Oral health and oral health-related quality of life in a homeless population in Ireland: a pilot study

Précis

Homeless populations face extreme oral health inequalities, experiencing more dental disease than the general population, and negative impacts on oral health-related quality of life.

Abstract

Background: Smile agus Sláinte – the National Oral Health Policy (2019), aims to reduce oral health inequalities by enabling vulnerable groups, including the homeless, to access oral healthcare. However, there is sparse evidence regarding the oral health of people experiencing homelessness. This study aims to assess the oral health and oral health-related impact on quality of life among homeless adults for the first time in an Irish population.

Methods: A pilot cross-sectional epidemiological study of homeless adults in Cork City, Ireland, including clinical examination and interviewer-administered questionnaire and OHIP-14 survey, was conducted. A convenience sample was recruited in collaboration with homeless service providers.

Results: The sample consisted of 25 participants. The mean D_{3vc}MFT of the participants was 19.4 (SD ± 7.1). The D_{3vc}T% was 41.8%. Participants had poor oral hygiene, and 70.8% had periodontal pocketing of 4mm or more. Some 79% of participants had experienced dental trauma. Participants' most commonly reported oral health-related impacts on quality of life were feeling embarrassed (60%), feeling uncomfortable to eat (56%), feeling self-conscious (48%), and painful aching (48%).

Conclusions: Homeless adults in Ireland experience extreme oral health inequalities. To achieve the goals of Smile agus Sláinte, a foundation of high-quality epidemiological evidence is required. Further research will require extensive collaboration with homeless service providers and the wider health profession, and should seek to inform the design of oral healthcare services for homeless adults.

Key words: Homeless; oral health; oral health-related quality of life; dental public health; epidemiology.

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Introduction

Homeless adult populations are more likely to suffer physical and mental ill health than their housed peers.[1] In addition to these greater needs, people experiencing homelessness face more barriers to accessing healthcare services than the housed population.[2,3] In high-income countries, they are more likely to endure toothache and loose teeth, and have untreated dental decay, than the general population.[4]

There is limited research regarding the oral health of the adult homeless population in Ireland. The only study of a homeless population in Ireland involving a clinical dental examination was conducted over 20 years ago[5] and found higher levels of dental disease and poorer access to dental services among homeless adults compared to the housed population. Subsequent research has primarily focused on self-reported oral health measures as part of wider surveys of the general health of homeless populations.[6-14]

Over the last decade, the number of homeless adults in Ireland has more than doubled to 7,431 people.[15] However, the so-called hidden homeless –

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Table 1: Living situation of the participants according to ETHOS typology (FEANTSA, 2017).

Conceptual category	Operation category	Living situation	% (n)
Roofless	People in emergency accommodation	Night shelter	8% (2)
Houseless	People living in accommodation for the homeless	Homeless shelter	24% (6)
Insecure	People receiving longer-term support (due to homelessness)	Supported accommodation for formerly homeless people	68% (17)

those sleeping rough, couch surfing, living in insecure or inadequate housing, and people living in domestic violence shelters – are excluded from this figure.[16] The European Federation of National Organisations Working with the Homeless developed the European Typology on Homelessness and Housing Exclusion (ETHOS) to improve measurement and understanding of homelessness.[17] This typology provides four conceptual categories to describe homelessness: rooflessness; houselessness; living in insecure housing; and, living in inadequate housing. ETHOS has been adopted to describe homelessness in this study.

Smile agus Sláinte – The National Oral Health Policy (2019) highlighted the absence of high-quality epidemiological evidence regarding vulnerable populations such as the homeless.[18] The aim of this pilot study is to describe the oral health, oral health behaviours, and the impact of oral health on quality of life for an adult homeless population in Ireland.

Methods

Ethical approval was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals (Ref: ECM 4 (k) 13/4/2021).

Participants and setting

A pilot cross-sectional epidemiological study of homeless adults (>18 years) according to ETHOS[17] was conducted in Cork City. The study was conducted in an emergency homeless shelter, supported residential units and a homeless charity across a four-week period in July and August 2021. The study was conducted in accordance with Health Protection Surveillance Centre Guidance on Managing Infection Related Risks in Dental Service during the Covid-19 Pandemic.[19] Homeless service users participating were informed of the study by homeless service providers. They were then approached by the examining team on data collection days, and invited to participate. All participants received an information leaflet, and gave written and verbal consent to take part in the study.

Variables

A clinical examination and an interviewer-administered questionnaire were conducted. Data regarding demographics, general health and health behaviours, self-reported oral health and oral health behaviours, and medical card ownership were collected.

The clinical indices used were oral soft tissue lesions, traumatic dental injuries, modified Community Periodontal Index (CPI), clinical attachment loss (CAL), $D_{3vc}MFT$, and removable dental prosthesis. The CPI, CAL and $D_{3vc}MFT$ were conducted as described by Whelton *et al.* (2007).[20] This permitted the measurement of the presence or absence of a periodontal condition in each sextant rather than only the worst score. It also allowed the charting of visual, non-cavitated dental caries into dentine rather than just cavitated lesions. The remaining indices were conducted as per World

Table 2: Frequency of self-reported general health, general health behaviours, oral health and oral health behaviours of the sample.

	% (n)
General health	
Receiving treatment for a medical condition	100% (25)
Heart disease	8% (2)
Diabetes mellitus	12% (3)
Epilepsy	20% (5)
Respiratory disease	24% (6)
Depression	28% (7)
General health behaviours	
Tobacco smoking	72% (18)
Alcohol abuse	24% (6)
Current illicit drug use	32% (8)
Former illicit drug use	32% (8)
Former IV drug use	12% (3)
Methadone	24% (6)
Medical card ownership	80% (20)
Self-reported dental problems	64% (16)
Oral health and oral health behaviours	
Self-reported dental problems	64% (16)
Dental problems worsened since becoming homeless	60% (15)
Aware of entitlement to oral healthcare	56% (14)
Toothbrushing:	
Twice or more per day	36% (9)
Once per day	16% (4)
Less than once per day	28% (7)
Never	28% (7)
Last dental attendance:	
<12 months	24% (6)
1-5 years	56 (14)
5-10 years	4% (1)
10+ years	16% (4)
Reason for last dental attendance:	
Check-up	12% (3)
Routine treatment	36% (12)
Emergency treatment	52% (13)
Experience of dental treatment:	
Extraction	80% (20)
Filling	68% (17)
Periodontal treatment	24% (6)
Removable prosthesis	20% (5)
Root canal treatment	12% (3)
Fixed prosthodontics	4% (1)
Preventive treatment	0% (0)

Table 3: Experience of dental caries (open and closed lesions) for total sample and by index age group.

	Mean (SD)	%
Total sample:		
$D_{3vc}MFT$[a]	19.4 (7.1)	-
$D_{3vc}T$[b]	8.1 (5.8)	-
$D_{3vc}T$%	-	41.8%
MT[c]	7.9 (7.6)	-
MT%	-	40.7%
FT[d]	3.4 (4.5)	-
FT%	-	17.5%
WHO index age group:		
16-24 years*		
$D_{3vc}MFT$	12.0	-
$D_{3vc}T$	9.0	-
$D_{3vc}T$%	-	75%
MT	0.0	-
MT%	-	0%
FT	3.0	-
FT%	-	25%
25-34 years		
$D_{3vc}MFT$	12.8 (6.1)	-
$D_{3vc}T$	9.3 (6.9)	-
$D_{3vc}T$%	-	72.6%
MT	1.5 (1.7)	-
MT%	-	11.7%
FT	2.0 (3.4)	-
FT%	-	15.6%
35-44 years		
$D_{3vc}MFT$	19.4 (6.3)	-
$D_{3vc}T$	8.5 (6.7)	-
$D_{3vc}T$%	-	43.8%
MT	7.5 (4.4)	-
MT%	-	38.7%
FT	3.4 (3.7)	-
FT%	-	17.5%
45-54 years		
$D_{3vc}MFT$	19.5 (5.5)	-
$D_{3vc}T$	7.0 (5.3)	-
$D_{3vc}T$%	-	35.8%
MT	7.5 (6.2)	-
MT%	-	38.5%
FT	5.0 (6.3)	-
FT%	-	25.6%
55-64 years		
$D_{3vc}MFT$	26.3 (5.5)	-
$D_{3vc}T$	10.7 (5.1)	-
$D_{3vc}T$%	-	40.7%
MT	13.3 (5.9)	-
MT%	-	50.6%
FT	2.3 (4.0)	-
FT%	-	8.7%
65+ years*		
$D_{3vc}MFT$	32.0	-
$D_{3vc}T$	0.0	-
$D_{3vc}T$%	-	0%
MT	32.0	-
MT%	-	100%
FT	0.0	-
FT%	-	0%

Table 3 cont'd

[a]Decayed, missing or filled teeth (open or closed lesions)
[b]Decayed teeth (open or closed lesions)
[c]Missing teeth
[d]Filled teeth
*$D_{3vc}MFT$, $D_{3vc}T$, MT and FT are constant when index age group = 16-24 years and 65+ years as there is only one participant in each of these groups

Health Organisation (WHO) guidelines for oral health surveys.[21] These indices were selected in line with previous research of homeless populations, general populations in Ireland, and WHO guidance to facilitate comparisons. The Oral Health Impact Profile (OHIP) 14 was used to measure the oral health-related impact on quality of life. The OHIP-14 measures people's perception of the impact of oral disorders on well-being, using a Likert scale response format as follows: very often = 4; fairly often = 3; occasionally = 2; hardly ever = 1; and, never = 0, with higher scores indicating poorer oral health-related quality of life.[22] The OHIP-14 has previously been used in homeless populations[23,24] and, in this study, was interviewer administered to facilitate completion (**Appendix 1** – available online).

The clinical examination and questionnaire were administered by a dentist who had undergone a training and calibration exercise (inter-examiner Kappa score = 0.902), chaperoned by a second independent dentist acting as the data recorder. Teeth were examined wet, using a portable Daray light (Hallux Spot MT 1207/- 240V; Derungs Licht AG) for illumination. Participants were informed of the findings of the examination and signposted to the appropriate oral healthcare services.

Data were coded and inputted to IBM SPSS Statistics for Windows, version 26 (IBM Corp., Armonk, NY, USA) for statistical analysis. Frequency tables were used to describe the distribution of variables. WHO index age groups were used where appropriate.[21]

Results

The response rate was 38% (25 individuals of 66 identified by homeless services and the examining team). All participants completed the questionnaire and clinical examination. The sample was composed of 88% male (n=22) and 12% female (n=3) participants. The mean age of participants was 43.7 years (SD 11.8, range 21-70 years). None of the sample were employed at the time of participation. The living situation of the sample is described in **Table 1**, with the majority (68%, n=17) living in 'insecure' accommodation.

General health and health behaviours

All participants indicated that they were currently under the care of a general medical practitioner (GMP) and 80% (n=20) had a medical card. The characteristics of the population with respect to general health and health behaviours are summarised in **Table 2**.

Self-reported oral health and health behaviours

Some 64% (n=16) of the participants had self-reported dental problems, with 60% (n=15) reporting that their dental problems had worsened since becoming homeless. A total of 44% of participants (n=11) were unaware of their entitlement to dental treatment if they had a medical card. Over a quarter of the sample (28%, n=7) reported that they never brush their teeth.

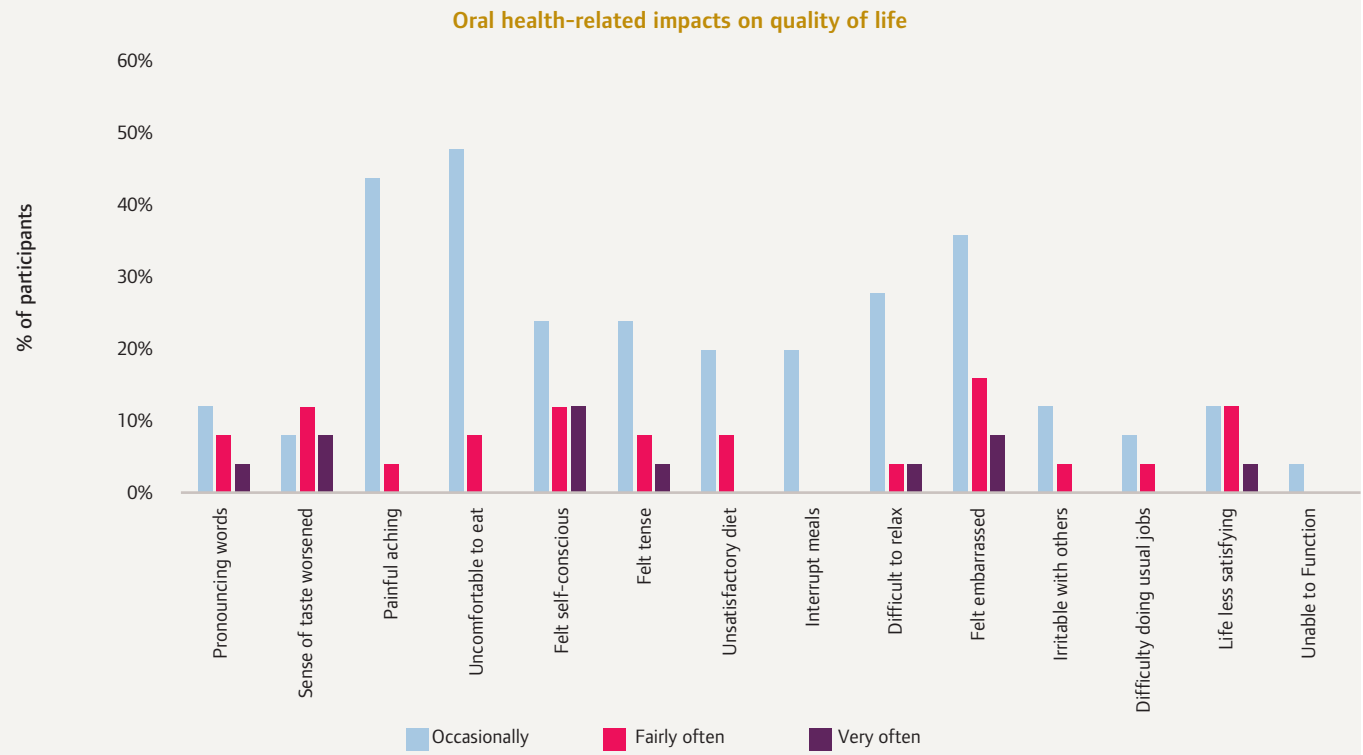

FIGURE 1: Distribution of frequency of oral health-related impacts on quality of life (occasionally, fairly often and very often): OHIP-14 results.

Clinical examination

Soft tissue lesions

Some 16% of participants (n=4) had soft tissue lesions, including angular cheilitis, candidiasis, cold sores and scarring.

Number of natural teeth present

All but one participant was dentate; the mean number of teeth present among the dentate participants (n=24) was 24.4 (SD 6.0).

Dental trauma

The prevalence of participants with at least one traumatised permanent incisor was 79%. Only one participant (4%) had received treatment for their dental injury. The mean number of traumatised teeth was 2.6 (SD 1.3).

Periodontal condition

Every dentate participant had calculus in at least one sextant (n=24). Periodontal pocketing of 4mm or greater in at least one sextant was present in 83% of dentate participants (n=20). The mean number of sextants affected by pocketing of 4mm or greater was 2.3 (SD 1.8). Clinical attachment loss of 4mm or greater was present in 96% (n=23) of dentate participants.

Experience of dental caries

The mean $D_{3vc}MFT$ of the participants was 19.4 (SD 7.1); every participant had $D_{3vc}MFT$ >0. The percentage of $D_{3vc}MFT$ attributable to untreated dentinal caries ($D_{3vc}T\%$) was 41.8%. Dental caries experience by WHO index age is set out in **Table 3**.

Removable dental prostheses

One participant had a removable partial denture. This denture was poorly fitting and fractured. A further 48% (n=12) of participants were deemed to require a removable dental prosthesis. The only edentulous participant had no dental prosthesis.

Oral health-related impact on quality of life

The mean OHIP-14 score of the participants was 12.0 (SD 8.5). The most commonly experienced oral health-related impacts on quality of life were "embarrassment" (60%, n=15), "uncomfortable eating" (56%, n=14), "feeling self-conscious" (48%, n=12), and "painful aching" (48%, n=12). More than a quarter of participants (28%, n=7) reported that life was less satisfying due to their teeth, mouth or dentures (**Figure 1**).

Discussion

The age profile, ethnicity and family status of the participants was reflective of the national homeless population.[15] However, the female representation in the sample was low. This is likely as a result of the low female representation across the participating homeless service providers in this study. The general health and health behaviours of the participants are consistent with other cross-sectional surveys of the Irish homeless population.[6,10,11] The participants are at increased risk of oral disease due to their poor oral hygiene habits and high rates of tobacco smoking, alcohol abuse, illicit drug use and methadone use.

Encouragingly, every participant was attending a GMP. Some homeless service providers have a GMP on site; this may influence the high rates of access to general healthcare services. This also underlines that people

experiencing homelessness do engage with some healthcare services. The proportion of participants with a medical card was high, reflecting an upward trend in medical card ownership rates among adults experiencing homelessness.[10,11] Collaboration with other health professionals could present an opportunity to integrate oral healthcare with general healthcare for adult homeless populations, and to develop interconnected and synergistic healthcare services.

The participants' experience of dental caries, dental trauma and periodontal disease was extremely high and greater than the participants of the most recent national survey of the oral health of Irish adults conducted between 2000 and 2002.[20] The $D_{3vc}T\%$ was particularly alarming at 41.8%. There were no premalignant soft tissue lesions that warranted further investigation.

The percentage of $D_{3vc}MFT$ attributable to restorative dental treatment was low (FT% = 17.5%). Only one participant (4%) had received treatment for their dental trauma. More than half of the participants (52%) required a removable partial denture, and the only edentulous participant had no dental prosthesis.

The participants' experience of oral healthcare was limited. No participants had reported receiving any preventive dental treatments. A medical card entitles the owner to access a limited range of oral healthcare services through the Dental Treatment Service Scheme (DTSS) in general dental practices.[25] Under the DTSS, one can have many teeth extracted, but a limited number of restorative procedures per calendar year. There are little or no oral health promotion or protection measures reaching this population. One participant had suffered lacerations to her lips during an alleged assault. The lacerations were not treated, and significant disfigurement had occurred. These findings emphasise the lasting negative impact that untreated oral conditions can have.

Some participants had difficulty understanding the meaning of some OHIP-14 statements and may have confused whether impacts reported were due to general health rather than specific oral problems. Similar problems were described by Daly *et al.* (2010).[24] Despite these difficulties, it was clear that poor oral health had a negative impact on the quality of life of some participants. The most commonly reported oral health-related impacts on quality of life were "embarrassment", "uncomfortable eating", "feeling self-conscious" and "painful aching". One participant described his teeth as a "tragedy".

Limitations

The selection of participants could be at risk of selection bias due to the convenience sampling strategy employed. The proportion of female participants among the sample is lower than that of the national homeless population. The study was conducted during the Covid-19 pandemic, where capacity at the homeless service providers was limited due to public health guidelines, limiting the number of potential participants. Some participants had difficulty with the OHIP-14 and this may have impacted on the reliability of the results regarding the oral health-related impact on quality of life. The study design did not capture data regarding tooth wear and the dietary habits of the participants.

Conclusion

We are in the midst of a housing crisis in Ireland. The link between housing and health is well established. The oral health of the adult homeless participants in this study is extremely poor. They experience a higher prevalence of untreated dental trauma, tooth loss, dental caries, and periodontal disease than the housed population. They have access to limited oral healthcare services to address their dental disease and no preventive treatments. Despite their challenging circumstances and lived experiences, the participants' oral health has impacted negatively on their quality of life. In order to strive towards the goals of Smile agus Slāinte, we must build on this foundation of epidemiological evidence and deliver better oral health for the most vulnerable in society.

Recommendations

1. The ETHOS typology should be adopted to classify living situations.
2. The dental profession should advocate for greater inclusion of oral healthcare services with general healthcare services.
3. The findings of this study should be used to calculate sample size in future research among homeless adults.
4. Further research of the oral health of the homeless should extensively engage with homeless service providers to recruit homeless participants, with a particular emphasis on recruiting female participants.
5. Future research should aim to inform the design of oral healthcare services for homeless populations, incorporating patient and public involvement (PPI).
6. Data regarding tooth wear and dietary habits should be recorded in future surveys of the oral health of the homeless.

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CPD questions

To claim CPD points, go to the MEMBERS' SECTION of www.dentist.ie and answer the following questions:

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CPD

1. The adult homeless population is:

- ○ A: 3,459
- ○ B: 5,023
- ○ C: 7,431

2. The percentage of $D_{3vc}MFT$ attributable to dental caries among the participants was:

- ○ A: 12%
- ○ B: 25%
- ○ C: 41.8%

3. OHIP stands for:

- ○ A: Oral Hygiene Improvement Programme
- ○ B: Oral Health Impact Profile
- ○ C: Oral Health Investigation Procedure

Appendix 1

Survey of participants.

Unique participant number
Date: Click or tap to enter a date.

Location Please Select

Demographics:	
Age:	
Sex:	Please Select
Ethnicity:	
First language:	
Marital status	Please Select
Do you live with a partner?	Please Select
Do you have children/dependants?	Please Select
Can you read and write?	Please Select
Education level: 1ry/2ndry/3rd	Please Select
Occupation/previous occupation:	
Do you have access to transport?	Please Select
Do you have a medical card?	Please Select
Living status:	Please Select
Length of time homeless:	Please Select
Reason for homelessness:	

Medical questionnaire:	
Are you receiving treatment from a doctor, hospital, clinic or specialist?	Please Select
Are you taking or using any medicines prescribed for you by a doctor (including pills, syrups, ointments, puffers or injectors)? Please list.	Please Select
Have you ever been told you had a heart murmur?	Please Select
Have you had angina?	Please Select
Have you had blood pressure problems?	Please Select
Have you ever had a heart attack?	Please Select
Do you suffer from any infectious disease, e.g., HIV, hepatitis?	Please Select
Do you have asthma or any other lung disease?	Please Select
Do you have epilepsy?	Please Select
Do you have diabetes?	Please Select
Do you bruise or bleed easily?	Please Select
Are you allergic to any medicine, food or materials? Please list.	Please Select
Are you pregnant?	Please Select
Have you ever had rheumatic fever?	Please Select
Do you chew tobacco, pan or betel?	Please Select
Is the any other information you think we should know about your medical history?	
Have you ever used drugs?	Please Select
Do you continue to use drugs? Please list.	Please Select
Do you use IV drugs? Please list.	Please Select
Do you drink alcohol? How many units per week?	Please Select
Do you drink alcohol most days?	Please Select
Do you smoke cigarettes? If yes, how many on average per day?	Please Select

Dental questionnaire:	
My teeth are important to me:	Please Select
Do your teeth cause you problems/pain?	Please Select
Have your dental problems gotten worse since you became homeless?	Please Select
How often do you clean your teeth?	Please Select
What do you use to clean your teeth?	
Where do you get your oral hygiene aids (toothbrush/toothpaste, etc.)?	
When was the last time you went to a dentist?	Please Select
What do you last go to the dentist for?	Please Select
What treatments have you had in the past?	
Do you know if you are entitled to free/subsidised treatment?	Please Select
Where did you find this information out?	
Where would you go if you needed to see a dentist?	Please Select
What would you do if you couldn't get to see a dentist?	
What stops you from going to the dentist?	
What would help you to improve your oral health?	

OHIP-14	
Have you ever had trouble pronouncing any words because of problems with your teeth, mouth or dentures?	Please Select
Have you felt your sense of taste has worsened because of problems with your teeth, mouth or dentures?	Please Select
Have you had painful aching in your mouth?	Please Select
Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?	Please Select
Have you been self-conscious because of your teeth, mouth or dentures?	Please Select
Have you felt tense because of problems with your teeth, mouth or dentures?	Please Select
Has your diet been unsatisfactory because of problems with your teeth, mouth or dentures?	Please Select
Have you had to interrupt meals because of problems with your teeth, mouth or dentures?	Please Select
Have you found it difficult to relax because of problems with your teeth, mouth or dentures?	Please Select
Have you been a bit embarrassed because of your teeth, mouth or dentures?	Please Select
Have you been a bit irritable with other people because of problems with your teeth, mouth or dentures?	Please Select
Have you had difficulties doing your usual jobs because of problems with your teeth, mouth or dentures?	Please Select
Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?	Please Select
Have you been totally unable to function because of problems with your teeth, mouth or dentures?	Please Select