Homelessness and Oral Health in Toronto

by

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Abstract

« **Objectives:** This study aimed to assess the oral health status of the Toronto adult homeless population; to learn how they perceive their own oral health; and how they interact with the dental care system.

Methods: This cross-sectional descriptive study collected data from 191 homeless adults who were randomly selected using a stratified cluster sample at 18 shelters. A questionnaire and clinical oral examination were conducted with participants.

Results: The mean Decayed/Missing/Filled Teeth (DMFT) score of the subjects was 14.4 (SD=8.1). Only 32% of them had visited a dentist during the last year; 75% believed that they had untreated dental conditions; and 40% had their last dental visit for emergency care. The clinical oral examination observed that 88% needed fillings, 70% periodontal, 60% prosthodontic and 40% emergency treatment.

Conclusion: Homeless adults in Toronto have poor oral health, significant oral health treatment needs and a lack of access to dental care.

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1 Introduction

There are direct and evident associations between homelessness and health.[1-3] Keeping healthy is one of the most serious challenges facing a person without adequate shelter, and this includes oral health. The homeless life-style makes it difficult to maintain personal hygiene, which worsen existing oral health problems and causes new ones. Among homeless individuals, it is common for oral problems to be ignored, which can lead to pain and infection that require more extensive and costly care.[4-6] Oral health impacts people's quality of life, social interactions and employability,[1,2,4,7-9] and socio-economic inequalities have a major influence on patients' experience of health, healthcare access and patterns of use of the healthcare system.[10-12]

In Canada, oral and dental care can often be limited to those who can pay, either out-of-pocket or from dental insurance plans funded as an employment-based benefit. The public healthcare system has limited programs for dental care, which mainly address the needs of children with acute problems.[13] The current system of providing dental care in Canada is not effectively meeting the oral health needs of individuals who are homeless and/or in poverty; moreover, it is suggested that the barriers homeless people face in accessing dental care are also related to the general scarcity of dental resources rather than only barriers related to factors associated with homelessness such as behavior, attitudes and psycho-social motivation.[13-15] Hospital emergency departments are frequently used by homeless people for oral/dental problems. However, emergency departments are not usually equipped or suitably prepared for dental interventions.[3,10,12,16] Indeed, the level of dental care in emergency rooms rarely involves much more than symptomatic advice or prescriptions for antibiotics and analgesics.[17] Given

these multiple risk factors for the homeless population it is expected that their oral health will be worse than the general population.

While more is known about the medical, psychiatric, and socioeconomic factors associated with homelessness, there has been a lack of research on the oral health status of the homeless population in Canada. Although it has been recognized that oral diseases represent a tremendous burden for people living in poverty, few studies have obtained data on the oral health condition of the homeless population in Canada and Toronto.[2] Therefore, this study was designed to investigate the current oral health status of the adult homeless population in Toronto and how they perceive their oral needs, as well as the patterns of oral healthcare use of this population.

Homelessness and its characteristics also make it a challenge to study this population. In order to understand some of these difficulties, a few concepts first need to be addressed. Initially, the phenomenon of homelessness seems to point towards a distinct group of people; however, not only is it a challenging task to distinguish this group, it is also a controversial matter. Attempts to define homelessness and estimate its magnitude represent more than an academic exercise. Definitions embody political statements as well as value judgments. Different definitions of homelessness have a direct influence on the statistical estimates of this population. Thus, the literature review below was designed to discuss these issues. Firstly, the different definitions of homelessness and its variations will be discussed. Secondly, the demographics of the homeless population will be introduced. Thirdly and lastly, there will be a presentation of that which is already known about the oral health status of homeless people in other communities and countries, and the impact this has caused on their lives.

2 Literature Review

2.1 Definition of Homelessness

There does not seem to be an international consensus on what constitutes homelessness. Questions and considerations about the inclusion of different subgroups of people have led to endless discussions concerning the definitions of homelessness. Definitions reflect different purposes, ideologies, political statements, and value judgments. The general concept of being homeless is the idea of people who live “on the street” and have no fixed address. However, there are many difficulties in reaching a consensus on a definition of homelessness and it is compounded by the very mobile nature of the homeless population. The mobility of a homeless person is manifested in two ways: geographical – from one city to another; or between types of accommodation – from shelter to shelter, friend’s house to friend’s house, and so on; and very often a combination of both. Nonetheless, there are exceptions to this general rule. For example, nomadic people do not have a fixed address and move from place to place, but they are excluded from most discussions of homelessness because they are categorized as having a travel-based culture and society. On the other hand, people who have lived in the same shelter for long periods of time are not mobile, but are usually considered homeless.

Theoretically, homelessness is the social and economic phenomenon characterized by the people who lack housing, usually because they cannot afford it, or are otherwise unable to maintain, regular, safe, and adequate shelter. It is also “a condition of detachment from society characterized by the absence or attenuation of the affiliative bonds that link settled persons to a network of interconnected social structures”.[18] The term "homelessness" may also include people whose primary nighttime residence is a homeless shelter, an institution that provides a temporary

residence for individuals intended to be institutionalized, or a public or private place not designed for use as a regular sleeping accommodation for human beings.[20,55,56] In North America the term "homeless" began to be used in the late 1970s with the noticeable presence of people living on the streets.[4,19] Poverty, unemployment, low wages, lack of affordable housing, mental and chronic illness, substance abuse, deinstitutionalization and family crises are the most common circumstances predisposing people towards this situation.[4,19-24,28-30] The population defined by homelessness is as diverse as is the experience of homelessness itself.

Defining homelessness is a controversial issue and has been at the centre of major policy considerations. Homelessness includes a much broader range of circumstances than merely a lack of appropriate accommodation; however, the use of a vast definition tends to increase the number of this population.[4,19-24] The definition varies according location and functional dynamics of the society; furthermore, homelessness is not a characteristic of an individual but is rather a life situation that may be temporary, cyclic or chronic.[20-22,38] In 1987, the Homeless Committee of the City of Montreal reached consensus about the definition of homeless, which was adopted by the Quebec Department of Health and Social Services in La Politique de la santé et du bien-être*:*

"A person with no fixed address, stable, safe and healthy housing for the next 60 days, an extremely low income, adversely discriminated against in access to services, with problems of mental health, alcohol and drug abuse or social disorganization, and not a member of any stable group."[20]

The phenomenon of homelessness, which incorporates complex causes and has the potential for tragic consequences, is directly related to poverty.[22,38,41] Literally, the subgroups of persons with high risk for becoming homeless include persons with mental disability or post-traumatic

stress syndrome (war veterans); those who have suffered domestic violence; have addiction problems*;* with limited or no social assistance support; and persons with income insufficient to maintain a home (unskilled workers and single mothers). [2,20-22,38,41,50,81] The condition of homelessness also causes and exacerbates health problems, leading to rates of illness and injury from two to six times higher than people who are housed.[1,2,8,10-12,16,48-50,52-54] Homeless individuals' personal issues (economic, self-esteem, cognitive and mental problems) lead to denial or lack of recognition of health problems mitigating against access to appropriate health care. Therefore, acute and chronic health problems may go underestimated or untreated, creating medical complications that worsen the homeless individuals' life condition.[2,3,10-12,52-54]

2.2 The Demographics of Homeless Populations

In population statistics, the number of homeless people is usually only a rough estimate.[56] Census is traditionally accomplished on the basis of domicile, so that to count those without a fixed address requires a different methodology. Estimations of homeless populations are usually based on extrapolations from estimations in community neighborhoods. Surveys which are based on scientific sampling procedures usually provide much smaller estimates than the numbers that exist in reality.[6,20,21 30] There are several problems associated with counting the homeless: it is easy to miss those people who sleep in box cars, in campgrounds or in all the other places that researchers are not aware of, or unable to reach; respondents may refuse to be identified or deny their homeless status; and those who are homeless for short or intermittent periods of time, or are homeless even occasionally, may not be included.[21,30] Consequently, the literature predicts that

the magnitude of homelessness is probably much higher than the statistics are capable of estimating.[20,22,56]

In addition to the regular difficulties in determining how many homeless people there are in the world, because of the different legal definitions of homelessness, natural disasters and sudden civil unrest also complicate the picture. The United Nations Commission on Human Rights 2005,[94] conservatively estimated 100 million homeless all over the world. This report looked only at people who did not have any home whatsoever and did not include people who lived in semi-permanent places such as abandoned buildings, vehicles, hastily put together shelters or tents. The report also did not include the "hidden" homeless, who bounce from shelter to shelter or from friend's house to friend's house. No one really knows exactly how many people do not have any permanent place to call their own, and since different countries might have different approaches to counting homeless people, comparisons should be made with caution. It is estimated that there could be as many as another 100 million hidden homeless in the world, bringing the conservative estimate of the total population of homeless to 200 million.

Recent data on homelessness, indicate that the number of homeless persons could range from 3.5 million to 13.5 million persons in United States.[65] In the European Union this number could reach 3 million, and approximately 100,000 in Australia.[72] The United States Conference of Mayors' "Hunger and Homelessness Survey" in 2004, estimated that the homeless population consisted of 41% single men, 40% families with children, 14% single women, and 5% unaccompanied youth.[22] Gibson *et al*, in 2003, observed that 23% of the homeless population was mentally ill, 30% were substance abusers, and 10% were veterans.[6] The same survey revealed that the length of time people were homeless was an average 8 months in the United States. Similar results were found in Hong Kong, in 2006, where 60% of the homeless

population lived on the street for less than one year.[7] Furthermore, these studies showed that17% of the homeless were employed in full-or part-time jobs in the United States, and in Hong Kong, 18% were employed full-time, and 8% were working temporily.[7,22]

2.2.1 The Demographics of Homeless Populations in Canada

In Canada, there are no accurate national statistics on the size of the homeless population.[66] Canada's National Secretariat on Homelessness has estimated that the problem affects approximately 150,000 people,[66] although other sources estimate Canada's homeless population, including not only those living in emergency shelters, to be between 200,000 and 300,000.[67,69] On any given night, 40,000 people stay in homeless shelters. [62] Single men are the largest segment of homeless people in most Canadian cities, but the Women's Housing Advocacy Group, in 2003, reported that women and children were the fastest growing group of those who were homeless in Canada.[68] Families with children living in poverty, street youth, Aboriginal persons, persons with mental illness, the working poor, and new immigrants were disproportionately reflected in the homeless population.[69] Barbara Murphy, a social policy consultant to the public and private sectors in Ottawa, estimated that on any given night in the year 2000, there were people sleeping in shelters or on the street, in numbers of up to 10,000 people in each of Montreal and Toronto, up to 5,000 in Vancouver, and between 1,000 to 2,000 in each of Edmonton, Calgary, Ottawa, Winnipeg, Hamilton, Halifax, Saskatoon and Regina.[21]

In Toronto, the City of Toronto eviction study found that over 30,000 tenant households faced eviction in 2005.[70] This number represented over 76,000 persons (women, men and

children). Furthermore, this study observed that 29% of the tenant households evicted ended up going to emergency homeless shelters and another 29% joined the ranks of the "hidden homeless" by finding temporary accommodation with family or friends.[67] More recently, the Toronto Street Needs Assessment Results 2009 homeless report card noted that the overall number of Toronto homeless population has remained stable, being comparable with a study using the same criteria methodology in 2006. In this study, the methodology used for counting the homeless population in Toronto was "point-in-time" which counts homeless people on one particular day. This method does not investigate the "hidden" homeless, which means that the number of homeless people has been underestimated. [73]

Table 2.1 shows the demographics of the homeless population in some Canadian cities. The methods and definitions used to count the homeless population in different jurisdictions are not the same, thus, direct comparison of the absolute numbers is not always appropriate.

Table 2.1: Estimates of Homeless People in Canada

City (year of the survey)	**Homeless (n)**	**Sheltered Homeless (n)**	**Hidden Homeless (n)**
Toronto (2009)		5,086	
Montreal (2009)	25,000		
Halifax (2009)		1,718	
Vancouver (2009)	2,660		23,543
Victoria (2008)	1,500		
Calgary (2008)	4,060		
Edmonton (2008)	3,079	1,217	
Saskatoon (2008)	260		
Winnipeg (not reported)		1,915	7,600
Ottawa (2008)		7,045	
Saint John (2008)		2,374	
Yellowknife (2008)		936	

Information obtained through: http://intraspec.ca/homelessCanada.php [71]

2.3 Oral Health

Homelessness reflects a diversity of challenging experiences; however, the face of homelessness typically includes an image of poor oral health.[5-7,23-29,31-35,60] The lack of permanent residence, psycho-social motivation, health insurance and money, make this vulnerable population one of the most limited populations with access to health care providers.[4,22,23,35] The literature reveals that studies of homelessness and oral health are limited to quite small sample sizes.[7,23,24,26-,27,29,31-34,37,39,40] However, overall, these studies have confirmed that homelessness is directly associated with poor oral health, and have described this population as suffering from significant oral health needs, including a high prevalence of missing and decayed teeth, gum disease, oral pain, infections and other related conditions in need of urgent care.[1,4,10,19,37,57,60]

Kaste *et al*, in Boston, in 1995, found 91.4% of the homeless adults had untreated dental caries, indicating a very high need for preventive and restorative dental services.[31] Han *et al*, in 1999, observed that in the United States dental problems were the main reasons for visits to The Health Care for the Homeless Program (HCHP), with advanced dental decay present in 57% of homeless adults.[35] De Palma *et al*, from 2000 to 2003, in Stockholm, detected a Decayed, Missing, Filled Teeth Score (DMFT) of 27.0 for women and 26.0 for men who were homeless.[33] Similar observations were made in Brisbane, Australia, where more than 95% of the homeless participants had significant calculus deposits, showing a lack of dental hygiene and motivation to seek oral care.[32]

Table 2.2 lists studies that provided descriptive data of the oral health status of the homeless population in different countries.

Table 2.2: Studies on the Oral Health Status of Homeless People

Author Year	Location	Sample size	Age Range	DMFT*	Selected Findings
Jago *et al*.,[32] 1984	Brisbane Australia	162	15-85	21.1	34.6% need urgent treatment for pain and infection; or pulpally involved teeth; or large carious lesions and fractured teeth.
Lee *et al*.,[24] 1994	Toronto Canada	174	14-25	5.7	40.8% had not been to the dentist in the previous 2 years.
Kaste *et al*.,[31] 1995	Boston U.S	73	19-64	19.7	88.6% were missing one or more teeth.
Blackmore *et al*.,[46] 1995	Leeds U.K.	101	18-75	20.8	59% of the dentate men had 12 or more missing teeth, and 69% need some dental intervention.
Clarke *et al*.,[60] 1996	North York Canada	155	14-20	3.44	59% had not been to the dentist in the previous year, and 18% had toothache in the previous 4 weeks.
Waplingon *et al*.,[47] 2000	Birmingham U.K.	70	19-94	19.7	52% had root caries and 54% caries involving the pulp.
Gibson *et al*.,[6] 2003	U.S national survey	1152	24-79	16.0	68.1% reported need for dental care.
Palma *et al*.,[33] 2005	Stockholm Sweden	147	20-79	27.0	Almost 100% had calculus and considerable plaque accumulation.
Luo *et al*.,[7] 2006	Hong Kong China	147	21-75	9.1	53% considered their oral health poor or very poor, and 52% had dental pain in the previous year.
Conte *et al*.,[29] 2006	Newark U.S.	46	40.4 (mean age)	16.2	66.7% reported oral facial pain during the previous year.

*DMFT: Decayed/Missing/Filled Teeth

In Canada

In Canada, the oral health situation of the homeless population is equally problematic.[57] Pizen *et al*, in Montreal, in 1993, found that 85% of the homeless people examined needed some dental treatment, and only 6% thought that dental health was not important.[23] In the same year, in Toronto, Lee *et al* observed that about half of the homeless youth from 14 to 25 years of age experienced dental pain, and nearly three-quarters (74%) of this population expressed their need for dental care; in addition, they were unaware of dental services that they could access.[23,24] Likewise, Clarke *et al* observed that 84.5% of the homeless youth in North York required dental treatment ranging from dental scaling to more complicated restorative and surgical treatment.[60] However, in Toronto, the oral health status of homeless adults has never been reported.

2.3.1 Causes of poor oral health

Among the complexities of homelessness, there are many known factors that contribute to poor oral health. These include:

- the homeless' lifestyle with no control of basic needs: poor diet associated with poor or non-existent oral hygiene habits;
- lack of money and access to preventive and restorative oral health services;
- mental health problems and substance abuse;
- acceptance of poor dental health and poor dental appearance as a normal condition;
- lack of psycho-social motivation. [5,25,35]

With the homeless life style it is expected that these factors exacerbate existing oral diseases and increase symptomatic problems.[7] Furthermore, the associations between oral health status, dietary practices, nutritional status, and general health status are complex and mutually dependent on one another. Inadequate nutrition affects oral health, and poor oral health affects food choice. In addition, homeless individuals are much more predisposed to violence than the general population, which could explain the high prevalence of oral traumatic injuries observed among them.[4,25] Many homeless people are unhappy and aware of the consequences of poor oral hygiene and its implications, as one young homeless person in Toronto reported:

"*I left home two weeks ago and I haven't been able to brush my teeth since. I hate that feeling – my teeth all furry. It's kind of embarrassing.*"[25]

Homelessness is a circumstance that can be translated into loss, not only of a permanent home but also self-esteem, self-confidence and social competence.[38,55] Homelessness also leads to a detachment from society, resulting in social exclusion or marginalization, because general and oral appearance is directly related to the level of personal acceptance in our society.[37] Physical characteristics such as having an unpleasant smell, being unclean, poorly dressed, having unsightly teeth can cause physical revulsion and aversion, devaluing and discrediting the person.[3,23,24] Illicit drugs (i.e. marijuana, crack, cocaine, crystal meth) and alcohol use disorders are widespread among the homeless population and have led to a general complaint by the homeless that health care providers do not give enough credit to the information provided by them.[1,2,10,15,26,43] This social intolerance between professional and patient makes homeless people reluctant to disclose their homeless status. It also affects the precision of diagnosis and efficacy

of treatment, therefore resulting in increased cost to the public health system, with a low rate of return for medical/dental follow-up appointments.[3,10,12,16] A lack of motivation is also present, as they can find it acceptable to have missing teeth, bleeding gums, no teeth at all, and may not consider these factors to be a physical or social limitation.[4,7,23,24,31,60]

The level of social exclusion combined with the transient lifestyle of homeless individuals affects their understanding of healthcare services, thus they present many barriers, such as lack of trust and unrealistic expectations of health professionals with regard to providing healthcare, including dental services.[2,3,35] Nevertheless, the major barrier that homeless people face is the cost of dental treatment. A homeless person cannot afford dental treatment on a regular basis and in the majority of cases, neither at a lower cost, as is offered by precious few institutions or special dental clinics.[25,35] Although certain groups of patients, such as children, youths aged 18 or 25 years old, seniors 65 years or older, and those on welfare benefits are exempted from charges for dental treatment in some clinics, the homeless cannot always take advantage of these benefits because they are unable to prove their eligibility (i.e. lack of personal documents) and they are unaware of the availability of these services.[12,44,57]

In Canada

In Canada, there are some indications that individuals who are homeless tend to rely on emergency departments as a source of treatment for dental pain and infections. Among homeless people, it is certainly possible that the higher rates of hospital emergency room use for oral/dental problems reflects the delay in receiving treatment for diseases early in their course.[3,10,12,16] Nevertheless, although homeless people have a greater burden of oral health

needs, the reality of their lives is that oral health, while nothing is hurting, is not as high priority to them, as are the other basic and more urgent needs, such as obtaining food and finding a place to sleep.[3,26,28]

The following factors are the most common barriers faced by the homeless population, in Canada, in accessing oral and dental care services: [13,23-25,44,60]

- not every homeless person has welfare benefits or any other dental insurance;
- lack of awareness of the few dental clinics that provide free or low cost dental treatment;
- due to fear of losing regular patients, not all dental professionals are willing to see homeless patients in their offices during regular working hours, because of the homeless individual's appearance, poor personal hygiene, unpredictable and disruptive behavior;
- the idea among dentists that homeless people may be a problem patient, who would be difficult to contact and have difficulty in keeping appointments;
- considerable misconceptions and negative stereotypes (the last two factors listed above) make the homeless perceive themselves as being discriminated against, which not always is real, but it is significant enough to make them avoid dental services in private clinics.

Providing the homeless population with oral health care services has been a challenge to the government, as there appears to be little political will to establish primary services in locations to which there is easy access, and on an affordable basis. There is clearly a need for urgent measures to provide oral preventive programs and comprehensive dental treatment to this population.

Health policy decisions geared toward lowering the barriers to appropriate dental health care use are needed.[11,51,57] When it comes to establishing an oral health care program for the homeless population, health authorities have difficulties in planning cost-effective interventions because there is a lack of reliable information on the available workforce and the epidemiology of oral diseases in this section of the society.[23,47,60] In addition, dental services are unavailable, most probably due the high cost of establishing and operating dental clinics, and this could be the reason why funding for oral care is frequently deferred to other public services.[51,81]

2.4 Purpose of the study

Initiatives and programs providing homeless populations with basic oral health care have been seen in many countries; however, there is no model that can be universally applied. To meet the needs of the homeless population in Toronto, an oral health program should be tailored to the local characteristics of the population and the local environment. The identification of the oral needs of this homeless population is the first step in this process and represents the purpose of this study.

The specific objectives of this study were as follows:

- To identify and quantify the oral health status and needs of the adult homeless population in Toronto;
- To determine how the homeless perceive their oral health and their dental experiences;
- To determine how the homeless use dental care services in Toronto as well as to define their interaction with the dental care system.

3 Research Methodology

3.1 Study design

This project was a cross-sectional descriptive study. It took place in Toronto homeless shelters designated for adult males, adult females, mixed adults, and mixed youth. The data collection instrument was composed of two parts: a structured questionnaire administered through a face-to-face interview and a clinical oral examination. Both parts of this study, interview and oral examination, were carried out in a homeless shelter in a separate room or in a private location at the facility in order to protect the privacy of the participants. The data collection was performed immediately after recruitment of the subjects and conducted by a trained dental professional. Overall, it took between twenty and thirty minutes to complete both parts of this assessment with each participant.

3.2 Ethics

All aspects of this project were approved by the Research Committee, Faculty of Dentistry, University of Toronto. An ethical approval was obtained from the University of Toronto Office for Research Ethics – Research Protocol Reference # 24808 (Appendix 1).

3.3 Sample size calculation

This study was designed to create a profile of the oral health status and the treatment needs of the adult homeless population in Toronto. The null hypothesis tested was that the oral health status and oral care needs of homeless adults in Toronto would be the same as the general population. Sample Power Version 3 (SPSS®, Chicago, III, USA) was used for the sample size calculation.

With the proposed sample size of 150 cases, the study would have power of 82.2% to yield a statistically significant result. This computation was based an expected mean of 3.8 decayed teeth (DT) among the adult homeless population (as observed in Conte M. et al, 2006)[29] to be tested against the Canadian adult general population (DT= 2.9, as reported in the Summary Report of the Canadian Health Measures Survey 2007-2009)[80] .The criterion for significance (alpha) was set at 0.050.

To ensure that sufficient data were obtained from respondents for analytic purposes and to compensate for unexpected occurrences during data collection (drop-outs, etc), the sample size was increased by 30% to the approximate number of 200 subjects.

3.4 Participant selection criteria and enrolment

For this study, a homeless person was considered anyone eighteen years of age or older, able to communicate in English and that has been living in a shelter for at least 7 days preceding the survey. The clinical oral examination did not involve any kind of invasive procedure (i.e. periodontal probing); therefore, no hazardous procedure was performed that could put the

participant at any kind of health risk. This oral examination was suitable even for individuals with medical restrictions, which require prophylactic antibiotic coverage for dental procedures. The exclusion criteria for this study were:

- Individuals who declined to give informed consent to participate in the study
- Individuals who exhibited altered behavior (e.g., abusive, psychotic, cognitively impaired or severely intoxicated) at the time of the interview, as determined by the interviewer. This measure was to lessen the risk of harm to the patient and/or the examiner during the interview and/or clinical oral examination
- Individuals who had already taken part of the study in another shelter
- Individuals who were not homeless or living in the shelter, but were visiting the shelter for other reasons (food, clothes, counseling, etc)

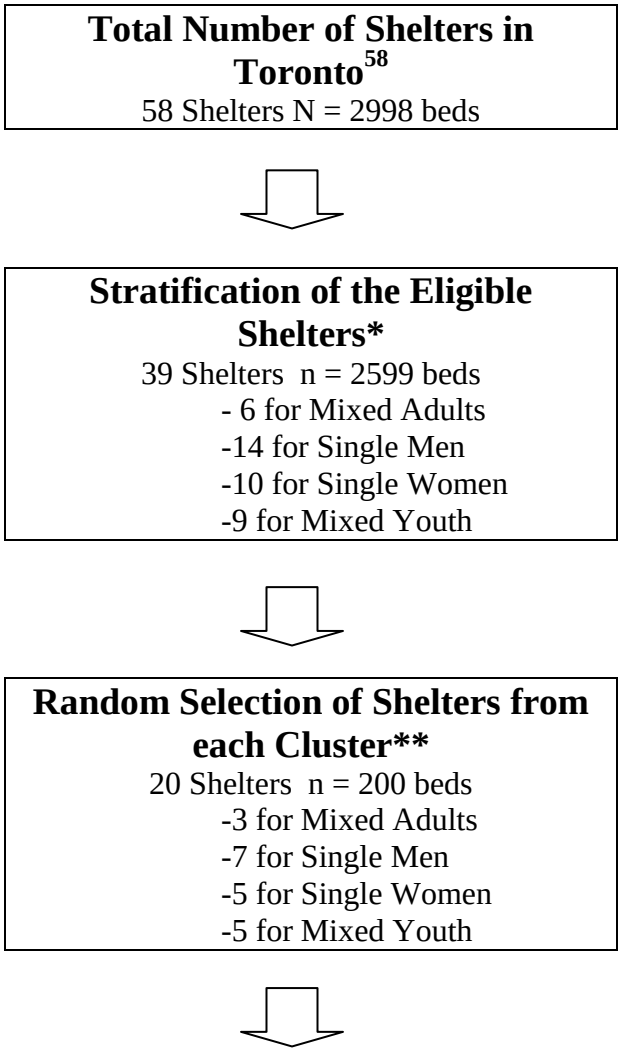
3.5 Sampling Strategy

Participation was voluntary. Due to the difficulty in compiling a list of the elements composing this population, a stratified cluster sample design was used in this study. The selection and recruitment of the participants started by excluding the shelters for families and children from the 58 homeless facilities in Toronto. The shelters were stratified and clustered by type of shelter: male, female, mixed adults and youth. From the 39 units eligible for this study 20 facilities and 10 subjects from each shelter were randomly selected using a proportional allocation from each cluster based on bed numbers. The Toronto shelters were identified through the "2009 Guide to Services for People Who Are Homeless" [58].The random sampling for both shelters and shelter bed numbers was done through the website: Research Randomizer

http://www.randomizer.org/ . This sampling program uses a JavaScript random number generator to produce customized sets of random numbers, and this service is part of Social Psychology Network. This approach is illustrated in the flow diagram in Figure 3.1.

This study's target was to enroll 200 single homeless adults, from 20 shelters, 10 participants from each shelter. The survey's sampling plan included only homeless adults in Toronto who use shelters, which represents 72.2% of the homeless population in Toronto[54], and excludes the subpopulation of homeless people who avoid using shelters, homeless families with children and youth under the age of 18 years old. The decision to exclude those who avoid using shelters was based on practical reasons: difficulty to identify and reach these individuals; impracticable random selection; and the necessity to have a physical location to collect the data (not feasible on the street). Homeless families, children and youth under age of 18 were excluded because a different instrument design with a different approach would be necessary to collect similar data from this subgroup of homeless population.

Figure 3.1: Flow Diagram of Selection and Recruitment



Random selection of Participants at each shelter

	Shelters eligible*	Shelters selected**	Number of Participants
Mixed Adults	**6 (15%)**	**3 (15%)**	**30**
Single Men	**14 (36%)**	**7 (35%)**	**70**
Single Women	**10 (26%)**	**5 (25%)**	**50**
Mixed Youth	**9 (23%)**	**5 (25%)**	**50**
Total	**39 (100%)**	**20 (100%)**	**200**

[58] 2009 Guide to services for people who are homeless, Toronto.

After obtaining the shelters' contact information an invitation letter to participate in the study was sent by mail to each of the selected shelters (Appendix 2). Approximately two weeks after mailing the invitation letter the shelter's managers were contacted by telephone. A meeting was then arranged with those who showed interest in participating in the study. The purpose of this meeting was to establish first contact with shelter personnel; clarify details about the procedures of the study; discuss the study instrument; answer questions, concerns and requirements; and decide which room or location in the shelter was appropriate to conduct the survey. At the end of this process 18 shelters agreed to participate. The reasons that two of the shelters refused to participate were: the first shelter was undergoing major renovations; and the other was a shelter only for refugees and the residents had problems in understanding and expressing themselves in English. However, the biggest shelter in Toronto, Seaton House, with more than 600 residents, suggested that a sample of 10 subjects for this shelter would under-represent their population; therefore, it was suggested to sample 10 participants from each of the shelter's programs. Three programs were chosen: Hostel Program (1st floor) with 215 individuals; Annex Program (3rd floor) with 90 participants; and Long Term Program (4th floor) with 126 residents. Again, due to language limitations, their program for refugees was excluded. In this way, the sample target of 200 subjects was reached with 18 shelters (one shelter with 3 programs) accepting to participate in this study.

A schedule was also established with the shelter management in order to conduct the survey. On average two weeks before the survey, a poster to advertise the study (Appendix 3) was given to shelter managers and asked to be posted in an area of easy access to all residents. The visits to the shelters were done during busy hours or according to the convenience of the shelter's dynamic. To reduce bias, it was agreed that if it would be necessary, multiple visits to

the same shelter would be scheduled at least 7 days apart, on a different weekday from the previous visit and without announcing the day of the visit to potential participants.

The shelters operate on a "drop-in" basis which justifies a random selection of subjects based on shelter bed numbers. The day before visiting shelters for data collection 15 randomly selected bed numbers were provided to the shelter's manager for identification of participants. The decision to select 15 bed numbers when the target was 10 participants was based on the assumption that some of the selected subjects would not participate in the study. The day of the data collection, potential participants were approached by a shelter employee, invited to participate in the study and then asked to go to the designated area for the survey.

The principal investigator and the recorder individually welcomed the participants. A hard copy of the Study Information (Appendix 4) was handed to the potential subjects with a verbal explanation of the study, answering any question that was asked. Those who agreed to participate were then asked to sign the Consent Form (Appendix 5).

To reduce the risk of duplicate interviews, each assessment began with collecting the name, date of birth and gender of each participant for subsequent database comparison and identification of potential matches. The study investigator was also able to visually identify potential duplicate enrollees. However, if someone was interviewed more than once, only the data from the first interview would be used for data analysis.

3.6 Survey Instrument

Part I consists of a 42-item questionnaire administered through a face-to-face interview with multiple-choice questions, questions with write-in options, and open-ended questions allowing for comments (Appendix 6). Most of the questions used in this questionnaire are from the "Oral Health Component from Canadian Health Measures Survey – Statistics Canada 2008"; and the other questions were sourced from peer articles at the literature review stage. The questionnaire is divided in three sections: 1) Oral Health; 2) General Health; and 3) Socio-demographics**.**

- **"Oral Health"** was made up of 22 questions focused on how participants perceives their oral health status; frequency and reasons for dental visits; consciousness about their own needs concerning their oral health; oral hygiene habits and frequency; their experience related with tooth pain episodes; their behavior dealing with tooth pain and the impact caused in their lives; their patterns of utilization for oral care services in Toronto; satisfaction and importance of their own oral health; having dental insurance; and choice of location to have dental care provided.

- **"General Health"** was composed of 6 questions aimed to gather information about how they perceived their general health; any existing chronic health condition or disability such as diabetes, heart problems, etc; frequency of emergency rooms and hospital use; where they first go when they need health care; and information about illicit drugs.

- **"Socio-demographic"** with 14 questions intended to outline the profile of participants concerning how long they had been living in a shelter; occurrence and duration of homelessness; where they were living when they first became homeless; how often they have difficulty finding shelter, enough to eat, clothing, a place to wash and a bathroom; how frequently they use food programs; where they were born, Canada or outside Canada; to which racial or cultural group they belong; their highest level of education; their job status; their income in the last 30 days; and their marital status.

The questionnaire took between fifteen to thirty minutes to complete and the questionnaire was completed prior to the oral examination.

Part II, the "Clinical Oral Examination" (Appendix 7), had the purpose of identifying the current oral health status and needs of participants. The odontogram model used for this examination was from the "Oral Health Component from Canadian Health Measures Survey – Statistics Canada 2008". This model uses codes for teeth instead of teeth surfaces. The teeth coding criteria for this oral examination was also done according to the "Canadian Health Measures Survey 2007-2009, Dentist's Survey Manual and Coding Criteria". The examination also included assessment of gingivitis, calculus, abnormal changes in soft tissue intra- or extra-oral, occlusal and prosthetic status of participants.

The equipment necessary to conduct this oral examination included disposable dental mirrors, wood tongue depressor, disposable gloves, and gauze to remove debris where it was necessary to better visualize the dental structures. No x-rays were taken, and the oral examination was conducted under standardized conditions observing normal infection control protocols**.** To complete the clinical oral examination, each participant's mouth was photographed to better portray the status of the homeless population's oral health. The photograph taken was an intra oral photograph; therefore, the anonymity of participants was preserved. Appendix 8 has examples.

Following the clinical examination each participant received a kit with a tooth brush, tooth paste and dental floss with general oral health instructions, advice and an explanation of appropriate oral hygiene techniques according to each individual's oral condition and necessities; a list of dental clinics which provide free or low-cost dental treatment in Toronto (Appendix 9); and a CA$ 10.00 honorarium, all in appreciation of their time and contribution to the study.

3.7 Examiner Calibration and Reliability

The collection of all data in this study, including the intra-oral examinations and face-to-face interviews were completed by only one examiner, thereby eliminating inter-examiner variability. However, an intra-examiner reliability test was done by performing repeated examinations with volunteer students from the Faculty of Dentistry, at the University of Toronto. A total of three students, approximately 2% of the sample size of this study received a dental

screening examination. This percentage is recommended for this type of reliability test according to Spolsky and colleagues on “Measurement of dental health status”.[74]

To avoid possible memory bias, repeat examinations were never done in sequence and had minimum one week interval between exams. Using SPSS Statistics 17.0, the value of the kappa statistic test obtained for the DMFT score in this intra-examiner reliability was K = 1.00. Values of the Kappa test between 0.81 and 1.00 indicate almost perfect reliability of the investigator (Landis and Koch, 1977).

Test-retest reliability was not done in this study. To examine homeless individuals on two different occasions with a time interval between them to compare the results was deemed unfeasible in terms of their migrant lifestyle.

3.8 Data Analysis

The statistical program SPSS version 18.0 (SPSS®, Chicago, III, USA) was used for data management and analysis. Descriptive statistics were used to summarize numeric and qualitative data such as the socio-demographic characteristics of the study participants. Outcome variables were summarized by DMFT Index (Decayed, Missing and Filled Teeth), mean, standard deviation, median and range (for continuous variables) and by rates and 95% confidence intervals (for the occurrence of specific events such as tooth pain episode).

Statistical tests such as the T- test, Chi-square test, One-way ANOVA and Non Parametric Correlations were used to assess the association between different variables of oral health self perception questionnaire, clinical oral examination and socio-demographic characteristics of study participants.

4 Results

This section presents the socio-demographics, self-perceived oral health, general health and clinical oral examination results of 191 homeless adults selected from 18 shelters in the Greater Toronto Area. All participants in this survey underwent an interview and clinical oral examination followed by picture exposure of their mouth. Comparisons and references to other homeless studies and/or general population will be presented in the "Discussion" section.

4.1 Characteristics of participants

The socio-demographic characteristics of the subjects included in the analysis are shown in detail in Table 4.1 and Table 4.2. This sample included a higher percentage of males (60.7%), whites (56.5%), singles (66.3%) and subjects with a highest level of education equivalent to high school (79.6%). The homeless people in this survey ranged in age from 18 to 75 years old (mean age = 39 years old). The participants were on average 33 years old when they first became homeless and more than 80% were living in Toronto at this time. The mean of the total time that they had been homeless was approximately 4 years and on average they had been living in the shelter where they were interviewed for almost one year. A little under than 40% were immigrants with a mean time living in Canada of 19 years. Three-quarters did not have a job and on average they had been unemployed for over 4 years. During the 30 days prior to the interview approximately 62% of the participants had a total income of CA$500 or less; however, a large majority (78.5% to 92.7%) reported never having difficulty: finding a shelter; finding enough to

eat; finding clothing; finding a place to wash; or finding a place to use the bathroom. Also, over 70% of the subjects reported "never" having a meal at a food program or food banks other than their shelter (Table 4.3).

Table 4.1: Summary of Socio-demographic Descriptive Data of this Sample of Toronto's Homeless Population

N=191	n	%	Mean (SD)	Min	Max
Gender:					
- Male	116	60.7	-	-	-
- Female	75	39.3	-	-	-
Age	191	-	39.76 (14.16)	18	75
Immigrant status:					
- Born in Canada	117	61.3	-	-	-
- Immigrant	74	38.7	-	-	-
-Years living in Canada	66	-	19.83 (13.72)	1	57
# of weeks living in the shelter	190	-	48.06 (107.55)	1	720 (15 yrs)
Age when first became homeless	187	-	33.13 (15.13)	0	73
Total time being homeless (months)	187	-	46.94 (65.42)	1	456 (38 yrs)
Last time employed (months)	125	-	50.73 (74.12)	1	432 (36 yrs)

Table 4.2: Socio-demographic Characteristics of this Sample of Toronto's Homeless Population

N=191		n	%
Race:	- White	108	56.5
	- Black	43	22.5
	- Asian	12	6.3
	- First Nations/Aboriginal	11	5.8
	- Other (Middle Eastern, Hispanic, etc.)	16	8.4
	- Refuse/Don't know	1	0.5
Marital status:	- Single	127	66.5
	- Divorced/separated	35	18.3
	- Married/partnered	15	7.8
	- Widowed	12	6.3
	- Refuse	2	1.1
Immigrant status:			
	- Born in Canada	117	61.3
	- Immigrant	74	38.7
Education completed:	- High school education or less	152	79.6
	- College or university graduate	38	19.9
	- Refuse/Don't know	1	0.5
Employment status:			
	- No job	142	74.3
	- Part-time, full-time or casual jobs	49	25.7
Last month income:	- $100 or less	43	22.5
	- $100 to $500	75	39.3
	- $500 to $1 000	41	21.5
	- $1 000 or more	28	14.7
	- Refuse/Don't know	4	2.1
"Were you living in Toronto when you first became homeless?"			
	- Yes	157	82.2
	- No	34	17.8
"How often do you have a meal at a food program?" (other than shelter)			
	- "Never"	136	71.2
	- "Always" or "occasionally"	55	28.8

Table 4.3: Percentage of Subjects Reporting Difficulty to Find Basic Needs

N=191			
"How often have you had difficulty finding…?		**n**	**%**
- shelter	- Never	172	90.1
	- Rarely/sometimes/usually	19	9.9
- enough to eat	- Never	167	87.4
	- Rarely/sometimes/usually	24	12.5
- clothing	-Never	150	78.5
	- Rarely/sometimes/usually	41	21.5
- place to wash	- Never	175	91.6
	- Rarely/sometimes/usually	16	8.3
- bathroom	- Never	177	92.7
	- Rarely/sometimes/usually	14	7.4

Table 4.4 shows statistically significant associations observed between sex and socio-demographic characteristics, such as perceived oral health needs and general health variables. It was found that there were statistically significant more homeless males born in Canada (67.2%) than females (52.0%) (*P=0.03)*. The results of the other variables reported in Table 1.3 will be presented in their respective sub-sections below.

Table 4.4: Statistically Significant Associations with Sex of Participant

	Male n (%)	**Female n (%)**	**P-value***
Immigrant status: (n= 191)			
- Born in Canada	78 (67.2)	39 (52.0)	
- Immigrant	38 (32.8)	36 (48.0)	0.035
Reason for the last visit to the dentist: (n= 176)			
- Emergency	51 (46.4)	20 (30.3)	
- Regular check up/cleaning/ dental treatment	59 (53.6)	46 (69.7)	0.035
Self Rated Oral Health: (n= 190)			
- Excellent/Very Good/Good	39 (33.9)	36 (48.0)	
- Fair/poor	76 (66.1)	39 (52.0)	0.052
Have you been using drugs regularly? (n=190)			
-Yes	50 (43.1)	21 (28.4)	
-No	66 (56.9)	53 (71.6)	0.041
"Where do you first go when you have any kind of health problem?" (n= 164)			
- Walking clinic/Emergency Room	70 (72.2)	29 (43.3)	
- Family doctor	27 (27.8)	38 (56.7)	<0.001

*Pearson Chi-square test

4.2 General Health

The general health features of participants are displayed in Table 4.5. Approximately 70% of these homeless adults reported having a good overall health, although approximately 60% reported some kind of medical condition. The most common health problems reported were: over 18% with “problem walking”; 17% with arthritis or rheumatism; 10.5% with heart problems; and 9% diabetes. More than 40% of respondents reported having some other medical condition not listed by the questionnaire such as Hepatitis C, asthma, anxiety or depression, allergies and back pain. In addition, approximately one in five participants had been in a hospital emergency room or in a hospital with at least one night stay (not counting the overnight stay in the emergency room) during the 30 days preceding the survey, and during the 12 months preceding the survey, about 50% of the subjects reported using a hospital emergency room or staying in a hospital.

Finally, when asked “Where do you first go when you have any kind of health problem?” it was found that a statistically significant higher percentage of homeless males (72.2%) reported going to a walk-in clinic or hospital emergency room as their first choice for any kind of health problem compared to 43.3% of homeless women who had chosen the same health provider ($P<0.001$) (Table 4.4).

Table 4.5: Self-reported General Health, Access to Healthcare and Drug Consumption by this Sample of Toronto's Homeless Population

N=191	n	%
Perception of general health:		
- Excellent/Very good/ Good	132	69.1
- Fair/Poor	59	30.9
Heath conditions:		
- Diabetes	17	8.9
- Anemia	10	5.2
- Hypertension	17	8.9
- Heart disease	20	10.5
- Liver problems	16	8.4
- Arthritis/Rheumatism	32	16.8
- Cancer	2	1.0
- Problem walking	36	18.8
- HIV/AIDS	2	1.0
- Other problems (asthma, back pain, allergies, etc)	80	41.9
- No health problem	78	40.8
Health care in the past 30 days:		
- Total	43	22.5
- Hospital Emergency Room	37	19.4
- Hospital with at least one night stay	16	8.4
Health care in the past 12 months:		
- Total	98	51.3
- Hospital Emergency Room	95	49.7
- Hospital with at least one night stay	39	20.4
"Where do you first go when you have any kind of health problem?"		
- Walk-in clinic/emergency room	99	51.8
- Family doctor	65	34.0
- Clinic for homeless	16	8.4
- Other (drugstore, anywhere, never)	11	5.8
"Have you been using drugs regularly?"		
- Yes	71	37.2
- No	119	62.3
Drugs regularly used: (n=71)		
- Marijuana	42	59.2
- Crack	19	26.8
- Cocaine	19	26.8
- Other (ecstasy, opium, crystal-meth)	24	33.8

The categories that represent less than 1% of the responses are not reported.

Approximately 40% of the subjects interviewed were using drugs regularly. The most common drugs used by this sample were marijuana, crack and cocaine (Table 4.5). In addition, 38% of drug users have been using more than one drug regularly and half of those using on a daily basis. The percentage of homeless men (43.1%) who were using drugs regularly was statistically significant higher than the percentage of homeless women drug users (28.4%) (*P=0.04*) (Table 4.4). However, no statistical significance was found on the DMFT score and its components between drug users and non-drug users. Also there was no statistically significant relationship between DMFT score and its components for specific drugs used (Table 4.6).

Table 4.6: Association of DMFT Score and its Components by Drug Consumption

	DMFT (SD)	DT (SD)	MT (SD)	FT (SD)
Drug users:*				
- Yes: n=71 (37.2%)	15.45 (8.08)	7.01 (6.02)	5.23 (7.67)	3.21 (3.10)
- No: n=119 (62.3%)	13.76 (8.10)	5.82 (5.41)	4.31 (7.02)	3.64 (4.10)
Cocaine/crack users: n=32**	17.69 ± 7.39	7.41 ± 6.63	6.50 ± 8.00	3.78 ± 3.39
Marijuana: n=33**	13.67 ± 8.12	7.09 ± 5.83	3.91 ± 6.88	2.67 ± 2.68
Other drugs: n=24**	13.92 ± 7.81	5.79 ± 5.93	4.33 ± 7.35	3.79 ± 3.69

Independent t-test *p-value not statistically significant
One-way Anova **p-value not statistically significant

4.3 Self-reported oral health and dental needs

Table 4.7 presents the results of self-reported oral health and dental care needs of the adults homeless interviewed. Even though 39.3% of the participants self rated their oral health as excellent, very good or good, 76% believed that they had some untreated dental condition. In addition, a trend (*P=0.05*) can be observed with homeless males who are more likely to self rate their oral health as fair or poor (66.1%) in comparison to females (52%) (Table 4.4).

Regarding the use of dental services, 32% of subjects reported that they had visited a dentist within the preceding year of the survey, and 35% had not visit a dentist within the previous 4 years or never. Almost 40% of the respondents' last dental visit was for emergency reasons. However, the proportion of homeless women who reported that they had visited the dentist for emergency treatment (30.3%) was statistically significantly lower (*P=0.03*) than the proportion of men (46.4%) (Table 4.4).

Over 32% of those interviewed had toothache in the last month but only one-fourth had sought care for this toothache and close to 60% did not take any medicine (analgesic, antibiotic, etc) for the pain. In addition, 25% reported that this toothache had lasted more than one week and for 20% of subjects the tooth pain had affected them in a way that they were not able to undertake their daily activities. In general, more than 40% of this sample "often or sometimes" found it uncomfortable to eat some kind of food because of problems with their mouth or teeth. Thirty-five percent reported that "often or sometimes" they had avoided eating particular foods because of problems with their mouth or teeth and one-fourth of respondents reported having other oral problems such as pain on gums, jaw or bones surrounding their mouth (Table 4.7).

Bleeding gums, bad breath and dry mouth were reported as persistent by 14.1%, 18.3% and 27.2% of participants, respectively (Table 4.8). However, the occurrence of bleeding gums, bad breath and dry mouth were not found statistically significantly more often in drug users when compared with non-drug users (Table 4.9). Forty-five percent of subjects were dissatisfied with the appearance of their teeth although over 84% reported that the appearance of their teeth was important. Daily oral hygiene (tooth brushing) was performed by 78% of the subjects but almost 70% never used dental floss. Only 27% of those interviewed had insurance or a government program that covered all or part of their dental expenses and exactly half of these insured people were covered by ODSP (Ontario Disability Support Program). The last question of the self-reported oral health section asked "If you need to have dental care where do you prefer it be provided?" Table 4.8 shows these results where 46% of the respondents answered that it "doesn't matter" where dental care is provided or they do not have a specific preference, yet 37.2% prefer at a "private dental office" and 13.1% in a "clinic only for homeless people".

Table 4.7: Self-reported Oral Health Status of this Sample of Toronto's Homeless Population

N=191		n	%
Self Rated Oral Health:	- Excellent/Very Good/Good	75	39.3
	- Fair/poor	115	60.2
Last visit to the dentist:	- Less than 1 year ago	62	32.5
	- 1 year to less than 4 years ago	57	29.8
	- 4 or more years ago/never	68	35.6
	- Don't know/refuse	4	2.1
Reason for the last visit to the dentist:			
	- Emergency	71	37.2
	- Regular check up /cleaning / dental treatment	105	55.0
	- Don't know/refuse	15	7.8
"Do you think you have any untreated dental conditions?"			
	- Yes	145	75.9
	- No	36	18.8
	- Don't know/refuse	10	5.2
Toothache in the past month:			
	- Yes	62	32.5
	- No	129	67.5
"Did you seek care for this toothache?" (n=62)			
	- Yes	15	24.6
	- No	46	75.4
"Did you take any medicine for this toothache? (n=62)			
	- Yes	26	42.6
	- No	35	57.4
"How long has this toothache lasted?" (n=62)			
	- One week or less	46	75.4
	- More than one week	15	24.6
"How much has this toothache affected your daily activities?" (n=62)			
	- I was not able to do anything.	12	19.7
	- I still managed to do my regular things /It didn't affect me at all.	49	80.3
Uncomfortable eating because of mouth problems			
	- Often/Sometimes	81	42.4
	- Rarely/Never	110	57.6
Avoided eating because of mouth problems			
	- Often/Sometimes	67	35.1
	- Rarely/Never	124	64.9
Pain in the mouth/gums/jaw in the past month			
	- Yes	47	24.6
	- No	143	74.9

The categories that represent less than 1% of the responses are not reported on the table.

Table 4.8: Self-reported Oral Health Status of this Sample of Toronto's Homeless Population (cont.)

N=191	n	%
"In the past month, did you experience…?"		
- persistent bleeding gums	27	14.1
- persistent bad breath	35	18.3
- persistent dry mouth	52	27.2
- none	83	43.5
"How satisfied are you with the appearance of your teeth?		
- Satisfied	57	29.8
- Neither satisfied nor dissatisfied	47	24.6
- Dissatisfied	86	45.0
"How important is the appearance of your teeth?"		
- Important	161	84.3
- Not important	30	15.7
Frequency of tooth brushing:		
- Daily	150	78.5
- Weekly or less	31	16.2
- Not at all	10	5.2
Frequency of tooth flossing:		
- Daily	21	11.0
- Weekly or less	42	22.0
- Not at all	128	67.0
Insurance that covers dental expenses:		
- Yes	52	27.2
- No	134	70.2
-Don't know/refuse	5	2.6
Place of preference for dental care:		
- Private clinic	71	37.2
- ER/PHD Clinic	4	2.0
- A clinic for homeless people	25	13.1
- Doesn't matter	88	46.1
- Don't know/refuse	3	1.6

The categories that represent less than 1% of the responses are not reported on the table.

Table 4.9: Association between Drug Use and Some Oral Health Symptoms

In the past month, did you experience persistent…	**Drug users (%)**	**No drug users (%)**	**p-value***
Bleeding gums:			
- Yes (n=27)	15 (21.1)	12 (10.1)	
- No (n=163)	56 (78.9)	107 (89.9)	0.35
Bad breath:			
- Yes (n=34)	16 (22.5)	18 (15.1)	
- No (n=156)	55 (77.5)	101 (84.9)	0.197
Dry mouth:			
- Yes (n=52)	26 (36.6)	26 (21.8)	
- No (n=138)	45 (63.4)	93 (78.2)	0.27

*Pearson Chi-square test

4.4 Clinical Oral Examination

The results of the clinical oral examination show great needs for dental services among this sample of Toronto's adult homeless population. Tables 4.10 through 4.15 report the oral health status observed in the clinical oral examination. In this sample population the median number of teeth was 23.37 per individual and the mean DMFT score was 14.42; however, the prevalence of decayed teeth (DT=6.28) was statistically significantly higher than filled teeth (FT = 3.52) ($P < 0.01$) (Table 4.11). The missing teeth (MT) component of the DMFT score may not represent teeth missing due to caries alone, yet patients often did not remember the cause of tooth loss; therefore, estimating previous caries experience through the missing teeth component may not be reliable.

Table 4.10 shows that in this sample only 3 % did not require any dental treatment (Figure 4.1) but over 40% were in need of urgent dental treatment (Figure 4.2). Eighty-eight percent of those examined needed some kind of restorative dental work (Figure 4.3) and approximately the same proportion (87.4%) required a professional cleaning (Figure 4.4). The clinical oral examination also observed that almost 60% needed some kind of prosthetic appliances on lower, upper or both arches but only 12% were currently using one (Figure 4.5). Nearly 40% of participants showed some degree of gingivitis and 70% had presence of calculus either restricted to one or few teeth or as a generalized condition (Figure 4.6). Tooth extraction, root tip extraction and any other condition requiring oral surgery such as hyperplasia were observed as necessary among 30% of the subjects (Figure 4.7). The detected prevalence for endodontic treatment was low 6.3% and could possibly be due by the fact that the clinical oral

examination was performed without using a dental explorer or X-ray making a more precise diagnosis impossible (Figure 4.8).

Mucosal abnormalities were observed in 6.3% of the participants with the highest prevalence for angular chelitis (2.6%) and denture stomatitis (1.6%). Other abnormalities such as denture induced hyperplasia, glossitis, fistula, aphthous, traumatic or unspecific ulcers were current in less than 1% of this sample. Concerning the occlusion of the participants, 23% did not have a "clinically acceptable" dental occlusion or they did not have occlusion at all, either because of missing some of their teeth or being completely edentulous on the upper, lower or both arches without wearing dental prosthesis.

Finally, in a small prevalence (less than 2%), there existed an orthodontic appliance. Mostly, these appliances were non-active braces and orthodontic retainers in the subjects from youth shelters (18-24 years old) (Figure 4.9). These young adults also reported that they were no longer following their orthodontic treatment and were willing to have these appliances removed but they could not afford to seek the care of an orthodontist. Figure 4.10 shows other dental issues observed among the participants: dental abrasion, diastema, hipocalcification, dental migration, non-functional implants, intrinsic pigmentation and dental debris. These dental issues were isolated and represented less than 1% prevalence among the participants.

Table 4.10: Oral Health Status of the Toronto Homeless Population Observed with the Clinical Oral Examination

N=191	n	%
Presence of prosthesis:		
- Total	**23**	**12.1**
- upper arch	19	9.9
- lower arch	12	6.3
Gingivitis:		
- Total	**75**	**39.2**
- upper arch	60	31.4
- lower arch	67	35.1
Presence of calculus:		
- Total	**135**	**70.7**
- upper arch	71	37.2
- lower arch	135	70.7
Mucosal abnormalities		
- Total	12	6.3
- Angular chelitis	5	2.6
- Denture stomatitis	3	1.6
Occlusal status:		
- No acceptable occlusion	45	23.6
- Anterior open bite	4	2.1
- Anterior crossbite	3	1.6
- Excessive overbite	7	3.7
Dental treatment needed:		
- No treatment	6	3.1
- Emergency	77	40.3
- Fillings	168	88.0
- Periodontics	136	71.2
- Surgery	57	29.8
- Endodontics	12	6.3
- Prosthesis	114	59.7
- Cleaning	167	87.4

The categories that represent less than 1% of the responses are not reported.

Figure 4.1: No Dental Treatment Needed

Figure 4.2: Urgent Dental Treatment

Figure 4.3: Restorative Treatment

Figure 4.4: Professional Cleaning

Figure 4.5: Prosthodontic Treatment

Figure 4.6: Periodontal Treatment

Figure 4.7: Dental/Oral Surgery

Figure 4.8: Endodontic Treatment

Figure 4.9: Orthodontic Treatment

Figure 4.10: Other Dental Issues

Table 4.11 outlines the mean DMFT score (decayed, missing, and filled teeth) and its components DT, MT and FT observed in this homeless sample. Both the mean of DMFT (12.93) and MT (3.41) scores among the women examined were statistically significantly lower ($P < 0.05$) than the DMFT (15.39) and MT (5.41) for men. As expected, the DMFT (8.22) and MT (0.36) for subjects aged 18 to 24 years old were statistically significantly lower ($P < 0.01$) than the DMFT (16.34) and MT (5.95) for individuals 25 years or older. The component FT had a smaller but still statistically significant difference ($P < 0.05$) between those aged 18 to 24 years old (2.47) and those 25 years or older (3.84). The DMFT of subjects born outside Canada (12.85) was statistically significantly lower ($P < 0.05$) than those born in Canada (15.42). Individuals with a high school level of education or less had a statistically significantly higher ($P<0.01$) score for MT (5.32) when compared with those who had college or university degrees (1.97). In the same group a statistically significantly lower score was found ($P < 0.05$) for the component FT= 3.17 compared with FT=5.00 for college or university graduates. Participants who reported having toothache in the last month had a significantly higher DMFT score (16.18) and DT score (7.50) than those who did not have toothache in the last month: DMFT (13.58) and DT (5.69), respectively ($P < 0.05$). Individuals who brush their teeth weekly or less often had a DMFT (18.8) and DT (9.29) significantly higher than those who brush their teeth at least once a day: DMFT (13.23) and DT (5.45), respectively ($P < 0.01$). Moreover, it was observed that the DMFT (15.56) and FT (4.11) scores of the subjects who had some kind of health problem were statistically significantly higher than those who did not report any issue with their general health: DMFT (12.78) and FT (2.67) ($P < 0.05$). Finally, those who reported being satisfied with the appearance of their teeth and/or dentures have a statistically significantly lower DMFT (10.47) and DT (3.74) than those who were not satisfied with their teeth appearance: DMFT (17.88) and DT (8.44) ($P < 0.01$). The same variable concerning how satisfied they were with the appearance

of their teeth and/or dentures showed a small but significant difference for the MT component: MT (3.09) for those who were satisfied and MT (8.44) for those who were not satisfied ($P < 0.05$).

Table 4.11: DMFT Score and Its Components by Socio-demographics and Self-reported Oral Health

N = 191	DMFT (SD)	DT (SD)	MT (SD)	FT (SD)
Total	14.42 (8.10)	6.28 (5.65)**	4.63 (7.26)	3.52 (3.78)**
Gender:				
-Female (n=75)	12.93 (7.52)*	5.89 (4.86)	3.41 (6.00)*	3.63 (3.70)
-Male (n=116)	15.39 (8.35)*	6.53 (6.11)	5.41 (7.89)*	3.45 (3.85)
Age:				
-18-24 (n=45)	8.22 (6.79)**	5.40 (5.45)	0.36 (1.07)**	2.47 (2.99)*
-24 or more (n=146)	16.34 (7.51)**	6.55 (5.69)	5.95 (7.83)**	3.84 (3.95)*
Immigration status:				
- Born in Canada (n=117)	15.42 (8.41)*	6.54 (5.83)	5.16 (7.77)	3.72 (3.76)
- Immigrant (n= 74)	12.85 (7.37)*	5.86 (5.36)	3.78 (6.32)	3.20 (3.82)
Education completed:				
-High school or less	14.61 (8.37)	6.11 (5.56)	5.32 (7.89)**	3.17 (3.66)*
-College/university graduate	14.08 (6.69)	7.11 (5.97)	1.97 (2.58)**	5.00 (3.97)*
Last month income:				
-$100 or less (n=43)	13.21 (7.90)	6.23 (6.24)	3.58 (6.46)	3.40 (3.52)
-$100 to $500 (n=75)	13.88 (8.34)	5.49 (4.89)	5.53 (8.01)	2.85 (3.34)
-$500 to $1 000 (n=41)	16.78 (7.70)	7.29 (5.91)	4.71 (6.75)	4.78 (4.73)
-$1 000 or more (n=28)	15.29 (8.13)	7.07 (6.50)	4.25 (7.48)	3.96 (3.59)
Toothache in the last month				
- Yes (n=62)	16.18 (7.39)*	7.50 (5.98)*	4.47 (6.67)	4.21 (4.03)
- No (n = 129)	13.58 (8.31)*	5.69 (5.40)*	4.71 (7.54)	3.19 ± 3.63
Brushing teeth:				
- Daily (n=150)	13.23 (7.87)**	5.45 (5.03)**	4.27 (6.81)	3.51 (3.78)
- Weekly or less often (n=41)	18.80 (7.49)**	9.29 (6.73)**	5.95 (8.66)	3.56 (3.84)
Insurance for dental care				
- Yes (n=52)	16.04 (8.78)	6.73 (6.34)	5.42 (7.46)	3.88 (4.09)
- No (n=134)	13.84 (7.81)	6.04 (5.35)	4.35 (7.24)	3.45 (3.69)
Any kind of health problem				
- Yes (n=113)	15.56 (7.96)*	6.01 (5.56)	5.44 (7.67)	4.11 (3.99)*
- No (n= 78)	12.78 (8.07)*	6.67 (5.78)	3.45 (6.48)	2.67 (3.30)*
Appearance of their teeth:				
-Satisfied (n= 57)	10.47 (7.50)**	3.74 (3.30)**	3.09 (6.69)*	3.65 (3.62)
-Not satisfied (n=86)	17.88 (7.08)**	8.44 (6.39)**	6.12 (7.62)*	3.33 (3.62)
Appearance of their teeth:				
-Important (n=161)	14.48 (8.01)	6.32 (5.72)	4.70 (7.35)	3.47 (3.71)
-Not important (n=30)	14.10 (8.69)	6.03 (5.34)	4.27 (6.82)	3.80 (4.20)

*P-value < 0.05; **P-value <0.01

Data presented in Table 4.12 outlines the DMFT score and its association with the overall duration of homelessness. It was observed that the DMFT of individuals who have been homeless for one year or less (DMFT = 12.3) was statistically significantly lower ($P < 0.05$) than those who had been homeless for one year or more (DMFT = 15.85). A statistical significant difference was also found for the FT component with a lower score for the participants who have been homeless for 12 months or less (FT = 2.90) compared with those that had been homeless for more than one year (FT = 4.05) ($P < 0.05$).

Table 4.12: Length of Time of Homelessness by the DMFT Score and Its Components

n=187	**n (%)**	**DMFT (SD)**	**DT (SD)**	**MT (SD)**	**FT (SD)**
12 months or less	77 (41.2)	12.30 (8.0)*	5.44 (5.1)	3.96 (6.8)	2.90 (3.37)*
13 months or more	110 (58.8)	15.85 (7.8)*	6.79 (5.9)	5.02 (7.6)	4.05 (4.03)*

Independent-Sample t-test *P-value < 0.05.

Table 4.13 shows the association between DMFT score of participants and the length of time that they had been unemployed. The DMFT of those who had not had a job for one year or more (DMFT = 17.00) was statistically significantly higher (*P < 0.001*) than those who were unemployed for one year or less (DMFT = 11.47). A similar association (*P = 0.05*) was observed for the MT component between those who were unemployed for less than one year (MT = 2.61) and those unemployed for more than one year (MT = 5.98).

Table 4.13: Length of Time of Unemployment by the DMFT Score and Its Components

n=174	**n (%)**	**DMFT (SD)**	**DT (SD)**	**MT (SD)**	**FT (SD)**
12 months or less	59 (47.2)	11.47 (7.13)*	5.31 (4.79)	2.61 (5.18)**	3.49 (3.67)
13 or more months	66 (52.8)	17.00 (7.98)*	7.17 (6.31)	5.98 (7.72)**	3.85 (3.89)

Independent-Sample t-test *P-value < 0.001; **P-value = 0.05.

Table 4.14 shows the comparison between the oral/dental needs detected with clinical oral examination and the self-perceived oral/dental needs reported by the participants. Overall, this sample population underestimated their needs for dental treatment. Approximately 20% of the subjects reported no need for any kind of dental treatment when only 3% were identified with a healthy mouth by the clinical oral examination. A large discrepancy was also observed on the self-perceived need for dental emergency treatment (3.1%) versus the over 40% detected in the clinical oral examination.

In addition, the reported percentage for a self-perceived need of restorative treatment (35.1%) is considerably lower than the need observed in the clinical oral examination (88%), and this difference could be increased if a more meticulous oral examination using dental explorer and X-rays were conducted. Possibly for the same reason the data did not show a significant discrepancy in the need for endodontic treatment. However, a large discrepancy was noticed between self-perceived need (6.8%) and clinical observed need (70.7%) for periodontal treatment. Also, only half of the subjects who needed prosthetic treatment reported that they perceived this need in either upper, lower or both arches. The same relationship was found among those subjects who needed some kind of oral surgery: only 16% reported need for extraction either of teeth or root tips and gum surgery when approximately 30% required this dental procedure. Professional cleaning is another dental treatment that was underestimated by this sample with a disagreement of 22% for a self-perceived need versus 87% observed in the clinical oral examination.

Comparison of selected results from the self-reported oral health questionnaire and the clinical oral examination among homeless adults in Toronto, the Canadian general population and the Canadian low income population are reported on Table 5.15.

Table 4.14: Comparison between Clinical and Perceived Dental Treatment Needs

N=191	Clinical dental treatment needs n (%)	Perceived dental treatment needs n (%)
No treatment needed	6 (3.1)	36 (18.84)
Emergency	77 (40.3)	6 (3.1)
Fillings	168 (88.0)	67 (35.1)
Periodontics	135 (70.7)	13 (6.8)
Surgery	57 (29.8)	30 (15.7)
Endodontics	12 (6.3)	10 (5.2)
Prosthesis	114 (59.7)	61 (31.9)
Cleaning	167 (87.4)	42 (21.9)

Table 5.15 Comparison of the Oral Health among Homeless Adults in Toronto, the Canadian General Population and the Canadian Low Income Population

N =191	Homeless	CHMS*	Low Income*
Self-rated Oral Health as good	39 %	84 %	75 %
Dental insurance coverage	27 %	68 %	50 %
Avoided eating because of mouth problems	35 %	12 %	13 %
Visit to the dentist in the last year	32 %	75 %	60 %
Toothache	33% (past month)	16% (past year)	16 % (past year)
DMFT (mean)	14.42	10.7	-
No treatment need	3 %	66 %	53 %
Urgent need	40 %	2 %	1.9 %
Restorative	88 %	16 %	23 %
Periodontics	71 %	2 %	-
Surgery	30 %	7 %	11 %
Prosthesis	60 %	4 %	5 %

*http://www.healthcanada.gc.ca/ocdo

5 Discussion

This exploratory study is the first investigation of the oral health status of adult homeless individuals who are users of the emergency shelter system in the Greater Toronto Area. Toronto is the largest municipality in Canada with approximately 5.5 million people.[88] Toronto has 57 emergency shelters which are administered by the Toronto Shelter Management Information System (SMIS).[87] In Toronto, in 2009, the occupancy rate of shelters for single adults was 94%, indicating the valuable services offered by the shelters.[91] Most of the shelters provide basic needs to their residents: three meals a day, morning and afternoon snacks, clothing, and some shelters offer extra activities such as television, games, workshops or lectures, doctor appointments and religious services.

The high level of co-operation of shelter management staff and the shelter's residents enormously facilitated this survey. There was a high participation rate with all of the invited subjects participating in all aspects of the data collection. Although the sample size of this study is comparable to other studies of homeless people with similar study designs, the results should be generalized with caution to the wider homeless population in Toronto.[6,7,23,24,28,29,31-34,37,46,47]

The data in this study support the hypothesis that homeless people have poor oral health and high rates of both oral disease and treatment needs. Likewise, other research concerning the oral health of homeless populations have reported similar results: poorer oral health status for homeless people when compared to the general population.[4,6,7,14,24,27-29,31,37,39,46,60,65,75,82] It was expected to find poor oral health in this sample of Toronto's homeless population, with the lack of access to dental services being great and showing a potential impact on their oral health

conditions. The descriptive data of this study also demonstrate the influence of the population characteristics, environment, barriers, needs, and personal health practices on oral health.

Recently a survey with the Canadian general population showed that 66% of those with natural teeth do not need dental treatment and 75% visit a dental professional annually (Table 5.15).[80] The oral health situation of the homeless population in Toronto is far from this ideal condition. The main contribution of this study is to bring attention to this high-risk homeless group whose dental health status has never been assessed and who suffer from a serious lack of access to care and major oral treatment needs.

5.1 Characteristics of Participants

Previous research on homelessness and oral health in Toronto has focused only on homeless youths.[24,25,60] The present study collected information on the general characteristics of subjects ranging in age from 18 to 75 years. Consistent with other research, the majority of participants in this study (60%) were single men, although the literature points to women and families as the faster growing groups among homeless people.[13,14,22,68,69] According to Statistics Canada,[88] in Toronto, the percentage of Canadian-born individuals was the same as the percentage of those born outside Canada. However, the findings of this study observed different proportions of immigrants in this sample of Toronto's homeless population. Among the participants, only 38% were immigrants, and 60% of these homeless immigrants were living in Canada for more than ten years. These data agreed with other homeless research in Toronto, [84,85] suggesting that immigration is not a strong predictor of homelessness. The percentage of respondents in this study who classified themselves as white (57%) is similar to that reported by Chiu *et al.*, in 2009.[85]

Despite living in an economically strong city that has a successful business district and a strong social service sector, homelessness is a stark reality in Toronto.[57,59,69,73] Over 80% of the subjects reported that they were living in Toronto when they first became homeless. The average length of time of homelessness of the participants in this study was approximately four years, and they were living in a shelter for almost one year at the time of the interview. This information suggests that, possibly, among homeless people in Toronto, their mobility happens more often from shelter to shelter or from different types of accommodation in the same municipality rather than from one city to another.

Although it is often difficult to determine whether oral health problems were preceded or followed by homelessness, the findings revealed that the length of time of homelessness plays an important role on the oral health status of individuals who experience homelessness in Toronto. A significant association was observed between poorer oral health of participants and the duration of homelessness and unemployment (Tables 4.12 and 4.13). A lack of employment is also an issue, as these individuals, whether homeless or not, do not generally have access to dental insurance coverage related to employment. The lack of public or private dental insurance coverage could be one of the reasons why homeless people delay seeking dental care. In addition, the finding that over 60% of participants had little or no income explains their inability to pay for dental care. Minimal income support is given by some of the shelters where residents receive CA$32.00 cash per week. This is not enough to cover any dental treatment in relation to the observed treatment needs of participants.

The majority of the respondents (80%) reported that high school was their highest level of education achieved. The low level of education of these individuals might influence their preference for living in a bigger city where one can find a job or survive as a homeless person.

The accessibility of casual jobs for non-qualified professionals and alternative methods of earning money such as freelancing, begging, prostitution, selling illegal drugs are arguably more viable in Toronto than in smaller cities. Another possible reason for this tendency of homeless individuals remaining in big cities can be explained by the opportunity to live anonymously avoiding social discrimination or stigmatization.

Despite their low income, very rarely, participants reported having difficulty in finding a shelter, food, clothing or even a place to use the bathroom or wash themselves. The same response was observed when they were asked how often they have a meal at a "food program". The low demand for these necessities in this survey was possibly due to the fact that this study was conducted in shelters. The response to these issues might be different if the interview were conducted with homeless people living wholly on the streets.

Substance abuse is a common finding among those who are homeless and the effects on their oral health can be extreme.[4,6,28,32,] Abusers of drugs such as methamphetamine (meth), heroin and cocaine experience carious lesions significantly more frequently than non users.[28,29,39] The homeless population examined in this study had some evidence of substance abuse. Approximately 40% of the respondents reported using illicit drugs and half of them used drugs on a daily basis. No significant association was found concerning the different kind of drugs used (marijuana, coca products, etc) and oral health status. Nearly 40% of the drug users consumed multiple illicit drugs regularly. Given the small sample size of this study, it was not feasible to isolate the subjects in groups by kind of drug used in order to analyze specific drugs and their influence on oral health.

The participants in this study perceived their general health as good, even though having some medical conditions and having used hospital services during the previous year (Table 4.5).

The most frequent health problem of the subjects was problem walking, an issue that has also been reported by other studies as a frequent occurrence among homeless populations.[2,10] In this study, arthritis and/or rheumatism was the second most reported health problem and could be associated with the problem of walking reported by the subjects. Only 1% reported either cancer or HIV/AIDS infection. The prevalence of HIV infection in this sample of homeless is comparable with the 0.6% prevalence in the homeless detected by previous studies in Toronto.[10,11,85] The prevalence of cancer reported by the participants (1%) was lower compared with the general population of Canadians (2.7%).[86] This lower prevalence could possibly be explained by the lack of diagnosis because homeless people tend to use more health emergency services than routine medical care where such diseases would be detected.[2]

5.2 Oral Health Care Utilization

Free or low cost dental treatment for adults in Toronto is almost non-existent[58] and only 27% of the subjects interviewed in this study had any type of dental insurance. The majority of those who reported having dental insurance were insured by the Ontario Disability Support Program (ODSP). ODSP provides a range of additional benefits for medical and disability-related needs in extension of financial "income support" for shelter and basic needs. The dental benefits available in this social program are under-used by the homeless population.[9] This could be because homeless individuals cannot always take advantage of these benefits because they are unable to prove their eligibility due to the lack of personal documents. Another reason reported in the literature is that dentists may be less willing to treat patients under these plans because the amount of paper work required or low remuneration.[14,44,57] The findings of the present study

showed that access to dental care in Toronto is very limited; however, access to dental care by itself cannot eliminate the burden of dental problems for the homeless population.

The severity of dental disease and oral health problems in homeless adults and its impact on individuals' general health and quality of life have been consistently reported in the literature.[4,10,19,37,57,60] The same impact was observed in this study with a large percentage of the participants being uncomfortable eating (42.4%) or avoiding eating particular foods (35.1%) because of mouth problems, and one-quarter of them reported having pain in the gums or bones surrounding their mouth. The clinical oral examination of this study confirmed that the subjects had more seriously decayed teeth, more missing teeth and a lower prevalence of filled teeth (Table 4.11) when compared to the general population (Table 5.15).[80] One-third of the subjects had not seen a dentist within the preceding 4 years or never and 37% of them reported that their last visit to the dentist was only for emergency reasons. Only one-quarter of the participants who had toothache sought dental care for this problem. Visiting a dentist is not always the approach taken by people with toothache,[17,89] and it would be expected to be even more common among those experiencing low income and homelessness. Avoiding visiting a dentist could also be related to dental fears and anxiety associated to dental treatment by itself. The literature has reported a relationship between anxiety and regularity of dental care attendance describing anxiety as a cause of a lack of commitment to dental services or total avoidance of dental care.[92,93]

It has been suggested that the difficulty in accessing oral services or delay seeking dental care among homeless could also be due of a lower priority relative to their other needs such as a finding a place to sleep and food.[3,26,28] The most common reasons reported by the participants for not seeking care for their toothache were lack of money or lack of coverage for dental services.

Those who had sought dental care for their toothache did go to a private dentist, to the University of Toronto's Faculty of Dentistry Clinic or to clinics for homeless people. It was reported by the subjects who sought care at private dental clinics without money or dental insurance that their care resulted in nothing more than a referral. At the Faculty of Dentistry Clinic, often the required dental services are inappropriate or inaccessible to this population because of cost or screening processes. A limited number of dental clinics for homeless people in Toronto such as Shout - Dental Treatment Clinic and Yonge St. Mission - Evergreen Centre offer a comprehensive health service including dental care but mostly for homeless and street-involved youth under 25 years old. Free dental care services (emergency, preventive and restorative oral care) for adults in Toronto are non-existent according to the Guide to Services for People Who are Homeless, 2009.[58]

Social barriers to oral health care are also important factors for consideration when addressing unmet dental treatment needs.[85] Even though almost 50% of the participants in this study reported that they do not have a preference for where dental services are delivered, over 13% preferred to have dental treatment at the shelters. These results suggest that although the majority of the respondents are potentially comfortable with existing service arrangements, a small percentage is concerned about comfort. Shelters still represent a place where they can feel safe and secure, not exposed to the risk of judgment or discrimination. The importance of this information lies in the fact that having dental services provided in a place where they are comfortable and familiar, will probably increase the use of such services.[4,5,51,82] Nevertheless, regardless of whether this sample are comfortable with seeking care in private practices, the fact remains that private practitioners may not feel the same.

5.3 Self-perceived Oral Health

The homeless people participating in this study were more likely to rate their oral health as poor compared to the general population (Table 5.15).[80] There were great discrepancies between having dental problems and low self-reported oral health issues (Table 4.14). Nevertheless, improved oral health may have beneficial effects on an individual's health perceptions. De Palma in her study[27] observed that a progressive oral rehabilitation influences people's perception of well-being and impacts their self-esteem. Poor oral health was also associated with the homeless individual's perception of the significance of oral health and their needs for oral health care. The findings of this study show that while the majority of the participants (85%) classify the appearance of their teeth as important, only a minority (30%) were satisfied with that appearance or had visited a dental professional during the previous year.

Other studies have reported that having missing teeth or no teeth at all, apparent untreated teeth, bleeding gums and/or a "dirty smile" may not be considered a physical or social limitation among homeless people.[4,7,23,24,31,60] The results of this study support this concept. Yet there was a discrepancy observed between perceived need and clinical need for periodontal treatment and dental professional cleaning, which may be indicative that stained teeth and gum problems such as gingivitis and calculus accumulation was not a physical or social concern among participants. In addition, only half of the subjects who needed prosthodontic treatment such as dentures, bridges or crowns reported a self-perceived need for this oral rehabilitation (Table 4.14). Dental treatment has a low priority among homeless individuals and the delay in seeking dental services for progressive dental disease compromises their esthetic and oral functionality (ability to chew). Oral health care does not often receive significant attention from the homeless population and as

a consequence may have impacts on their self-esteem and may contribute to their detachment from society.[4,7,23,31,60]

A large discrepancy was also observed between self-reported urgent needs for dental treatment (3%) and the need detected upon clinical oral examination (40%). This discrepancy could possibly be explained due to the fact most individuals reported need for emergency dental treatment only when they were in pain or feeling uncomfortable at the moment asked. Large carious lesions, retained root tips and severe periodontitis are not perceived as an urgent need if they are not causing pain. This is unfortunate given that oral preventive measures and minor dental problems are easy and more affordable to treat than major problems such as pain, infection, and abscesses, which require medication and more intensive and extensive work.

Oral/dental appearance is a concern to the general population because it directly influences social and professional relationships. Conversely, social limitations caused by oral esthetic impairment do not seem to have the same significance to the homeless population.[24,7,23,31,60] Homeless individuals who are economically and socially disadvantaged suffer from a range of dental problems that go from a simple professional cleaning to the need for a complete oral rehabilitation.[2,28,45] Homelessness contributes with a progressive decline of the individuals' oral health accentuating difficulties on self-image, employability and sociability. The social isolation to which the homeless lifestyle puts individuals, potentially, makes them have a sense that nobody cares or that nothing is really important. This lack of motivation of a good oral/dental appearance seems to be more influential in the homeless individuals' decisions concerning oral health care than the lack of knowledge of dental care needs. Physical characteristics such as unaesthetic teeth become acceptable among homeless people in their environment.[3,23,24] In addition, it appears that the social isolation directly influenced by the

increase length of time of homelessness and unemployment reinforces these concepts of indifference. A dental health program for the homeless population should be designed to restore people's oral health and to reduce dental problems that pose barriers to employment and self-sufficiency. A rehabilitative dental program will facilitate the social re-integration process for homeless people improving their dental appearance and arguably their self-esteem.

5.4 Oral Health Status

The results of the clinical oral examination in this study showed a critically high rate of chronic and acute oral health problems in participants compared to the general population. These results were compared with the results from the Oral Health Module of the Canadian Health Measures Survey (CHMS).[80] The CHMS was a national survey providing estimates of the oral health status of Canadians. The data were collected between 2007 and 2009 in 15 sites. The results of this national survey demonstrate that, overall, Canadians have very good oral health.

In this homeless survey only 3% of the subjects did not need any dental treatment as compared to 66% of the general population (Table 5.15). As would be expected, the average number of teeth in this homeless population was lower than the general Canadian population. This information suggests that among homeless people tooth extraction is probably a more preferred treatment option because it is the least expensive type of dental treatment. Tooth extraction is likely to create additional oral needs such as prosthodontic treatment. It was observed that nearly 60% of the subjects were in need of prosthodontic treatment compared to 4% of Canadians (Table 5.15). The number of missing teeth as well as complete edentulousness

in the homeless group significantly increased with age, and was inversely related to the level of education completed by the subjects. Clearly, no follow-up treatment has been performed after dental extraction in a large percentage of the participants.

Not surprisingly, the number of decayed teeth of the subjects is much lower among those with daily oral hygiene habits (Table 4.11). Considerable plaque accumulation and calculus with gingivitis and/or periodontits was highly prevalent in the population examined in this study suggesting either a lack of knowledge about the problems or a lack of attention that these dental pathological conditions require. The lack of proper oral care in this homeless population was highlighted by the observed results of 71% of periodontal treatment required versus only 2% of the participants from the CHMS (Table 5.15). The presence of periodontal disease can impact general health contributing significantly to the overall systemic inflammatory burden. Importantly, recent research has highlighted the strong associations between periodontitis and certain systemic disorders such as diabetes and cardiovascular diseases.[90] It would seem reasonable that oral health policies and preventive services should be developed to make positive changes not only for the oral health of the homeless population but also for their general health.

In Toronto, the dental services required by the homeless population are extensive. It was observed that among homeless single adults in Toronto, tooth decay or replacement of existing defective fillings was necessary in 88% of the participants compared with only 16% of the general Canadian population (Table 5.15). Dental crown and bridges preceded or not by endodontic treatment, and removable prosthesis and implants were also in high demand. The latter are examples of dental treatment that are costly but necessary for a complete oral rehabilitation. Furthermore, based on the findings of this study it is likely that many hours of

dental services will be needed for dental emergencies. The prevalence of dental urgent needs observed was 40% compared with the minimal 2% of general Canadians (Table 5.15).

5.5 Policy considerations

The results of this study suggest that, in Toronto, access to dental care for homeless people is not straightforward, with significant challenges present in accessing care. Moreover, it is likely that the current lack of access helps to sustain existing social and health disparities and possibly increases general costs for the healthcare system. The provision of oral health services for homeless populations is unquestionably necessary. Having dental services available will arguably impact people's health and lives, both in the short- and long-term. The provision of early access to dental care is key to improvements in the oral health of homeless populations and should be a major interest to health professionals and policy makers. However, there is no clear solution on how to provide dental care for homeless people, to whom comprehensive dental treatment is highly necessary particularly since they have lower levels of perceived need and demand as well substantial clinical management problems. Any dental program that will attend to the needs of this population must be responsive to the local environment with the integration of patient needs, a commitment of dental professionals and adequate financial resources.

Planning and implementing a dental program for the homeless population will require significant political will.[9] Identification of dental needs is the first step in this process and this has been accomplished with this study. Further steps in establishing oral health services for the homeless population in Toronto will now rely on the initiative of designated health authorities.

An oral health services program for a homeless population should be the outcome of collaboration between health professionals, shelter administrators and health care programs. It is unreasonable to expect that homeless people who are generally not organized as a social group will have the initiative to claim a policy need for oral health services.[9,26]

The major difficulty lies in developing an oral health care delivery system that provides services in an environment that places minimal stress on the individuals being served and maximizes their commitment to oral health.[5,24] Possibly, the ideal solution will be to structure a dental clinic designated only for economically disadvantaged people. Such a dental clinic will allow patients to feel comfortable, and may facilitate a commitment to treatment and health promoting behaviours.

Community-based health services with volunteer-operated dental clinics such as the Shout Clinic and Evergreen Health Centre have provided great services for street-youth in Toronto; however, the current dental services provided are unable to meet the demand of the target population or provide services for people over 25 years old. To expand the oral healthcare services provided by these clinics to the adult population might be a cost-effective initiative. The advantage of expanding an existing program is that having a location with a dental office already in place reduces the cost of the project. The expanded workforce requirements could be met by creating a partnership with the University of Toronto's Faculty of Dentistry alongside Dental Hygiene Schools in the Greater Toronto Area so that students could be provided with training. This concept is not a new one. In the 1970s Toronto West Central Community Health Centres used this alliance for training dentists.[25] This type of partnership has been successful in other communities with the advantages of providing students a public health experience and serving those most in need.[26,75] With this workforce any dental clinics for the homeless may be able to

operate five full days a week, hopefully satisfying the dental needs of this population. Another benefit with the expansion of the existing dental services in these clinics is that they have already developed an eligibility criteria for the patients served.

Another possibility will be the provision of dental services with mobile clinics. This working setting is recommended for dental emergency procedures or one appointment treatments.[97] It is more appropriate for small communities where the demand of services does not justify the installation of regular dental clinics, and in isolated communities with difficult access to health care services. There are drawbacks for this plan because mobile clinics present several management problems such as recruitment of patients, problems related to the weather (Canadian winters) and the continuity of dental treatment.

Although oral health is part of general health, in Canada, publicly funded dental care is very limited.[95,96] As a result, many individuals go to hospital emergency rooms with dental issues. This has been studied in Ontario for the general population, but requires considerations for the homeless populations as well. The dental treatment provided by hospital emergency rooms are ineffective and inefficient, most often no dental care at all, placing an unnecessary burden on already busy acute care settings, and ultimately representing poorly spent health care resources.

In addition to the provision of dental services, simple preventive measures such as provision of free toothbrush and toothpaste could be a valuable benefit. An oral hygiene kit as well as pamphlets with dental clinic addresses and relevant oral/dental information for this population should be available in shelters, community-based health clinics and other places regularly frequented by the homeless population. Again, this initiative will be an adaptation of a

measure already taken for the prevention of sexually transmitted diseases modified for oral health purpose.

Finally, in an ideal world, emergency shelters that provide meals to their residents and soup kitchens (food programs) should try to improve their meals according to a balanced diet high in nutrients and low in refined carbohydrates and sugar.

Certainly, one or all the suggestions above will be very beneficial to the Toronto adult homeless population that until at the present time does not receive any dental assistance whatsoever.

6 Limitations of this Study

Given the exploratory nature of this study, there are some limitations that should be noted. The main limitation of this study was the exclusion criteria established. For practical reasons, this study examined only single homeless adults who were living in shelters. The study excluded families and children under 18 years as well as homeless people who did not use shelters or lived on the street. This study thus only describes the oral health of a small subset of all homeless people in Toronto. Even though language could be a limitation in this study none of the participants were excluded by inability to communicate in English. All the subjects who were invited, accepted to participate in this study. However, given that the investigator was not part of the participants' first contact process, it was not possible to determine if the 10 participants from each shelter were the first 10 bed numbers on the list of randomly generated numbers.

The clinical oral examination was performed outside of a dental environment with limited conditions. Not using a dental explorer, radiographs, appropriate lighting and positioning of the patients contributed to under-identifying the oral health problems of participants. Diagnoses, especially for endodontic treatment and restorative dentistry were particularly limited in this regard. Concerning comparisons with the CHMS, even though this homeless study used the same coding criteria for the clinical oral examination, limited operating conditions again influenced comparability of results.

A larger sample size would have allowed the utilization of advanced statistical techniques that would result in more precise inferences about the characteristics of the homeless population in Toronto. An increased sample size may also reveal differences within sub-groups such as drug users. Even though the sample size of this study restricts the ability to make broad conclusions,

this study does provide important dental health information on homeless people in Toronto and the sample is arguably representative of those who are using the shelter system in Toronto.

Overall the responses for the questions satisfied the purpose of the questionnaire in gathering information. However, the question related to the kinds of drug used would have more accurate responses if it had been designed as “check all that apply” instead as an open-ended question. In addition, the question concerning the number of children who were living with the participants became irrelevant. All the shelters selected for this study were shelters for single adults where children under 18 years are not allowed to enter. However, although 100% of the subjects responded not having any children living with them it cannot be assumed that the participants in this study did not have any children.

7 Conclusion

This was the first study to date to explore the oral health status of the adult homeless population in Toronto using an oral health assessment questionnaire and clinical oral examination. The homeless population represents a high-risk group concerning oral health. This study demonstrated direct associations between homelessness and poor oral health in Toronto. The Toronto adult homeless population has a significantly higher degree of dental needs as well as a lower rate of utilization of dental services compared to the general Canadian population. With no free oral care in Toronto, it is hypothesized that these individuals use hospital emergency departments for their urgent needs and place an undue burden on the acute care system, an issue that will require careful study in the future.

In Toronto, the homeless population could benefit enormously from dental public health programs. It is anticipated that upgrading oral health care assistance to the homeless in Toronto will be essential to facilitate early access to oral health services. Provision of free or low cost dental treatment such as professional cleaning, treatment of urgent problems and/or symptoms of dental pain would make a great impact in these people's lives. Health authorities need to recognize that standard health services do not meet the needs of the homeless population in this regard.

Ultimately, the main objective is to improve the overall oral health of the homeless. The development of public dental health programs targeting this high-risk population will be crucial to reach this goal. The challenge lies in tailoring oral health interventions suitable for this heterogeneous group with reasonable cost-effective services. Improving the oral health status of homeless individuals will also facilitate their social re-integration and diminish the obstacles

related to this integration, such as employment. Good oral health is a right for all citizens and this includes the homeless. A healthy mouth would allow more societal acceptance and would reduce the physical revulsion and aversion frequently suffered by this group. Hopefully, the present study will help encourage local public health authorities and policy makers to develop a dental program for this population in Toronto.

Future research will require a larger sample size and mixed method study designs to explore all subgroups of the homeless population and to investigate alternative oral care services used by this population.

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9 Appendices: Appendix 1 – Ethics Approval

University of Toronto
Office of the Vice-President, Research

Office of Research Ethics

PROTOCOL REFERENCE #24808

January 26, 2010

Dr. Carlos Quiñonez
Faculty of Dentistry
University of Toronto
124 Edward St.
Toronto, ON M5G 1G6

Dr. Rafael Luis Fiori de Figueiredo
Faculty of Dentistry
University of Toronto
124 Edward St.
Toronto, ON M5G 1G6

Dear Dr. Quiñonez and Dr. Figueiredo

Re: Your research protocol entitled "Homelessness and oral health in Toronto"

ETHICS APPROVAL	**Original Approval Date: January 26, 2010** **Expiry Date: January 25, 2011** **Continuing Review Level: 1**

We are writing to advise you that a member of the Health Science Research Ethics Board has granted approval to the above-named research study, for a period of **one year**, under the REB's delegated review process. **Please ensure that you submit an Annual Renewal Form or a Study Completion Report 15 to 30 days prior to the expiry date of your study. Note that annual renewals for studies cannot be accepted more than 30 days prior to the date of expiry, as per federal and international policies.**

All your most recently submitted documents have been approved for use in this study.

Any changes to the approved protocol or consent materials must be reviewed and approved through the amendment process prior to its implementation. Any adverse or unanticipated events should be reported to the Office of Research Ethics as soon as possible.

If your research has funding attached, please contact the relevant Research Funding Officer in Research Services to ensure that your funds are released.

Best wishes for the successful completion of your project.

Yours sincerely,

Daniel Gyewu
Research Ethics Board Manager- Health Sciences

McMurrich Building, 12 Queen's Park Cres. W, 2nd Floor Toronto, ON M5S 1S8
TEL: 416-946-3273 FAX: 416- 946-5763 EMAIL: ethics.review@utoronto.ca

Appendix 2:

Faculty of Dentistry
University of Toronto

CDHSRU
COMMUNITY DENTAL HEALTH SERVICES RESEARCH UNIT

Dear (name of the shelter's director):

The Community Dental Health Services Research Unit (CDHSRU), Faculty of Dentistry, University of Toronto, is conducting a study to determine the oral health needs of homeless people in Toronto and their barriers to accessing dental care services.

This study will gather information from homeless individuals who are using shelters in Toronto. The study includes two parts: a face-to-face interview with a structured questionnaire and a clinical oral examination. Both parts of this study will ideally be conducted in a private area of your facility to guarantee participant's personal privacy. All interviews and oral examinations will be conducted by a trained dental professional. Overall, it will take between 30 to 45 minutes to complete both parts of this study for each participant. All homeless individuals are eligible for this study, even those with medical restrictions, because the oral examination designed for this study is visual in nature and does not require any kind of invasive procedure.

This letter is to notify you of the study and to seek your consideration of your facility's participation. Our researcher, Rafael Luis Fiori de Figueiredo (Master of Science candidate) will be contacting you in the next week to provide you with more detailed information.

In the meantime, if you have any questions or concerns, please contact Rafael at: Rafael.Figueiredo@dentistry.utoronto.ca Tel: 416 979 4900 Ext: 4497.

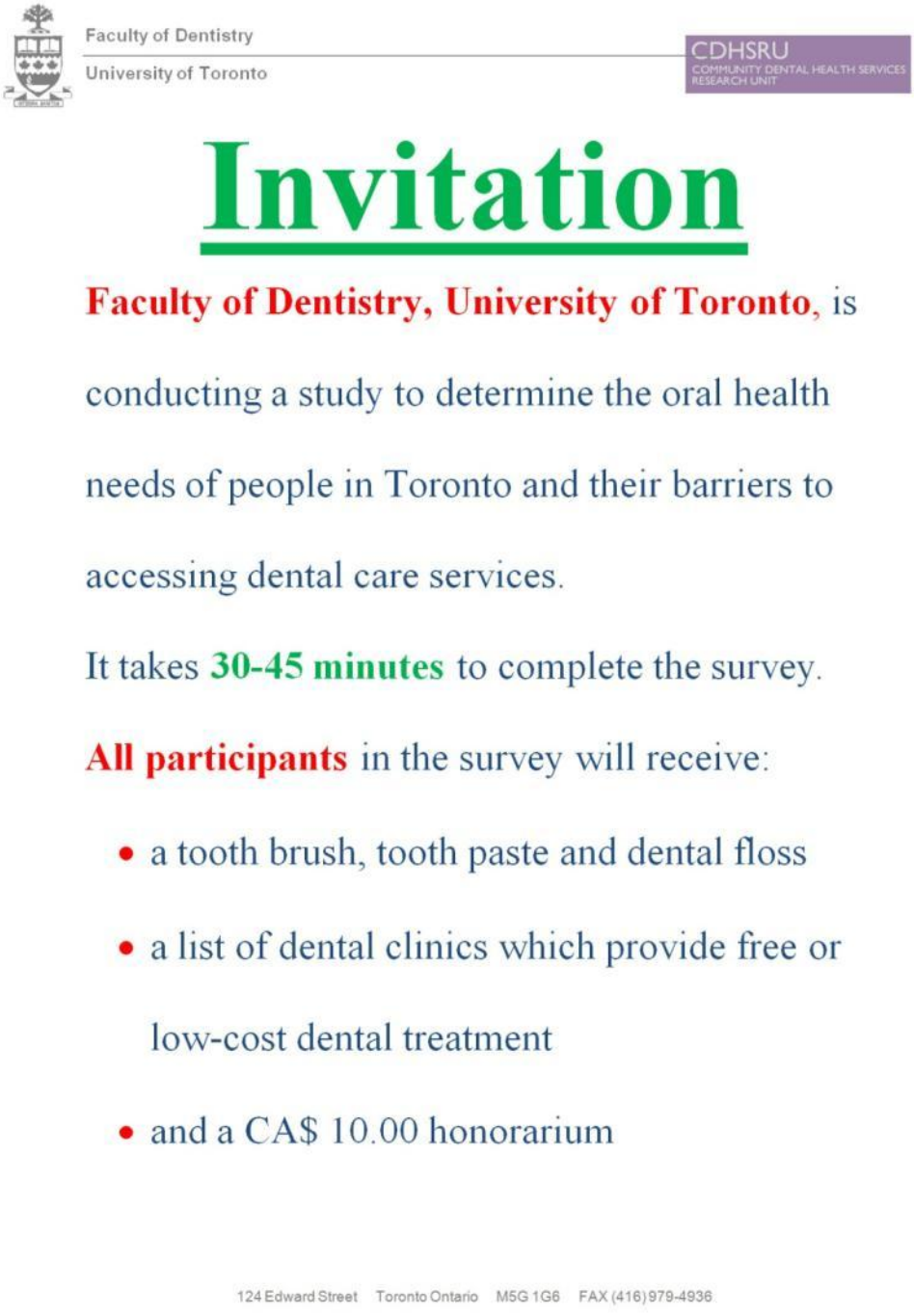
Thank you for your consideration.

Respectfully,

Rafael Luis Fiori de Figueiredo - DDS

124 Edward Street Toronto Ontario M5G 1G6 FAX (416) 979-4936

Appendix 3: Poster to the Shelters



Faculty of Dentistry
University of Toronto

CDHSRU
COMMUNITY DENTAL HEALTH SERVICES RESEARCH UNIT

Invitation

Faculty of Dentistry, University of Toronto, is conducting a study to determine the oral health needs of people in Toronto and their barriers to accessing dental care services.

It takes **30-45 minutes** to complete the survey.

All participants in the survey will receive:

- a tooth brush, tooth paste and dental floss
- a list of dental clinics which provide free or low-cost dental treatment
- and a CA$ 10.00 honorarium

124 Edward Street Toronto Ontario M5G 1G6 FAX (416) 979-4936

Appendix 4:

Faculty of Dentistry
University of Toronto

CDHSRU
COMMUNITY DENTAL HEALTH SERVICES RESEARCH UNIT

Study Information

Title of Study: Homelessness and oral health in Toronto.
Principal Investigator: Rafael Luis Fiori de Figueiredo, Master of Science candidate, University of Toronto.
Rafael.Figueiredo@dentistry.utoronto.ca
Supervisor: Dr. Carlos Quiñonez, Assistant Professor, Faculty of Dentistry
Sponsor: Community Dental Health Services Research Unit, University of Toronto

Introduction

This survey, conducted by the Community Dental Health Services Research Unit, Faculty of Dentistry, University of Toronto in conjunction with Toronto shelters, is interested in finding out about: (1) the oral health problems experienced by the homeless population in Toronto; (2) their concerns about their oral health; and (3) their experience with oral health care.
The information we gather will be put into a report in an attempt to influence government policy makers and health professionals to improve dental care services for homeless people in Toronto

Methods:

This survey will collect data in two parts. First, a face-to-face interview asks about general/oral health and socio-demographic information. The second part consists in a visual oral examination using wood tongue depressor, disposable dental mirror and gauze to remove debris where necessary to better visualize dental structures. An intraoral photograph will also be taken, which is a photograph of the mouth only in order to protect your identity. No x-rays will be taken and the oral examination will be conducted under standardized conditions observing normal infection control protocols. The questionnaire and oral examination will be conducted in a private area of the shelter to guarantee your personal privacy. All the interviews and oral examinations will be conducted by a trained dental professional. Overall, it will take 30 to 45 minutes to complete both parts of this study. It is important to know that the examination does not include any kind of dental treatment for you or any other participant.

Eligibility:

To participate in this study you, as participant, must be at least 18 years old, fluent in English and living in a shelter for at least 7 days preceding the survey.

Risks:

There are minimal risks associated with participation in this study. The clinical oral examination designed for this study is visual in nature and does not realize any kind of invasive procedure, consequently you will not experience any discomfort or harm during the oral examination, even if you have medical restrictions. You will only feel slight pressure from the wood tongue depressor or dental mirror and from the gauze used to remove teeth debris when necessary. The answers provided to the questionnaire will in no way affect any benefit or service that you are currently receiving in this shelter. The findings of this study will be presented as group data and you or the shelter will not be identified by name, location or photograph.

Potential Benefits:

The CDHSRU is conducting this research because we believe that identifying the magnitude of the oral health problems among the adult homeless population in Toronto is the first step to improve dental care services for this group. Although you will not benefit immediately from participating in this study, we hope that ultimately all homeless people in Toronto will be benefit from any changes made because of the findings of this study.

Participation and Withdrawal:

Participation in this study is voluntary. During this study we will ask questions about socio-demographic, general and oral health. You are under no obligation to answer any or all of the questions. You can also contact any of the study investigators to withdraw from the study after you have completed the survey. During the dental examination the examiner will do their best to make it brief and comfortable for you. You are also under no obligation to complete the examination and you are perfectly free to withdraw from this study at any time. If you choose not to participate or withdraw from the study this will in no way affect any benefit or services that you are receiving in this shelter.

Privacy and confidentiality:

We assure that all information gathered during this study will be kept completely confidential. Participants' and facilities' privacy and confidentiality will be guaranteed to the extent permitted by law. All raw data collected, photographs and papers containing personal information will be stored in a locked cabinet at the Faculty of Dentistry, University of Toronto. Processed data will be stored electronically in a computer accessible by a secret password. All data will be identified through a code number to conceal your identity and only the principal investigator will have access to the data collected from this study.

Report of the results:

The findings of this study may be published in a scientific journal or presented at professional meetings, however, it will be presented as group data and you or the shelter will not be identified by name, photograph or location. The results will not contain any private or personal information. The findings of this study will be made freely available to you and all participants.

Reimbursement to Participants:

You, as a participant of the study, will be provided with: an oral hygiene kit containing a tooth brush, tooth paste and dental floss and also oral health instructions, advice and an explanation of appropriate oral hygiene techniques according to your oral condition and necessities; a list of dental clinics which provide free or low-cost dental treatment; and a CA$ 5.00 honorarium.

Questions regarding the study:

If you have any question about this study that are not answered in this information sheets, please contact the principal investigator, Dr. Rafael Luis Fiori de Figueiredo, via e-mail rafael.figueiredo@dentistry.utoronto.ca or telephone (416) 979-4907 Ext.: 4497.

Appendix 5:

Faculty of Dentistry
University of Toronto

CDHSRU
COMMUNITY DENTAL HEALTH SERVICES RESEARCH UNIT

CONSENT FORM

Homelessness and Oral Health in Toronto

I acknowledge that the research procedures described on the attached form "Study Information" have been explained to me and that any questions that I have asked have been answered to my satisfaction. I understand the potential benefits of joining the research study. I know that I may, at any time, ask any questions about the study or the research procedures. I have been assured that records and photographs relating to me will be kept confidential and that no information will be released or printed that would disclose personal identity without my permission.

I understand that my participation is entirely voluntary and I am free to withdraw from the study at any time, and if I do withdraw, it will not affect in any way the benefits I am receiving in this shelter. I also understand that to increase safety during the oral examination of my teeth and gums, I should do my best to remain still and try to make any sudden movements.

I hereby consent to participate in the above named study, and have been given a copy of the study information sheets and consent form.

Participant's name: _____

Participant's signature: _____

Witness: _____

Date: _____

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Appendix 6:

Faculty of Dentistry
University of Toronto

CDHSRU
COMMUNITY DENTAL HEALTH SERVICES RESEARCH UNIT

Oral Health Assessment

1- Survey Identification Number: _____ **Date:** _____

2- Place of interview: _____

3- Participant's Name: _____

4- Date of Birth: _____ **Age:** _____years old.

5- Gender: □ Male □ Female

Part I – Section: Oral Health

The next questions are related to your oral health

1- **In general, would you say the health of your mouth/teeth is:**

□ Excellent
□ Very good
□ Good
□ Fair
□ Poor
□ Don't know/refuse

2- **When was the last time you saw a dental professional?**

□ Less than 1 year ago
□ 1 year to less than 2 years ago
□ 2 years to less than 3 years ago
□ 3 years to less than 4 years ago
□ 4 years to less than 5 years ago
□ 5 or more years ago
□ Never
□ Don't know/refuse

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3- **What was the reason for your last visit to the dentist?**

□ Emergency (tooth/mouth pain)

□ Regular check up/cleaning

□ Dental treatment (not emergency)

□ Other _____

□ Don't know/refuse

4- **Do you think you have any untreated dental conditions?**

□ Yes

□ No **(go to question # 6)**

□ Don't know/refuse

5- **What untreated dental condition(s) do you think you have?**

□ Prevention

□ Fillings

□ Temporomandibular joint disorder (TMD)

□ Surgery

□ Periodontics

□ Esthetics

□ Endodontics

□ Orthodontics

□ Soft tissue

□ Prosthetics – partial or full denture

□ Prosthetics – implant, bridge or crown

□ Other – Specify _____

□ Don't know/refuse

6- **In the past month, have you had a toothache?**

□ Yes

□ No **(go to question # 11)**

□ Don't know/refuse

7- **Did you seek care for this toothache?**

□ Yes - **Where?** _____

□ No - **Why not?** _____

□ Don't know/refuse

8- **Did you take any medicine for this toothache?**

□ Yes - **What medicine?** _____

□ No - **Why not?** _____

□ Don't know/refuse

9- **How long has this toothache lasted?**

□ Only once/one day

□ One week

□ One month

□ Other _____

□ Don't know/refuse

10- **How much has this toothache affected your daily activities?**

□ I was not able to do anything

□ I still managed to do my regular things

□ It didn't affect me at all

□ Other _____

□ Don't know/refuse

11- **In the past month, how often have you found it uncomfortable to eat any food because of problems with your mouth/teeth?**

□ Often

□ Sometimes

□ Rarely

□ Never

□ Don't know/refuse

12- **In the past month, how often have you avoided eating particular foods because of problems with your mouth/teeth?**

□ Often

□ Sometimes

□ Rarely

□ Never

□ Don't know/refuse

13- **In the past month, have you had other pain in your mouth/gums/jaw?**

□ Yes – Where? _____

□ No

□ Don't know/refuse

14- **In the past month, did you experience .... ? (check all that apply)**

- □ Persistent bleeding gums
- □ Persistent bad breath
- □ Persistent dry mouth
- □ None
- □ Don't know/refuse

15- **How satisfied are you with the appearance of your teeth and/or dentures?**

- □ Very satisfied
- □ Satisfied
- □ Neither satisfied nor dissatisfied
- □ Dissatisfied
- □ Very dissatisfied
- □ Don't know/refuse

16- **How important is the appearance of your teeth and/or dentures to you?**

- □ Very important
- □ Not so important
- □ Not important at all
- □ Other _____
- □ Don't know/refuse

17- **Do you brush your teeth and/or dentures?**

- □ Yes
- □ No (go to question # 19)
- □ Don't know/refuse

18- **How often do you usually brush your teeth and/or dentures?**

- □ Per day
- □ Per week
- □ Per month
- □ Other _____
- □ Don't know/refuse

19- **Do you use dental floss on your teeth?**

- □ Yes
- □ No (go to question # 21)
- □ Don't know/refuse

20- **How often do you usually floss your teeth?**

□ Per day
□ Per week
□ Per month
□ Other _____
□ Don't know/refuse

21- **Do you have insurance or a government program that covers all or part of your dental expenses?**

□ Yes - **Which one?** _____
□ No
□ Don't know/refuse

22- **If you need to have dental care where do you prefer it be provided?**

□ Private dental office
□ A clinic only for homeless people
□ Public Health Department Clinic
□ Hospital Emergency Room
□ Other _____
□ Don't know
□ Refuse

Part I – Section: General health

Now some questions about your general health

23- **In general, would you say your health is....**

□ Excellent
□ Very good
□ Good
□ Fair
□ Poor
□ Don't know
□ Refuse

24- **Do you have any of the following conditions?**

□ Diabetes	□Yes	□No	□ Don't know	□Refused
□ Anemia	□Yes	□No	□ Don't know	□Refused
□ Hypertension	□Yes	□No	□ Don't know	□Refused
□ Heart disease/stroke	□Yes	□No	□ Don't know	□Refused
□ Liver problems	□Yes	□No	□ Don't know	□Refused
□ Arthritis/rheumatism	□Yes	□No	□ Don't know	□Refused
□ Cancer	□Yes	□No	□ Don't know	□Refused
□ Problem walking	□Yes	□No	□ Don't know	□Refused
□ HIV/AIDS	□Yes	□No	□ Don't know	□Refused

□ Other _____

25- **In the past 30 days, have you gotten health care from:**

a) a Hospital Emergency Room?

□ Yes □ No □ Don't know/refuse

b) a hospital where you stayed at least one night, not counting staying overnight in the Emergency Department?

□ Yes □ No □ Don't know/refuse

26- **In the past 12 months, have you gotten health care from:**

a) a Hospital Emergency Room?

□ Yes □ No □ Don't know/refuse

b) a hospital where you stayed at least one night, not counting staying overnight in the Emergency Department?

□ Yes □ No □ Don't know/refuse

27- **Where do you first go when you have any kind of health problem?**

_____

_____

28- **Have you been using drugs regularly?** (marijuana, crack, cocaine, crystal meth or etc)

□ Yes □ No □ Refuse/Don't know

-If "Yes": - **which one?** _____

- how often? □ Daily □ Weekly □ Monthly □ Refuse/Don't know

Part I – Section: Socio-demographic

Now some questions about you

29- **What is your living situation at the present time?**

□ Living at your own place (go to question # 32)
□ Living with family or relatives
□ Living with friends
□ Living in a shelter or homeless
□ Other _____
□ Refuse

30- **How old were you the first time you were homeless?**

_____ age □ Don't know □ Refuse

31- **If you add all the time in your life, how many months or years have been homeless?**

_____Months _____Years □ Don't know □ Refuse

32- **Were you living in Toronto when you first became homeless?**

□ Yes
□ No - **Where you were living? (city)**_____
□ Refuse

33- **In the last 30 days, how often have you had difficulty…?**

	Never	Rarely	Sometimes	Usually
a) Finding shelter	□	□	□	□
b) Finding enough to eat	□	□	□	□
c) Finding clothing	□	□	□	□
d) Finding a place to wash	□	□	□	□
e) Finding a place to use the bathroom	□	□	□	□

34- **How often do you have a meal at a food program?**

□ Always/everyday
□ Once a week/occasionally
□ Never **(go to question # 35)**
□ Other _____
□ Refuse

35- **Do you always go to the same food program?**

□ Yes
□ No
□ Refuse
□ Don't know

36- **Do you have any children who are under 18 years old and who live with you?**

□ Yes
□ No
□ Refuse
□ Don't know

37- **Where you were born?**

□ Canada - Which province? _____
□ Outside Canada - Where? _____
□ Refuse
□ Don't know

38- **To which racial or cultural group do you belong?** (check only one).

□ White
□ Black, African-Canadian
□ First Nations/Aboriginal (Cree, Micmac, Metis or Inuit)
□ Asian (Chinese, Japanese, Korean, etc)
□ Middle Eastern (Afgan, Arab, Iranian, Iraqi, Turkish, etc)
□ Hispanic, Latin American
□ Other _____
□ Don't know
□ Refuse

39- **What is the highest level of education you have achieved?**

□ Grade 8 or less
□ High school graduate
□ College/university graduate
□ Other _____
□ Don't know
□ Refuse

40- **Do you have a job?**

- □ Part-time job
- □ Full-time job
- □ Only occasionally casual jobs or self-employed job
- □ No - **When was the last time you were employed?** _____
- □ Refuse

41- **Over the last 30 days, what was your total income from ALL sources?**

- □ Less than $100
- □ Between $100 and $ 500
- □ Between $500 and $1,000
- □ More than $1,000
- □ Refuse
- □ Don't know

42- **What is your marital status? Are you...?**

- □ Single/never married
- □ Divorced/separated
- □ Married/partnered
- □ Widowed
- □ Refuse

Appendix 7:

Faculty of Dentistry
University of Toronto

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COMMUNITY DENTAL HEALTH SERVICES RESEARCH UNIT

Part II - Clinical Oral Examination

SIN: _____

	17	16	15	14	13	12	11	21	22	23	24	25	26	27
CROWN														
ROOT														

	47	46	45	44	43	42	41	31	32	33	34	35	36	37
CROWN														
ROOT														

NOTE: Data are recorded for each tooth whether or not present.

1 Sound – never decayed or restored
2 Missing – due to orthodonthic treatment
3 Missing – due to trauma
4 Missing – due to caries or periodontal disease
5 Decayed severely
6 Decayed – pit and fissure caries
7 Decayed – smooth surfaces caries
8 Decayed – both smooth surface and pit and fissure caries
9 Filled with amalgam, no other decay
10 Filled with other material (resin, GIC, inlay, crown), no other decay
11 Filled with amalgam and other material (resin, GIC, inlay, crown), no other decay
12 Filled with amalgam, no other decay, but filling is defective and needs replacement
13 Filled with other material (resin, GIC, inlay, crown) but filling is defective and needs replacement
14 Filled with amalgam and other material (resin, GIC, inlay, crown) but filling is defective and needs replacement
15 Bridge abutment, special crown or veneer
16 Implant
17 Fractured due to trauma
18 Other

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1- **Prosthetic status of the upper arch:**

□ No prosthetics

□ Fixed bridge

□ Implant

□ Partial denture - acrylic

□ Partial denture – cast chrome

□ Full denture

2- **Prosthetic status of the lower arch:**

□ No prosthetics

□ Fixed bridge

□ Implant

□ Partial denture - acrylic

□ Partial denture – cast chrome

□ Full denture

3- **Gum status of the upper arch:**

□ No gingivitis

□ Mild gingivitis

□ Moderate gingivitis (or a not generalized condition)

□ Severe gingivitis (generalized condition)

□ Edentulous

4- **Gum status of the lower arch:**

□ No gingivitis

□ Mild gingivitis

□ Moderate gingivitis (or a not generalized condition)

□ Severe gingivitis (generalized condition)

□ Edentulous

5- **Calculus status of the upper arch:**

□ No calculus

□ Presence of calculus but restricted to one/few teeth

□ Presence of calculus but generalized condition on the arch

□ Edentulous

6- **Calculus status of the lower arch:**

□ No calculus

□ Presence of calculus but restricted to one/few teeth

□ Presence of calculus but generalized condition on the arch

□ Edentulous

7- **Mucosal status:**

□ No mucosal abnormalities

□ Angular chelitis

□ Mucosal white patches

□ Denture stomatitis

□ Denture induced hyperplasia (epulis)

□ Glossitis

□ Sinus or fistula

□ Aphthous ulcer

□ Traumatic or unspecified ulcer

□ Other – Specify_____

8- **Occlusal status:**

□ Acceptable occlusion

□ Anterior crossbite

□ Severe crowding

□ Severe spacing

□ Posterior crossbite

□Anterior open bite (>1 mm)

□ Excessive overbite (100% or more)

□ Excessive overjet (>9 mm)

□ Midline shift (>4 mm)

9- **Record the dental treatment currently needed by the respondent: (check all that apply)**

□ No treatment needed

□ Emergency (tooth pain, traumatic injury, etc.)

□ Fillings

□ Periodontics

□ Surgery (tooth extraction)

□ Endodontics

□ Prosthesis

□ Soft tissue

□ Other – Specify _____

Appendix 8:

Sample photograph of teeth and gums that will be taken on this study.

Appendix 9:

Institutions offering dental treatment

The following sites offer free or low-cost dental treatment. For more information call the number listed or see the Toronto Public Health website at www.toronto.ca/health/dental/index.htm

Institutions offering low-cost dental treatment

Toronto/East York

Faculty of Dentistry, University of Toronto
416-979-4927 (adults)
101 Elm Street
- Open September-June.

George Brown College, Casa Loma Campus
416-415-4547
175 Kendal Avenue
- Low-cost cleanings, small fillings and dentures.

Queen West Community Health Centre
416-703-8481
168 Bathurst Street
- All Toronto residents, reduced prices.

Regent Park Community Health Centre
416-364-2261 ext. 7019
465 Dundas Street East
- All Toronto residents.

Shout, Dental Treatment Clinic
416-927-8553
467 Jarvis Street
- Free services for youth 16-25.

St. Joseph's Health Centre, Ambulatory Care Centre Clinics
416-530-6043
30 The Queensway
- Access by Tranquility Gardens Entrance.
- Lower cost, must call to make appointment.

Yonge St. Mission, Evergreen Centre
416-977-7259
381 Yonge Street
- Free dental services for street youth under 25.

Scarborough

Scarborough Hospital, Urban Dental Clinic
416-438-3872
3000 Lawrence Avenue East, Building A, 2nd Floor
- For youth and low-income adults.
- Free emergency dental care.

The following provide hygiene services only

North York

Toronto College of Hygiene
416-423-3099
300 Steep Rock Drive
- No fixed schedule, appointment to be booked with student

Scarborough

Oxford College of Arts and Business
416-439-8668
670 Progress Avenue

Toronto/East York

Canadian Business College Dental Hygiene Clinic
416-925-6594
2 Bloor Street West, Upper Cumberland Terrace

Regency Dental Hygiene Academy
416-341-0100
481 University Avenue
- Anyone is eligible

Yorkville College
416-929-0121
94 Cumberland Street

Toronto Public Health Dental Clinics

These clinics offer free dental care for eligible children, high school students and seniors:

Etobicoke

416-338-1790
8 Taber Road

416-338-8399
399 The West Mall

416-252-6471
185 Fifth Street

North York

416-338-8399
5100 Yonge Street, Ground Floor

416-338-2025
12 Flemington Road

416-338-1224
1651 Keele Street

Scarborough

416-338-7442
160 Borough Drive

Toronto/East York

416-392-0907
2398 Yonge Street

416-392-6683
791 Queen Street East

416-392-0934
235 Danforth Avenue

416-392-6680
277 Victoria Street, 2nd Floor

416-392-1410
340 College Street, Suite 370

416-392-0988
2340 Dundas Street West

416-392-1777
95 Lavinia Avenue