Oral health needs of Canadian prisoners as described by formerly incarcerated New Brunswickers

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ABSTRACT

Background: The oral health of prison populations in several countries has been shown to be compromised. However, little published research on Canadian prison populations is available. The purpose of this research paper is to determine whether such populations in Canada also suffer from compromised oral health. **Methods**: A convenience sample of forty-one formerly incarcerated individuals participated in the study in three New Brunswick urban centres. The study consisted of a questionnaire administered as a structured interview. **Results**: Reported risk factors included tobacco use (74% of respondents), type 2 diabetes (13%), drug or alcohol dependency (38%), and consumption of cariogenic foods and beverages (100%). One hundred per cent of the sample reported access to toothbrushes and dentifrice, while 42 per cent reported access to dental floss or floss picks. Seventy-six per cent reported toothbrushing frequency ≥ twice daily; 68 per cent reported "never" flossing. Fifty-four per cent reported having had dental treatment while incarcerated. The majority of the respondents (85%) expressed interest in a complimentary dental cleaning. **Discussion**: The findings were consistent with the results of studies from Australia and the UK. Dental hygienists may help prisoners meet their specific oral health needs, once these are properly identified through appropriate research such as clinical studies. **Conclusion:** Although the sample size of this study was limited, its findings imply that Canadian prison populations are likely to present with high oral health needs due to multiple risk factors. Correctional facilities may provide a novel environment for initiatives to improve oral hygiene self care modalities. Future clinical studies and surveys involving larger, multicentre samples of prison populations are indicated to assess accurately specific prisoner needs.

RESUMÉ

Contexte : La santé buccodentaire de la population carcérale s'avère compromise dans plusieurs pays, mais peu de publications en font état au Canada. Le présent article cherche donc à établir si la santé buccodentaire de ce type de population est aussi compromise dans notre pays. **Méthode :** Un échantillon de commodité de quarante-et-un anciens prisonniers de divers centres urbains du Nouveau-Brunswick a participé à l'étude qui comportait un questionnaire présenté sous forme d'entrevue structurée. **Résultats :** Les facteurs de risque mentionnés comprenaient le tabagisme (74% des répondants), le diabète de type 2 (13%), la dépendance à la drogue ou à l'alcool (38%) et la consommation d'aliments et de breuvages cariogènes (100%). Cent pour cent de l'échantillonnage a dit utiliser la brosse à dents et un dentifrice alors que 42 pour cent ont indiqué l'utilisation du fil ou de la soie dentaire. Soixante-seize pour cent ont dit se brosser les dents souvent, soit ≥ deux fois par jour; 68 pour cent n'ont jamais utilisé la soie dentaire. Quarante-quatre pour cent ont reçu un traitement dentaire pendant leur incarcération. La majorité des répondants (85%) se sont dit intéressés à recevoir un nettoyage dentaire gratuit. **Discussion :** Les données concordaient avec les résultats des études d'Australie et du Royaume-Uni. Les hygiénistes dentaires peuvent aider les prisonniers à satisfaire à leurs besoins particuliers de soins buccodentaires, lorsque ceux-ci sont correctement identifiés grâce à une recherche pertinente comme celle des études cliniques. **Conclusion :** Bien que l'échantillonnage de cette étude soit limité, les résultats laissent entendre que les populations des prisons canadiennes semblent présenter des besoins élevés en matière de santé buccodentaire, dus à plusieurs facteurs de risque. Les installations correctionnelles peuvent procurer un nouvel environnement pour les initiatives visant à améliorer les modalités de soins buccodentaires personnels. Il y a lieu de poursuivre d'autres études et sondages auprès de plus grands échantillonnages dans un plus grand nombre de centres d'incarcération, afin de répondre avec précision aux besoins particuliers des prisonniers.

Key words: oral health; health behaviour; public health; dental anxiety; tobacco; substance related disorders; dental health services

INTRODUCTION

Reports from the Correctional Service of Canada (CSC) indicate that approximately 13,000 individuals are incarcerated under its jurisdiction at any given time.[1] However, this represents only a fraction of adults incarcerated in Canadian correctional institutions—sixty-four per cent are in the custody of provincial and territorial, rather than CSC's federal institutions.[2] Overall, Canada's incarceration rate has been reported at 141/100,000 population.[2] The *Corrections and Conditional Release Act* mandates the provision of dental care to prisoners in federal facilities, and CSC's policies define dental care as an essential health service.[3,4] CSC reports state that a functioning dentition is considered a basic necessity for prisoners.[5] Inmates of institutions under CSC's jurisdiction may receive preventive and restorative care, in addition to emergency treatment,[6] while prisoners in provincial institutions may receive emergency treatment only (New

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Brunswick Director of Public Safety Institutional Services, 25 May 2011 [telephone interview]).

Walsh et al.[7] in a recent systematic review of research into dental health in prisons, noted increasing amounts of available relevant literature, citing studies from the USA, Europe, China, Australia, and South Africa; they did not reference any studies from Canada. CSC reports on inmates' health—based on Offender Intake Assessments (OIAs) available for over seventy per cent of the federally institutionalized population at the time of reporting—indicated that approximately fifteen per cent of federally incarcerated individuals were deemed to have "poor dental" health upon admission; both the magnitude and nature of dental problems were unspecified.[8,9] Bouchard[10] reported that over half of CSC inmates' OIAs indicated unmet financial needs upon admission. As reduced oral health outcomes and increased oral health needs are associated with low income Canadians,[11] and studies in the USA, the UK, and Australia have found prisoners to exhibit high prevalence of dental and periodontal disease and oral neglect,[12–18] it is suggested that specific oral health research is warranted for Canadian prison populations.

This student table clinic research paper shall determine whether it is likely that Canadian prison populations also suffer from compromised oral health based on assessment of concomitant risk factors as described by formerly incarcerated residents of the New Brunswick (NB) urban centres of Moncton, Fredericton, and Saint John. Secondarily, assessment of oral hygiene behaviours and attitudes will be used to provide implications for practice and recommendations for future research.

METHODS

Study Design

Quantitative methods were used in this descriptive study. The following paragraphs list the steps taken in the design of this study.

A literature review on the oral health status of Canadian prisoners was performed. Due to the scarcity of available publications from Canada, the search was expanded to include publications on the oral health status of inmates in correctional institutions throughout the USA, the UK, and Australia. In addition to these searches for publications, an inquiry regarding oral health measures surveys and data on usage of dental services was sent electronically via the CSC website contact form, and the NB Director of Public Safety Institutional Services was contacted regarding usage of dental services by inmates within NB provincial correctional institutions. The responses from the Nursing Project Manager with CSC Health Services (2011, March 14 [email correspondence]) and from the NB Director of Public Safety Institutional Services (2011, May 25 [telephone interview]) both indicated that the requested data were unavailable.

The lack of published and unpublished data required the authors to collect original data on Canadian prisoners' oral health needs. Questionnaires consisting of twenty items were used to expedite data collection for this preliminary study.

As a result of time restrictions and due process within government administered institutions, the authors were unable to survey incarcerated individuals serving their time. Therefore, the information obtained in this study regarding prisoners' oral health habits and oral health risks is limited to retrospective accounts from a sample of previously incarcerated persons.

Questionnaires were administered verbally as structured interviews by both of the authors primarily to overcome potential literacy issues, documented in CSC populations.[19] A similar methodology was employed by Heidari et al.[12] The authors of this study also supported the method of conducting personal interviews to establish rapport, increase response rate, and ensure greater confidence in response validity.

Upon receiving approval from the Oulton College Ethics Committee, a pilot study of six questionnaires was conducted at Community Chaplaincy For Ex-Offenders, Moncton. Following this pilot study, minor alterations to the questionnaire were made. The pilot questionnaires were included in the final calculations to increase sample size, as the content of the questionnaire was essentially unchanged. Amendments to the questionnaire (see Supplementary information) were as follows:

- The question regarding date, institution, and length of incarceration was streamlined to expedite data collection; it provided multiple Atlantic region institutions as check box options, as well as an option to write in unlisted institutions. The same format was applied to the question regarding what dental services were accessed while incarcerated.
- Negative responses were added to check box lists, for example, "none of the above" or "never".
- Wording for the Likert scale of 1 to 5 used to evaluate attitudes towards dental services was simplified, for example, from "very poor" to "strongly disagree". The question regarding access to dental care after release was similarly simplified.
- One question was omitted following the pilot; and its data omitted from the results.

Two of the completed questionnaires were omitted from the results, bringing sample size down to thirty-nine. The respective respondents made it clear to the interviewers that many of their responses were fabricated; thus their validity was deemed unfavourable.

Descriptive statistical analysis was performed as appropriate, including means, standard deviations, ranges, and frequency distribution charts (both actual and relative). Responses from the thirty-nine questionnaires were used in the analysis.

Sample

A convenience sample was employed during the timeframe of 11–25 April 2011, using several facilities in the NB urban centres of Moncton, Fredericton, and Saint John as data collection sites. A questionnaire was administered to forty-one formerly incarcerated individuals (39 male and 2 female) at the following sites: Community Chaplaincy For Ex-Offenders, Moncton; John Howard Society, Moncton; YMCA ReConnect Street Intervention Program, Moncton; Saint John Community Chaplaincy;

and Fredericton Community Kitchen. Individuals were invited verbally to participate, and all participants signed consent forms. In Moncton, participation was encouraged by entering participants into draws for a free dental cleaning at Oulton College Dental Hygiene Clinic and a gift certificate. Participants in Fredericton and Saint John were not entered into the draws due to geographic separation from Oulton College in Moncton. These participants were instead offered free toothbrushes as an incentive. Names for the draws and consent forms were collected independently of questionnaire responses in order to ensure anonymity of respondents.

The only inclusion criterion required of respondents was prior incarceration. However, two questionnaires were later excluded due to lack of confidence in response validity. Ninety-five per cent of the included questionnaires' respondents were male and five per cent were female. The mean age of all respondents was 43 (±12) years; ranging from 22 to 70 years. The majority of respondents (72%) reported incarceration within provincially operated Atlantic region facilities—all but four of whom reported spending time in NB provincial institutions; 46% within federally operated Atlantic region facilities; 26% within Canadian facilities outside of the Atlantic region; and 5% within facilities in the USA. Cumulative lengths of incarceration ranged from 1 month to 272 months, with a mean of 45 (±53) months. The mean cumulative length of incarceration is based on 38 figures, as this information was omitted by one respondent.

Bias and limitations

The authors identified several limitations of this study and contributors to bias in the research design that should be taken into consideration:

- Face to face interviews may have influenced the respondents' answers. Though it is believed that this method of questionnaire administration contributed to an overall higher degree of validity, the respondents may have been reluctant to answer sensitive questions honestly or may have provided answers that they believed would please the interviewers.
- The limited number of female respondents should also be taken into consideration as a source of bias.
- The interviewers were unable to survey participants during their sentences in prison. This may have affected the results, as there could have been changes in products available, such as foods and beverages or oral hygiene implements, since the respondents' release. Changes in prison policies may also have occurred.
- The time lapse between the respondents' incarcerations and questionnaire responses varied, leading to a potential inability of some respondents to recollect accurately details and attitudes pertaining to their time spent in prison.
- Most notably, the facilities selected for questionnaire administration serve a small population of ex-offenders, most of whom voluntarily access these services. The convenience sample included only one individual who was not utilizing the services of these facilities. As such, the sample may not be highly representative of the entire population of formerly incarcerated individuals, and is unlikely to be generalizable.

Challenges researching in prison systems

Challenges conducting research in prison facilities have been documented in other countries. Problems cited include prisoner release and transfer between institutions, security clearance, adequate prison staffing, and prisoners' lack of interest in study participation.[12,13,20] This study encountered similar challenges in gaining access to the prison population.

RESULTS AND DISCUSSION

Owing to a lack of existing data from NB provincial institutions, this study's data were compared only to data from CSC's federal institutions and from other countries.

Sample

The sample exhibited similar gender ratios to CSC's incarcerated offender population (about 4% of federally incarcerated individuals are women). The ages of the study sample were generally older than CSC's incarcerated offender population.[1] This may be related to the fact that respondents had already been released from prison. Prisoners within provincial institutions may be considered short term (having sentences under two years) or remand prisoners (those awaiting trial), whereas federal prisoners typically serve longer sentences (NB Director of Public Safety Institutional Services, 2011 May 25 [telephone interview]).[2]

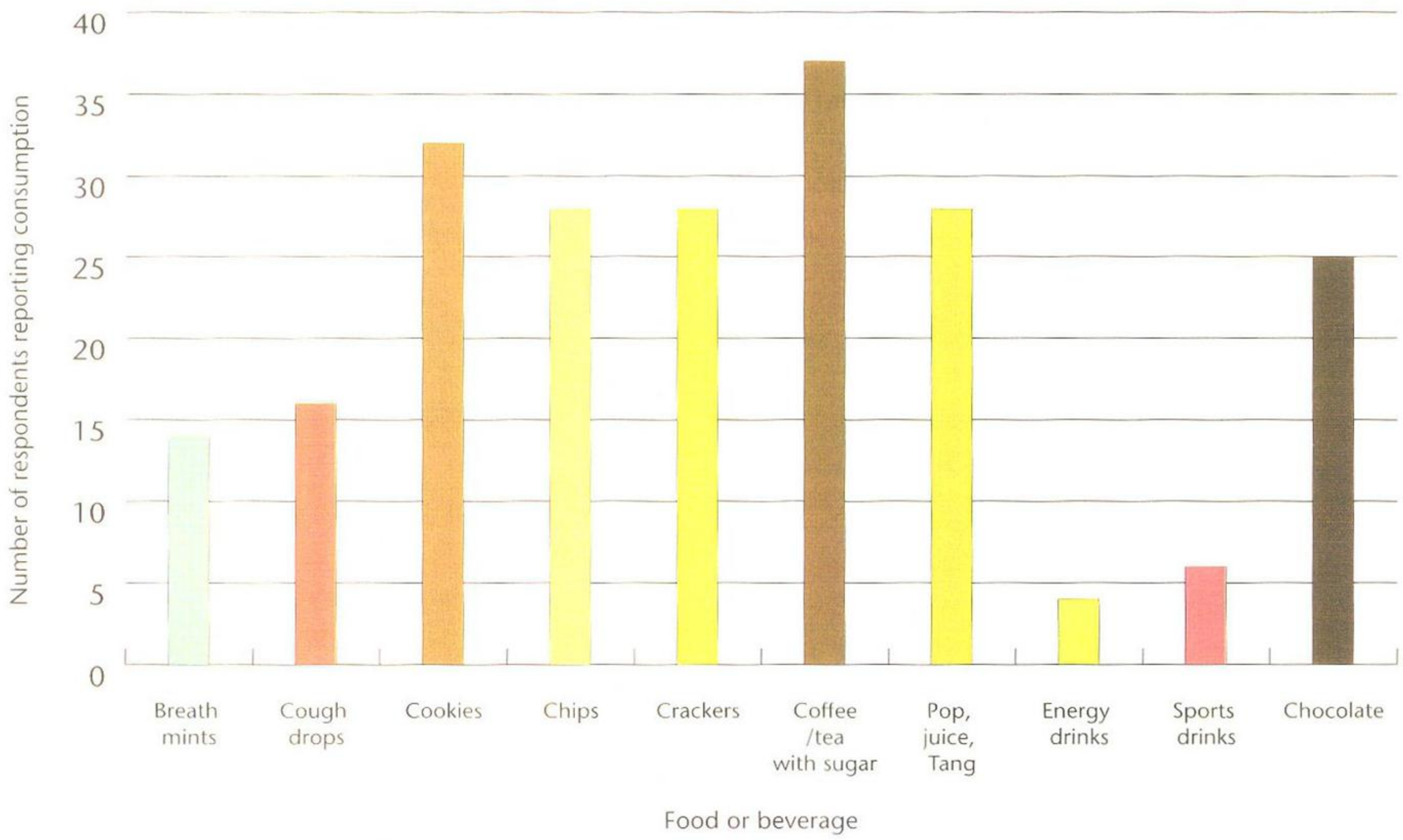
Risk factors and disease

Thirteen per cent of the respondents (5/39) reported having type 2 diabetes, 8 per cent (3/39) frequent vomiting, and 3 per cent (1/39) sexually transmitted infections (STIs) while incarcerated. Seventy-four per cent (29/39) reported tobacco use while incarcerated. Thirty-eight per cent (15/39) reported drug or alcohol dependency while in prison. Figure 1 illustrates reported cariogenic food and beverage consumption while in prison. While several of this study's respondents stated verbally that energy drinks were not available to prisoners, all of the study sample reported consumption of at least one listed type of cariogenic food or beverage, with hot beverages containing sugar (95%) and cookies (82%) being reported by the highest percentages of respondents. Data on frequency of cariogenic diet were not collected. This study's data on prevalence of risk factors and diseases generally reflect data available on CSC's inmate population.

CSC data found that male inmates are 40 per cent more likely to be treated for diabetes than similarly aged Canadian males.[10] The prevalence of diabetes in Canadian males aged 20 years and higher has been reported to be 8.5 per cent.[21] This differs from the findings of international studies; Heidari et al.[12] reported similar prevalence of diabetes between their sample and the general population in the UK.

CSC data indicated that 72 per cent of inmates surveyed

Figure 1: Consumption of listed cariogenic foods and beverages reported by the sample population (N=39).



in 1995 reported tobacco use, which is over twice the expected prevalence based on Canadian males of similar ages.[10] Heidari et al. also found self reports of tobacco use similar to this study—78 per cent prevalence for an average of fifteen years.[12]

The data obtained from this study's reports of sexually transmitted infections (STIs) are unlikely to reflect accurately the health status of the sample, partially due to the vague nature of the term "STI" and the lack of a clearly communicated definition during the interviews. It is recommended that future studies adopt CSC's Infectious Disease Surveillance System definition (documenting HIV and HCV independently of STIs)[22] and communicate a specific definition of the term "STI" to respondents.

This study indicated high prevalence of drug or alcohol dependence while incarcerated; this finding may still underestimate actual prevalence. The prevalence of drug or alcohol abuse at intake among CSC prisoners has been found to approximate 70 per cent.[10] Illicit drug use, without indication of dependency, was reported by 83 per cent in the sample of Heidari et al.[12] CSC data state that 11 per cent of inmates reported injecting drugs since being admitted into custody.[23] Collection of data on drug and alcohol use within prisons may be confounded by the illicit nature of these activities; for example, prisoners may be unwilling to report drug use when surveyed.

Prisoners' access to cariogenic foods and beverages has been noted in the USA and the UK.[12,16] It is recommended that future studies consider frequency of cariogenic diet as well as overall nutritional value of cariogenic foods.

Oral hygiene habits and denture use

Questions regarding respondents' access to oral hygiene supplies and their toothbrushing and flossing habits were not answered by one respondent; therefore, the statistics regarding oral hygiene habits are based on only thirty-eight respondents' reports. All other statistics are based on thirty-nine included responses. One hundred per cent (38/38) of the respondents reported having access to a toothbrush, all (38/38) to dentifrice, and 42 per cent (16/38) to dental floss or floss picks while incarcerated. Seventy-six per cent (29/38) of respondents reported toothbrushing frequency greater than or equal to twice daily, and 11 per cent (4/38) reported frequency less than once per day while incarcerated. However, 68 per cent (26/38) reported never using interdental aids, and only 16 per cent (6/38) reported frequency of using an interdental aid greater than or equal to once daily while incarcerated. An interesting discovery was that boredom was cited informally as a factor contributing to increased toothbrushing frequency by a small number of respondents of this study. Twenty-six per cent (10/39) of the respondents reported having dentures while in prison. Of these, 50 per cent (5/10) reported never removing them.

The comparatively low numbers of respondents reporting access to dental floss may reflect the policies of correctional facilities. Dental floss is reported to be available in CSC prison canteens;[10] however, it is not permitted within NB provincial correctional facilities, as it may be used as a weapon. NB provincial prisoners are supplied with dentifrice and special correctional facility

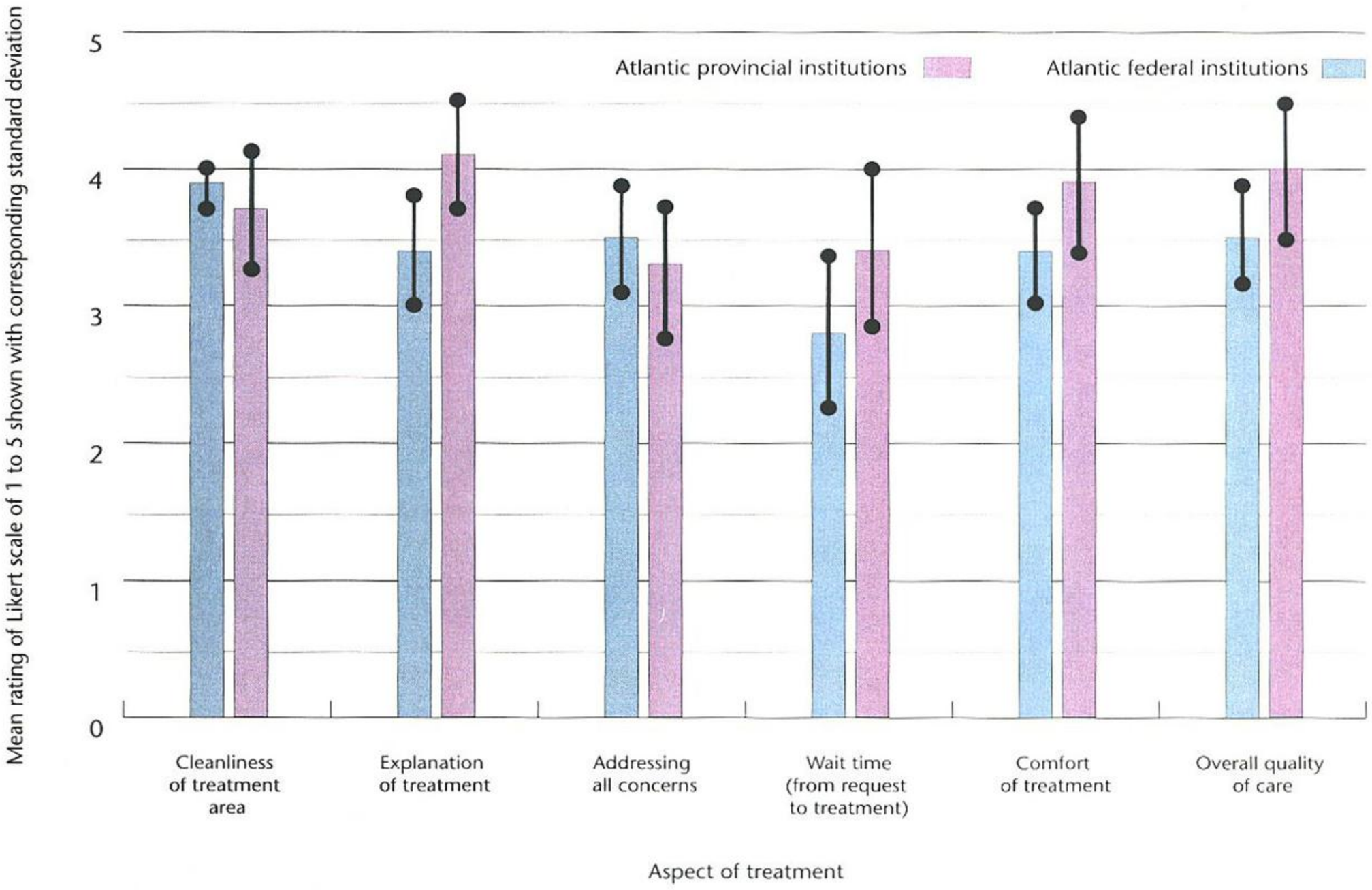
toothbrushes having shorter and more flexible handles to prevent their use in the fabrication of weapons (NB Director of Public Safety Institutional Services, 2011 May 25 [telephone interview]). Restriction of oral hygiene implements has been a recurrent theme in the literature, reported in the USA, the UK, and Australia.[13,24,25]

The reported toothbrushing frequencies were similar to reported frequencies for the general population.[11] Similar findings were noted in the UK—77 per cent of a sample of prisoners at Her Majesty's Prison (HMP) Leeds, HMP Wealstun, and Wetherby Young Offenders' Institution, and 70 per cent of a sample at HMP Brixton reported brushing twice per day.[12,26] However, it should be noted that the same HMP Brixton sample population was also found to exhibit high plaque levels, decayed/ missing/ filled tooth index (DMFT) scores, and periodontal disease prevalence. A study in Australia also recorded self reports of high toothbrushing frequency—50 per cent of respondents brushing twice in one day—with high DMFT scores and higher extraction rates than the general Australian population.[13] The authors of the study at HMP Brixton do not discuss possible reasons for the discrepancy between reported toothbrushing frequency and dental biofilm control; it may be that prisoners have poor toothbrushing technique, did not respond truthfully to the examiners' questionnaire, or have high exposure to cariogenic diet between toothbrushing. These findings illustrate the need for clinical research within Canadian correctional facilities.

Attitudes towards dental services

Twenty-three per cent (9/39) of the respondents reported having dental fear or anxiety. Thirty-three per cent (13/39) of the respondents felt that their access to dental care had improved since release, 23 per cent (9/39) felt that it had deteriorated and 44 per cent (17/39) felt that it had remained the same. Eighty-five per cent (33/39) of the respondents expressed interest in a complimentary dental cleaning. Fifty-four per cent (21/39) of the respondents reported having had dental treatment while in prison. Of these, 62 per cent (13/21) reported accessing treatment in federally operated Atlantic region facilities, 33 per cent (7/21) in provincially operated Atlantic region facilities, and 14 per cent (3/21) in other Canadian or American facilities. Twenty-four per cent (5/21) of respondents—reporting use of dental services while incarcerated—received dental cleanings, 67 per cent (14/21) extractions, 24 per cent (5/21) fillings or root canal treatment, 19 per cent (4/21) denture fittings, and 10 per cent (2/21) dental exams. Figure 2 compares the attitudes

Figure 2: Attitudes towards provided dental services of respondents accessing dental services while incarcerated in federally- (N=15) and provincially-administered (N=8) institutions within Atlantic Canada.



towards these dental services conveyed by respondents who reported accessing dental services while incarcerated at federally administered and provincially administered correctional facilities within Atlantic Canada. Eighty-six per cent (18/21) of the respondents who reported dental treatment while incarcerated reported having dental services paid for by prison coverage, 10 per cent (2/21) by Ministry of Indian Affairs and Northern Development, and 14 per cent (3/21) by social services.

This study found that extraction was the most frequently reported service accessed at respondents' most recent dental visits, as well as at their dental visits while incarcerated. This may reflect on the policies of the correctional institutions. Inmates in New Brunswick provincial institutions receive only emergency treatment (New Brunswick Director of Public Safety Institutional Services, 2011 May 25 [telephone interview]). Published literature indicated that remand prisoners in Australia also typically receive only emergency dental treatment.[13]

The percentage of respondents of this study reporting dental fear or anxiety was low compared to findings by Heidari et al.[12] at HMP Brixton—49 per cent of their sample reported the same.[12] However, by Canadian standards, it may in fact be somewhat high: a recent survey of 1101 Canadians indicated that 15.3 per cent of the general adult population is expected to be at least somewhat afraid of the dentist.[27]

The results of the present study did not indicate clearly whether former prisoners' access to dental services was perceived to be greater while in prison or since release; however, CSC data suggest that federally incarcerated individuals visit the dentist more frequently than comparably aged Canadians.[10] Several of the respondents of this study indicated informally that they had not made the effort to seek treatment since release. This self reported lack of motivation may relate to findings from:

- the *Oral Health Component of the Canadian Health Measures Survey,* which indicated that lower income Canadians experience diminished use of professional dental services and have increased dental treatment needs when compared to those with higher incomes,[11] and
- to the findings of Heidari et al. that prisoners made more use of elective dental services while in prison than outside. Their respondents generally rated their oral health as poor and thought they needed treatment (71%).[12]

This self assessment of need is similar to that of the respondents of this study—85% of whom exhibited interest in a free dental cleaning—and is in contrast to findings of the Osborn et al.[12] study that prisoner self perception of need for a dental cleaning was low (8.2% among males and 10.6% among females). However, only 13 per cent (5/39) of this study's respondents reported having a dental cleaning while incarcerated. Again, this may be related to policies of the correctional institutions.

Significance of findings to Dental Hygiene

Osborn et al. suggested,[13] "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." Other recommendations in the literature include the establishment of structured oral hygiene and diet counselling programs to decrease dental decay among prisoners[12,16] and additional periodontists and dental hygienists in the prison system based on treatment needs.[18]

Numerous strategies have been explored to provide dental services to prisoners. Tactics employed in the American facilities include permanent staffing by US Public Health Service dentists,[16] private contractors,[16,28–30] partnerships between academic institutions and prisons to provide dental and dental hygiene services,[16,25,28,31,32] and employing prisoners themselves as dental assistants.[16,33]

In Canada, arrangements for dental treatment have involved salaried part time dental staff, prisoners trained to fabricate dentures, and services provided by local dentists (New Brunswick Director of Public Safety Institutional Services, 2011 May 25 [telephone interview]).[34] Specific data on employment in prison settings were unavailable for Canadian dental hygienists; 0.3 per cent of dental hygienists in the USA reported a prison environment as a primary workplace, and 0.4 per cent as a secondary workplace.[35,36]

The legal mandate for dental services in Canadian correctional facilities could provide increased opportunities for dental hygienists to provide oral health promotion and oral hygiene education services, as well as clinical services, to a population with multiple oral health risk factors. There may also be partnerships formed with private sector corporations or educational institutions for which hygienists could act as administrators.

CONCLUSION

Summary of findings

While the study sample size was limited, this study's findings imply that Canadian prison populations are likely to present with high oral health needs due to multiple risk factors. Correctional facilities may provide a novel environment for initiatives to improve oral hygiene self care modalities, as prisoner motivation to perform these habits is indicated to be advantageous.

Recommendations for future research

The oral health status of Canadian prisoners must be determined via clinical research within institutions, preferably in larger, multicentre studies. Other important facets to consider are the efficacy of current dental interventions, prisoner access to oral hygiene implements, and the potential benefits of an oral hygiene education program within correctional facilities.

Recommendations for optimal methodology have been made in the literature. Research initiatives could capitalize on routine prisoner screenings to provide more comprehensive oral health data.[7,12] Walsh et al.[7] recommend prospective studies rather than retrospective analyses of chart records. Longitudinal and intervention studies are recommended in Canadian institutions to

determine the efficacy of prison dental services. These recommendations are in accordance with those of Walsh et al.[7] in the UK, and Mixson et al. and Salive et al. in the USA.[16,17] Based on the findings of American and Australian studies, oral health of prisoners may vary by gender[13] and by ethnicity.[16–18] Future research should attempt to determine whether similar patterns prevail in Canadian institutions. Furthermore, research should distinguish between institution types. This study's findings showed that available dental services and oral hygiene implements vary by institution type—comparing different prison types was also recommended by Salive et al.[17] Finally, according to Boyer et al.,[15] studies conducted on Canadian prison populations should follow a standardized, transparent methodology to facilitate comparison of data sets.

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- Saint John Community Chaplaincy, Saint John, NB

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Supplementary information

The revised questionnaire *Oral Health Needs of Formerly Incarcerated New Brunswickers* is available with the online version of this article (www.cdha.ca/onlinejournal/Suplementary_Information.pdf) or it may be requested from the corresponding author.

Conflict of Interest

The authors declare no conflicts of interest.

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