not an option as the groups were treated in different locations. The potential bias of this is, however, considered to be small as the study is cross sectional and not evaluating treatment outcome. Another limitation of the study is the high level of missing data regarding age in the socially endangered group. Unfortunately, this is the terms when you are dealing with socially endangered; they do not respond well to self-administered data collection. The results showed that the participants who reported their age were more impaired than the ones who did not report their age. The reason for this might be that participants with many problems were keener on getting treatment and thus filled out the questionnaire without hesitation.

The OHIP-14 was chosen as the OHRQoL measure because of its well-tested psychometric properties and ease of use in larger populations. Even though the method has been used in socially endangered groups before,[6–8] the methods psychometric properties have not been tested in such a population. In this study we found the internal reliability of the method in our sample to be high.

The actual investigation showed that the socially endangered had poor oral status, with a high frequency of missing teeth, in both the masticatory and aesthetic zone. Especially, in comparison with the control group, which was the same age group, the socially endangered had poor oral status. This is in accordance with an investigation on inequalities in health in Denmark finding poorer oral status in socially endangered people than in the general population.[13]

The poor oral status suggests that the OHRQoL in this group would be impaired.[14] Indeed this is the case; the mean OHIP-14 score of 15.5 was the highest in the groups included in this study. It is especially thoughtful that the score is markedly higher than in the control group, which is roughly the same age, and, at the same level, as the older patients with multiple tooth loss opted for an RDP. To further get a perspective on the magnitude of the mean score in the socially endangered group, a comparison with other studies investigating the OHRQoL using the OHIP-14 is warranted. In

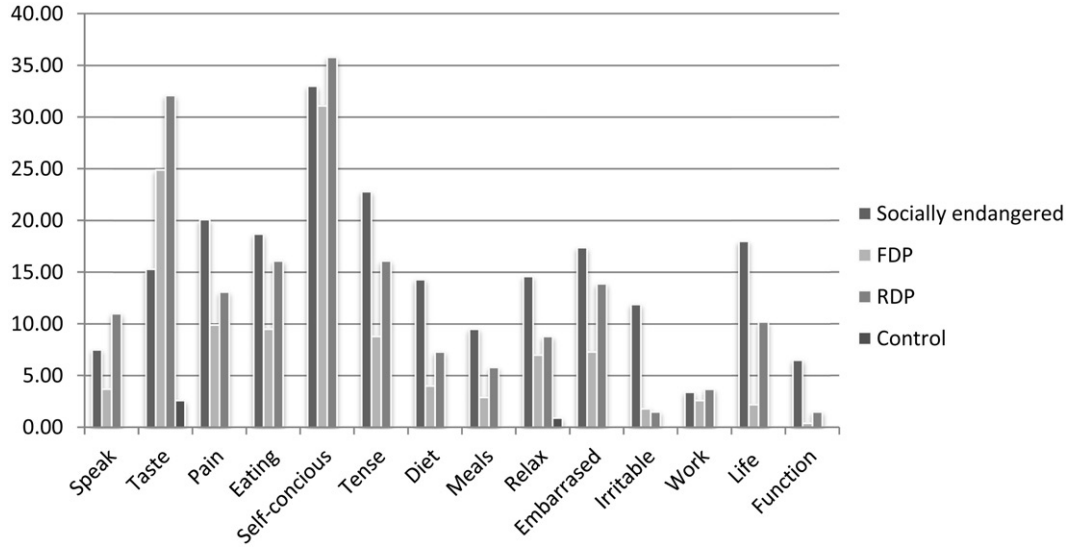

Figure 2. The frequency of experienced problems for the groups.

a study investigating the Swedish norms of OHRQoL, it was found that the general population had a mean OHIP-14 score of 4.3; it was lowest for people having their own teeth or FDP's (3.9), higher for people wearing RDP (4.7) and highest for people wearing complete dentures (8.3).[15] Other studies investigating the OHRQoL in socially endangered people have focused on homeless people. These studies have found mean OHIP-14 scores of 20.1 [7], 32 [6] and 29.3.[8] This indicates that the more endangered a person is, the higher the oral impairment. This is most likely a reflection of poorer oral status in more endangered groups.[4] It might, however, also partly be because socially endangered persons feels their lives in general are highly impaired, which naturally also includes their oral status.[16]

Since several studies have found a negative correlation between age and OHIP score,[9,10,17,18] the effect of age was highly relevant to include in our study. It seems that age did not affect the differences between the patient groups: the socially endangered group still had higher score than the FDP group and similar score as the RDP group in all age groups. It is thoughtful and unfortunate that the socially endangered group is relatively young and already having so many troubles with their oral region. This group of people probably will have to deal with many hardships because of their poor oral status for many years to come. If they do not succeed in turning their lives around, they might end up as even more socially endangered, which will result in even poorer OHRQoL.[19] When looking further at the age groups, it was seen that the most impaired persons were people in the group between 30 and 49 years. This applied especially to the RDP and socially endangered group. It seems understandable that younger persons with poor teeth and/or multiple tooth loss are highly impaired; it probably reflects that younger people have difficulties accepting the poor tooth status and the view to an RDP. The lower score in the younger age group compared with the older age groups within the socially endangered group might be attributed to a better oral status in this group. It is, however, not possible to test in this study.

We used items reported as problems very often or fairly often as indication of types of problems registered by the participants. This is in agreement with other studies.[10–22] The registration of the most frequent problems in the socially endangered group showed that the group was frequently troubled by pain. This is interesting for the clinician, who should firstly take care of the acute problems, i.e. pain, and then consider if any other treatments should be undertaken. From our study, it seems, however, that further treatment is indicated. The socially endangered were impaired on a relatively high level in their live, i.e. the items concerning the domains psychological disability, social disability, and handicap are frequently appearing as problems. This might be due to the general impairment in the socially endangered group, i.e. they feel their lives in general are problematic and, therefore, also consider their oral region to cause many problems. The difference might also be due to a difference in general personality between the socially endangered group and the other groups. Other studies have shown that OHRQoL is affected by personality.[23–25] For instance, Özhayat showed that high negative affectivity was associated with high oral impairment measured by the OHIP in patients with tooth loss.[23] If the socially endangered group had higher negative affectivity, then it was not tested in the study.

It is not possible from this study to elaborate on the effect of the oral treatments on social rehabilitation and job possibilities in the socially endangered group. But based on the findings in this study, the work performed by the volunteers in the public dental clinic seems justified; both pain relief and oral rehabilitation seem to be indicated in many of the users. One question remaining is, if the rehabilitation with removable prosthesis is enough to reconstruct the oral functions needed by the users; such prostheses are often considered the last solution from the patient perspective.[26,27]

Acknowledgements

The authors wish to thank the personnel at the volunteer clinic for helping in the data collection process.

Disclosure statement

The author reports that they have no conflicts of interest.

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