SCIENTIFIC ARTICLE

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Oral health status of prison inmates – New South Wales, Australia

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Abstract

Background: This paper assesses the oral health status in a prison population and identifies risk factors associated with oral health.

Methods: Cross-sectional stratified random sample of 789 prisoners (657 males and 132 females) from 27 correctional centres across New South Wales, stratified by sex, age and aboriginality. A face to face interview was used to collect information on health status and behavioural risk factors. A subset of participants (312 males and 22 females) received an oral examination which enabled the decayed, missing or filled permanent teeth (DMFT) score to be calculated.

Results: In the last 12 months 391 (50 per cent) inmates had visited a dentist. Reports on treatment received at this last visit were mainly for dental examinations, (62 per cent), dental fillings, (38 per cent), and dental extractions (28 per cent). Self-reported dental needs indicated that 42 per cent perceived the need for a check-up; the perceived need for dental fillings was highest in females compared with males. The mean DMFT for the population was 20.4 and 3.4 for decayed teeth.

Conclusions: This survey demonstrates that the standard of past oral health care for prison inmates is low. There is a need to be more attentive to oral health promotion as eventually respondents will be returning to the community.

Key words: Prison oral health, perceived needs, DMFT, extractions.

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INTRODUCTION

The oral health status of the Australian population has generally improved over the last 20 years. However, there have been no studies on a prison population. Factors which have contributed to this improvement include the introduction of water fluoridation, fluoride toothpaste, better diet education, improved personal oral hygiene, increase in regular dental care, improved dental technology and treatment options such as sealants.[1,2,3]

Providing dental health services in prison presents a number of challenges with security concerns vying with the need to provide effective oral health care to inmates. Within the New South Wales (NSW) correctional system there are few limitations to seeing a dental practitioner, the main restriction is whether the correctional centre has an available dentist. In the more remote centres, inmates have to be transferred to a gaol with a dental practitioner. Waiting time to see a dentist depends on availability.

Specialist care is also available to inmates. Those with a low security classification can normally receive specialist treatment in local facilities under escort from custodial staff, whereas inmates with a more restrictive security classification are transported to a dental hospital via Long Bay Prison in Sydney. Cosmetic dentistry is not routinely available. However, if the inmate is prepared to pay, arrangements can be made to have a private dentist provide this treatment. When receiving dental treatment in the prison clinic, the standard rule is that at least one custodial officer be present in the clinic.

The procedure for seeing a dentist at the time of the survey was for the inmate to visit the prison clinic, the nurse would then add the inmate to the dental list. More recently Corrections Health has implemented the Information System for Oral Health (ISOH) whereby inmates are triaged over the telephone.

In NSW, remand inmates are normally restricted to emergency dental treatment only. However, remandees who are detained for considerable time (up to two years in some cases) are assessed on an individual basis by the attending dental officer (Dr Peter Hill, NSW Corrections Health Service, personal communication).

Certain items used for oral hygiene are prohibited in prisons such as mouth washes, which contain alcohol. Certain oxidizing denture cleaning products are also not available as they can be used for making illicit alcohol ('moonshine').

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There is a growing recognition that there is a direct link between oral health and other lifestyle-related diseases such as heart disease.[4] This understanding is of importance to health care providers and gives voice to the notion of a holistic integrated health care model. The implications of the findings for Australian prisons are discussed with some of the broader issues of oral health in prison communities.

The oral health status of prison inmates has not been previously described in NSW. We report the results of a survey of prison inmates, which includes self-assessment of their oral health needs as well as the results of an oral examination.

METHODS

Sample

In 1996, inmates at 27 NSW correctional centres (24 male and three females only centres) participated in a health survey developed by the NSW Corrections Health Service (CHS) and the NSW Health Department. The sample was selected using a cross-sectional age-stratified random sampling technique. Details of the methods have been described elsewhere.[5-7]

Face to face interview

The health survey included an extensive face to face interview covering physical and mental health issues, screening for a number of infectious diseases (tuberculosis, HIV, syphilis, hepatitis B, C, and G) and various health status indicators (e.g., blood pressure, blood sugar level, and blood cholesterol).

Information was collected during the interviews about dental visit history including number of visits in the previous 12 months, venue of last dental visit and treatment received. Respondents were also asked to indicate the number of times their teeth were brushed on the previous day and their self-perception of need for dental treatment.

Oral examinations

Dentists conducted oral examinations on a subset of 334 prison inmates from the main sample using a standardized protocol following the guidelines used by the National Oral Health Survey Australia (NOHSA) in 1987-1988.[8] The clinical assessments included denture status and needs, edentulousness, caries status and needs, periodontal status and needs, malocclusion status and needs, treatment of teeth, disorders of oral mucosa and other dental conditions. The NSW Corrections Health and the NSW Department of Corrective Services Ethics Committees independently granted approval.

Measurements

Dental caries experience was measured as the number of decayed, missing or filled permanent teeth (DMFT), and represents that person's lifetime attack at the time of observation. Dental caries experience was averaged over the whole sample and expressed as mean DMFT or DMFS (tooth surfaces). Root caries included both active and restored lesions and only the total number of teeth affected were recorded. The Community Periodontal Index of Treatment Needs (CPITN) provided a summary score of possible periodontal treatment needs.[9] The worst mouth score indicated a healthy mouth or gingival bleeding as the worst condition, calculus, shallow pocketing of 4-5mm and deep pocketing of 6mm or more. Using the overall mean DMFT score as a guide, subjects were classified into two groups: 'high' DMFT (> 10) and 'low' DMFT (<=10) for the purpose of assessing risk factors associated with DMFT score.

Statistical methods

Logistic regression was used to determine factors associated with the 'low' and 'high' DMFT scores using SAS version 6.12 (SAS Institute, North Carolina, USA).

RESULTS

Demographic details

A total of 789 inmates participated in the main survey (657 males and 132 females) representing approximately 11 per cent of all full-time male and 40 per cent of full-time female prisoners. The overall response rate was 90 per cent. Those selected were invited to participate and briefed on the aims and objectives of the study. Only those who provided written consent were eligible to take part in the survey. Those refusing to participate were replaced from a reserve list until the required sample had been achieved. Each participant received $10 for taking part in the survey.

The mean age of men was 33.8 years (SD = 12.4) and for women, 33.3 years (SD=10.5; t=0.42, p=0.7). The mean age of the subset of respondents who underwent oral examinations was 35.8 years and the age range was from 18 to 77 years. Reasons for loss to follow-up with this sample were difficulty with access, movement between correctional centres and release from prison.

Total sample: Oral health behavioural information

Length of time since visit to the dentist

In the last 12 weeks 26 per cent (209/789) of the sample had visited a dentist about their teeth, dentures or gums within the previous 12 weeks. Females were more likely to have visited a dentist in the last 12 weeks compared with males (41 per cent vs. 27 per cent, p=<0.0).

In the last 12 months 48 per cent (314/657) of males had not visited a dentist and 2 per cent (13/657) of males reported they had never visited a dentist.

The most recent dental visit for all respondents was most likely to have been with the prison dentist 62 per cent (488/789), with 24 per cent (193/789) having visited a private dentist and with 14 per cent having visited other dental providers, e.g., dental hospitals.

Table 1. Dental treatment received at last dental visit and self-perception of treatment needed

	Males (n=657)		Females (n=132)		
Treatment received at last dental visit	Frequency*	%	Frequency*	%	p value
Dental examination	405	61.6	87	65.9	ns
Dental fillings	246	37.4	50	37.9	ns
Dental extraction	184	28	40	30.3	ns
Dental X-ray	165	25.1	30	22.7	ns
Dental clean	151	23	29	22	ns
Dental construction	67	10.2	17	12.9	ns
Fluoride treatment	49	7.5	14	10.6	ns
Gum treatment	32	4.9	3	2.3	ns
Dental orthodontics	9	1.4	4	3	ns
Self-perception of treatment needs					
Check-up	274	41.7	58	43.9	ns
Dental fillings	187	28.5	56	42.4	0.002
Dental extraction	93	14.2	26	19.7	ns
Dentures	92	14	25	18.9	ns
Gum treatment	73	11.1	21	15.9	ns
Clean/polish	54	8.2	14	10.6	ns
Dental orthodontics	19	2.9	6	4.5	ns
Bridging work	10	1.5	1	0.8	ns

*Multiple responses were permitted

Over 86 per cent of respondents reported having brushed their teeth in the previous day with 50 per cent brushing them twice. Six per cent reported not brushing their teeth.

Treatment received and self-perception of treatment needed at last visit for males and females are shown in Table 1. No significant differences were identified in the proportion of males and females receiving various dental treatments. A higher proportion of females than males reported that they required dental fillings.

Oral health examination – Subset

An oral health examination was conducted on 42 per cent (334/789) of those who participated in the survey. Table 2 summarizes the main findings of the oral health examination conducted on the subset.

Overall, 5 per cent of subjects were edentulous, all of whom were over the age of 25. For those aged over 40 one reason for the complete loss of teeth were causes other than dental caries.

Thirty-two per cent (107/334) of those examined were wearing some form of denture or bridge. For those over 40 years, 68 per cent (86/126) wore some form of denture or bridge.

Forty per cent (134/334) of those prisoners examined were judged by the examining dentist to need some form of denture; this was highest (75 per cent) in those aged over 40 years.

Ninety-six per cent (322/334) of those under 25 years of age had been affected by dental caries, and all those over 25 years were similarly affected. Fourteen

Table 2. Results of the oral health examination of 334 NSW prisoners by age group

	< 25 years (n=105)		25-40 years (n=103)		Over 40 years (n=126)		Total
Dentures	Frequency	%	Frequency	%	Frequency	%	Total
Upper needed	5	4.8	17	17	40	31.7	62
Upper worn	1	1.0	15	15	61	48.4	77
Lower needed	2	1.9	16	16	54	42.9	72
Lower worn	0	–	5	4.9	25	19.8	30
Edentulous	0	–	2	1.9	15	11.9	17
Reasons for edentulous:							
Caries	0	–	1	na	7	5.6	8
Other	0	–	1	na	8	6.3	9
Extractions							
Extractions for dental caries	15	14.2	19	18	12	9.5	46
Extractions for periodontal disease	0	na	2	2	5	3.9	7
Other reasons for extractions	8	7.6	1	na	1	na	10
	Mean	Se	Mean	Se	Mean	Se	
Decayed teeth	3.7	0.4	3.7	0.4	2.5	0.2	3.4
Filled and decayed	2.0	0.3	2.06	0.3	2.6	0.7	2.2
Filled and no decay	4.3	0.3	5.7	0.4	7.0	0.5	5.8
Missing teeth due to caries	3.0	0.4	6.0	0.6	13.2	0.8	8.9
DMFT	13.0		17.6		25.4		20.4
CPITN score	1.8	0.1	2.3	0.1	2.7	0.1	2.2
Root caries	0.1	0.1	0.4	0.1	0.5	0.1	0.3
Teeth needing treatment	4.0	0.5	5.0	0.5	3.0	0.4	4.0

Table 3. Odds ratios for factors associated with a 'high' DFMT (>10) score in NSW prisoners

Risk factors	n	DMFT >10 (%)	Odds ratio	p-value	95% CI
Sex					
Male	312	51.9	1.0		
Female	22	40.9	0.6	0.3	0.3-1.5
Age					
<=Median age	154	22.1	1.0		
>Median age	190	76.1	11.2	0.0001	6.7-18.7
Aboriginal					
No	254	53.9	1.0		
Yes	80	42.5	0.6	0.07	0.4-1.0
Injector					
No	57	52.6	1.0		
Yes	135	38.5	0.6	0.07	0.3-1.1

per cent of those examined had teeth missing as a result of dental caries with an average of 13.2 missing teeth per person over the age of 40 years.

Almost all (93 per cent) of those examined required some form of dental treatment. The highest mean number of total teeth (five) requiring treatment was in the 25-40 year age group (Table 2).

Eleven per cent of those examined had root caries which was highest (17 per cent) in those aged over 40. Of the dentate population (those aged over 19 years) over 45 per cent had calculus detected as the worst score.

Risk factors associated with DMFT score

In the univariate analysis, being older than the median age of 36 years was associated with a significant increase in the risk of a 'high' DMFT score (Table 3). In the multivariate model increasing age remained as the only significant independent predictor of a DMFT score of over 10, (OR=11.2, p=0.0001, 95 per cent CI=6.7-18.7).

For inmates with a history of injecting drug use, there was an increase in risk of a 'high' DMFT score associated with having ever been on a methadone programme (OR=1.9, p=0.09, 95 per cent CI=0.9-4.1). However, this was not significant.

DISCUSSION

There have been very few studies carried out on the oral health status of prisoner populations. Overseas studies report[10-12] that the oral health status of prison inmates is worse than that of the population generally.

The dental caries index measured by calculating the mean DMFT for the prison sample increased with age, as is the norm for any population. This is reflected in those high numbers (mean of seven) requiring one surface filling which peaks at age 25 years and over. The numbers of prison inmates 25 years and under requiring multiple fillings was high (35 per cent). A study of male prison inmates in the United States found that prisoners were more likely to have extractions due to dental caries.[13]

Another United States prison study[11] reported lower DMFT rates (12.9 for prisoners aged 20-34 years) than the NSW study and demonstrated a correlation between utilization and low DMFT rates.

Regular oral care is likely to enable individuals to become more knowledgeable regarding their oral health and need for treatment thereby improving their oral health status. For those inmates with poor perceptions of their oral health, lack of regular oral care may initiate a downward spiral leading to fulfilment of poor oral health status. The National Oral Health Survey Australia[8] reported 6 per cent of the population between 15 and 64 years of age reported having an extraction at the last visit. In the prison sample, for a similar age group, 28 per cent of the sample reported extraction as a treatment at the last visit. Extraction rates reported from other Australian studies are high where individuals have visited an emergency department for oral care, for those who live in rural areas or are adult concession cardholders and those on low household incomes.[8,14,15]

This study demonstrated the self-defined need for preventive oral care such as cleaning, polishing and check-up was low, indicating a low expectation of oral health care. When asked if they thought they needed oral care only 42 per cent of the prison sample thought so. Perceived need for dental fillings or crowns (33 per cent) was highest in the 20-25 year age group.

Understanding what influences oral health perceptions can direct services to improve oral health. For example, prior experiences with oral health care systems have been reported as an important measure in oral health because of the association with dental utilization and actual clinical status.[16] A better understanding is needed of both the clinical conditions of oral health and how overall perceptions based on personal expectations of treatment needs to enhance understanding of how they interact.

In NSW the Corrections Health Service is responsible for the management and delivery of oral health care. In 1996, 2.5 full-time dental staff across 22 clinics were serving over 7000 inmates. Monthly reports sent to the NSW Health Department's Oral Health Branch during the survey period indicate that 65 per cent of all oral health visits to be first time visits.[17] This is clearly reflected in the respondents' reply to time since last visit, which indicates that more than 51 per cent visited a dentist in the last three months.

Root caries is a common oral condition occurring in older adults. International surveys report between 60-90 per cent of older adults have root caries.[18,19] Studies also show that 15-20 per cent of older adults have root surfaces with gum recession that have been attacked by root caries.[20] Dental caries and root caries tend to appear together, and those who have gingival recession with lactobacilli present are also more likely to have root caries.[21]

In this survey 9 per cent of the population aged 25-40 years had an experience of root caries. Of the dentate population 25 years and over 45 per cent had

calculus detected as the worst score. A raised CPITN score in addition to a high number of respondents with root caries raises questions of a population having possible high levels of plaque disease. Prime factors contributing to this situation are lifestyle issues. The prison population has 32 per cent females and 21 per cent males reporting injecting drug use in prison at some time in the past.[5] Sixty-two (50 per cent) females and 108 (16 per cent) males reported having ever been on a methadone programme either in the community or in goal.[5] Methadone is known for the high level of sugar that exacerbates the level of bacteria in the plaque and in the presence of gingival recession could contribute to the high rate of root caries. Other drugs reported being used such as heroin, tranquillisers, ecstacy and speed can result in xerostomia or dry mouth which predisposes dental caries.[22] In this study we found no association between a history of being on a methadone programme and a higher DMFT score.

Lifestyle diseases are closely related to oral diseases and it is important to consider the wider social determinants of health when looking at treatment options. Oral health should be seen in the context of a population health approach. Therefore, working in collaboration with other health sectors of Correction Health Service to identify the required health gains for those most at risk. There are groups of prison inmates whose social experience is different, often leading to a negative impact on their general health or a reduced potential for health gain.

In conclusion, visiting a prison dentist for the first time should ideally be one where exposure to oral health care is maximized. This initial visit would be a time to allow the patient to plan for future care and to introduce preventive concepts of care. An improvement in the oral health may play an integral role in improving the general health of prison inmates. Prisons represent an important public health opportunity to improve the health status of prisoners, including oral health. The incarceration period is an ideal opportunity to educate this group in good oral health care practices and provide the necessary treatment.

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