Rural-urban disparities in patient satisfaction with oral health care

Abdalgader Ibrahim Alhozgi

Master of Science
Faculty of Dentistry, McGill University
Montreal, Quebec, Canada
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DEDICATION

This work is dedicated to my beloved my father and my mother, my brothers, my sisters, my wife, and to the entire my family for their endless support and guidance throughout the course of my master's degree.

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LIST OF ABBREVIATIONS

PSQ	Patient Satisfaction Questionnaire
MSSS	Quebec Ministry of Health and Social Services
INSPQ	Institut National de Santé Publique du Québec
ICS-II	International Collaborative Study of Oral Health Outcomes

ABSTRACT

Background: Identifying spatial variation in patient satisfaction is essential to improve quality of care. Thus, the objective of this study was to investigate rural-urban disparities in patient satisfaction and determine factors that could influence satisfaction with oral health care.

Methods: Data from 1,788 parents/caregivers of children who participated in the Quebec Ministry of Health clinical study were subject to secondary analysis. The Perneger Model of patient satisfaction was used as the conceptual framework for the study. Satisfaction with oral health care was measured using the WHO-sponsored International Collaborative Study of Oral Health Outcomes (ICS-II). Explanatory variables included patient characteristics, predisposing factors and enabling resources. Statistical analyses were comprised of descriptive statistics, as well as bivariate and linear regression models.

Results: Individuals with higher income, dental insurance coverage, having a family dentist, having ease in finding a dentist and access to a private dental clinic were more satisfied with oral health care ($p< 0.001$). There were statistically significant differences between rural and urban Quebec residents in scores of patient satisfaction on four items, including: dental office location ($p = 0.013$), dental equipment ($p = 0.016$), cost of dental treatment ($p <0.001$) and cleanliness of dental office ($p = 0.004$). The multiple linear regression model showed that major determinants of patient satisfaction were being a native Canadian, married, having dental insurance coverage, having perceived good oral health, having a family dentist and having visited the dentist for regular checkups ($p <0.005$). Having difficulty finding a dentist negatively influenced patient satisfaction with oral heath care ($p < 0.001$).

Conclusion: These findings suggest that Quebec rural-urban disparity exists in patient satisfaction with care and that determinants of health are predictors of patient satisfaction. Intensive and powerful knowledge dissemination activities will help to mobilize policy makers in implementing public health strategies to reduce this disparity.

RÉSUMÉ

Contexte : La variation dans la satisfaction des patients constitue un aspect important à considérer dans les démarches d'amélioration de la qualité des soins. Ainsi, l'objectif de cette étude a été d'étudier les différences en matière de satisfaction, chez des patients des régions rurales et urbaines et aussi, de déterminer les facteurs qui pourraient influencer la satisfaction à l'égard des soins buccodentaires.

Méthodologie: Cette étude utilise les données recueillies de 1 788 parents/soignants d'enfants ayant participé à l'étude clinique du ministère de la Santé du Québec. Le modèle Perneger de satisfaction des patients a servi de cadre conceptuel et la satisfaction à l'égard des soins buccodentaires a été mesurée à l'aide de l'Étude collaborative internationale sur les résultats en matière de santé buccodentaire (ICS-II), approuvée par l'OMS. Les caractéristiques des patients, leurs ressources et les facteurs qui influencent la satisfaction représentent les variables explicatives dans le modèle conceptuel. Des statistiques descriptives ainsi que des modèles de régression bivariée et linéaire ont été utilisés.

Résultats: Un revenu plus élevé et la présence d'une assurance dentaire, un dentiste de famille, la facilité à trouver un dentiste et l'accès à une clinique dentaire privée sont des facteurs qui influencent positivement la satisfaction avec les soins dentaires reçus ($p<0,001$). Des différences statistiquement significatives ont été trouvées entre les résidents des régions rurales et urbaines du Québec en ce qui concerne les scores de satisfaction des patients sur quatre points : 1. l'emplacement du cabinet dentaire ($p = 0,013$), 2 l'équipement dentaire ($p = 0,016$), 3. le coût du traitement dentaire ($p < 0,001$) et 4. la propreté du cabinet dentaire ($p = 0,004$). Le modèle de régression linéaire multiple a montré que les principaux déterminants de la satisfaction des patients

étaient le fait d'être natif du Canada, d'être marié, d'avoir une assurance dentaire, d'avoir une bonne santé buccodentaire, d'avoir un dentiste de famille et d'avoir consulté le dentiste régulièrement ($p < 0,005$). La difficulté à trouver un dentiste a eu une influence négative sur la satisfaction des patients à l'égard des soins buccodentaires ($p < 0,001$).

Conclusion: Ces résultats démontrent une différence entre les régions rurales et urbaines du Québec quant à la satisfaction des patients à l'égard des soins. Les déterminants de la santé semblent prédire la satisfaction des patients. Des actions intensives et soutenues de transfert de connaissances aideront à mobiliser les décideurs dans la mise en œuvre de stratégies de santé publique visant à mieux répondre aux attentes des patients.

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CONTRIBUTION OF AUTHORS

I, Abdalgader, extracted the data from the database, analyzed and interpret the data, wrote the manuscript. Dr. Elham Emami and Dr. Jocelyne Feine guided and helped me throughout the thesis. They assisted in data interpretation and revision of the manuscript, and revision of the entire thesis. Dr. Farzeen Tanwir also helped in the revision of the manuscript.

CHAPTER I

LITERATURE REVIEW

1.1 Introduction

Health is defined by the WHO as "*a state of physical, mental, and social well-being*" (1). If this definition is accepted, one must also acknowledge that satisfaction has a role to play in the individual's well-being (2). A patient who is not satisfied with health care is not in a state of complete well-being (2). Although rarely stated, this idea lies behind the view that patient satisfaction is much more than an indicator of the quality of care, or a proxy measure for it. In fact, patient satisfaction is a desired outcome of care and an essential part of its quality (2).

Accordingly, patient satisfaction with health care has been gaining attention from health care practitioners and health care administrators (15) and has been widely used to evaluate the quality of health care services in both public and private health care sectors.

Patient satisfaction with care is a crucial element of the marketing concept in which the success of public and private health care organizations is dependent on meeting patients' perspectives and expectations and guaranteeing their satisfaction (3-7). Patient satisfaction with health care is believed to be the key to any successful practice and is becoming a practical reality across all market sectors around the world (8, 9). Satisfying patients will result in positive health care outcomes, including increased trust in health care providers and health care systems (10).

Patient satisfaction entails numerous dimensions and is related to several factors, such as socio-economic background, cultural values, environmental characteristics of health care settings, accessibility and availability of care, patients' previous experience with health care, the quality and

effectiveness of the treatment, as well as health care providers' attitudes, experiences, and knowledge (10-12).

In this chapter, we will provide a brief description of the concept of patient satisfaction.

1.2 Patient satisfaction with care: definition

Consumers' satisfaction in broad terms is a complex and multidimensional concept (13) that has acquired extensive recognition, particularly since the release of the National Health Service's Management Inquiry in 1983 with its call for customer views to be collected (14). This arose partially because of a desire for greater engagement of patients with their own care and to empower them in making health care decisions such as suggested therapy and the use of medication (14). Patients, previously considered to be health care *recipients*, are now identified as *consumers* of health care.

The definition of consumer satisfaction goes back to the year 1977, when Hunt defined satisfaction as an "*evaluation reaction resulting from the interaction of the product/situation with the individual's expectations*" (15). In the other words, satisfaction relies on the consumer's feelings of satisfaction or dissatisfaction that stem from a product's performance in relation to the consumer's expectations (16). If expectations meet the level of performance, the consumer will be satisfied and vice versa (16).

However, consumer satisfaction is not easy to define because it is an intangible and subjective concept linked to individuals' lifestyle, past life experiences, expectations, beliefs, and social values (17). Thus, it may be defined differently at different times and by different people (16). The

lack of a widely accepted definition of patient satisfaction also leaves the arena open for scientists to apply their own individual interpretations (7); Locker and Dunt wrote in 2005, "*It is rare to find the concept of patient satisfaction defined and there has been little clarification of what the term means either to the researchers who employ it or respondents who respond to it*" (18).

Wagner et al. (19) did a concept analysis within the nursing framework and defined patients' satisfaction as "*the extent of an individual's experience compared with his or her expectations"*; Sepight defined it as *"the patient's evaluation of the process of taking the medication and the outcomes associated with the medication*" (20); and Mohan et al. (20) defined patient satisfaction as *the sentiments, feelings, and perception regarding the health care services received* (20). Other authors have further defined patient satisfaction as *the degree of conformity between patient expectations of ideal care and their perceptions of actual care received* (20). Finally, satisfaction in a physiotherapeutic context has been defined as "*a sense of contentedness, achievement of fulfilment that results from meeting patient's needs and expectations with respect to specific and general aspects of healthcare*" (21). Currently, the most common definition refers to a "*patient's response to a significant aspect of her/his experience of health care services*" (22).

1.3 Determinants of patient satisfaction with care

Certainly, the principal finding that stands out from studies is that the majority of patients are usually satisfied with the services they received (23). The satisfied expression of the majority can be taken as an indicator of patient attitudes, both those arising from an accumulation of previous experiences with health care and as a generalized orientation towards potential future interactions with health care (23). A research study conducted on medical service quality indicated the following variables related to patient satisfaction: general quality, trust, reputation, continuity,

expertise, data, organization, equipment, attention to psychosocial issues, humanity, and outcome of care (24). Different levels of satisfaction have been reported by patients who were questioned about particular aspects of health care. One study summarized these distinctions thusly: "*Care recipients are more sympathetic or dissatisfied with the way and means of health care delivery procedures than the outcome of health care services*" (23, 25). Higher levels of satisfaction were more frequently reported with respect to the technical quality of care received compared to access of care, which reported generally lower levels of satisfaction (23). One reason for this finding may be that participants are more reluctant to criticize doctors' skills (23).

Batbaatar et al. (12) conduced a systematic review in 2016 in which they included more than 100 articles published between 1980 and 2014 (12). According to this recent systematic review, the determinants of patient satisfaction have been classified into two groups: health care provider-related determinants and patient-related determinants (12).

1.3.1. Health care provider-related determinants

These determinants can be categorized into three dimensions: 1) factors specific to health care providers, which are related to the clinicians' skills in interpersonal and technical aspects of care; 2) the environment where the care is delivered; and 3) the accessibility of care.

1) Clinicians' skills in interpersonal and technical aspects of care

Various studies showed that clinicians' interpersonal and communications skills will improve patient satisfaction with health care (12, 26-29). Furthermore, clinicians' knowledge, competency, technical skills, and experience with various type of treatment play a significant role in patient satisfaction as well (12). A much deeper analysis of this hypothesized correlation can be gleaned

from Ben-Sira's explanation of the technical and non-technical elements of care in which he attempts to explain potential predictors of patient health care assessments (30). Ben-Sira emphasizes that the experience of watching and evaluating doctor performance during medical consultations has a great impact on subsequent perceptions of patient satisfaction (30). In other words, patients evaluate a doctor mainly by his/her "affective behavior" which can be summarized as "the doctor's behavior toward the patient as a person rather than as a case." Lack of medical understanding prevents the patient from properly interpreting the doctor's actions (23).

2) The environment where the care is delivered

Several studies showed that the physical environment has an impact on patient satisfaction (12, 26, 29, 31-35). According to these studies, clinic atmosphere, comfort of rooms, cleanliness, noise level, convenience of temperature and lighting, size and type of facilities, arrangement of equipment and facilities, as well as access to parking are positively correlated with patient satisfaction (12, 36). Interestingly, studies showed that patients were more likely to be dissatisfied with care if the services are crowded (12, 37).

3) Access to health care

Access to health care is a multidimensional concept that includes accessibility, availability, and affordability of the care (12, 38, 39). Numerous studies have demonstrated that easy access to care increases patient satisfaction with the health care (12, 40-43). Research studies indicated that patient satisfaction was strongly linked to the distance at which the health care facilities were located, waiting time as well as admission and discharge processes (12, 36, 44-54). Furthermore, these studies showed that availability (which refers to available workforce) and affordability

(which refers to flexibility of payment mechanisms, insurance status, and insurance coverage) increase patients' ratings of satisfaction (12, 32).

1.3.2 Patient-related determinants

Patient-related characteristics can be classified into three dimensions. The first is related to socioeconomic status, the second is related to health status, and the third dimension is related to the patient's expectations (12).

1) Socio-economic status

Demographic and socio-economic characteristics of patients including age, gender, place of residency, education, income, marital status, and race are considered to be among the main determinants of patient satisfaction with health care (12, 55). Among these factors age was considered as the most significant factor determining patient's level of satisfaction (56). Accordingly, studies showed that elderly patients were generally more satisfied with health care than younger patients because they had a lower level of expectations towards the treatment that they usually received (57-59). The connection between age and satisfaction was found to be nonlinear, as patient satisfaction increased with patients up to 80 years of age and fell sharply thereafter (60, 61). A study by Jaiphual-Rosenthal et al. (7) indicated that the age group of 15–24 years showed the greatest level of satisfaction, incrementally decreasing over the next age brackets, and increasing again in the category of those over 60 years of age (7). However, Stege et al. (62) reported that although elderly patients were more satisfied than younger patients with the care they received, they were less satisfied with the method of communication (6). These results are

consistent with attitudinal variations reported within the literature on the overall life satisfaction perceptions of young populations relative to older populations (63).

An examination of patient satisfaction suggests that essential care criteria for elderly people may differ from those for younger adults (6). Liddell and Locker (1992) found that accepting behaviors (i.e., feeling welcome, engaging in therapy, and being treated seriously) were more crucial for elderly patients than for younger patients (6, 64). Stege et al. (1986) noted that elderly patients were more satisfied than younger patients with the care they received but were less satisfied overall with the communication methods used by care providers (6).

Gender is another patient characteristic that determines patient satisfaction with health care (12), and numerous studies have demonstrated a clear correlation between gender and patient satisfaction with health care (12, 65, 66). However, the results of these studies on the gender–patient satisfaction relationship differed significantly (12, 66, 67). This can be explained by different patterns of usage and gender-based health care experiences, but it may also represent men's and women's different level of expectations (13). Women generally rated their overall satisfaction lower than men (68). Some studies found that women especially seemed less satisfied with primary health care, medical treatment, and care management than men (7). Men had higher ratings of satisfaction for nursing care, checkups, and cleanliness and convenience of health care facilities (12).

According to research studies, the level of education was inversely correlated to the level of satisfaction with care (12, 69-71).

Place of residency and spatial variations are considered as the most important predictors of patient satisfaction with health care (12, 42, 72). Research studies have emphasized the importance of

considering spatial factors and neighbourhood characteristics when determining any type of health care outcomes (73-75). Understanding spatial variations in patient satisfaction with the quality of services supplied by health care systems is instrumental in enhancing quality and creating a patient-centered health care system by making it more responsive to the cultural elements of the population's health care needs (76). The most common reasons for regional variations in patient satisfaction with health care are infrastructure-related factors such as inadequate infrastructure development, lack of skilled health workers, socio-economic status, and education, which led to reduction in the quality of health care services and thus spatial variation in patients' satisfaction with care (76). For example, according to a research study on regional variations in patient satisfaction in Ghana, 2014, geographical regional differences were a major factor in the level of satisfaction as rural residents were less satisfied with primary health as compared to their urban counterparts (76). According to another study that was conducted in the former Soviet Union in 2010, country of residence was correlated with levels of patient satisfaction, with the finding that the population of Ukraine was more likely to report greater health care satisfaction than the Russian population (12, 77).

According to Arutyunyan et al. (78), patients who were less educated and those from rural regions were more satisfied with care because educated people had higher expectations, whereas less-educated patients had less understanding of what optimal care ought to involve and were less likely to have access to information about care quality (78). However, some studies in contrast showed that those who were less educated tended to be less satisfied with care (12, 34, 58, 79). Economic status also has a substantial influence on patients' satisfaction with care (27). Wealthier patients reported higher levels of satisfaction with health care services than patients with low economic status (8, 80).

Research studies have also shown that married patients are generally more satisfied with health care facilities (53, 81), while other research findings show that single or divorced patients are more satisfied with certain aspects of care, such as convenience, visitation, and cleanliness (12, 42). Race/ethnicity was also found to be a determinant of patient satisfaction with health care. Ethnic minorities were generally less satisfied compared to the general population (12, 82). Interestingly, ethnic minorities were more satisfied with the health care providers from their own race or ethnicity (12, 58, 83). Moreover, some studies found that health care providers' racial diversity made patients feel more comfortable and increased their trust in health care (12, 84).

2) Patients' health status

Patients' overall health condition or status was one of the strongest predictors of patient satisfaction with health care services (12, 83). Patients with poor health condition tend to have lower ratings of satisfaction with health care because they feel frustrated and depressed especially if they are suffering from incurable diseases (12). Patients who were suffering from severe pain with serious disease-related symptoms reported reduced health care service satisfaction (12, 60, 69, 85, 86). In addition, long-term chronic disease, obesity, disability, and low quality of life were found to be potential reasons for low rating of satisfaction (9, 12, 60, 87). Furthermore, some studies found a significant association between a patient's mental health status and general patient satisfaction (12, 79, 85). Absence of mental illness was found to be a major determinant of patient satisfaction (12, 88).

3) Patients' expectations

Patients' expectations have been suggested as one of the most important predictors of patient satisfaction with health care (12, 67, 89). Every patient receiving health care-related services has expectations that are affected by their understanding, concern, cultural background, values, and attitudes towards health (7). Patient expectations of care services are also influenced either by previous personal experiences or by other users' information (90). When the expectations of patients match the quality of health care, patients usually feel satisfied with health care services (12, 42, 91). Studies have shown that unmet expectations are associated with low rating of patient satisfaction (90).Thus, health care professionals' understanding of their patients' expectations will assist in increasing patient satisfaction (92).

1.4 Patient satisfaction: conceptual frameworks

Although various determinants of patient satisfaction have been identified in the literature, only a few theories and conceptual frameworks have been developed in the literature to explain the concept of patient satisfaction. Here we briefly discuss some of these conceptual frameworks.

1.4.1 Health care quality theory of Donabedian (1980)

Donabedian (1980) suggested that satisfaction is the main result of the interpersonal care process. Accordingly, the expression of satisfaction or dissatisfaction is the judgment of the patient on the quality of care in all its dimensions, with more focus on the interpersonal element of care (93).

1.4.2 Cognition–Affect model of satisfaction (1980)

This model was developed by Oliver and Parasuraman (94) in 1980. In this model cognitive backgrounds include expectations, achievement, disconfirmation, assignment, and equity (3). Expectations and performance can have a direct effect on satisfaction, or the effect can be mediated indirectly via the disconfirmation process as shown (3).

1.4.3 Discrepancy and transgression theories of Fox and Storms (1981)

Discrepancy and transgression theories of Fox and Storms (1981) state that if patients' health care orientations and the provider conditions match each other, the patients will be satisfied, but if they are different, the patients will be dissatisfied (93, 95).

1.4.4. Expectancy-value theory in Linder-Pelz model (1982)

The expectancy-value theory in the Linder-Pelz model (1982) assumes that satisfaction is mediated by individual attitudes, care values, and previous expectations (15).

Linder-Pelz used psychological and social theories of attitudes and characterized patient satisfaction as a positive attitude (40). Further, the Linder-Pelz model includes specific dimensions of health care, such as access, effectiveness, cost, and accessibility, and combines a variety of experiences with these dimensions of health care (40).

Research results show that the social psychological versions of the Linder-Pelz model only explain a tiny percentage of the satisfaction variance, although their input varies with the satisfaction dimensions (7).

1.4.5 Determinants and components theory (1983)

This theory was developed by Ware et al. in 1983 (96). Accordingly, patient satisfaction depends on the personal preferences of patients and their expectations from health care (93, 96, 97).

1.4.6 Multiple models theory of Fitzpatrick and Hopkins (1983)

According to the model developed by Fitzpatrick and Hopkins in 1983, expectations are socially mediated, reflecting the patient's health goals and the extent to which the patient's personal satisfaction is influenced by disease and health care (93).

1.4.7 Andersen's behavioral model of health care utilization

The behavioral model of health services utilization proposed by Andersen et al. (1995) is one of the most frequently used frameworks for evaluating patient use of health care services (98, 99). Andersen's behavioral model has been used to examine how predisposing and enabling factors and the need for care could influence the use of care services and patients' satisfaction with oral health care (99, 100).

The expanded version of Andersen's Health Services Utilization Behavioral Model is used as the theoretical and analytical framework for the International Collaborative Study of Outcomes in Oral Health (ICS-II) (99). This expanded model conceptualizes health behaviors as intermediate dependent variables that affect oral health results (patient satisfaction) (99). Figure 1 presents the conceptual framework of the ICS-II USA based on an expanded version of the widely used Andersen Health Services Utilization Behavioral Model (1968–1995) (99).

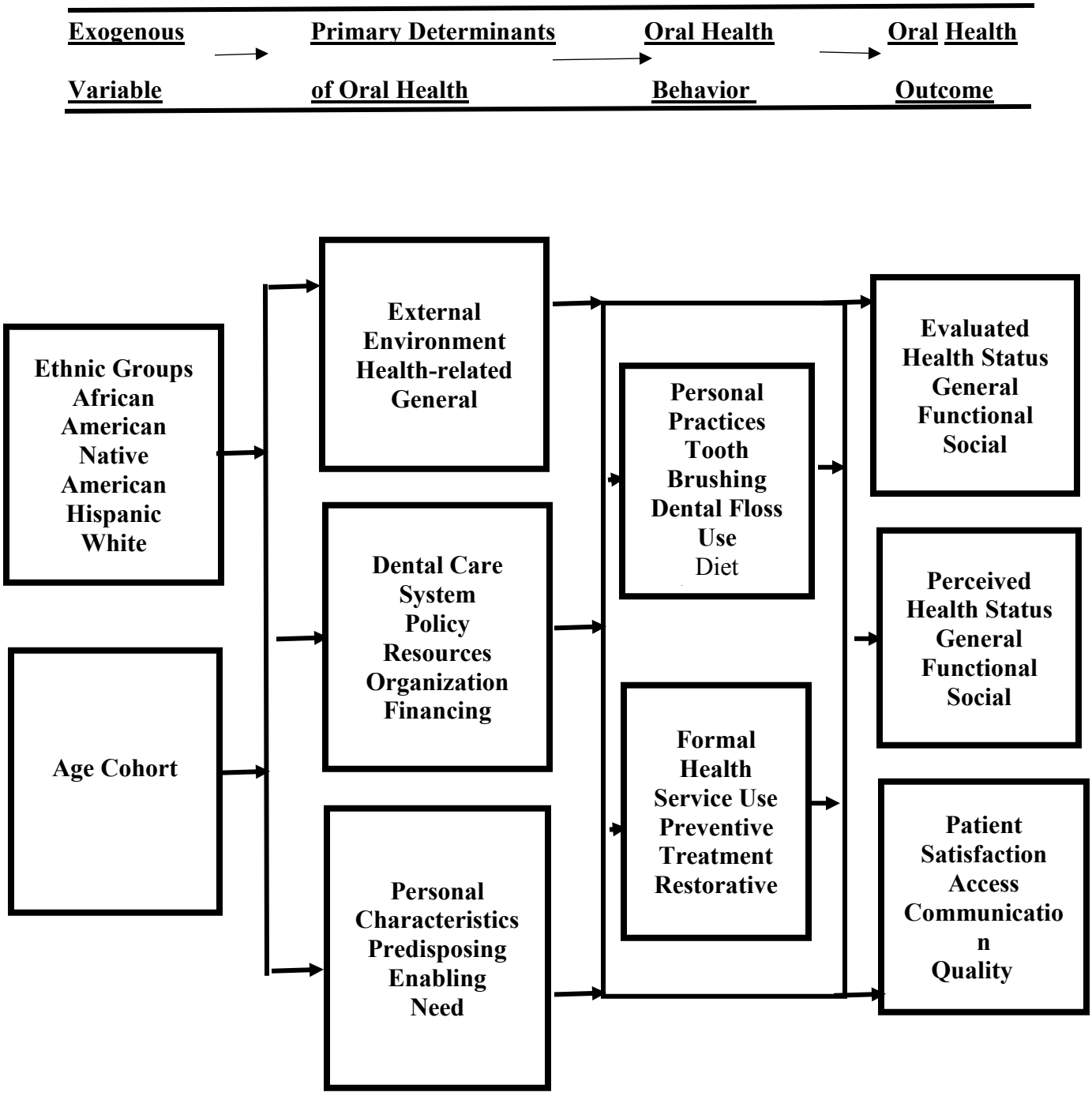

Figure 1: Andersen's behavioral model of health care utilization (99).

1.4.8 Perneger's model (2002)

A detailed model for case-mix adjustment of satisfaction scores was developed by Berenger et al. (101). In this model patient satisfaction is determined by two separate sets of variables: the health care provider, and patient characteristics (Figure2) (101, 102). According to this model, patient characteristics are closely related to patient satisfaction (Figure 2): "*Patients give different ratings of satisfaction with care because they differ in (i) the type and specific aspects of health care provided to them, (ii) their perception and experience of care, (iii) their expectations about care, and (iv) their tendency to praise or criticize—to rate high or low—while completing a survey questionnaire*" (101).

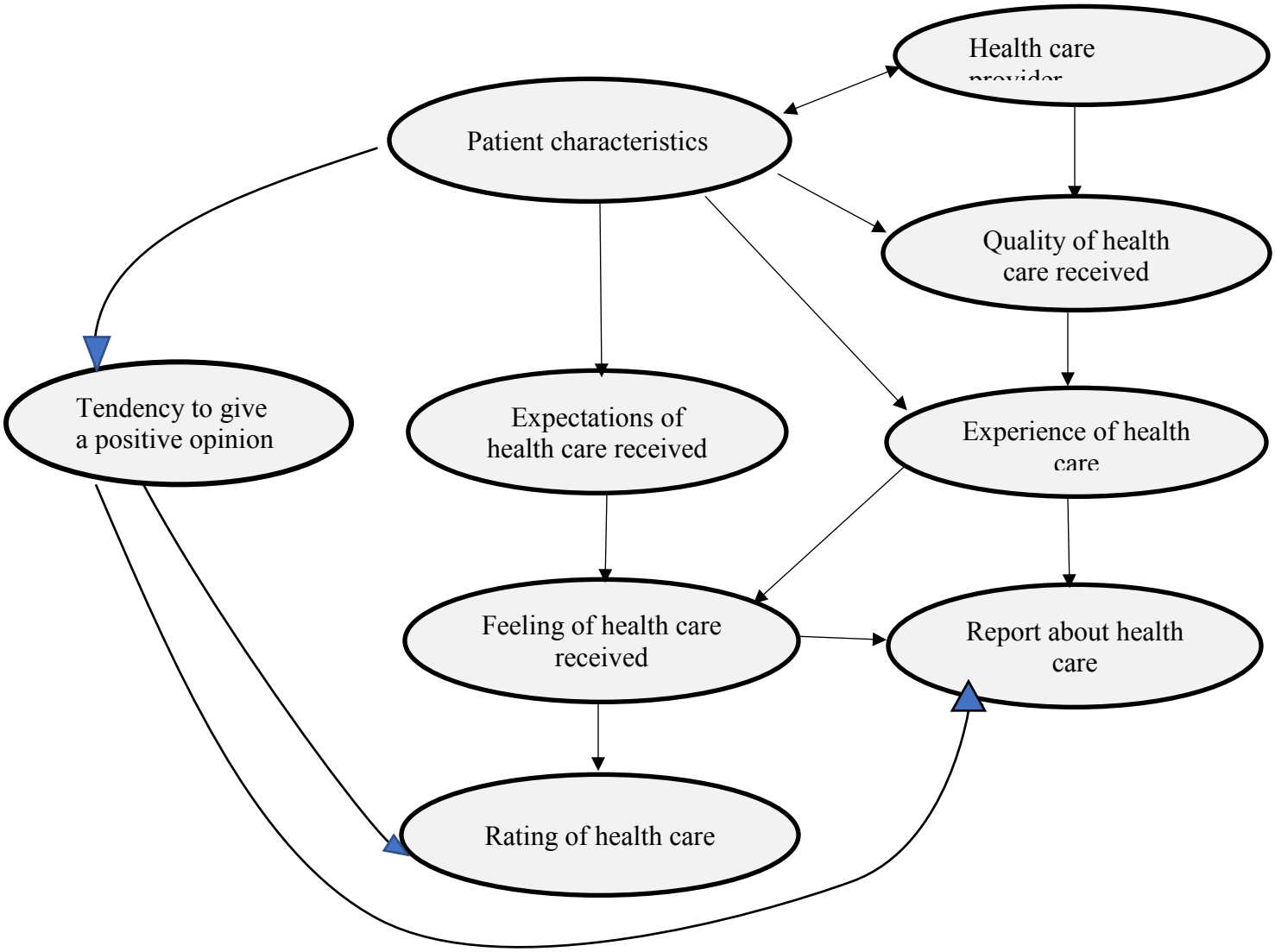

Figure 2: Perneger's detailed model for case-mix adjustment of satisfaction scores (101).

1.5 Patient satisfaction: measurements

For nearly half of a century, patient satisfaction with health care has been an area of unique concern for scientists engaged in health system research. Research on this concept was initiated in the early 1960s, but active research started only in the late 1970s and early 1980s. Since then, investigators have published numerous studies on this significant concept (103). Its salience continues to increase as patients are more exposed to media and social networks and are more aware of advances in health care and health care services (103).

The satisfaction measurement differs based on the assumptions taken as to what satisfaction means. The diversity in the meaning of patient satisfaction has led to various measurement methodologies and instruments across research studies (12, 104).

1.5.1 Patient satisfaction measurements

The conceptualization of patient satisfaction has proved to be difficult in terms of the development of effective measurement tools (105). The methods for measurement of patient satisfaction can be classified into two main approaches, quantitative and qualitative (106, 107). These approaches are discussed separately below.

1.5.1.1 Qualitative approach

In this approach, non-numerical data such as narrative and visual-based data are developed. The benefit of using the qualitative approach is that participants are free to express the notions that are crucial to them (108). Semi-structured interviews and focus group discussions are usually conducted to explore patients' perspectives on satisfaction. Focus group discussion is used to

investigate the perspectives of a group of individuals and usually consist of seven to ten participants. The respondents are chosen because of certain features appropriate to the problem of interest, such as gender, socio-economic factors, culture, or similar backgrounds or experiences (109, 110). Within this approach an interview guide is usually developed. This guide consists of open-ended questions to encourage patients to convey their opinions clearly. By avoiding asking the participants closed questions, it becomes feasible to recognize aspects that the investigator was unaware of, resulting in a deeper understanding of the topic of patient satisfaction (108).

The researcher usually records the comments of the interviewees (111). After transcription, the comments are coded and categorized into different themes (112). Qualitative data analyses such as content analysis, narrative analysis, thematic analysis, and framework analysis are used to analyze the data (113).

1.5.1.2 Quantitative methods

The quantitative approach offers statistical techniques for systematic empirical measurement of patient satisfaction. Patient satisfaction is measured using valid and standardized questionnaires which could be either self-reported or administered by an interviewer (20, 59).

Quantitative satisfaction measures produce numerical data and a score indicating the patient's level or degree of satisfaction (108). The advantage of quantitative measures is that they allow comparison between different sample populations and could identify the minimum and maximum levels of satisfaction in the target population (108). The survey is one of the methods used to measure patient satisfaction. In this method, questionnaires with primarily closed items are sent to large samples of patients to seek their opinions on the health care they received (108, 114).

1.5.2 Measurements methods

The measurement of satisfaction differs based on the assumptions taken as to what satisfaction means, and several measurements can be used accordingly (93). Nguyen et al. (115) (1983) stated that it was nearly impossible to create significant comparisons between distinct patient satisfaction scores, given the lack of standardized tools (93, 115). Further, Ware et al. (1983) reported that some type of acquiescent reaction was biasing between 40% and 60% of participants, and Coyle and Williams (1999) claimed that reliance prevented patients from reporting dissatisfaction (93, 96).

The history of the first study conducted to measure patient satisfaction goes back to 1970. This study was conducted by Hulka et al. (93) who developed the "Satisfaction with Physician and Primary Care Scale" (93). Five years later (1975), Ware and Snyder used the “Patient Satisfaction Questionnaire” for assessment of health service delivery programs (93).

At the end of the 1970s, Larsen et al. (116) developed the "Client Satisfaction Questionnaire" (93, 116). This questionnaire is an eight-point Likert scale for evaluating overall patient satisfaction with health care facilities (93). Several tools have been created since then, but the validity of some of these instruments remains an issue (93).

The vast majority of patient satisfaction instruments have been developed in the United States for "ad hoc" hospital use (93).

Van Campen et al. (1995) (117) did an extensive investigation into patient satisfaction, identifying over 3,000 published papers and dozens of measuring instruments created in the 10 years prior to their assessments (93, 117). They found that quality of care from the patient’s perspective had

often been measured as patient satisfaction (93). They found that only five of the 113 selected tools were theoretically or methodologically rigorous, and of those five, only two were effectively designed to measure perceived service quality, and patient judgment on the hospital quality (93, 118).

A review conducted by Sitzia in 1999 identified that only 11 studies (6% of the 181 qualitative studies) reported valid and reliable content, and the new instruments specifically designed for the reported studies showed substantially less reliability and validity than the old instruments (119).

A recent comprehensive review of patient satisfaction by Hawthorne et al. (120) (2006) identifies more than 38,000 patient satisfaction papers using the Medline / Pub Med database plus more than 10,000 Internet-based websites (93, 120). This research evaluated tools that met its inclusion criteria and highlighted that most articles did not properly report patient satisfaction: few reported the tool used, its psychometric characteristics or real outcomes, and most reported patient satisfaction based on a single product (93).

1.5.2.1 Types of instruments

Questionnaires are the most common method for data collection on patient satisfaction. (121). In studying the assessment of satisfaction, numerous sub-scales measuring separate domains or dimensions of satisfaction may be included, as opposed to including several items that add up to an overall satisfaction score (18).

These tools must be accurate, reliable, and valid (122). Most questionnaires measure satisfaction on a Likert scale, which is a rating scale of 4 or 5 points indicating variations between *strongly agree* and *strongly disagree* (123).

Questionnaires used for patient satisfaction can be classified into different categories:

1. Non-standardized instruments

This type of questionnaire is provided by private vendors and there is no evidence about reliability and validity (20).

2. Standardized instruments

This type of questionnaire, such as PSQ-18 (Patient Satisfaction Questionnaire) and Consumer Health Assessment Plans (CAHPS), has excellent reliability and validity; however, the range of questions is restricted (20).

3. Internally developed instruments

Internally developed instruments are generated entirely de novo or produced primarily from other current standardized tools (20, 124).

According to a survey carried out in 16 academic medical centers across the United States (2002), most of medical centers were using an internally developed instrument for outpatient satisfaction, while using private vendor tools to inpatient satisfaction (20).

Ware et al. (125) developed the Patient Satisfaction Questionnaire (PSQ) at Southern Illinois University School of Medicine during a study funded by the National Center for Health Services Research and Development (125). The PSQ is a self-reporting tool targeting the general population (125). The tool includes various dimensions of patient satisfaction, including interpersonal behavior, technical quality, accessibility or comfort, finances, effectiveness, continuity, physical environment, and availability of services (105).

Heinemann et al. developed a 40-item satisfaction questionnaire (105) in 1997 by asking participants what was important to them. Seven areas of satisfaction were recognized: process of entry, quality of care, timeline of service, communication, efficiency, atmosphere, and factors related to discharge from care. They subsequently defined satisfaction as a one-dimensional construct that varied across groups of patients or clients (105).

The International Collaborative Study (ICS-II) patient satisfaction questionnaire was developed by using several questions previously established for the WHO-sponsored International Collaborative Study of Oral Health Outcomes II (ICS-II) (6). The ICS-II was tested at every study location in which patient satisfaction was conceptualized as an outcome measure (6). The questionnaire contains 12 satisfaction items (Table 1). Each item was scored on a four-point Likert-type scale, ranging from "very satisfied" to "very dissatisfied." The summary of this scale is calculated by adding the scores for all items, resulting in a total summary score ranging from a low of 12 to a maximum of 48 (6).

1.7 Patient satisfaction with dental care research: a brief overview

Patient satisfaction with dental care has been receiving more attention, with the aim of improving the quality of dental care services. In the last decades, there has been a shift toward conducting research on patient satisfaction with oral and dental health care (126).

Dental facilities differ from their medical counterparts by assuming a more private setting and permanent connection with the patient, as even the easiest dental operation requires a comparatively lengthy session (126). According to a study conducted to identify the key drivers of patient satisfaction with dental care in Taiwan (1998), "clean and hygienic appearance" and

"thorough sterilization of instruments" were considered to be the most crucial attributes by the vast majority of participants, and failure to meet the requirements of these elements led to high dissatisfaction with dental care services (126). Furthermore, patient satisfaction research in the field of dentistry found that individuals from ethnic minorities had lower ratings across three dimensions of patient satisfaction: dental care and communication, dental staff , and dental office effectiveness (127).

A study was conducted in 1993 by Ntabaye et al. (128) on patient satisfaction with emergency oral health care in rural Tanzania to determine factors that might influence patient satisfaction with dental care. According to this study, most of the participants were satisfied with the dental care services, and absence of post-treatment complications significantly influenced patient satisfaction (128). According to another study conducted on patient satisfaction with Prosthodontics and Orthodontics facilities in the Netherlands (2005), the general patient satisfaction rating of the service delivered by these centers was high, and individuals were satisfied with the delivered services and the delivery time (129).

Jennifer Yu Ning Luo et al. (130) conducted a qualitative study on patient satisfaction with dental care in the teaching dental hospital of the University of Hong Kong in 2012. Six keys themes on dental satisfaction were obtained from the content of the focus group discussions: (i) attitude, which was usually mentioned by participants when asked about their level of satisfaction, (ii) cost of services, (iii) convenience of the hospital services, (iv) pain management, (v) quality of dental services such as dental equipment and facilities, and (vi) patients' perceived need for prevention of oral disease (130).

A survey was conducted in Brazil in 2014 to assess patient satisfaction in Brazilian dental primary health care. The results of this survey showed that lower education and patient perception of clinical circumstances were correlated with higher patient satisfaction with dental primary health care (131). In addition, a greater level of satisfaction was related to favorable reception and hospitality, enough time for therapy, and guidelines to meet the requirements of patients (131).

Nair et al. in 2016 reviewed the full text of 73 out of 1,879 publications that were published between 1984 and 2009 for the validation process reported for oral health care satisfaction scales. For most of this research, initial validation was performed among adults visiting dental clinics, while for the remaining studies was conducted among adults chosen from non-clinical settings. The primary studies were performed in the US, Australia, India, Japan, Sri Lanka, and Sweden, and the result was that 14 publications out of the total number of publications recorded initial development and validation while the remaining five publications were follow-up research reassessing certain validity and reliability aspects (132).

Date

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Identification Code

Section F. **Satisfaction with care**

For each question below, please indicate your level of **satisfaction** with regard to your last dental visit	Very Satisfied	Fairly Satisfied	Dissatisfied	Very dissatisfied
F.1. Getting an appointment when you wanted it…	❒	❒	❒	❒
F.2. The time it took to get there…	❒	❒	❒	❒
F.3. The neighborhood where the dental office is located…	❒	❒	❒	❒
F.4. The way you were made to feel welcome by the receptionist…	❒	❒	❒	❒
F.5. The way you were made to feel welcome by the hygienist/dental chairside assistant…	❒	❒	❒	❒
F.6. The way you were made to feel welcome by the dentist…	❒	❒	❒	❒
F.7. The information given you about what was wrong with your teeth…	❒	❒	❒	❒
F.8. The information given you about what treatment was provided for you…	❒	❒	❒	❒
F.9. How up-to-date the dental equipment is…	❒	❒	❒	❒
F.10. The cost of your last dental visit…	❒	❒	❒	❒
F.11. The amount of time you waited to see the dentist…	❒	❒	❒	❒
F.12. The cleanliness and neatness of the office…	❒	❒	❒	❒

Table 1: Patient satisfaction questionnaire (6)

CHAPTER II

RESULTS

2.1 MANUSCRIPT

Rural-urban Disparities in Patient Satisfaction with Oral Health Care

*AbdalgaderAlhozgi1, Jocelyne Feine1, Farzeen Tanwir1, Chantal Galarneau2, Elham Emami1,2

1Faculty of Dentistry, McGill University, Quebec, Canada.

2Institut National de Santé Publique du Québec, Canada.

ABSTRACT

Background: Identifying spatial variation in patient satisfaction is essential to improve the quality of care. Thus, the objective of this study was to investigate rural-urban disparities in patient satisfaction and determine factors that could influence satisfaction with oral health care.

Methods: Data from 1,788 parents/caregivers of children who participated in the Quebec Ministry of Health clinical study were subject to secondary analysis. The Perneger Model of patient satisfaction was used as the conceptual framework for the study. Satisfaction with oral health care was measured using the WHO-sponsored International Collaborative Study of Oral Health Outcomes (ICS-II). Explanatory variables included patient characteristics, predisposing factors and enabling resources. Statistical analyses included descriptive statistics, as well as bivariate and linear regression models.

Results: Individuals with higher income, dental insurance coverage, having a family dentist, having ease in finding a dentist and access to a private dental clinic were more satisfied with oral health care ($p< 0.001$). There were statistically significant differences between rural and urban Quebec residents in their ratings of patient satisfaction on four items, including: dental office location ($p = 0.013$), dental equipment ($p = 0.016$), cost of dental treatment ($p <0.001$) and cleanliness of dental office ($p = 0.004$), with greater satisfaction for urban dwellers. The multiple linear regression model showed that major determinants of patient satisfaction were being a native Canadian, married, having dental insurance coverage, having perceived good oral health, having a family dentist and visited the dentist for regular checkups ($p <0.005$). Having difficulty finding a dentist negatively influenced patient satisfaction with oral health care ($p < 0.001$).

Conclusion: These findings suggest that Quebec rural-urban disparity exists in patient satisfaction with care and that determinants of health influence this outcome. Intensive and powerful knowledge dissemination activities will help to mobilize policy makers in implementing public health strategies to reduce this disparity.

INTRODUCTION

The evaluation of health care quality has been traditionally based on objective measurements of regulation bodies, such as harm and clinical errors, with less attention to patients' experiences, expectations and ratings of care delivery (1). In 2010, the Institute of Medicine (IOM) published guidelines for the improvement of quality health care systems, with an emphasis on patient centered-care, equity and efficiency of care (2). Accordingly, in the last decades of evidence-based practice, patients have been involved in clinical decision making and evaluation of care, and patient satisfaction has been used as an indicator of quality of health care (3-5). Patient satisfaction is defined by Pascoe as "a patient's response to a significant aspect of her/his experience of health care services" (6). Satisfying patients results in positive health care outcomes, including increased trust in health care providers and health care systems (7).

Patient satisfaction entails numerous dimensions and is related to several factors, such as socio-economic background, cultural values, environmental characteristics of health care settings, accessibility and availability of care, patients' previous experiences with health care, the quality and effectiveness of the treatment, as well as health care providers' attitudes, experiences and knowledge (7, 8). Demographic and socio-economic characteristics of patients including age, gender, place of residency, education, income, marital status, and race are considered to be among the main determinants of patient satisfaction with health care (9, 10). According to the Batbaatar et al. (10) systematic review, the determinants of patient satisfaction include the environment where the care is delivered, as well as the accessibility of care. Numerous studies have demonstrated that easy access to care increases patient satisfaction (10-14). In addition, research studies have indicated that patient satisfaction is strongly linked to the distance where the health care facilities are located, as well as waiting time (10, 15-26). Furthermore, these studies showed

that availability is dependent on available workforce and affordability, as well as flexibility of payment mechanisms, insurance status and insurance coverage; all of these increase patient ratings of satisfaction (10, 27).

Evidence shows that rural communities have lower levels of satisfaction with health care than do urban populations (28-32). People living in rural areas may also be less satisfied with their oral health care because of poor access to oral health care services that, in turn, could be influenced by several factors such as low socioeconomic status, geographic remoteness, shortages of dental professionals, lack of public transportation and limited dental insurance coverage (33-37). Identifying spatial variation in patient satisfaction is essential to improve the provision of quality oral care (37). According to available evidence, there is no study that examines rural-urban disparity in patient satisfaction with oral health care. Thus, additional research is needed to fill this knowledge gap. Therefore, the objective of this study was to investigate rural-urban disparities in patient satisfaction with oral health care and to determine factors that could influence this satisfaction.

METHODS

Design, setting, study participants

This study used the data (n=1,788) obtained from a previous survey entitled "Dent Ma Region" (38). The research study methodology has previously been published (38). In brief, this study was an add-on to a provincial survey on the oral health status of Quebec's primary school students (2nd and 6th grade school children), carried out in collaboration with the Institut National de Santé Publique du Québec (INSPQ) and the Quebec Ministry of Health and Social Services (MSSS). The target population of this survey was parents/caregivers of school children (second grade &

sixth grade) who were living in the eight regions of the province of Quebec. A random subsample of the provincial survey was selected for the Dent Ma Region study using stratified two-stage data sampling. Over sampling of certain schools in some rural areas was done to increase the reliability and precision of estimates for these regions. The sampling design considered the proper weighting of each unit and unequal probabilities of each sample, to be representative of rural-urban population of parents/caregivers of school children. Parents/caregivers, who agreed to participate after learning about the study from the dental examiner or the hygienist responsible for the INSPQ, received questionnaire packages with informed consent forms sent from the administrators of their children' schools. Ethical approval was provided by the institutional review boards of the Université de Montréal and McGill University.

Study outcome and data collection

An adapted Perneger's model of patient satisfaction was used as the conceptual framework to analyse the study results (39). According to this model, satisfaction with care is associated with the patient experience with health care and the quality of care, as well as patient characteristics.

The satisfaction that parents/caregivers had with care was measured using a validated and highly reliable instrument (α= 0.87) developed originally for the WHO-sponsored International Collaborative Study of Oral Health Outcomes (ICS-II) (40). The questionnaire contains 12 items, with each item scored on a four-point Likert-type scale (very satisfied =4, fairly satisfied =3, dissatisfied =2, very dissatisfied =1). The total summary score was calculated by adding the scores for all items, resulting in a total summary score ranging from 12 to 48 (41).

Andersen's Behavioral Model of Health Services Utilization was used to examine to what extent predisposing, enabling factors and the need for care could influence patients' satisfaction with oral

health care (28, 42, 43). Accordingly, the predisposing factors included age, gender, ethnicity, marital status, place of birth, language, education, occupation, perceived general and oral health, oral health knowledge and place of residency. Enabling resources included household income, dental insurance coverage, having a family dentist, difficulty in finding a dentist, distance to dental care provider in kilometers, means of transportation to dental care services and type of dental care providers. Questions about dental visits during the past year, the need for dental treatment and reason for dental visit were asked to evaluate the perceived dental care need.

These data were collected through a self-administered and validated multi-dimensional questionnaire (28, 41). The items in this questionnaire were extracted from the Canadian Oral Health Measures Survey and the Quebec Oral Health Surveillance questionnaire (22, 24, 28, 29). The residential postal code was used to assign respondents' census geography using the Postal Code Conversion File Plus (44).

Data analysis

The data were weighted prior to the data analyses and were adjusted to take into account the survey design (value of 1.5). The data were first subjected to descriptive statistical tests to achieve frequency counts, percentages and univariate means, as well as to test for normality. Student t-tests and Pearson's correlation were used to examine the association of independent variables with patients' satisfaction ratings. Independent variables with results from univariate analyses at $p<0.05$ were incorporated into the multiple linear regression model to determine which of these variables are associated with patient satisfaction mean total scores. The statistical significance was set at $p\leq0.05$, and data analyses were carried out using SPSS software version 20.0 (SPSS Inc., Chicago, IL, USA).

RESULTS

The data set contained 1,788 participants. The sample population was representative of the Quebec rural-urban population with approximately 19.0 % (n=333) living in rural areas and 81.4% (n=1,455) living in urban areas. The mean age of the sample was 39.3± 5.2 years. Most of the survey respondents were women (87.5%), married (87.5%) and had college/university education (81.0%). Most of them were employed full time (70.1%), with an annual income of ≥40,000$ CAD (56.7%). Rural residents had lower education and employment rates, as well as lower incomes than their urban counterparts.

Bivariate analysis showed that the mean total patient satisfaction score for the sample was high (42.33± 4.53), and there was no significant difference in this score regarding place of residency ($p = 0.66$; Table 1). However, females, those living in Canada, North Americans, married and those having oral health knowledge and good perceived oral and general health were more satisfied than their counterparts ($p<0.05$). Respondents having incomes greater than ≥40,000$ CAD, dental insurance coverage, a family dentist, ease in finding a dentist and access to private dental clinics were more satisfied, as well ($p< 0.001$). Those who visited the dentist in the previous year, having no dental treatment needs and visited dentist for regular checkups rated their satisfaction higher with oral health care ($p< 0.001$; Table 1).

Regarding individual questionnaire items, all study participants highly rated their satisfaction with cleanliness and neatness of the dental office, whereas the lowest mean item score was for the cost of the last dental visit.

As shown in Table 2, there were statistically significant differences between rural and urban Quebec residents in patient ratings of four satisfaction items, including: dental office location ($p =$

0.013), dental equipment ($p = 0.016$), cost of dental treatment ($p < 0.001$) and cleanliness of the dental office ($p = 0.004$). Rural residents were less satisfied than their urban counterparts with the neighborhood where the dental office was located, as well as the cost of their last dental visit. In contrast, urban residents were less satisfied with the dental equipment and the cleanliness of the dental office than were rural residents.

The multiple linear regression model showed that major determinants of patient satisfaction were being a native Canadian, married, having dental insurance coverage, perceived good oral health, having a family dentist and having visited the dentist for regular checkups ($p < 0.005$). However, having difficulty finding a dentist negatively influenced patient satisfaction with oral health care ($p < 0.001$; Table 3). These factors explained 14% of the variability in patient satisfaction ratings.

DISCUSSION

Patient satisfaction is a complex and multi-factorial concept (10, 45-51). Satisfaction with dental care services has been previously studied, since patients' evaluation of the quality and experience of care is instrumental to improvement of the quality of services (51-54). Nevertheless, disparities in these services remain a challenge for user access to health and oral health services globally, particularly for people who live in rural and remote neighborhoods (19, 20). Statistics Canada (2016) shows approximately 6.3 million Canadians and 19.4% of Quebec residents live in rural areas (21). Spatial disparity that could influence patient satisfaction in oral health care has previously been highlighted in the literature (5, 36, 47, 55, 56). To the best of our knowledge, this is the first study that investigates rural-urban disparities in patient satisfaction with oral health care in a Quebec population.

In our study, patients' characteristics, enabling resources and predisposing factors were associated with patient ratings of satisfaction with care. People living in rural areas were less satisfied with the location of the dental office and cost of dental treatment than those in urban settings. These results are in line with the findings of a recent systematic review (10) in which the determinants of patient's satisfaction were shown to include patients' characteristics, affordability of care and access to care (10). There is overwhelming evidence that rural residents must travel long distances to access dental care and that they have less dental insurance coverage (5, 28, 36, 57). Accordingly, our study highlighted that determinants of health, including social determinants, have an impact on patient satisfaction with care. As our study is in line with the Perneger (39) theoretical concept, factors such as expectations of health care, health care provider attitudes, the quality of health care and patient characteristics could all influence patient satisfaction (6, 39, 58). According to the previous dental literature (39-41), meeting patients' expectations produces greater satisfaction with care. In line with other study findings, our investigation showed that the facilities and cleanliness of a dental office could influence patient satisfaction; urban residents were less satisfied with dental equipment and cleanliness of dental office (59, 60) than were rural residents. In fact, they might have higher expectations of dental care, as they have greater access to dental offices with high end technologies and facilities (5, 52, 61, 62).

We found no rural-urban differences in general satisfaction with care scores; this finding agrees with the results of previous studies that indicate patients are generally satisfied with oral health care (60, 62). Geographical location was not the key determinant of satisfaction for rural population in our study. This could be because of an adaption to rural conditions, for example in terms of longer distance tolerance for doctor visits (63) and having fewer expectations regarding patient satisfaction with health care (64, 65). High satisfaction ratings also could be attributed to

the ceiling effect (66) or may suggest that individual item scoring might be a more sensitive measure for the quality and experience with care than global scoring. Respondents are generally reluctant to express negative opinions or openly disagree and try to give socially acceptable answers, possibly because of cultural differences in communication or attitude of patients (35, 37, 45).

Our regression model demonstrates that native Canadians have higher satisfaction scores than do non-Canadians, possibly because they face some kind of racial or ethnic discrimination that is not necessarily sensitive to their needs (10, 39, 67).

In our study, patients who visited the dentist for checkups showed higher satisfaction scores (62). Regular checkups indicate increased compliance, fewer missed appointments, fewer pain episodes and a decreased need for advanced treatment (62,68). Not attending dental clinics regularly suggests a lack of awareness regarding the importance of oral health (28, 69). Thus, improving public dental awareness in order to promote regular dental checkups by the oral health professionals might increase patient satisfaction with dental care received (57, 59, 62).

The results of our study should be interpreted with caution due to certain limitations. Firstly, our study results could not be generalized to other geographical areas, as this study was conducted with Quebec residents. Secondly, since the study was an add-on to the MSSS provincial clinical study, there were some limitations regarding narrow variability in age and gender. On the other hand, the strength of our study lies in the large sample size, and the dimensions used in our survey could possibly be used in future studies in the assessment of dental care.

CONCLUSION

These findings suggest that, although rural-urban differences in general satisfaction with care in Quebec is not significant, rural-urban disparities exist in sub-domains of patient satisfaction with care and the determinants of health influence this outcome. Intensive and powerful knowledge dissemination activities will help to mobilize policy makers in implementing public health strategies to reduce this disparity.

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Table 1: Bivariate analysis of predisposing factors, enabling factors, dental treatment needs (Andersen's Behavioral Model of Health Services Use - based variables) associated with patient satisfaction.

Satisfaction differences		Mean ± SD	T	Mean Difference	Std. Error	95% Confidence Interval	*p*-value
Gender	Male Female	41.8±4.6 42.4±4.5	-2.04	-0.663	0.32	(-1.30, - 0.03)	0.042
Place of birth	Canada Others	42.6±4.4 39.3±4.4	7.72	3.25	0.42	(2.43, 4.08)	<0.001
Ethnicity	North American Others	42.5±4.3 40.7±5.6	4.51	1.80	0.40	(1.02, 2.58)	<0.001
Marital status	Single Married	41.5± 4.7 42.4± 4.5	2.87	0.94	0.33	(0.30, 1.57)	0.004
Income	<40000$ CAD ≥40000$ CAD	41.7±4.8 42.8±4.3	-4.54	- 1.04	0.23	(-1.49, -0.59)	<0.001
Dental knowledge	Yes No	42.4±4.5 40.5±4.7	3.08	1.93	0.63	(0.70, 3.16)	0.002
Perceived general health	Poor Good	38.9±4.4 42.4±4.5	4.53	3.51	0.77	(1.99, 5.02)	<0.001
Perceived oral health	Poor Good	39.0±5.1 42.5±4.4	7.03	3.50	0.50	(2.52, 4.47)	<0.001
Dental insurance	Yes No	42.8±4.4 41.4±4.7	6.50	1.47	0.23	(1.03, 1.91)	<0.001
Type of clinic	Private Public	42.4±4.5 40.8±5.0	3.22	1.64	0.51	(0.64, 2.64)	0.001
Difficulty finding dentist	Difficult Easy	39.0±5.1 42.6±4.4	-8.04	-3.53	0.44	(-4.39, -2.67)	<0.001
Having family dentist	Yes No	42.6±4.3 37.3±5.2	11.21	5.31	0.47	(4.39, 6.24)	<0.001
Dental treatment need	Yes No	41.7±4.7 42.7±4.4	-4.78	-1.07	0.22	(-1.50, -0.63)	<0.001
Having dental visit last year	Yes No	42.7±4.2 40.2±5.4	8.36	2.51	0.30	(1.29, 3.10)	<0.001
Reason of visiting dentist	Check up Other reasons	42.9±4.4 41.8±4.6	5.30	1.13	0.21	(0.71, 1.55)	<0.001
Place of residency	Rural Urban	42.2±4.3 42.4±4.6	0.43	0.12	0.28	(-0.42, 0.66)	0.66

Table 2: Rural-urban differences: Patient Satisfaction with Oral Health Care

Questionnaire's Item	Urban mean± SD	Rural mean± SD	Mean Difference	Std. Error	95% Confidence Interval	*P*-value*
Getting an appointment when you wanted it	3.3±0.6	3.3±0.7	-0.002	.039	(-0.78, 0.75)	0.70
The time it took to get there?	3.4±0.7	3.4±0.6	-0.007	0.039	(-0.084,0.071)	0.87
The neighborhood where the dental office is located	3.6±0.6	3.5±0.5	0.085	0.034	(0.018,0.152)	0.013
The way you were made to feel welcome by the receptionist?	3.7±0.5	3.7±0.5	0.025	0.029	(-0.033, 0.083)	0.39
The way you were made to feel welcome by the hygienist/dental chairside assistant?	3.7±0.5	3.7±0.5	0.037	0.028	(-0.092, 0.018)	0.19
The way you were made to feel welcome by the dentist?	3.7±0.5	3.7±0.5	0.029	0.028	(-0.026, 0.084)	0.30
The information given you about what was wrong with your teeth?	3.6±0.2	3.6±0.5	0.010	0.038	(-0.052, 0.072)	0.75
The information given you about what treatment was provided for you?	3.6±0.5	3.7±0.5	-0.040	0.032	(-0.102, 0.022)	0.21
How up-to-date the dental equipment is?	3.6±0.5	3.7±0.5	-0.079	0.033	(-0.142, -0.015)	0.016
The cost of your last dental visit?	3.0±0.8	2.8±0.9	0.193	0.049	(0.097, 0.289)	<0.001
The amount of time you waited to see the dentist?	3.4±0.6	3.5±0.6	0.193	0.049	(-0.083, 0.061)	0.79
The cleanliness and neatness of dental office	3.7±0.5	3.8±0.4	-0.077	0.027	(-0.129, -0.024)	0.004

*Adjusted for the effect plan

Table 3: Multiple linear regression model: factors associated with patient satisfaction total scores.

Variable	*B*	*SE B*	*ß*	*t*	95% Confidence Interval	Sig.
Place of birth (ref: Canada)	2.43	0.63	0.14	3.83	(1.18, 3.67)	<0.001
Marital status (ref: Married)	0.79	0.39	0.06	2.05	(0.03, 1.54)	0.040
Dental insurance (ref: Yes)	0.58	0.28	0.06	2.07	(0.03, 1.12)	0.038
Perceived oral health (ref-Good)	1.23	0.61	0.06	2.00	(0.022, 2.44)	0.046
Difficulty to find a dentist (ref: Yes)	-3.33	0.54	-0.17	-6.20	(-4.38, -2.27)	<0.001
Having family dentist (ref: Yes)	3.60	0.69	0.17	5.25	(2.25, 4.94)	<0.001
Reason of visiting the dentist (ref: Checkup)	0.62	0.25	0.07	2.47	(0.13, 1.12)	0.014

CHAPTER III

DISCUSSION

3.1. Choice of study design

To our knowledge this is the first study that has examined rural–urban differences in patient satisfaction with oral health care in Canada. This study will provide valuable evidence that may help policy-makers to implement strategies for optimal oral health care services. Furthermore, the study offers new data on the Quebec rural and urban population that may inspire other scholars and researchers to conduct more population-level research on oral health in Quebec, Canada, and worldwide.

We used a quantitative cross-sectional study to investigate the potential rural–urban disparity in patient satisfaction with oral health care and to evaluate factors that could influence our study outcome. The study was conducted in collaboration with the Institut National de Santé Publique du Québec (INSPQ) and the Quebec Ministry of Health and Social Services (MSSS) to facilitate the conduct of the study within the platform of the Ministry's provincial clinical study on the oral health status of Quebec's primary school students (2^{nd} and 6^{th} grade school children). This approach ensured our study's feasibility and leveraged the experience and expertise of key stakeholders of these institutions. Furthermore, it added information regarding a number of determinants of oral health care that were not measured in the INSPQ study.

3.2. Choice of conceptual frameworks

To conceptualize how spatial factors affect patient satisfaction with health care, different theoretical frameworks have been introduced in the literature (3, 15, 93, 95, 96, 98, 99, 101). Research shows that some models are based on socio-cultural aspects of population and have the potential to link people

and space together to study health outcomes (133, 134). All the conceptual models studied thus far have limitations, and no single model captures the complete scenario of heath care outcomes in terms of patient satisfaction and its determinants (135). In our study we used Andersen's behavioral model of health services utilization as well as the Perneger model (98, 101). Ronald M. Andersen developed his multi-level model in 1968 taking into account both individual and contextual determinants of health services use (136). Since that time this model has been widely used in heath care research including oral heath research (137-140). According to Andersen's behavioral model, oral health outcome is a function of predisposing factors, enabling resources, and the need for dental care services utilization (99, 137, 140). Predisposing factors include the socio-demographic characteristics and health beliefs. Enabling factors are those that facilitate the use of health services, such as the individual's health insurance, transportation, and travel time as well as waiting time to access health care. Need factors make it possible to analyze how patients perceive the need for health services (136-138, 140). The behavioral model of Andersen is adaptable to many research equations and scholars can choose to analyze specific variables of this model according to their research objectives (139). We also used Perneger's model of patient satisfaction as a conceptual framework to better explain and discuss our study results. According to this model, satisfaction with care is associated with the quality and patient experience with health care, health care provider, health care received, expectation about health care, feeling of satisfaction, rating of health care, report about health care, as well as patient characteristics (101). Among various dimensions of patient satisfaction, access to care, interpersonal interactions with health care professionals, and technical competence of health care providers have been found to account for 75% of the variance in patient satisfaction (141). In our research study, the 12-item questionnaire of patient satisfaction with oral health care was classified under two main dimensions: experience with health care and quality of health care. To our knowledge this model has

not previously been used as the conceptual framework in surveys of oral health care services and our study will be the first to introduce this model in such research. Previously the Emami research group has used this model in analyzing patients' expectation of and satisfaction with an immediate loading dental protocol (142).

3.3. Discussion of study findings and study limitations

Evaluation of the quality and experience of health care services has been used as a key element for improving health care services (143, 144). Over the last decade, patient satisfaction has emerged as an essential outcome in quality assurance in health care delivery (26, 145). Furthermore, patient satisfaction has become a practical reality across all market sectors around the world (29).

Gürdal et al. (144) evaluated patient satisfaction/dissatisfaction of about 1,000 patients in a dental faculty outpatient clinic in Turkey (144). Their study showed that about 39% of patients were satisfied, only 5% were dissatisfied, but the majority didn't comment or had mixed perceptions of satisfaction and dissatisfaction (144). The study showed that despite the diversity in the cultural and ethnic background of patients, the most important variables in patient satisfaction were the interaction between dentists and patients, the organization of the health care system, and the scientific ability of dental personnel. The results of that study are in line with our findings showing high satisfaction in general and no rural–urban difference in regard to general satisfaction score. Our results may be confounded by a ceiling effect in which respondents are likely to provide socially acceptable responses (146, 147). However, in our study, we compared rural–urban difference regarding some other dimensions of patient satisfaction as well. Accordingly, people living in rural areas were less satisfied with the location of dental office and cost of dental treatment whereas the urban residents were less satisfied with dental equipment and cleanliness of dental office. These results confirm the previous

research showing that patient satisfaction is a multi-factorial concept in which many factors could play a role in patients' perception of quality of health care and experience of health care (14, 17, 20, 40, 67, 121, 125, 143, 148-151).

Spatial disparity in oral health care has previously been highlighted in the literature (130, 152, 153), and could influence satisfaction with care. Accordingly, our study results could be explained by low socio-economic status of individuals living in rural communities and difficulty in access to care in these areas (100, 154). There is overwhelming evidence that rural residents have less dental insurance coverage and access to dental care (130, 100, 154). Furthermore, dental offices in rural regions are usually sparse, and rural residents usually travel a long distance in their own vehicle or by other means because sometimes they do not have access to public transportation. Furthermore, In Canada, weather conditions and poor quality of roads can affect transportation, forming a significant barrier to accessing dental care. This may lead to additional cost and burden of care for this population.

On the other hand, the lower rating of satisfaction of urban residents in regard to equipment and cleanliness of dental offices could be explained by higher expectations of urban residents regarding dental care, as they are more informed about or exposed to various dental clinics equipped with the latest technology. These results confirm the results of a study carried out by Wen Jen Chang (126) in the dental department at Taiwanese hospital, as well as other studies showing that the facilities and cleanliness of dental offices are some of the key drivers of patient satisfaction (14, 126).

Our multiple linear regression model showed that major determinants of patient satisfaction were being a native Canadian, being married, having dental insurance coverage, having perceived good oral health, having a family dentist, and having visited the dentist for regular checkups However, having difficulty finding a dentist negatively influenced patient satisfaction with oral heath care. These factors explained 14% of the variability in patient satisfaction ratings.

These results are in line with the study that Bleich et al. published in 2009 in the bulletin of the World Health Organization (46). That study analyzed the data obtained from the world health survey of 21 European Union countries in 2003 (46). It showed that patients' experience with the health care system was associated with patient satisfaction and explained about 10% of the variations in patient satisfaction score, whereas other factors such as patient expectations, patients' health status, and type of care explained in total about 17.5% of these variations.

Our study showed that native Canadian were more satisfied with dental care than other groups. This could be explained by the fact that non-native patients such as new immigrants may have high health care expectations compared to natives and are likely to face limited access to care upon their immigration (101, 155). Other studies have also shown that patient satisfaction is associated with race and ethnicity as well as patient's cultural background, values, and attitudes towards health in general (7). According to some studies, ethnic minorities were generally less satisfied with health care than their counterparts (12, 82). As indicated in the 2001 Health Care Quality survey on the adult sample population of Asian Americans and Whites living in the USA, racial or ethnic minorities may face disparities in access to care and may thus be less satisfied (101, 155). In addition, some studies showed that patients were more satisfied when their health care providers were from the same race or ethnicity and that racial diversity made patients feel more comfortable and trusting about the care (12, 58, 83, 84).

In our study, having dental insurance was also one of the predictors of patient satisfaction. Previous literature (153, 154) suggested that lack of dental insurance and the cost of oral health care are important barriers in the use of oral care services and could affect patient satisfaction. A study conducted by Macarevich et al. in 2018 in Brazil (156) found that the use of public services was

associated with lower satisfaction than the use of private services and health plans, among adolescents (156).

Our study results also showed that married people, those with good perceived oral health, and those who visited the dentist regularly for checkups showed higher satisfaction scores (153). Research studies have shown that married patients are generally more satisfied with health care facilities (53, 81). Patients who were suffering from severe pain with serious disease-related symptoms reported decreased health care service satisfaction (12, 60, 69, 85, 86). Evidence shows that having regular checkups empowers patients in their own care and will lead to compliance with care, and decreased need for complex treatment due to preventive therapy (153). Improving public dental awareness of preventive dental care and encouraging regular dental exams by oral health practitioners, therefore, may improve patient satisfaction with oral health care (153).

The results of our study should be interpreted with caution due to certain limitations. Firstly, our study results should not be generalized to other geographical areas as this study was conducted on Quebec residents. Secondly, since the study was an add-on study to the data in the INSPQ provincial clinical study, there were some limitations regarding narrow variability in variables like age and gender. In this study, we didn't measure patients' expectations. Patient expectations of health care services could be influenced either by previous personal experiences or by information received from the other users (90). Studies have shown that unmet expectations are associated with reduced patient satisfaction Thus, health care professionals' understanding of their patients' expectations will assist in increasing their practice performance and their patients' satisfaction (90, 92).

CHAPTER IV

CONCLUSIONS, RECOMMENDATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Ninety percent of Canada is geographically rural, and approximately 25% of the population live in rural areas with fewer than 10,000 people. Rural communities face various challenges in regard to oral health and access to dental care because of long distances between their homes and oral care health services, lack of public transportation, limited number of dentists living in these areas, and limited awareness on the importance of oral health. A large percentage of elderly and poor people are living in rural areas with substantial oral health problems but with environmental and financial difficulties to access dental care. Other oral health risks are low education and non-healthy behaviors leading to poor oral health, such a smoking. Despite this, limited research has been conducted on oral health, access to dental care, quality of care, and oral health education for this population. Having a better understanding about the consequences of oral health poor behavior will help the patient's self oral health care management.

The results of this master research project suggest the following.

Major determinants of patient satisfaction were being a native Canadian, being married, having dental insurance coverage, having perceived good oral health, having a family dentist, and visiting the dentist for regular checkups. Having difficulty finding a dentist negatively influenced patient satisfaction with oral heath care.

There were statistically significant differences between rural and urban Quebec residents in their ratings of patient satisfaction on four items: dental office location, dental equipment, cost of dental treatment, and cleanliness of dental office, with greater satisfaction for urban dwellers.

These findings suggest that in Quebec a rural–urban disparity exists in patient satisfaction with care and that determinants of health influence this outcome.

Providing evidence, intensive and powerful knowledge dissemination activities will be facilitated by the creation of a partnership between rural organizations and scientists, which will also serve to increase policy-makers' awareness of how rural poor oral health affects this population's general health. Patients' involvement in the research will increase their willingness to care about themselves and will lead to social awareness to encourage greater quality standards in the provision of public dental care. Furthermore, it will motivate policy-makers to introduce policies to boost the quality of oral health care for rural residents. Further research is needed to evaluate rural–urban differences in clinical outcomes and to determine which patients experience the greatest benefits of innovation in dental care, such as use of e-oral health technology and teledentistry. Future studies could use the Perneger framework to investigate the relationship between patient satisfaction and the expectations of patients with different socio-economic and socio-cultural backgrounds. Moreover, use of qualitative methods may also give new information or confirm the results of this quantitative study in other provinces of Canada or in other countries.

CHAPTER V

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Université de Montréal

Comité d'éthique de la recherche en santé

18 janvier 2018

Objet: Certificat d'approbation éthique - 3ième renouvellement – « Investigating urban-rural disparities in oral health and oral health services: A Quebec profile »

Mme Elham Emami,

Le Comité d'éthique de la recherche en santé (CERES) a étudié votre demande de renouvellement pour le projet de recherche susmentionné et a délivré le certificat d'éthique demandé suite à la satisfaction des exigences qui prévalent. Vous trouverez ci-joint une copie numérisée de votre certificat; copie également envoyée au Bureau Recherche-Développement-Valorisation.

Notez qu'il y apparaît une mention relative à un suivi annuel et que le certificat comporte une date de fin de validité. En effet, afin de répondre aux exigences éthiques en vigueur au Canada et à l'Université de Montréal, nous devons exercer un suivi annuel auprès des chercheurs et étudiants-chercheurs.

De manière à rendre ce processus le plus simple possible et afin d'en tirer pour tous le plus grand profit, nous avons élaboré un court questionnaire qui vous permettra à la fois de satisfaire aux exigences du suivi et de nous faire part de vos commentaires et de vos besoins en matière d'éthique en cours de recherche. Ce questionnaire de suivi devra être rempli annuellement jusqu'à la fin du projet et pourra nous être retourné par courriel. La validité de l'approbation éthique est conditionnelle à ce suivi. Sur réception du dernier rapport de suivi en fin de projet, votre dossier sera clos.

Il est entendu que cela ne modifie en rien l'obligation pour le chercheur, tel qu'indiqué sur le certificat d'éthique, de signaler au CERES tout incident grave dès qu'il survient ou de lui faire part de tout changement anticipé au protocole de recherche.

Nous vous prions d'agréer, Madame, l'expression de nos sentiments les meilleurs,

Guillaume Paré
Conseiller en éthique de la recherche.
Comité d'éthique de la recherche en santé (CERES)
Université de Montréal

c.c. Gestion des certificats, BRDV
p.j. Certificat #12-115-CERES-D(3)

adresse postale
C.P. 6128, succ. Centre-ville
Montréal QC H3C 3J7

3333 Queen-Mary
2e étage, bur. 220-3
Montréal QC H3V 1A2

Téléphone : 514-343-6111 poste 2604
ceres@umontreal.ca
www.ceres.umontreal.ca

Université de Montréal

Comité d'éthique de la recherche en santé

N° de certificat
12-115-CERES-D(3)

CERTIFICAT D'APPROBATION ÉTHIQUE

- 3ième renouvellement -

Le Comité d'éthique de la recherche en santé (CERES), selon les procédures en vigueur et en vertu des documents relatifs au suivi qui lui a été fournis conclu qu'il respecte les règles d'éthique énoncées dans la Politique sur la recherche avec des êtres humains *de l'Université de Montréal*

Projet	
Titre du projet	**Investigating urban-rural disparities in oral health and oral health services: A Quebec profile**
Chercheuse requérante	**Elham Emami** (05671), Professeure agrégée, Faculté de médecine dentaire - Département de dentisterie de restauration
Note :	Ajout de la bourse de salaire provenant des IRSC (Décembre 2014). Ajout de la subvention FRQS (juillet 2015). Ajout du financement CIHR Clinician Scientist - Phase 2 (22 avril 2017)
Financement	
Organisme	Fondation de l'Ordre des dentistes du Québec // Réseau de recherche en santé buccodentaire et osseuse et IRSC // FRQS /// IRSC
Programme	Bourse salariale // Subvention d'établissement de jeune chercheur clinicien /// CIHR Clinician Scientist - Phase 2
Titre de l'octroi si différent	Les disparités urbaines-rurales à l'égard de la santé et des services buccodentaires: Le profil du Québec /// Investigating Urban-Rural Disparities In Oral Health And Oral Health Services: A Quebec Profile
Numéro d'octroi	// FRQS: 32604 /// No de demande 264223
Chercheur principal	
No de compte	

MODALITÉS D'APPLICATION

Tout changement anticipé au protocole de recherche doit être communiqué au CERES qui en évaluera l'impact au chapitre de l'éthique. Toute interruption prématurée du projet ou tout incident grave doit être immédiatement signalé au CERES.

Selon les règles universitaires en vigueur, un suivi annuel est minimalement exigé pour maintenir la validité de la présente approbation éthique, et ce, jusqu'à la fin du projet. Le questionnaire de suivi est disponible sur la page web du CERES.

Guillaume Paré
Conseiller en éthique de la recherche.
Comité d'éthique de la recherche en santé
Université de Montréal

18 janvier 2018	**1er février 2019**
Date de délivrance du renouvellement ou de la réémission*	Date du prochain suivi
6 octobre 2012	**1er février 2019**
Date du certificat initial	Date de fin de validité

*Le présent renouvellement est en continuité avec le précédent certificat

adresse postale
C.P. 6128, succ. Centre-ville
Montréal QC H3C 3J7

3333 Queen-Mary
2e étage, bur. 220-3
Montréal QC H3V 1A2

Téléphone : 514-343-6111 poste 2604
ceres@umontreal.ca
www.ceres.umontreal.ca

McGill

Faculty of Medicine
3655 Promenade Sir William Osler #633
Montreal, QC H3G 1Y6

Faculté de médecine
3655, Promenade Sir William Osler #633
Montreal, QC H3G 1Y6

Fax/Télécopieur: (514) 398-3870
Tél/Tel: (514) 398-3124

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

The Faculty of Medicine Institutional Review Board (IRB) is a registered University IRB working under the published guidelines of the Tri-Council Policy Statement, in compliance with the Plan d'action ministériel en éthique de la recherche et en intégrité scientifique (MSSS, 1998), and the Food and Drugs Act (17 June 2001); and acts in accordance with the U.S. Code of Federal Regulations that govern research on human subjects. The IRB working procedures are consistent with internationally accepted principles of Good Clinical Practices.

At a full Board meeting on 11 March 2019, the Faculty of Medicine Institutional Review Board, consisting of:

John Breitner, MD	Joséane Chrétien, MJur
Kelly Davison, MD	Patricia Dobkin, PhD
Frank Elgar, PhD	Anathasios Katsarkas, MD
Catherine Lecompte	Kathleen Montpetit, M.Sc.
Roberta Palmour, PhD	Lucille Panet-Raymond, BA

Maida Sewitch, PhD

Examined the research project **A01-E05-19B** titled: *Investigating the urban-rural disparities in oral health and oral health services: a Quebec profile*

As proposed by: Elham Emami (Applicant) to _____ (Granting Agency, if any)

And consider the experimental procedures to be acceptable on ethical grounds for research involving human subjects.

11 March 2019
Date

Chair, IRB

Dean/Associate Dean

Institutional Review Board Assurance Number: FWA 00004545

McGill

Faculty of Medicine
3655 Promenade Sir William Osler #633
Montreal, QC H3G 1Y6

Faculté de médecine
3655, Promenade Sir William Osler #633
Montréal, QC H3G 1Y6

Fax/Télécopieur: (514) 398-3870
Tél/Tel: (514) 398-3124

8 March 2019

Dr. Elham Emami
Faculty of Dentistry
2001, avenue McGill-College, Suite 500
Montreal QC H3A 1G1

RE: IRB Study Number A01-E05-19B
Investigating urban-rural disparities in oral health and oral health services: a Quebec Profile

Dear Dr. Emami,

Thank you for submitting the above-referenced study (and clarifications) for an ethics review. This study was reviewed on behalf of your Masters Student, Abdalgader Ibrahim 'Alhozgi.

As this study involves no more than minimal risk, and in accordance with Articles 2.9 and 6.12 of the 2014 Edition of the Canadian Tri-Council Policy Statement of Ethical Conduct for Research Involving Humans (TCPS2 2014) and U.S. Title 45 CFR 46, Section 110 (b), paragraph (1), we are pleased to inform you that final ethics approval for the above-referenced study (Study Protocol, dated February 2019) is granted under the expedited/delegated review process on 8 March 2019. The ethics authorization is valid until **January 2020**. The study proposal will be presented for corroborative approval at the next meeting of the Committee and a certification document will be issued to you at that time.

A review of all research involving human subjects is required on an annual basis in accord with the date of initial approval. The annual review should be submitted at least one month before **January 2020**. Please inform the IRB promptly of any modifications that may occur to the study over the next twelve months.

Regards,

Roberta Palmour

Roberta Palmour, PhD
Chair
Institutional Review Board

cc: Abdalgader Ibrahim Alhozgi
A01-E05-19B

Rural-urban disparity in patient's satisfaction with oral health care

Abdalgader Ibrahim Alhozgi
McGill University
February 2019

Master of Science in Dental Sciences

Supervisors:

Dr. Elham Emami

McGill University, Faculty of Dentistry

Dr. Jocelyne Feine

McGill University, Faculty of Dentistry