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Oral Health Survey of Scottish Prisoners 2019 Report

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THE ORAL HEALTH AND PSYCHOSOCIAL NEEDS OF SCOTTISH PRISONERS AND YOUNG OFFENDERS EXECUTIVE SUMMARY 2019



University
of Dundee



Scottish Oral Health Improvement Prison Programme (SOHIPP)

THE ORAL HEALTH AND PSYCHOSOCIAL NEEDS OF SCOTTISH
PRISONERS AND YOUNG OFFENDERS
EXECUTIVE SUMMARY 2019

Foreword by Tom Ferris, Chief Dental Officer, Scottish
Government

'Self-Portrait with toothache' HMP Grendon, 2009. Courtesy of the Koestler Trust,
Registered Charity.

Foreword

This 3rd Scottish Report on Oral Health in Prisons is part of the monitoring of the oral health and psychosocial needs of people in prison in Scotland from 2002 to 2019. In addition to assessing the oral and dental health of prisoners it supports the evaluation of policy change in 2011 and the introduction of the Mouth Matters Oral Health Improvement Programme in 2014.

There have been improvements in access to and acceptability of dental services following their transfer to the Public Dental Service of NHS Boards, following the policy change of 2011. Introduction of the Scottish Government's Mouth Matters programme in 2014 has resulted in improved gum health, toothbrushing behaviours and more positive attitudes towards oral health. However, it is disappointing that the levels of tooth decay in 2019 remain high. As an important marker of deprivation and health inequity this demonstrates the persistence of underlying social determinants of health to reduce the benefits of improved dental service provision. The surveys of 2002, 2011 and 2019, therefore, by placing oral health in the centre of health and social care policy provide a means not only of monitoring oral health but also demonstrating that oral health acts as a marker of the health and social inequities experienced by people in prison.

The recommendation to introduce multidisciplinary working within and across the prison estate, will mean that the work of Public Dental Service's clinical and health promotion teams will be central to strategies to improve the oral health and the health of those in custody. Acknowledging the role of the social determinants of health on the oral health status of people in prison permits the use of decay experience as a marker of inequity. Furthermore, the recommendation to support current peer oral health improvement interventions to promote health and well-being of people in prison during their sentences, will enable them to maximise their capabilities and take control over their lives.

I commend this report to all those working with people in prison to help ensure that they are able to maintain and improve their oral health, health and psychosocial well-being during custody, on liberation and beyond.

Tom Ferris
Chief Dental Officer, Scotland

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Executive Summary

1.1 Background

In March 2005, the Scottish Executive Health Department's 'An Action Plan for Improving Oral Health and Modernising NHS Dental Services in Scotland' (Scottish Executive, 2005) was published in response to the two consultations documents, 'Towards Better Oral Health in Children' (Scottish Executive, 2002) and 'Modernising NHS Dental Services in Scotland' (Scottish Executive, 2003). The two main areas of the Dental Action Plan were to focus on the improvement of oral health of the Scottish population and to identify specific priority groups needing additional support to improve their oral health. Prisoners were identified as a group of individuals requiring enhanced support to achieve and maintain their oral health.

By 2007, the Prison Healthcare Advisory Board recommended the responsibility for the healthcare of prisoners including oral health should be transferred from the Scottish Prison Service to NHS Scotland and specifically to the NHS Boards in which the prisons were located (Prison Healthcare Advisory Board, 2007). In August 2010 a legislative amendment to enable the transfer of responsibility was passed by the Scottish Government, and by October 2011 the memorandum of understanding ensured that the responsibility of healthcare in prisons became the responsibility of the NHS Boards (NHS Scotland, 2011). The common purpose of this policy was to 'improve prisoners' access to an appropriate range and quality of health services based on their needs.' The intention being to ensure equity in healthcare delivery and access. In order to achieve this aim, partnership working was highlighted as of central importance, with continuous professional education for all those working within the prison sector.

The health of prisoners has been described as 'poor', reflecting marked health inequities associated with the so-called cliff-edge of inequalities (Aldridge *et al.*, 2018). The first Health Promotion Strategy to promote health among prisoners in Scotland, 'The Health Promoting Prison' was published in 2002 (Scottish Prison Service, 2002). Later, in 2008, the Scottish Government's 'Equally Well' (Scottish Government, 2008) report of the Ministerial Taskforce on Health Inequalities highlighted the need to put in place a programme to improve the oral health of prisoners. Therefore, by 2012, the publication of 'Better Health, Better Lives for Prisoners' (ScotPHN, 2012), a framework to support a new partnership between the SPS and NHS Boards was published. This framework promoted the adoption of a 'whole prison approach' focussing on three key elements for [1] developing health promotional policies, [2] promoting a healthy prison environment and [3] the promotion of prevention, health education and other health promotion initiatives to address the health needs of people in prison. Oral health was placed as a central and integral part of 'Better Health, Better Lives for Prisoners'.

In 2011 a survey of the Oral Health and Psychosocial Needs of the Scottish Prisoners and Young Offenders was conducted by the Scottish Oral Health Improvement Prison Programme in conjunction with NHS Boards (Freeman *et al.*, 2013). The results of the 2011 SOHIPP report led to the development of the 'Mouth Matters' oral health promotion intervention for people in custody (Freeman *et al.*, 2014). This Scottish Government, national oral health initiative aimed to promote oral health improvement for people in prison in Scotland supported by the NHS Boards' oral health improvement teams. The Mouth Matters Guide for Trainers was specifically designed to support the health professionals, prison staff and support workers to meet the detailed oral health needs of the Scotland's prison population.

In 2017 the SPS announced its intention for all prisons in Scotland to be smoke free by the end of 2018 (Scottish Prison Service, 2017) and to support this policy NHS Health Scotland published a Smoke-free prisons pathway and highlighted 'peer support' as a key step in the pathway (NHS Health Scotland, 2018). At this time and following a qualitative exploration of the participants' oral health concerns (Freeman *et al.*, 2013) the Mouth Matters intervention adopted the concept of the 'peer support model' to develop a peer oral health mentoring intervention in Scottish Prisons. SOHIPP in collaboration with NHS Forth Valley and HMYOI Polmont developed the Mouth Matters Peer Oral Health Mentoring Programme. With Anne Crowe, NHS Education Scotland an SQA level 5 award in Oral Health Improvement Mentoring (Scottish Qualification Authority, 2018) was achieved in 2018, for those undertaking the peer mentoring training. Therefore, Mouth Matters was considered as an important peer support intervention to support the smoke-free prisons agenda and was included as a key initiative for Smoke-Free Prisons by NHS Health Scotland (NHS Health Scotland, 2018).

The 2011 Oral Health and Psychosocial Needs of the Scottish Prisoners and Young Offenders, thus, serves as a benchmark for the assessments of quality, appropriateness and accessibility of dental health care within Scottish prisons following Scottish Government and SPS policy changes between 2011 and 2020. The 2019 Oral Health and Psychosocial Needs of the Scottish Prisoners and Young Offenders is both timely and appropriate to: 1) assess the health and oral health of people in custody, 2) identify the effect of healthy public policies on their oral health and psychosocial health status and 3) serve as a benchmark for future assessments of the quality, appropriateness and accessibility of dental health care within the Scottish prisons.

1.2 Aims and Objectives

The aim of the 2019 survey was to [1] conduct an oral health and psychosocial needs assessment of people in custody in 10 prisons across Scotland and [2] compare the findings of the 2019 survey with the 2011 survey to provide evidence-based recommendations to inform oral health policy and strategy to promote the oral health and psychosocial wellbeing of those in prison.

The specific objectives were to:

1. Conduct an oral health survey of people in prison;
2. Examine their health and oral health behaviours;
3. Assess their dental anxiety, oral health-related quality of life and depression;
4. Compare the findings of the 2019 with the 2011 survey results to examine the effect of:
 - (i) Change of policy of the transfer of responsibility of healthcare from SPS to NHS in 2011 on dental decay experience;
 - (ii) Introduction of the Mouth Matters intervention in 2014 on toothbrushing behaviours, plaque scores, dental visiting and dental health attitudes.
5. Make recommendations to inform oral health strategy to promote the oral health of those in prison.

1.3 The main findings of the 2019 Oral Health and Psychosocial Needs of Scottish Prisoners and Young Offenders

A total of 353 prisoners took part in the survey, which was conducted in HMP Dumfries (15), HMP Cornton Vale (35), HMYOI Polmont (152), HMP Grampian (5), HMP Inverness (10), HMP Shotts (14), HMP Addiewell (20), HMP Edinburgh (47), HMP Castle Huntly (15) and HMP Perth (40)¹.

Demographic profile

Age, ethnicity and employment status: The mean age of the participants was 32.10 years. Their age ranged from 16 to 83 years. Ninety four percent were Caucasian, while the remainder stated that they were of Black (6), Mixed Race (5), Asian (3), Chinese (2), Lithuanian (1), Middle Eastern (1), Romanian (1) and Vietnamese (1) ethnicities. Sixty three percent were unemployed prior to their current imprisonment, 30% reported being in employment, 3% in formal education and 1% in training.

Marital status and living experience: Seventy-six percent of the prisoners stated they were single. Forty-seven percent reported they had children and 19% stated that they were living together as a family prior to their current imprisonment. Twenty-three percent of participants had been in children's institution or 'in care' and 12% had been in foster care. Thirty-two participants stated that they had experience of both children's institutions and foster care. Thirty-nine percent stated that they had experienced homelessness at some point in their lives, with 46% of those who had experienced homelessness reporting they had been homeless for less than six months; 24% for six months to under 12 months and 17% had been homeless for over 24 months.

Profile of prison experience

At the time of the 2019 survey, participants reported they had spent on average 2.90 years (95% CI: 2.30, 3.48) of their lives in prison. One hundred and twenty-nine prisoners (56%) had been on remand at least twice. The mean number of reported prison remands was 3.45 (95% CI: 2.94, 3.95) with the range being between one and 25. One hundred and fifty-one prisoners (54%) had at least one previous prison sentence, with the number of sentences experienced ranging from one to 25. The mean number of imprisonments was 2.74 (95% CI: 2.28, 3.20). One hundred and sixty-four (52%) participants stated that their current imprisonment was for a short-term period (four years or less); 152 (48%) stated being on longer-term sentences (five years or more).

Health and Health Behaviours

Health status: The vast majority (99%) of the prisoners answered the medical history questions. Forty-four percent of prisoners stated that they suffered from at least one of the illnesses mentioned on the medical history questionnaire, ranging from cardiovascular disease to allergies. Equivalent proportions of prisoners who participated in the 2019 survey had diabetes (3%) and epilepsy (3%) compared with the findings of the Health in Scottish Prisons Report of 2007 (Graham, 2007).

¹ Since the prisons sampled were predominately for adult men, women and male young offenders, the variable 'prison category' was calculated and used as an explanatory variable to explain differences in age and gender.

Gender differences in health were noted in the reported experience of communicable and non-communicable diseases. Woman prisoners reported greater ill-health than adult male prisoners for all health conditions except for cardiovascular diseases. With regards to communicable diseases greater proportions of females (3%) reported having HIV/Hepatitis C infection compared with male prisoners. This finding is supported by the work of Taylor *et al.*, (2012).

Prescribed medications: One hundred and ninety-eight respondents (59%) stated that they had been prescribed medication and 167 provided details of the medication prescribed. Of those who provided details of their prescribed medication, 71% were psychotropic preparations: 40% anti-depressants, 20% anxiolytics and 11% antipsychotics. Of the other named medications, 31% stated they were prescribed analgesics, 17% cardiovascular medication and 16% stated they had been prescribed methadone and anti-epileptics.

Health Behaviours: Forty-four percent (152) of the sample reported that they either smoked tobacco (n= 136) or used electronic cigarettes (n= 16). The mean number of cigarettes smoked daily (outside of prison) was 18.21 (95% CI: 16.38, 20.04). Fifty-four of the prisoners stated that they smoked between 11-20 cigarettes per day when living outside of prison. The number of cigarettes smoked outside daily did not vary by gender or age.

Seventy-four percent (255) respondents stated that they had a history of drug use, with 21% (71) stating that they had used intravenous drugs. Previous drug use and injecting drug use varied significantly by prison category. Eighty two percent of male young offenders stated that they had previously used drugs compared with 81% female prisoners and 63% male prisoners. However, a history of injecting drug use was highest among female prisoners (45%) compared with adult male prisoners (18%) and male young offenders (5%). This finding is supported by Taylor *et al.*, (2012), which showed 59% of women with a reported history of injecting drug use compared to 30% men among Scottish prisoners. Prisoners who stated that they had experienced homelessness were significantly more likely to have used and injected drugs. Drug-taking behaviour also varied by prison experience, with prisoners with greater experience of prison remand and sentences stating that they had a history of drug use and injecting drug use. Prisoners with a current shorter sentence (4 years or less) stated they had injected drugs.

Fifty-three (15%) prisoners reported that they had taken part in a drug rehabilitation programme. Eight percent of the entire prisoner sample stated they had been prescribed methadone, suggesting that they were on a maintenance programme. These figures are lower than reported by the SPS Prisoner Survey 2017 (Carnie *et al.*, 2017) wherein 20% of the prisoners reported being prescribed methadone, of which 48% were on a maintenance programme. Participation in a drug rehabilitation programme varied in accordance with prison category and prison experience. Greater proportions of female prisoners (30%) compared with adult male (14%) and male young offenders (5%) stated they had taken part in a drug rehabilitation programme. This finding is supported by earlier work from HM Inspectorate of Prisons (2007), which found that 33% females compared with 6% males had taken part in drug maintenance programme (HM Inspectorate of Prisons, 2007). Prisoners with greater experience of remand and sentences were more likely to have taken part in a drug rehabilitation programme.

Psychosocial health

Dental anxiety: This sample of prisoners had an equivalent prevalence of dental anxiety as reported for the UK general population (Hill *et al.*, 2013). Thirteen percent of the sample were identified as being

extremely dentally anxious as assessed by the Modified Dental Anxiety Scale (MDAS). Larger proportions of participants were extremely anxious about having a local anaesthetic injection (13%) and having their teeth drilled (12%). Female prisoners compared with male prisoners and male young offenders were more anxious of all aspects of dental treatment. Dental anxiety scores did not vary by prison experience.

Oral health related quality of life: Oral Health-related Quality of Life (OHRQoL) was assessed by the Oral Health Impact Profile-14 (OHIP-14). The mean OHIP-14 total score for prisoners in this sample was 14.42, which was lower than that reported for prisoners in England (17.8) (Marshman *et al.*, 2014). The oral health impact of physical pain (painful aching in the mouth) was highlighted as being experienced occasionally by all prisoners in the 2019 survey. The impacts of psychological discomfort (feeling self-conscious about the appearance of teeth) and psychological disability (feeling embarrassed about the appearance of teeth) were experienced very often by 23% and 20% of the sample respectively. Female prisoners had higher mean OHIP-14 scores compared with male prisoners and male young offenders, suggesting that they experienced more oral health impacts and had poorer OHRQoL. The grouping variable 'prison category' significantly explained differences in the mean scores of individual items of the OHIP-14 scale for all items except for 'trouble pronouncing any words'. Women prisoners compared with adult male prisoners and male young offenders felt more self-conscious about the appearance of their teeth. Prisoners who were serving shorter prison sentences of four years or less had higher mean scores for the oral health impacts of 'difficulty in doing usual jobs' and 'unable to function' than those serving longer sentences.

Depression: Depression was measured using the Center for Epidemiologic Studies Depression Scale (CES-D). One hundred and thirty-nine participants (39%) scored 16 or above, suggesting that they were suffering from a depressive illness. The prisoners' experience of depression as measured by the CES-D in the 2019 survey compared unfavourably to the prevalence for depression of 11% for the general population of Scotland, 2016/17 (McLean *et al.*, 2018).

Female prisoners had significantly higher mean total CES-D scores than male prisoners and male young offenders. Female prisoners compared with male prisoners and male young offenders were more likely to experience depressive symptoms such as 'bothered by things', 'poor appetite', 'couldn't shake off blues', 'trouble keeping mind on task', 'felt depressed', 'everything was effort', 'fearful', 'crying spells', 'felt sad', 'people dislike me' and 'could not get going'. These findings are supported by the work of Bastick and Townhead, (2008) and Fazel and Seewald, (2012) that showed that women prisoners had a higher prevalence of mental health problems than male prisoners.

Mental health problems are reported to be both a cause and a consequence of imprisonment (Penal Reform International, 2007). Mental health has also been shown to fall with imprisonment, with the length of imprisonment having little effect on mental health status (World Health Organization, 2009). However, in the 2019 survey, prisoners with shorter prison sentences had higher mean scores for CES-D items as 'was happy' and 'enjoyed life' compared with prisoners with longer sentences and those with greater experience of remands who had higher mean scores for CES-D items as 'people dislike me' and 'could not get going' than others.

Oral Health and Oral Health Behaviours

Dental attendance and dental treatment experience: Seventy-four percent of participants stated that they had attended a dental practice either inside or outside the prison within the previous year and 15% reported that they had attended a dental practice within a two years period. The reasons for dental visits

included trouble with teeth or gums (48%), routine dental examination (35%), other reasons (11%) concerning issues with scale and polish or dentures.

Seventy-eight percent of prisoners stated that they had accessed dental services inside the prison but experienced barriers to attending. Barriers to accessing dental services inside the prison included: difficulty in accessing the dental service in the prison (appointment) (40%), the infrequent nature of the dentists treatment schedules (32%), disliking the prison dental service (6%), difficulty in getting a request form (5%) and difficulty in completing a request form (3%). Twenty-four percent stated they were 'dental anxious', 'not liking dentist in general' or 'feared going to dentist' and had experienced 'unsatisfactory previous treatment'.

With regards to their experience of dental treatment the most stated dental treatments were local anaesthetic injections, fillings, x-rays and scale and polish. Comparison of dental treatments by prison category showed that a greater proportion of adult males compared with females and male young offenders received fillings and extractions. With regards to preventive treatment, lower proportions of male young offenders stated that they had scale and polish and fluoride treatment compared with adult male prisoners and female prisoners. Prisoners with longer prison sentences of five years or more stated that they had more extractions, dentures and scale and polishes compared with prisoners with shorter sentences of four years or less.

Dental decay experience: Three hundred and forty-eight prisoners had an oral examination. The mean $D_{3CV}MFT$ was 13.70 (95% CI: 12.75, 14.64): the mean number of decayed teeth ($D_{3CV}T$) was 2.93 (95% CI: 2.56, 3.29): the mean number missing teeth (MT) was 6.68 (95% CI: 5.80, 7.56): the mean number of filled teeth (FT) was 4.09 (95% CI: 3.69, 4.50). The care index was 30%.

Differences in dental decay experience varied with prison category, reported experience of remands, number of sentences and length of current imprisonment. Women prisoners had greater mean dental decay experience and missing teeth due to tooth decay compared with adult male prisoners and male young offenders. Male young offenders had greater mean numbers of decayed teeth than female and adult male prisoners, whereas adult male prisoners had greater mean number of filled teeth compared with female prisoners and male young offenders.

Prisoners with greater experience of remand, sentences and longer current imprisonment had increased dental decay experience. With regards to decayed teeth, prisoners with greater experience of remand and shorter current sentences had greater numbers of decayed teeth. Prisoners with longer current sentences had higher mean number of filled teeth compared with prisoners with short term sentences. The mean number of missing teeth did not vary by prison experience.

Differences in dental decay experience were also observed in prisoners with regards to prescribed medication, those with a history of drug use and drug rehabilitation. Those prisoners who stated that they were prescribed medication at the time of the survey had greater dental decay experience and greater numbers of missing teeth and filled teeth. Prisoners with a history of drug use, injecting drug use and drug rehabilitation had increased mean numbers of decayed teeth. The mean number of filled teeth was higher among prisoners with no history of drug use. Prisoners with history of injecting drugs and drug rehabilitation had higher numbers of missing teeth due to caries.

Periodontal health: plaque scores: On average plaque covered less than a third of the total tooth surfaces examined, suggesting that good oral hygiene was maintained by the prisoners in this sample. The amount of plaque present varied by prison category, therefore, male young offenders had lower mean plaque scores compared with female and adult male prisoners. Prisoners who reported that they brushed their teeth with fluoride toothpaste whilst in prison had significantly lower mean plaque scores compared with those who stated they did not brush. The amount of plaque present did not vary by prison experience. It may be suggested that the routine of prison life may provide a supportive environment for the adoption of toothbrushing and oral hygiene behaviours.

Oral mucosa, functional dentition and dentures: Six areas of the mouth and throat were examined for the presence of oral lesions for monitoring and referral. These areas were the lips, the buccal mucosa (cheeks), the tongue, the floor of the mouth (under the tongue), the palate and fauces (throat). Twenty-nine (8.3%) participants had at least one lesion that required to be monitored or referred. Lesions on lips (16), buccal mucosa (6), palate (3), tongue (2) and floor of the mouth (2) required monitoring. One female participant required immediate referral for lesion on the buccal mucosa.

Seventy five percent of participants had at least 20 standing teeth and were considered to have a functional dentition, 22% had a shortened dental arch and 4% were edentulous. Larger proportions of male young offenders (97%) compared with adult males (69%) and females (59%) had 20 or more standing teeth. With regards to prison experience, lower proportions of prisoners with longer current prison sentences had 20 or more standing teeth.

Eighty-seven (25%) prisoners reported that they had been provided with some kind of denture at some point in their life. Of those who had an oral examination, 55 (16%) participants were wearing complete and/or partial dentures. Dentures were made of acrylic or metal with support obtained from tissues and tooth or both. Five dentures in the upper arch needed repair. With regards to denture care and hygiene, a greater number of participants reported cleaning their dentures inside the prison compared to cleaning it outside when at home. More female prisoners stated that they cleaned their dentures inside the prison than when liberated and at home, however, more male prisoners reported that they left their dentures out at night while in prison than when outside of prison. This once more suggests that the routine of prison life may provide a supportive environment for the adoption and maintenance of oral health behaviours.

1.4 Synopsis of the 2019 findings

The 2019 survey examined the health, psychosocial health and oral health of three groups of people in custody across 10 Scottish prisons. The aim of the survey was to use this information to provide recommendations to inform the oral health strategy to promote the oral health of those in prison.

The demographic findings of the prisoners in the 2019 survey showed that they were overwhelmingly younger (mean age 32 years), belonged to the 'white' ethnic group (94%) and were unemployed prior to imprisonment (63%), suggesting no change in their demographical profile from that reported by Graham in 2007 (Graham, 2007) and SPS Prisoner Survey 2017 (Carnie *et al.*, 2017). With regards to the prison experience some similarities in custodial sentence and length of current imprisonment were noted with the SPS Prisoner Survey 2017 (Carnie *et al.*, 2017). The majority of the prisoners in the 2019 survey reported having been on remand (74%) and sentenced (85%) between one and five times, and greater proportions of prisoners (52%) stated that their current length of sentence was for four years or less.

Despite the transfer of responsibility of healthcare from the SPS to the NHS in 2011 only 41% of responders in the 2019 survey stated that they had attended primary and/or secondary level medical services, whereas over 70% of responders in the SPS Prisoner Survey 2017 stated they had attended both nurse and a doctor or seeking medical care (Carnie *et al.*, 2017). The prevalence of self-reported illness such as COPD/asthma among prisoners in the 2019 survey was equivalent to that of the Scottish general population (McLean *et al.*, 2020) whereas the prevalence of hypertension and diabetes was lower than for the Scottish general population (McLean *et al.*, 2018; McLean *et al.*, 2020). The prevalence of HIV/Hepatitis C and injecting drug use was higher among female prisoners (Taylor *et al.*, 2012). Nearly 15% of the respondents stated that they had taken part in a drug rehabilitation programme and only 8% of the sample stated that they had been prescribed methadone. Although it is not possible to make a direct comparison, these figures are lower than reported by the SPS's Prisoner Survey 2017 (Carnie *et al.*, 2017) wherein 20% of the prisoners reported being prescribed methadone of which 48% were on a maintenance programme. Forty-two percent of the sample stated that they either smoked tobacco or used electronic cigarettes. As the data for the 2019 survey were collected after the smoking ban in November 2018, therefore those who reported smoking were presumably doing so outside the prison. Interestingly, this prevalence is lower than reported by the SPS's Prisoner Survey 2017 (Carnie *et al.*, 2017) (68%) but higher than the Scottish general population (17%) (McLean *et al.*, 2018).

With regards to dental anxiety, 13% of the sample were identified as being extremely dentally anxious, equivalent to the population norm for the UK (Hill *et al.*, 2013). Female prisoners were more dentally anxious than male prisoners or male young offenders. Similarly, oral health related quality of life of women prisoners was poorer than male prisoners or male young offenders. Female prisoners had worse psychosocial health as assessed by having greater dental anxiety, poorer quality of life and increased depressive symptoms compared with male prisoners and male young offenders.

Over a third of the sample (39%) scored 16 or above on the CES-D scale and 40% of those who provided details of their medication had been prescribed anti-depressants. The mental health of prisoners was poorer than that of the general population in Scotland (McLean *et al.*, 2018). More women than adult male prisoners or male young offenders had increased depressive symptoms. A careful examination of the psychosocial health of people in custody would suggest a need for gender specific interventions to address the psychosocial needs of women in prison.

A change in dental health attitude was noted, with the majority of the prisoners wishing to have their front and back teeth restored, together with an interest in knowing what the dentist was going to do and why.

The oral examination showed that the prisoners in this sample had increased numbers of missing teeth and fewer filled teeth, a pattern previously reported in the Scottish Prisons' Dental Health Survey of 2002 (Jones *et al.*, 2004) and 2011 (Freeman *et al.*, 2013). However, the overall burden of dental disease was overwhelmingly higher than that reported in the Scottish Adult Oral Health Survey 2016-2018 (Information Services Division, 2019b). The dental decay experience was significantly higher for female prisoners, those who were on prescribed medication and those with a history of injecting drug use. When dental decay experience was explored by prison experience, those prisoners that stated that their current length of imprisonment was for five years or longer had lower mean numbers of decayed teeth, higher mean numbers of missing teeth and filled teeth than those on short term sentences of less than four years. This finding suggests that the prisoners' decayed teeth were being converted into missing and filled

teeth and that they had received dental treatment inside the prison. Interestingly, the proportion of prisoners stating that they had accessed prison dental services was higher (78%) than those stating that they had ever accessed dental services either inside or outside the prison (74%). Most of the participants stated they had received dental treatments such as fillings, (90%) extractions (77%) and preventive treatments such as scale and polish (74%) at some point in their life. With fewer respondents stating they had received preventive treatments such as fissure sealants and fluoride treatment. Among dentate participants total plaque coverage for this sample covered no more than one third of the total tooth surfaces examined and those who brushed their teeth inside the prison had significantly improved oral hygiene.

It may be reasonable to suggest that the change in dental service provider has affected dental attitude and it may be proposed that the prison environment with its routines provided supportive atmosphere to adopt and maintain toothbrushing and denture care hygiene practices.

1.5 The main findings of the comparison of the 2011 and the 2019 Oral Health and Psychosocial Needs of the Scottish Prisoners and Young Offenders

A total of 342 participants in 2011 and 353 participants in 2019 consented to participate in the survey. Forty-four participants in 2011 and five participants in 2019 did not participate in the oral examination.

Demographic profile

Age, ethnicity and employment status: Participants in the 2019 survey had a significantly higher mean age of 32.10 years (95% CI: 20.68, 33.52) compared with participants in the 2011 survey with a mean age of 28.33 years (95% CI: 27.16, 29.50). Nearly 93% of the sample in both survey years stated that they were Caucasian. Employment status did not vary between the two survey years, with almost equivalent proportions of prisoners stating they were unemployed in the 2011 (67%) and 2019 (63%) surveys and in employment in the 2011 (26%) and 2019 (30%) surveys.

Marital Status and Living experience: Equivalent proportions of prisoners in both surveys stated that they were single and lived together as a family prior to imprisonment. Greater proportions of prisoners in the 2011 survey (58%) than the 2019 (42%) survey stated that they had resided in a children's institution. No difference was noted between the proportions of participants in foster care experience between the survey years. Fifty-two percent of prisoners in the 2011 and 48% of prisoners in the 2019 survey stated that they had experienced homelessness. The length of homelessness did not vary by survey year, however, greater proportions of prisoners in the 2011 survey stated that had been homeless for six months to one year and one to two years than in the 2019 survey and greater proportions of prisoners in the 2019 than in the 2011 survey stated that they had been homeless for more than two years.

Profile of prison experience

The total mean length of time of imprisonment for those who participated in the 2011 and 2019 surveys was 3.05 years. The range includes those in prison for the first time to those with 46 years of imprisonment in total. With regard to year of survey, participants in the 2011 survey had spent on average 2.37 (95% CI: 1.82, 2.91) years in prison compared with participants in the 2019 survey who had spent on average 2.90 (95% CI: 2.30, 3.48) years in prison. Mean total years of imprisonment varied by prison category. Male young offenders (0.75; 95% CI: 0.16, 1.33) had significantly lower mean numbers of years

of imprisonment than female prisoners (2.09; 95% CI: 1.42, 2.77) who also had significantly lower mean years of imprisonment than adult male (4.18; 95% CI: 3.63, 4.80) prisoners.

The mean number of prison remands and sentences varied by survey year and prison category. Prisoners in the 2011 survey had greater mean number of remands (4.65; 95% CI: 3.79, 5.51) compared with prisoners in the 2019 survey (3.45; 95% CI: 2.94, 3.95). Adult male prisoners (5.49; 95% CI: 4.73, 6.24) had a significantly higher mean number of prison remands compared with female prisoners (2.55; 95% CI: 1.66, 3.48) and male young offenders. (3.45; 95%CI: 2.74, 4.16). Prisoners in the 2011 survey had greater mean number of sentences (3.16; 95% CI: 2.47, 3.86) compared with prisoners in the 2019 survey (2.74; 95% CI: 2.28, 3.20). Adult male prisoners (4.21; 95% CI: 3.59, 4.83) had significantly higher mean number of sentences compared with female prisoners (1.97; 95% CI: 1.15, 2.78) and male young offenders (2.07; 95% CI: 1.40, 2.75).

Health and Health Behaviours

Health status: Almost all of the prisoners (99%) in both survey years answered the medical history questions. Equivalent proportions of prisoners in both survey years reported that they suffered from at least one of the medical conditions itemised in the medical history form. Greater proportions of prisoners in the 2019 survey (55%) compared with the 2011 survey (45%) reported that they attended primary and/or secondary level healthcare services.

Prescribed medications: Reporting of prescription medication varied by survey year and prison category with greater proportions of prisoners in the 2019 survey (56%) compared with prisoners in the 2011 survey (44%) stating they had been prescribed medication. Similarly, greater proportions of adult male prisoners in the 2019 survey (63%) compared with the 2011 survey (37%) reported being on prescribed medication. The largest proportion of reported and named medications in both 2011 and 2019 were within the psychotropic medicine group, accounting for 61 percent of all reported prescribed medications. These included prescriptions for depression (33%), anxiety-related disorders (18%) and psychosis (9%). There were significantly lower reported and named medications for depression in 2011 (46%) than in 2019 (58%) ($\chi^2_{[1]}=4.10$; $p=0.04$) and similarly for anxiolytics; 22% in 2011 and 27% in 2019.

Health Behaviours: Larger proportions of prisoners in the 2011 survey (63%) compared with 2019 survey (37%) stated that they smoked cigarettes or vaped. The 2019 data were collected after the smoking ban in Scottish prisons was introduced in November 2018 and so although there was a significant difference in the survey years for smoking/vaping status it should be noted that of those who reported smoking in the 2019 survey, it was assumed they reported their smoking behaviours outside of the prison.

Smoking/vaping behaviour varied by prison category and survey year. Across the three prison categories greater proportions of females, adult males and male young offenders in the 2011 survey smoked/vaped compared with their counter categories in the 2019 survey. The reported mean number of cigarettes smoked daily did not vary by survey year with the mean number of cigarettes reportedly smoked daily in the 2011 survey being 17.41 (median: 15; range: 2 to 50) (95% CI: 16.32, 18.50) and in 2019, 18.21 (median: 20; range: 1 to 55) (95% CI: 16.38, 20.04). Surprisingly, male young offenders in 2019 survey reportedly smoked greater mean numbers of cigarettes daily (20.38) than male young offenders in the 2011 survey (16.79).

Greater proportions of prisoners in the 2011 survey (51%) compared with prisoners in the 2019 survey (49%) reported a history of drug use. Differences in prison category across survey years with regards to

drug use was noted, with greater proportions of female and male prisoners in the 2019 survey than in the 2011 survey stating they had used drugs. Lower proportions of male young offenders who had participated in the 2019 survey (44%) than in the 2011 survey (56%) reported drug use. The number of prisoners stating a history of injecting drugs was lower in both survey years compared with those reporting drug use. Fifty-eight prisoners in the 2011 survey (45%) and 71 prisoners in the 2019 survey (55%) stated that they had used intravenous drugs. Similarly, only a small number of prisoners in both survey years stated that they had taken part in a drug rehabilitation programme. Sixty-three prisoners in the 2011 survey (54%) and 53 prisoners in the 2019 survey (46%) stated that they had taken part in a drug rehabilitation programme.

Psychosocial health

Dental Anxiety: Prisoners in the 2011 and 2019 surveys reported equivalent levels of dental anxiety. Female prisoners had significantly greater mean MDAS scores than male prisoners and male young offenders in both survey years. Forty-two participants in the 2011 and 45 in the 2019 survey scored 19 or over and were characterised as dentally phobic. Larger proportions of the participants in both survey years were extremely anxious about having a local anaesthetic injection and having their teeth drilled.

Oral health related quality of life: The mean OHIP-14 total scores for participants in the 2011 survey were 14.94 (95% CI: 15.33, 18.56) and 14.42 for participants in the 2019 survey (95% CI: 13.10, 15.73). The grouping variables survey year, prison category and the interaction of survey year with prison category significantly explained differences in the total mean OHIP-14 scores. Lower proportions of prisoners in the 2019 survey compared with prisoners in the 2011 survey reported experiencing occasional, fairly often and very often the following oral health impacts; painful aching mouth, having to interrupt meals, difficulty in doing usual jobs, life less satisfying and unable to function. Twenty percent of participants in 2019 compared with 28 percent in 2011 felt embarrassed very often on account of their teeth, mouth or dentures and a significant fall in the proportions of prisoners who felt irritable with others was noted between 2011 (11%) and 2019 (4%). Male prisoners in the 2011 than in the 2019 survey had significantly higher mean scores for the following oral health impacts: interruption of meals, being irritable with other people, difficulty in doing usual jobs and unable to function. Male young offenders in the 2011 survey had significantly higher mean OHIP-14 scores than male young offenders in the 2019 survey for twelve OHIP-14 items. OHIP-14 scores for individual items did not vary between women participants in both survey years.

Depression: The total mean CES-D scores for prisoners in the 2011 survey were 17.69 (95% CI: 16.28, 19.10) and 16.51 in the 2019 survey (95% CI: 15.17, 17.85). The grouping variable prison category and the interaction of survey year with prison category significantly explained differences in mean CES-D scores. Females had significantly greater mean CES-D scores than male prisoners and male young offenders in 2019 than in 2011 while male young offenders a significantly lower mean CES-D scores in 2019 than in 2011. Interestingly, greater proportions of prisoners in the 2019 survey (54%) compared with prisoners in the 2011 survey (46%) scored 16 or above on the CES-D scale, suggesting that they were suffering from a depressive illness. Greater numbers of female and male prisoners in the 2019 survey scored above the cut-off for depression compared with female and male prisoners in the 2011 survey respectively. A fall in the number of male young offenders scoring 16 and above on the CES-D was noted in the 2019 compared with the 2011 survey.

Oral Health and Oral Health Behaviours

Dental attendance and dental treatment experience: The reported pattern of dental attendance changed between the 2011 and 2019 surveys with significant differences noted in the reported interval between dental visits inside or outside prison by survey year. Greater proportions of prisoners, therefore, in the 2019 (74%) than in the 2011 survey (45%) stated that they had attended the dentist inside or outside prison within the previous year with lower proportions in 2019 than 2011 stating that they attended the dentist between one to five years or more. Reasons for dental visits also varied between survey years. Greater proportions of prisoners in the 2019 (35%) than in the 2011 survey (22%) stated that they visited the dentist for a routine dental examination and lower proportions of prisoners in the 2019 survey (48%) than in the 2011 survey (59%) reported that they attended when experiencing 'trouble with their teeth or gums'.

With regards to accessing prison dental services, greater proportions of prisoners in the 2019 survey (63%) than in the 2011 survey (37%) reported that they had accessed dental services while in prison. Greater proportions of all participants in 2019 than participants in 2011 stated that they had accessed prison dental services. Barriers to accessing prison dental services were also noted. However, the proportion of prisoners reporting perceived barriers such as difficulty in accessing the service (appointment), infrequent nature of the dentists' treatment schedule, disliking the prison dental service, difficulty in getting a request form and difficulty in completing a request form was lower in 2019 compared to 2011.

The most commonly reported past dental treatments mentioned in both 2011 and 2019 were local anaesthetic injections (92%), fillings (90%), extractions (73%), radiographs (80%) and scale and polish (66%). By 2019 larger proportions of participants reported having received radiographs, extractions and scale and polishes compared with prisoners in the 2011 survey. Of interest was an increase in the proportion of prisoners reporting experience of fissure sealants and fluoride treatments in 2019 survey compared to 2011.

Dental decay experience: Two hundred and ninety-eight prisoners in the 2011 survey and 343 prisoners in the 2019 survey had an oral examination. The mean dental decay experience ($D_{3CV}MFT$) of prisoners in 2019 was significantly higher (13.70) than prisoners in 2011 (12.17). The mean $D_{3CV}MFT$ varied between female prisoners in the two survey years wherein female prisoners in 2019 compared with females in 2011 had significantly higher mean $D_{3CV}MFT$. Prisoners in the 2019 survey had significantly higher mean numbers of decayed teeth into dentine ($D_{3CV}T$) compared with prisoners in the 2011 survey. Female and male prisoners and male young offenders in the 2019 survey had significantly higher mean numbers of $D_{3CV}T$ compared with those who participated in the 2011 survey. Mean numbers of missing teeth due to dental decay (MT) and filled teeth (FT) did not vary by survey years and prison category even though increases in the mean numbers of MT were noted for female participants and small decreases in the mean number of MT for male prisoners and male young offenders between the 2011 and 2019 surveys and increase in the mean numbers of filled teeth noted in male prisoners and male young offenders in the 2019 compared with the 2011 survey. The overall care index in both the 2011 and the 2019 surveys was 30%. An increase was noted in the care index of male prisoners in the 2019 survey to 40% from 38% in the 2011 survey and for male young offenders from 18% in 2011 to 20% in 2019. A reduction in the care index for women, however, was observed with a fall from 34% in 2011 to 28% in 2019.

When the analysis of dental decay experience ($D_{3cv}MFT$) and decayed teeth into dentine ($D_{3cv}T$) was inspected across survey year and prison category it was found that the number of years of imprisonment as a co-variant had an effect on dental decay experience ($D_{3cv}MFT$) but not on the decayed teeth ($D_{3cv}T$). Therefore, the greater the number of years of imprisonment the greater the $D_{3cv}MFT$ but not $D_{3cv}T$. Adding the number of remands as a co-variant explained greater mean $D_{3cv}MFT$ and number of teeth decayed into dentine, however, the number of prison sentences explained greater dental decay experience ($D_{3cv}MFT$) only.

The prevalence of dental decay experience ($D_{3cv}MFT > 0$) was 96% in the 2011 and 97% in the 2019 surveys. Significantly larger proportions of participants in the 2019 (68%) than those in the 2011 survey (48%) had greater unmet treatment need. Fifteen percent of the participants in the 2019 survey had enamel lesions requiring preventive treatment compared with 14% in the 2011 survey.

Prisoners in both survey years had a mean of 23 teeth present. Prisoners in the 2011 survey had significantly higher mean numbers of sound teeth (a mean difference of four teeth between survey years) than those in the 2019 survey. Prisoners in the 2019 survey had significantly higher mean numbers of teeth which had been fissure sealed than those in the 2011 survey. Male young offenders had a mean increase of 0.5 of a tooth fissure sealed in the 2019 compared with the participants in the 2011 survey.

Periodontal health: plaque scores: Prisoners in the 2019 survey had significantly lower mean total, upper and lower plaque scores than those in the 2011 survey. Female prisoners and male young offenders in the 2019 survey had a significantly lower mean total, upper and lower plaque score than those in the 2011 survey. Male prisoners, however, in the 2019 survey had significantly higher mean total, upper and lower plaque score than those in the 2011 survey. Prisoners who stated that they brushed their teeth while in prison had lower mean plaque scores in both survey years compared with prisoners who stated they did not brush their teeth while in prison. Interestingly, the prisoners who stated that they brushed their teeth while in prison, in the 2019 survey, had significantly lower mean total, upper and lower plaque scores compared with prisoners in the 2011 survey. When the analysis of total plaque scores was inspected across survey year and prison category it was found that the effect of placing the number of years in prison, number of remands and number of sentences as a co-variant did not assist in explaining the mean total, upper and lower plaque scores.

1.6 Conclusions

The comparison of the 2011 with the 2019 survey of the oral health and psychosocial needs of people in prison in Scottish prisons showed:

[1] Few differences if any were found by survey year regarding education attainment, employment status, childhood residential care or experience of homelessness, suggesting that people in prison represented a group of people who may be considered to have the characteristics of people described as experiencing social exclusion. The need remains for people in prison on release to have the opportunity 'to maximise their capabilities and have control over their lives' (Marmot *et al.*, 2010). It may be suggested that peer interventions enable people to communicate with others and attain experiential learning resulting in educational and/or vocational qualifications. Peer interventions for health and oral health will not only promote health in its widest sense but also assist in allowing people in custody to become more socially included in society and to have 'fair employment and good work' (Marmot *et al.*, 2010).

[2] The change in dental service provider from the Scottish Prison Service to the NHS, Public Dental Service in late 2011 appears to have improved access to dental care in prison, reduced perceived barriers to accessing dental care in prison and enhanced treatment preferences in 2019. Improved oral health-related quality of life supports this conclusion that the treatment afforded to people in Scottish prisons in 2019 compared to 2011, was associated with a reduction of oral health impacts associated with toothache and pain and oral health functioning.

[3] There was little change in dental caries experience, with the mean number of teeth extracted or restored by survey year remaining similar. The incidence of decayed teeth increased by survey year and was affected by prison category with a large unmet treatment need noted in 2019. Despite the change in service provider no improvement in dental caries experience was noted.

[4] Periodontal health as indicated by plaque scores and oral cleanliness showed significant improvements by survey year and prison category. Of interest to note was the relationship between reported and increased toothbrushing behaviours when in prison with reduced plaque scores in 2019 compared to 2011.

[5] The introduction and implementation of the oral health improvement intervention in 2014, Mouth Matters, with its emphasis on the promotion of toothbrushing, denture hygiene and accessing and attending for dental care, would seem to be associated with improved oral health-related attitudes and oral hygiene behaviours as reflected in the lower plaque scores by survey year found in the 2019 than in the 2011 survey. Few if any changes, however, were noted in the avoidance of sugar-containing foods and drinks in prison and, for people in high security prisons and on longer term sentences. This is an important finding since there is a need to develop interventions which are peer implemented by and for people in custody, to promote health learning capacity, cognitive and psychosocial skills set to improve not only oral health and health but also life skills.

1.7 Recommendations

General Recommendations

- Gender specific recommendations should be tailored to the needs of the female prisoners, male prisoners and male young offenders.
- Prisoners should be provided basic life skills for maintenance of health, oral health and mental health and well-being.
- Prisoners should be trained as peer oral health mentors and complete SQA educational awards.
- Access to healthcare and health promotion should be part of pre-release preparations.
- Dental health care and oral health promotion protocols should be nested in Public Health Scotland policy documents.

Dental health care recommendations

- Dental health services and oral health promotion should be part of a multidisciplinary and multi-sectorial approach within and across the prison estate.
- There should be an equitable distribution of dental treatment provision protocols within the prison estate as provided by the NHS Boards.
- Prisoners should be provided with the skills to access dental health services within and out with the prison estate.
- There should be an equitable distribution of oral health-health promotion initiatives across the prison estate.
- There should be the provision of dental through-care and oral health promotion from within the prison to the outside world.
- Access to oral health promotion services should be an integral part of pre-release preparation.
- Access to dental health services should be an integral part of pre-release preparations.

Training and continuing professional development recommendations

- Training of dental health professionals should include effective communication with prisoners inside and with people during and after liberation.
- Training of all those working within the prison sector should provide tailored oral health promotion interventional to prisoners.
- Training of all those working within the criminal justice sector should provide tailored oral health promotion interventions to people during and after liberation.

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