Taking Dentistry to The Social Level: Are Quebec Dental Professionals Ready?

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This thesis is dedicated to Iran, "a home that no longer exists, or that never was"[1].

[1] This quotation is from the website of Sarah Bringhurst Familia, a personal blogger. She wrote this to explain the meaning of "Hiraeth", a Welsh word for homesickness. According to the Collins dictionary, Hiraeth is a nostalgic longing for a place which can never be revisited. As Sarah elaborates, "it is homesickness tinged with grief or sadness over the lost or departed." Please refer to http://casteluzzo.com/2017/02/01/a-home-that-no-longer-exists-or-that-never-was/ and https://www.collinsdictionary.com/dictionary/english/hiraeth for further information.

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English abstract

Objectives: This thesis aimed to understand the perspectives of dentists towards the Montreal-Toulouse model, an approach that encompasses person-centeredness and social dentistry. More specifically, we wanted to know a) how dentists perceived the Montreal-Toulouse model; and b) how ready they were to adopt it.

Methods: We conducted a qualitative descriptive study based on semi-structured interviews with a sample of dentists in the Province of Quebec, Canada. We employed a combination of maximum variation and snowball sampling strategies and recruited 14 information-rich dentists; these dentists were both working in private practice and as teachers in a dental faculty. The interviews were conducted and audio-recorded through Zoom and lasted approximately two hours. After transcribing the interviews verbatim, we performed a thematic analysis with a combination of inductive and deductive coding.

Results: The participants explained they valued person-centred care and, as clinicians, tried to put the individual level of the Montreal-Toulouse model into practice. However, they expressed little interest in the social dentistry aspects of the model, such as providing domiciliary dental services. They acknowledged not knowing how to organize and conduct upstream interventions and were not comfortable with political activism. According to them, advocating for better health-related policies, while a noble act, "was not their job". They also highlighted structural challenges that dentists faced for fostering biopsychosocial approaches.

Conclusions: To promote the adoption of biopsychosocial approaches in dentistry, dental schools need to reject the biomedical, disease and sometimes dentist-oriented model of practice, which perpetuates a narrow definition of professionalism. We also encourage dentistry's governing bodies to shift their focus from a market-based healthcare system to a socially oriented one.

French abstract

Objectifs : Cette thèse visait à comprendre les perspectives des dentistes envers le modèle Montréal-Toulouse, une approche qui englobe l'approche centrée sur la personne et la dentisterie sociale. Plus précisément, nous voulions savoir a) comment les dentistes percevaient le modèle Montréal-Toulouse; et b) dans quelle mesure ils étaient prêts à l'adopter.

Méthodes : Nous avons mené une étude descriptive qualitative basée sur des entretiens semi-directifs avec un échantillon de dentistes de la province de Québec, au Canada. Nous avons utilisé une combinaison de stratégies d'échantillonnage à variation maximale et boule de neige, et ainsi recruté 14 dentistes riches en informations; ces dentistes travaillaient en clinique privée et, en parallèle, exerçaient des activités d'enseignement dans une faculté dentaire Québécoise. Les entretiens étaient menés et enregistrés sur Zoom et duraient environ deux heures. Après avoir retranscrit les entretiens textuellement, nous avons effectué une analyse thématique avec une combinaison de codage inductif et déductif.

Résultats : Les participants ont expliqué qu'ils valorisaient les soins centrés sur la personne et tentaient de mettre en pratique le niveau individuel du modèle Montréal-Toulouse. Cependant, ils ont exprimé peu d'intérêt pour les aspects de dentisterie sociale du modèle, comme par exemple fournir des soins dentaires mobiles, c'est à dire au domicile des patients. Ils reconnaissaient ne pas savoir conduire des interventions en amont et n'étaient pas à l'aise avec l'activisme politique. Selon eux, plaider pour de meilleures politiques en matière de santé, bien qu'il s'agisse d'un acte noble, « n'était pas leur travail ». Ils ont également souligné les défis structurels auxquels font face les dentistes pour favoriser les approches biopsychosociales.

Conclusions : Pour promouvoir les biopsychosociales en dentisterie, les écoles dentaires doivent abandonner le modèle biomédical, axé sur la maladie et même sur le dentiste, car il perpétue une définition étroite du professionnalisme. Nous appelons également les organes directeurs de la médecine dentaire à rejeter le système de santé actuel, basé sur une logique de marché, et à faire la promotion d'un système à orientation sociale.

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Contribution of authors

The MSc Candidate (Homa Fathi) wrote the initial draft of all sections of this thesis. Under the guidance of the thesis supervisor (Dr. Christophe Bedos) and co-supervisor (Dr. Jacqueline Rousseau), Ms. Fathi also conducted the literature review, data collection, and data analysis. Furthermore, Dr. Bedos and Dr. Rousseau provided input on the manuscript preparation and revisions.

Contribution of authors to the journal article 1 (the scoping review)

Dr. Christophe Bedos and Dr. Jacqueline Rousseau designed and supervised this study and edited the manuscript. Mr. Martin Morris carried out the data collection and drafted the majority of the methods section. Dr. Jean-Noel Vergnes and Dr. Alessandra Blaizot performed the critical appraisal of articles and drafted the relevant parts in the methods section. Dr. Nora Makansi screened the initial candidate articles, charted the extracted data, and supervised the study. The MSc Candidate, Homa Fathi, charted the extracted data, designed the model, and drafted the manuscript.

Contribution of authors to the journal articles 2 and 3 (the qualitative research)

Dr. Christophe Bedos and Dr. Jacqueline Rousseau designed these studies, supervised and contributed to the data collection and analysis, and edited the manuscripts. The MSc Candidate, Homa Fathi, carried out the data collection and data analysis and also drafted the manuscripts.

1- Introduction

Although the 'biomedical model' has been highly criticized in the literature (1, 2), it still dominates the education and practice of dentistry (2). This model solely focuses on eliminating the biological causes of dental diseases (2, 3) and ignores the psychosocial factors that might cause, contribute to, and maintain them. It is also dentist-centered and prioritizes dentists' expertise over patients' experiences, concerns, and expectations. Consequently, the patient-dentist interaction tends to be paternalistic with communication mostly one-way from the dentist towards the patient which may lead to patient dissatisfaction (4, 5).

In response to these shortcomings, researchers have proposed alternative models over the past few decades. 'Person/patient centered care', for instance, tries to balance power between the dentist and the patient and emphasizes on the importance of the patient's experiences, concerns, and expectations (6-9). It also advocates for a shared decision-making process where patients' values and choices are respected (4). Furthermore, researchers have also proposed 'social dentistry' models that encourage dentists to tackle patients' social determinants of health through social prescription and upstream actions (10, 11).

Recently, a biopsychosocial approach named the 'Montreal-Toulouse model' has entered the dentistry literature (12). This model incorporates patient-centeredness and social dentistry, amalgamating their foremost values and principles. In more practical terms, it encourages dentists to take three types of actions (understanding, decision-making, intervening) on three overlapping levels (individual, community, societal) (see appendix 1). The individual level corresponds to the provision of person-centered care, while the next two levels mostly include components of the social dentistry model.

At the individual level, the model stipulates that dentists should build a trustful relationship with patients and *understand* their experience of illness, their expectations or concerns as well as their social determinants of health. This allows dentists to engage in a shared *decision-making* process that incorporates patients' choices and priorities and leads to an *intervention.* The intervention may includes surgical and non-surgical treatments along with medical and even social prescription.

At the community level, dentists should *understand* and have good knowledge of the local community in which they practice; this way, they could adapt their clinic to people's needs and

values and even develop partnerships with local medical and non-medical resources; these partnerships could empower dentists and help them participate in *decision-making* processes and advocate for *interventions* that could promote the health of their community.

Finally, at the societal level, the model encourages dentists to *understand* and comprehend "social, political and economic structures that shape the oral health of the general population"; but also "country's legislations, policies and programmes that, directly or indirectly, may influence people's oral health". Dentists could then try to participate in *decision-making* processes related to health policies, for instance through engagement in professional and non-professional organizations. This way, they could *intervene* and advocate for healthy policies, such as water fluoridation, universal public dental coverage and levying tax on cariogenic products.

The Montreal-Toulouse model is founded on humanistic values of professionalism, particularly social accountability and moral inclusion (13, 14). It holds dental professionals accountable for addressing oral health inequalities and encourages them to serve all groups of people, with a focus on the most vulnerable, such as people living in poverty, people with disabilities, and the elderly. The Montreal-Toulouse model is particularly appropriate to address the needs of the latter, which represent a growing population in Canada, as in most industrialized countries (15).

Elderly people often experience physical and cognitive issues that limit their access to dental services. Because of mobility limitations, some seniors are indeed unable to refer to dental clinics (16). Others have cognitive conditions, such as Alzheimer's, that make them confused or frightened in the unfamiliar setting of a dental office and prevent them from receiving the care they need (17). Indeed, the literature reveals that this population suffer disproportionately from unmet dental needs and lack access to oral health services (18).

To address these issues, dentists adhering to the Montreal-Toulouse model may opt for portable dentistry, "a service that reaches out to care for those who cannot reach a service themselves" (17). Employing this approach, mobile dentists deliver oral health services in people's residence using portable dental equipment (19, 20). This type of service significantly improves access to oral healthcare for the elderly population and people with mobility disabilities (17, 21, 22).

Portable dentistry is a good example of practicing the Montreal-Toulouse model at the individual and community levels. Indeed, mobile dentists identify the oral health needs of the older adults

with limited mobility (Understanding); they then establish rapport with local nursing homes and bring up the oral health needs of residents with their managers (Decision-making); and finally, they respond to the elderly's oral health needs by providing portable services inside the residences (Intervening).

In brief, the adoption of the Montreal-Toulouse model and related approaches, such as portable dentistry, could improve the population's access to dental services and overal health. In order to implement this model though, it is important to know what dental professionals think about it and how they perceive its relevance (23, 24). At this stage, however, we do not know if dental professionals are ready to adopt this model and, more generally, biopsychosocial approaches that redefine the way they have practiced dentistry so far. This thesis aims at addressing this knowledge gap and explore dentists' perspectives about the Montreal-Toulouse model.

2- Literature review

2-1 The biomedical model

Medicine adopted the biomedical model a few centuries following the popularity of the 'mind-body dualism' theory. First suggested by Aristotle and later enunciated by Galileo, Newton, and Descartes (25, 26), this concept suggested that mind and behaviour were entities related to the soul, while the body was a 'machine' distinct from them. It was therefore generally accepted that the breakdown of this machine leads to disease, and that a doctor's task was to repair it (1).

This notion was further nurtured in the late 19th century when scientists, such as Louis Pasteur and Robert Koch, successfully explained the causal relationship between microorganisms and diseases (2). This encouraged the scientific world to embrace the 'Doctrine of Specific Etiology' (3), which attributed each disease to a single biomedical cause and ignored the psychological and social factors. It also promoted the dichotomy of 'health-disease' and assumed that health meant the absence of disease, a state attainable by the removal of biomedical causal factors (1).

These concepts founded the 'biomedical model' that still dominates the education and practice of the healthcare professions. In addition to focusing on biomedical factors, this model ignores the subjective experience of diseases by patients – the illness experience – which is highly influenced by psychological and social circumstances (2). It also presumes that patients are the least informed about their health-related needs and should be passive recipients of the care based on the discretion of doctors (27). Consequently, the information flow is mostly one-way, from the clinician towards the patient (28): the healthcare professional suggests an ideal treatment aimed at the removal of the disease regardless of patient's values and preferences (12).

The biomedical model started receiving critiques some 70 years ago when Balint (29) shed light on the 'professional-orientation' of medical practices, arguing that "the most frequently used drug in general practice [is] the doctor himself; It [is] not only the medicine in the bottle, or the pills in the box… but the whole atmosphere in which the drug is given and taken." Ever since, a wealth of literature has been produced that discredits the biomedical model and highlights its flaws.

Ignoring the psychosocial dimensions of illness, for instance, may lead to disease recurrence and poor treatment maintenance. Patient dissatisfaction is another consequence of neglecting patients' subjective experiences and excluding them from the treatment process (27). It is also well

documented that health and disease are not distinct entities, but rather the end points of a continuum along which people move throughout their life depending on biological, psychological, and social circumstances (2).

Dentistry, similar to the other health professions, has historically been governed by the biomedical model and a reductionist understanding of oral health (4). Below I will present a brief history of the birth of dentistry as a profession and discuss how the biomedical model shaped numerous aspects of it.

2-2 The biomedical model in dentistry

Dentistry attained professional status at the beginning of the 20th century and immediately began to iterate norms and standards set by medicine, namely the biomedical approach. Indeed, an important argument to legitimize dentists' claim to the professional status was through the germ theory, a central characteristic of the biomedical model. For instance, Willmott (1904) and Day (1917), two pioneers of dental profession, "tried to define for the public exactly how many bacteria and germs were in their mouths at any given moment… swimming around in the mouth, polluting the air people breathed, and infecting the body at every swallow… Dentists held that poor oral health led to poor physical health; thus, dentistry was as important as medicine to the maintenance of health and well-being" (30-32).

At the first half of the 20th century, the biomedical model served dentistry well, as at time "dental disease was prevalent, and prevention was more a philosophy than a reality in dental practice" (31). During the late 20th century, however, an epidemiological shift from the acute to predominately chronic conditions changed patients' needs. Indeed, the biomedical model was, and still is, less fit to address chronic oral conditions – such as periodontitis – as they are multidimensional and their successful treatment largely depends upon dentists' understanding of the psychosocial aspects of care (33).

Furthermore, the biomedical model's reductive standards of communication have resulted in poor dentist-patient interaction that is unwelcome by both parties. Mataki, for instance, reported that "communicative dominance" manifested by dentists through "conversational floor time, interruptions, criticism, loudness, gaze aversion, and directives" was linked with dental fear and anxiety – a leading causes of patients' dissatisfaction (5). This has been expressed by patients' non-

compliance, treatment discontinuation (4), and malpractice litigations (34), which in turn may favor distress and emotional exhaustion among dentists (35).

The biomedical model's governance over the dental education has also had repercussions for students and patients (36). Warren, for instance, considered that "the way of life of physicians-in-training prepares them for a life of fighting the enemy of disease, even as novice soldiers are prepared -- in boot camp or West Point -- for fighting a war. In both cases, status differentiation by rank is clearly maintained, and technical proficiency is stressed. The training period… is a moral test. To pass, obedience and extreme self-sacrifice are required" (37).

Indeed, having authority has been well established within the professional identity of dentistry educators and at times, their approach might be paternalistic and even belittling towards students (4, 38). As Rowland, et al. consider, intimidation and bullying is prevalent within dental teaching and training environments and might negatively impact students' progress and wellbeing as well as patient care (38). Consequently, dental students experience a profound sense of overwhelm and stress (39) and are commonly cynical about their future profession (40).

Besides, dental education's heavy focus on manual dexterity and technical skills has left little room in the curricula for the improvement of what many call "soft skills" – such as interpersonal skills and socio-cultural competencies (41). For instance, empathy, a core quality that helps clinicians put themselves in place of patients and understand their illness experience cognitively and emotionally (42), has been reported to decline steadily among dentistry students throughout their education due to a lack of empathetic role models, fatigue, and stress in the educational environment (43, 44). According to Haghparast et al., a decrease in students' intrinsic interest in tasks, understanding of the topic, and problem-solving abilities could be seen throughout their training (45).

In brief, the governance of the biomedical model in healthcare professions, while useful for managing acute diseases, has failed to effectively address chronic conditions. It has also increased patient and clinician dissatisfaction and undermined their therapeutic relationship. Healthcare education is another negatively affected domain as the dominance of a dogmatic atmosphere has led to increased anxiety among students and decreased their academic and clinical performance.

That is why many voices have called for a reform in the practice and education of healthcare professions and development of biopsychosocial approaches (6, 11, 46-49). In response, researchers have presented various models that promote patient empowerment and a more balanced therapeutic relationship; also taking patients' environment and social determinants of health into account when envisioning treatment plans. Below I present one of the most important models in this regard; the person/patient-centered care approach.

2-3 The person/patient-centered care model

The term 'patient-centered care' first appeared in the literature in 1950s when researchers highlighted the importance of understanding "what the patient thinks and feels about his condition" (50) and viewing them beyond their diseases and as "unique human-beings" (51). Balint et al. later expanded this term into a universal model in medicine and investigated its challenges and benefits (29, 51). Ever since, other researchers have tried to determine what patient-centered care should consist of. Gerteis et al. (52), for instance, were among the pioneers who proposed the following seven principles as the core dimensions of patient-centered care. (See table 1)

Table 1: The seven dimensions of patient-centered care suggested by Gerteis (1993)
1. Respect for patients' values, preferences and expressed needs 2. Co-ordination and integration of care 3. Information, communication, and education 4. Physical comfort 5. Emotional support and alleviation of fear and anxiety 6. Involvement of family and friends 7. Transition and continuity

The United States National Academy of Medicine later slightly modified these principles by merging the second and seventh dimensions and identified patient-centered care as one of the six major indicators of quality in healthcare. It defined this approach as "providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions" (53).

In parallel with these efforts to conceptualize patient-centred care, researchers tried to apply it and developed clinical models based on empirical evidence. McCracken et al., for instance, presented

a family-medicine model according to which clinicians should try to understand people's illness experience by asking open-ended questions, actively listening, and responding to patients' verbal and non-verbal cues (28). Stewart et al. (54) also suggested a six-step-process (see table 2) that focused on finding common ground – agreeing on problems, goals, and roles – with patients and reaching mutual healthcare decisions. They later integrated the fourth and sixth steps into the other steps and presented a practical approach comprising the remaining four components (55).

Table 2: The six steps of providing patient-centered care suggested by Stewart et al. (1995)

1. Exploring both the disease and the illness experience
2. Understanding the whole person
3. Finding common ground regarding treatment management
4. Incorporating prevention and health promotion
5. Enhancing the patient-doctor relationship
6. Being realistic regarding time and resources

The terms person- and patient-centered care have been used interchangeably in the literature, as they both relate to a model of care that is "individualized around the person regardless of the health care setting" (56). However, some authors have attributed a more comprehensive meaning to the term 'person-centered care' (4, 57). For instance, Perez, et al. argued that "the patient-centred approach focuses on dental care needs of patients; whereas the person-centred approach is responsive to all the care needs (including, but not limited to dental needs) of patients. Thus, in the person-centred approach, all the healthcare needs of patients are considered and addressed through providing direct care or facilitating access to care" (57). For the purpose of this literature review and to prevent confusion, I will use each term according to the cited article.

Person-centered care requires healthcare professionals to view patients holistically, not merely as a diseased entity, and investigate the psychosocial aspects of the illness along with the biomedical ones (58). They should understand the unique meaning of illness for each patient; also how an individual's personality (58) – habitual behaviours, cognitions, and emotional patterns – might influence their illness experience (59).

Clinicians should also learn about the proximal factors that could affects patients' interpretation of their symptoms; for instance, receiving financial compensation for sick leave and the fear of getting labeled as unfit to work could motivate or discourage patients from interpreting their

symptoms as illness, respectively. Furthermore, clinicians should learn about the culturally determined norms and beliefs that could affect patients' explanatory models (58); for instance, tooth loss due to untreated chronic periodontal diseases is considered a normal sign of old age – rather than an illness – in many cultures (60).

Patient-centered care is based on an egalitarian doctor-patient relationship in which the doctor does not assume a paternalistic role, but mutually participates in the decision-making process with patients (58). The information flow is thus two-sided, with patients bringing their values, expectations, and illness experience, and doctors bringing their scientific expertise and professional advice, that is, the information patients need and want for making an informed-decision (61). Clinicians should encourage patients to voice their opinions, feelings and experiences by asking open-ended questions (62). This approach leads to patient empowerment and satisfaction as they feel respected, cared for, and in control of their own health (63).

There is an abundance of literature that reports the benefits associated with person-centered approaches. These benefits extend to the patients – higher satisfaction level and better clinical outcomes; healthcare professionals – higher professional satisfaction and less litigation cases; and the health systems – reduced service usage. Incorporating this approach into the healthcare policies, medical schools' curricula, and physicians' daily practice has thus been a long-time aspiration of the healthcare professional bodies (9, 63-66).

2-4 Person/Patient-centered care in dentistry

The adoption of patient-centeredness in dentistry could be traced back to 1980s when the University of Minnesota launched a 'patient-centered treatment planning' course that focused on how to value patients' input and conduct shared decision-making (6). Later, at the beginning of the 21st century, researchers started to propose dentistry-specific patient-centered models by tailoring this concept into the profession's specific needs. Kulich et al, for instance, argued that the current models did not provide sufficient guidance on how dentists should effectively communicate with patients. Consequently, they used a grounded theory methodology based on interviews with dentists and developed a patient-centered care model that could lead to the improvement of the dentist-patient interaction (7).

Apelian et al. also argued that dentistry could not readily use the current models as "unlike other professions, dentistry has a therapeutic intervention process, often surgical, within the initial encounter… associated with pain, anxiety, and financial considerations". To help dentists effectively manage these encounters, they developed a new model based on the literature and on their own experiences as clinicians and patients (67-69). Apelian et al. used the term person – rather than patient – centered care, as their model aimed to respond to all care needs of patients, and not merely their dental needs (4, 57).

This model encourages dentists to perform person-centered care in three consecutive steps: 1- understanding (patients' fears, expectations, explanatory models, and their life "as a context for disease"); 2- shared decision-making (based on "an equally powered relationship" with dentist as a decision advisor and supporter); and 3- intervention (based on the co-constructed treatment plan and guided by patients' values and expectations).

In parallel with Apelian et al., Scambler and Asimakopoulou argued that the current models in dentistry failed to guide clinicians how to "be patient-centred in a way that patients are encouraged to have some responsibility about decision-making in a dental consultation". They thus developed a "practical hierarchy of patient-centredness" based on the literature (54, 58) and presented "a series of stages that a dental care professional needs to move through in order to provide care that is patient-centred". This model encouraged dentists "to have more open, unambiguous communication, both about the risks and benefits of courses of action and about the choices available to patients"(8).

The abovementioned models provided valuable insight into the concept of patient-centered care, but, as Mills (2015) and Lee (2018) considered, solely from a dentist's perspective. Mills et al. thus introduced a new model that focused on patients' perspective and used the term person – rather than patient – centered care as it "inferred greater autonomy" on part of patients. This model is based on interviews with patients and categorizes person-centeredness's aspects into rational and functional; the rational aspects are related to patients' expectations of care and dentists' attitudes, and functional aspects refer to the influences of the physical environment and healthcare system on the delivery of care (70).

Lee et al. further elaborated on the roles and responsibilities of the healthcare systems in the care process by introducing a new model of person-centeredness. More specifically, they reviewed the

literature and identified three key players whose actions defined and affected the delivery of person-centered care: person or primary caretaker, healthcare provider, and care designer. They defined the latter as "entities and systems rather than personnel who create infrastructure for the person-provider team" and argued that it is the care designers' responsibility to provide a context in which the person-provider interaction "forms in the most meaningful and efficient way" (71).

While the benefits of patient/person-centered care are well-documented within other health disciplines, the topic remains understudied in dentistry (72). Indeed, "a considerable number of papers on person-centered care [in dentistry] are opinion papers or reviews, which do not examine the concept in depth" (72); also, only a few empirical studies (73-75) have assessed its impact on the education and practice of dentistry (70). Nevertheless, there is a forward movement for the adoption of this concept in dentistry. The Association of Canadian Faculties of Dentistry (ACFD), for instance, has recognized patient-centered care as one of the five competencies new dentists must possess upon graduation (76).

Although patient/person-centered care encourages healthcare professionals to pay attention to the social determinants of health, it does not discuss their social roles and responsibilities towards patients and the society. There are, however, other concepts that mainly focus on these social aspects of care, most famously the 'social medicine' discipline. Below I will briefly present this concept and explain its emergence in and influences on dentistry.

2-5 Social medicine

The origins of the modern social medicine could be traced back to the nineteenth century and to the work of social reformists such as the German pathologist and liberal politician, Rudolf Virchow (1821-1902) (77). Known by many as the founder of social medicine, Virchow argued that "human health and disease are the embodiment of the successes and failures of society as a whole, and the only way to improve health and reduce disease is by changing society by, therefore, political action" (78). He therefore highlighted the roles and responsibilities of healthcare professionals in recognizing and addressing the social inequalities that according to him, created and maintained the population health issues.

In the 20th century, social medicine gained widespread attention in continental Europe, South Africa, Chile, and England with scientists highlighting the role of contextual factors such as

socioeconomics, education, housing, employment, and one's environment in shaping their health (79). Indeed, the discipline of social medicine argues that "the determinants of health are best conceptualized as biosocial phenomena, in which health and disease emerge through the interaction between biology and the social environment" (80).

This has been supported by the World Health Organization (WHO); in its 1948 Constitution, for instance, WHO clearly acknowledged "the impact of social and political conditions on health, and the need for collaboration with sectors such as agriculture, education, housing and social welfare to achieve health gains" (81). In order to raise awareness and promote action, the WHO outlined the most important social determinants of health in the early 2000s (82) and later defined them as "the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems".

The social medicine discipline encourages clinicians to practice medicine that integrates understanding and applying the social determinants of health; but also recognize health as a basic human right and advocate for social equity and justice (83). It argues that clinicians should go beyond the biomedical interventions and "engage with social realities outside the clinic or hospital to optimize human health" (84, 85). The healthcare professionals' roles and responsibilities in addressing these determinants, however, has been constantly debated over the past few decades.

The most ambitious view may belong to Virchow who argued that "doctors are the natural attorneys of the poor'' and should therefore 'direct' the development and application of healthcare laws and policies (78). Other social medicine advocates have been less expectant; instead of putting the entire burden of political activism on physicians, they have tried to inform physicians' political and social actions by developing frameworks and guidelines. Gruen et al. (86) for instance, introduced a "model of physician responsibility" based on the literature and categorized physicians' sphere of influence into four domains: access to care, direct socioeconomic determinants of health, broad socioeconomic determinants of health, and global socioeconomic determinants of health (see table 3).

Table 3: Four domains of physicians' sphere of influence (Gruen, et al.)

1	Access to care	Factors that influence patients' access to care, namely insurance coverage and availability of care for uninsured patients, geographic distribution of services, and access for disabled patients.
2	Direct socioeconomic determinants of health	Direct socioeconomic factors such as smoking, road safety, interpersonal violence, housing conditions that cause disease.
3	Broad socioeconomic determinants of health	Local socioeconomic factors such as local disparities in income, education, or opportunity.
4	Global socioeconomic determinants of health	Global socioeconomic factors such as the global distribution of resources, knowledge, and opportunity.

According to this model (86), physicians have a 'professional obligation' to tackle the first two domains – access and direct determinants – as they are "areas in which the link between policy and health is well established and in which physicians' involvement is feasible and potentially effective." They argue, however, that such obligation does not apply to the last two domains – the broad and global determinants – as "the evidence of their link with individual patients' illness is weaker, or the feasibility or efficacy of physician action is less clear". Instead, physicians could 'aspire' to tackle these domains, if such actions are "consistent with their expertise, interests, and situation."

Andermann et al. (87) also introduced a framework for tackling the social determinants of health and suggested that physicians take actions on three levels: patient, practice, and community. On the patient level, they should inquire about the social determinants and provide social prescription – that is, "connecting patients with various support resources within and beyond the health system". On the practice level, they should reduce barriers to accessing care for vulnerable groups; also, hire 'patient navigators' who could help patients access support services. On the community level, they should develop partnerships with local groups and leaders and attempt for improving the community's health; also, advocate for social changes that reduces health disparities.

The social medicine advocates argue that medicine has failed to educate healthcare practitioners on the interplay of biological and social causes of diseases; physicians thus lack the necessary knowledge and skills to recognize and address these factors. While some schools offer elective courses on the subject, social medicine is still far from institutionalized in medical schools'

curricula (80, 88). Therefore, different scholars have tried to inform social medicine training through developing guidelines and frameworks.

Stevens et al. (83), for instance, developed a 'social medicine toolkit' and envisioned six ways in which "a clinical training program with social medicine as a core" should prepare competent healthcare professionals (see table 4). Hubinette et al. (89) also introduced a framework as a tool for the guiding and evaluation of health advocacy practice and training. They further suggest moving towards medical education that prepares physicians for "ensuring access to care, navigating health systems, mobilizing resources, influencing health policies, and creating system change".

Table 4: The expected skills of healthcare professionals trained in a social medicine program (Stevens, et al.)

1. Developing ways to recognize and challenge their own biases, sources of power and privilege.
2. Learning how to work collaboratively with other professions.
3. Understanding the relationship between the individual and population and how this relationship is affected and shaped by social and systemic forces.
4. Recognizing that interventions and strategies are meaningless unless they match local needs and conditions.
5. Practicing skills that challenge and correct societal, structural, and political forces that create health disparities
6. Advocating for patients and the community to improve the social determinants of health.

2-6 Social dentistry

Although not under the term "social dentistry", it has been almost three decades since voices have called for dentists' social and political involvement in addressing population oral health inequalities. In 1998, for instance, the American Association of Public Health Dentistry identified 'understanding and promoting individual and community health and welfare' as a main principle of professionalism and argued that dental professionals had "a duty to promote policies that improve oral health service resources" (90).

In parallel, the American Academy of Pediatric Dentistry (AAPD) declared 'advocacy for children' as its primary mission and encouraged its members to promote "policies, guidelines, and programs that support optimal oral health and oral health care for children" at local, state, and

national levels (91, 92). Other researchers also highlighted the social roles and responsibilities of dental professionals in improving access to care, particularly for special needs patients (93-96).

Furthermore, some patient/person-centered care models in dentistry highlighted the importance of understanding the social aspects of care and how they might affect patients' illness experience and treatment process (4, 7, 70, 71). More recently, the Association of Canadian Faculties of Dentistry (ACFD) identified "health promotion" among the five competencies dentists should have upon graduation and defined it as "the responsible use of professional expertise and influence to advance the health and well-being of individual patients, communities and populations" (97).

While all these efforts formed a professional dialogue around dentists' social roles and responsibilities, they did not provide explicit and practical guidance on how dentists might effectively fulfill their social duties. It was only in 2018 that Bedos et al. encouraged "researchers, educators, and dental professionals to be at the forefront of actions addressing social determinants of health" and "develop competency frameworks describing how clinicians can address the social determinants of oral health at the individual, community, and societal levels" (11).

Bedos et al. later introduced the first official 'social dentistry' model and encouraged dentists to address the social determinants of health on three overlapping levels: micro, meso, and macro. On the micro level, dentists should provide person- and family-centered clinical care, but also provide social prescription. On the meso level, they should adapt their clinics to the needs of the community and partner up with local leaders for the improvement of their community's oral health. On the macro level, dentists should advocate for healthy public policies that could directly or indirectly affect the populations' oral health (10).

2-7 The Montreal-Toulouse Biopsychosocial Model for dentistry

The Montreal-Toulouse model is a continuum of Bedos et al.'s efforts in introducing biopsychosocial approaches in dentistry (12). This model incorporates person-centeredness (4) and social dentistry (10), amalgamating their foremost values and principles. In more practical terms, it encourages dentists to take three types of actions (understanding, decision-making, intervening) on three overlapping levels (individual, community, societal). The individual level corresponds to the provision of person-centered care, while the next two levels mostly include components of the social dentistry model.

More specifically, at the individual level, the model encourages dentists to learn about the patients' expectations and values, but also their social determinants of health. They should then invite the patient to co-construct the treatment plan in a shared decision-making process, which is followed by clinical interventions and social prescription, or therapeutic abstention. At the community level, dentists are encouraged to learn about the demographics of their community and the available medical and non-medical organizations and develop partnerships with them.

This should be followed by active participation in making decisions that will affect the oral health of the community, adapting their clinics to the needs of the community, and also making relevant community interventions. The societal level is similar, with a focus on learning about the social, political, and economic structures that directly or indirectly affect the population oral health; it also includes advocating for beneficial oral-health related policies and programs through "social/political activism", that is, going beyond what is conventional or routine to bring about a change in society, often by confronting the 'status quo', or 'the way things are' (12, 98, 99).

The Montreal-Toulouse model is founded on humanistic values of professionalism, particularly social accountability and moral inclusion (13, 14). It holds dental professionals accountable for addressing oral health inequalities and encourages them to serve all groups of people, with a focus on the most vulnerable, such as people living in poverty, people with disabilities, and the elderly. The Montreal-Toulouse model is particularly appropriate to address the needs of the latter, which represent a growing population in Canada, as in most industrialized countries (15).

Elderly people often experience physical and cognitive issues that limit their access to dental services. Because of mobility limitations, some seniors are indeed unable to refer to dental clinics (16). Others have cognitive conditions, such as Alzheimer's, that make them confused or frightened in the unfamiliar setting of a dental office and prevent them from receiving the care they need (17). Indeed, the literature reveals that this population suffer disproportionately from unmet dental needs and lack access to oral health services (18).

To address these issues, dentist adhering to the Montreal-Toulouse model may opt for portable dentistry, “a service that reaches out to care for those who cannot reach a service themselves” (17). Employing this approach, mobile dentists deliver oral health services in people's residence using portable dental equipment (19, 20). This type of service significantly improves access to oral healthcare for the elderly population and people with mobility disabilities (17, 21, 22).

Providing portable dental services in nursing homes is a good example of practicing Montreal-Toulouse model. Indeed, mobile dentists identify the oral health needs of people with limited mobility (Understanding); they then establish rapport with local nursing homes and advocate for responding to the oral health needs of their residents (Decision-making); and finally, they respond to residents’ oral health needs by providing portable services inside the residences (Intervening).

The literature also encourages dentists to take upstream actions for addressing the unmet health needs of the home-bound patients. As Helgeson et al. suggested three decades ago, “all caregivers should advocate against the neglect of oral health problems suffered by vulnerable adults who cannot advocate for themselves” (100). In the next section I will present the history, definitions, and benefits and challenges of portable dentistry for both providers and patients.

2-8 Portable dentistry

The literature on portable dentistry could be traced back to the early 1990s when Strayer, et al. reported on the unmet dental needs of the nursing homes’ residents (101) and predicted that “the anticipated growth in the functionally dependent elderly population will place tremendous demands on the current health care system” (102). They thus called upon governments to address the access issues faced by the community dwelling, functionally dependent elderly and advocated for the promotion of ‘home-delivered services’.

Ever since, authors have used various terms to describe a practice model where dentists deliver dental care to the bed-ridden patients in their place of residence. The most common term is “domiciliary dental care’, but authors have also used terms such as ‘portable dentistry’ (103, 104), ‘on-site dental care’ (100), ‘home-delivered dental services’ (101, 102), and ‘dental home-visit’ (20). As the word ‘domicile’ mostly refers to “a person's fixed, permanent, and principal home” (105), it might not well comprehend the range of environments where home-bound patients may reside, namely long-term care homes. We thus will use the term ‘portable dentistry’ in the rest of

this document, as its focus is on the nature of the service provided rather the environment it takes place.

Fiske defined portable dentistry as “a service that reaches out to care for those people who cannot reach a service themselves” (106, 107). Sweeny et al. described it as “the provision of dental care in an environment where a person is resident either permanently or temporarily, as opposed to dental care delivered in a fixed dental clinic or a mobile dental unit.” (108). Indeed, the terms ‘portable dentistry’ and ‘mobile dentistry’ are not interchangeable, as the latter refers to providing dental care on “a fully equipped dental vehicle that is essentially a walk-in dental surgery and delivers a service inside the van” (109). However, the term ‘mobile dentist’ could be used to describe the healthcare provider in both these models.

Mobile dentists could benefit greatly from providing portable services. The office-management requirements, for instance, are minimized and “there are no failed appointments or waiting for patients to arrive” (109). It could also elicit dentists' sense of giving back to the society and be professionally rewarding, as it benefits to an underserved population with unmet needs (110). Portable dentistry could even become a niche for dentists who wish to expand their practice and gain new income opportunities (111).

Portable dentistry is also greatly beneficial for people with mobility disabilities. In addition to accessing dental care that might otherwise be unreachable, home visits represent a welcome social contact for people confined to the home (20) and might even be the “highlight of the day” for some of them (26). In addition, home environment can be conducive to active patient participation in the care process as they usually feel more relaxed and in control in their familiar surroundings (17, 20). This is particularly important for patients suffering from Alzheimer’s disease, as they might become confused and disoriented in a clinical environment (17, 53).

Despite these positive aspects, both dental professionals and patients might face multiple challenges and barriers with respect to portable dental services. To better illustrate the process of planning and delivering portable dentistry as well as the mentioned challenges and barriers, we conducted a comprehensive search in the literature and published the results in the format of a scoping review, presented in the following section.

2-9 Journal Article 1: What do we know about portable dental services? a scoping review

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(This scoping review was published in the Gerodontology journal on January 2021(112))

Abstract:

Background: Delivering dental care to patients in their home or residential institutions is known as "portable dentistry". The demand for portable dental services is on the rise, but dentists remain reluctant to adopt portable practices.

Objectives: To explore the literature on portable dental services and understand a) the process of planning and delivering portable dental services and b) the benefits and challenges of portable dentistry for service providers and patients.

Methods: A systematic scoping search was conducted. We retrieved 3994 documents, 28 of which were included in the final synthesis. Three authors read the papers and conducted thematic content analyses independently.

Results: We present a synthesis of the literature and proposed a model of portable dentistry containing three levels with the patient is at the center surrounded by concentric rings representing the dentist (dental team) and society. At each of these levels, our model is further subdivided into three components: 1) organization of the service; 2) arrival and set up of the service; and 3) delivery of the service. In addition, each level includes 1) human factors, which are related either to the dental professional or the patient; 2) non-human factors, which refer to either the equipment or the physical environment; and 3) financial factors, which are related to cost and remuneration.

Conclusions: We propose a model for portable dentistry that dentists and dental educators interested in this practice should find useful.

Keywords: domiciliary dental care, disability, seniors, access to care.

Introduction:

Globally, the proportion and absolute numbers of people aged 65 and over are increasing (113, 114). In Canada, for example, it is estimated that by the year 2040, this age group will represent approximately one quarter of the population (52). Given the association between aging and

becoming functionally dependent, an increase in the number of home-bound and institutionalized seniors is also anticipated (17, 115). Research has shown that this population suffers disproportionately from various oral health problems, which have been linked to limited physical and cognitive functioning (4), systemic conditions, and reduced access to oral health services (116).

With more people maintaining their natural teeth into old age (17), this situation presents considerable challenges for the current dental care system. One solution could be to expand the alternative model of oral healthcare delivery referred to as portable dentistry, "a service that reaches out to care for those who cannot reach a service themselves" (116). In this type of service, the dental professional team travels to see patients in their place of residence – be it their house or nursing home – to provide dental care using portable equipment (116-118).

Dentists who provide portable dentistry services are rare; the numbers meet neither current nor anticipated future demand from the population (119, 120). Dentists' reluctance to provide portable dentistry could be due to their lack of training and consequent lack of familiarity with this type of service (17, 121, 122). This is not surprising as portable dentistry is scarcely discussed in undergraduate dental education (17).

In order to build comprehensive models of portable dentistry that may be used in undergraduate and continuing dental education, an overview of the available research evidence is warranted. The objective of this scoping review is therefore to explore the existing literature on a) the process of planning and delivering portable dental services and b) the benefits and challenges of portable dental care for service providers and patients.

This review was inspired by a framework developed by Rousseau et al., which describes interaction among human (dental professional and patient), nonhuman (physical and contextual) factors in the environment (28, 123, 124).

Methods

Identifying relevant studies

A systematic scoping search was developed for Ovid (Medline) by a medical librarian (MM) and reviewed by other members of the research team. The search was then translated to Embase

(Medline), CINAHL and Scopus. All searches were run from inception to 10 October 2018. No limits were applied with respect to language or publication type.

As candidate articles were screened and data extracted, new resulting search terms were incorporated into the search strategy [aa], and the updated search was rerun on 24 April 2019, and 16 July 2020. The resulting final search strategy for Ovid (Medline) is provided in figure 1. Records were deduplicated using Endnote.

Selecting studies and charting the data

Two authors (NM, HF) and a research student independently screened the titles and abstracts of the 3,917 references retrieved after deduplication, using Rayyan [bb], and excluded 3,880. The full texts of the remaining 37 articles were then independently screened, with disagreements resolved through consensus. To be included, articles had to specifically describe the concept of portable dentistry, defined as the introduction of a dental unit and services into the patient's place of residence. Articles focusing on dental vans were therefore excluded. The article selection process is illustrated in figure 2.

The two authors independently extracted relevant data from the final 25 articles using an Excel spreadsheet with the following fields: advantages, challenges, facilitators, equipment, and financial aspects. Differences were resolved through discussion. This process was repeated for the three added articles gleaned from subsequent search reruns.

Critical appraisal of included studies

Qualitative research approaches have been recognized within clinical epidemiology as appropriate for gathering data about the social and behavioral context of health status (125-127). For this study, critical appraisal was performed using the Critical Appraisal Checklist for Qualitative Research Studies 10-item checklist.

Two investigators (HF, NM) independently assessed the eligibility of articles for critical appraisal. To be eligible, an article had to report original data from an observational study or provide a narrative review of the literature. Any synthesis presenting a bibliography was included in accordance with the definition of a narrative review as "an attempt to summarize the literature in a way which is not explicitly systematic, where the minimum requirement for the term systematic relates to the method of the literature search, but in a wider sense includes a specific research

question and a comprehensive summary of all studies" (125). Articles dealing with medico-economic issues were not critically appraised, because no standard methodology exists for critical appraisal of such studies (128).

Two investigators (AB, JV) determined the quality range of critically appraisable studies using assessment grids adapted to the type of article and validated from the literature (Newcastle-Ottawa for observational studies (126), SANRA – the Scale for the Assessment of Narrative Review Articles – for narrative reviews (125)). Discrepancies were resolved through a consensus discussion.

Results:

The 28 documents included 12 original research, eight review articles, and three opinion/editorial papers. We identified one detailed guideline for portable dentistry, published in the UK. Most documents originated in the UK (n=7) and the USA (n=9). It should also be noted that two papers (129, 130) dealt with medico-economic evaluations. Table 1 lists the main characteristics of the 18 articles retained for quality analysis.

Critical appraisal results:

Observational studies consisted of one case-control and seven cross-sectional studies. Overall, the quality of observational studies was quite heterogeneous (eliciting scores ranging from 1 to 9 on the Newcastle-Ottawa scale). However, four studies obtained a high assessment score mainly because they did large-scale evaluations by using recorded data in national databases or surveying dentists about their portable dentistry experience; such surveys enable researchers to do large-scale evaluations as they do not require any blinding investigations (table 3 and 4). Regarding narrative reviews, critical appraisal was performed using the SANRA 12-items checklist (table 5). All narrative reviews were rated as presenting "moderate" methodological quality, having scored between 4 and 6, except for one that presented "high" methodological quality, with a score of 10 on the SANRA scale.

Thematic content analysis results:

After performing a thematic content analysis of the 25 documents retained, we organized our findings in a model presented in figure 3. The benefits, drawbacks, and financial aspects of portable

dentistry for the patient are at the core of the model. The surrounding ring represents the "dentistry level", which encompasses three stages of the portable dentistry process: 1) *organization of the service;* 2) *arrival and set up of the service*; and 3) *delivery of the service.* Each of these three stages includes three aspects: 1) human factors, which are related either to the dental professionals or the patient; 2) non-human factors, which refer to either the equipment or the physical environment; and 3) financial factors, which are related to cost and remuneration. Finally, both patient and dentist levels are circumscribed by the "societal level" which encompasses the cultural, legislative, and financial factors affecting portable dentistry. Distribution of the reviewed articles across the categories of analysis is provided in table 2.

In the following paragraphs, we will describe how our findings can be integrated into the structure of this model, starting with the patient level at the center, continuing with the three stages of the care process at the dentistry level, and concluding with the societal level.

1. Patient level

On this level, we will describe the benefits, drawbacks, and financial aspects of portable dentistry for patients.

1.1 Benefits:

The literature cites improved dental service accessibility as the main advantage of portable dentistry for patients (17, 29, 53, 117, 130, 131). It is posited that portable dentistry is particularly pertinent for people confronted with transportation restrictions such as the medically compromised seniors and people with physical disability (118, 122). It is also appropriate for people with cognitive disorders, such as Alzheimer's disease, who might become confused and disoriented in a clinical environment (17, 53).

In addition to increased accessibility, other benefits of portable dentistry are reported: Shahidi and colleagues, for instance, states that home visits enhance the doctor-patient relationship and represent a welcome social contact for people confined to the home (20). Chung similarly considers that dental visits are often the "highlight of the day" for the elders (132). Visiting dentists might even become significant members of patients' social networks and contribute to the improvement of their overall well-being (122). In addition, since patients generally feel more in

control and relaxed in familiar surroundings, the home environment can be conducive to active patient participation in the care process (17, 20).

1.2 Drawbacks:

Besides these benefits, there are also drawbacks associated with portable dentistry. One basic challenge for patients is finding a practitioner, given there are not many dentists who provide such services (17). The waiting lists are often long, and patients are limited in their choice of practitioners. In many cases, the scope of care is also restricted due to lack of equipment. Another issue is lack of timely follow-up, as the dental team is always traveling, sometimes over a broad territory. This might be particularly problematic if any post-operative complications happen (117, 133).

1.3 Financial aspects:

The literature discusses various financial aspects of portable dentistry for patients. For instance, two authors mention that portable dentistry eliminates patients' transportation expenses to a dental clinic (29, 115). However, home-visit costs are less commonly covered by insurance services according to Strayer and colleagues; in many cases, the patient has to pay for services out of the pocket (115). Dentists might, moreover, charge an additional fee to compensate for the time and cost of the transportation and set-up of equipment (134). These factors could render portable services costly and even inaccessible to many patients.

2. Dentist level:

On this level, we will describe how the dental team delivers portable services at each of the following three stages: organization, arrival and set up, and delivery of the service.

2.1 Organization of the service:

This stage starts when the dental team makes initial preparations for the visit. Although some dentists might prefer to work alone or with minimal help, a portable dentistry team is generally comprised of a dentist, a dental hygienist and dental assistant(s) (134). While organizing the service, there are a number of human, non-human, and financial factors that the dental team should be aware of.

2.1.1 Human factors:

The literature suggests that this stage could be relatively time-consuming for the dental team (117, 121), considering they need to prepare the dental instrument and material packages and travel to the patient's place of residence (117, 120, 134). To facilitate this process and gain time, several authors suggest that dentists obtain relevant information about the patient's chief complaint, medical history, and preferences beforehand (20, 135). Navigating the residence and inquiring about parking facilities could also save the dental team some time (116, 136). From a managerial perspective, dentists could better take charge of the overall time spent on portable dentistry by dedicating specific workdays to this service, instead of merely responding to calls on an *ad hoc* basis (136).

Another point to consider is risk assessment concerning the possibility of encountering medical emergencies. This is pertinent since senior home-bound patients are more likely to have progressive medical conditions and, therefore, experience a medical emergency (116). To address this concern, Fiske and colleagues highlight the importance of taking a patients' medical history beforehand. In this way, the dental team could be adequately prepared and pack a dedicated emergency toolkit (116, 136).

2.1.2 Non-human factors:

One challenge of this stage is moving heavy equipment. While this is an inevitable part of portable dentistry, carrying the full set of equipment may prove unnecessary as the requirements of each visit might vary (104, 120, 130). This could be addressed by careful step-by-step planning and package preparation (104), starting with a basic portable kit (136) and prearranged individual kits (134). Equipment could also be prearranged based on the type of treatment, i.e. examination, prosthetic, surgical, restorative and periodontal kits (104, 136, 137).

Nonetheless, emergency items including oral airways, portable suction, oxygen, and an Ambu bag are always essential for the potential scenarios of cardiovascular resuscitation, according to Fiske and colleagues (17). Oxygen tanks may require special safety considerations when transported by car; it is therefore recommended to notify the vehicle insurance company accordingly(136).

2.1.3 Financial factors:

The *initial cost of setting up the service* is a financial concern of this stage for dentists (17, 104, 117). While the literature suggests that the initial investment for setting up a portable practice is

significantly lower than for a regular dental office (7), there are some suggestions to further reduce these costs; for instance, the beginning dentist could start by purchasing basic equipment, including a light source, dental mirrors, and denture adjustment tools (104), and slowly add more advanced equipment like a dental unit (104, 134). Another option is to purchase light and small units at the start and upgrade the equipment as the practice grows (104, 117). One author also recommends availing oneself of tax credits for such equipment, if legislations permit (135).

2.2 Arrival and set up of the service:

Upon arriving at the patient's place of residence, the dental team needs to interact with human and non-human elements of the household; this includes conversing with the family/caregivers and setting up the equipment in the most appropriate space. The following sections outline the potential human, non-human and financial factors at this stage.

2.2.1 Human factors:

When providing care in patients' homes, one human factor to consider is the safety of the occupants. This is relevant since team members are essentially strangers entering the privacy of someone else's home. Two authors state that the dental team should provide the occupants with proper identification information upon arrival. Another encourages dentists to always be chaperoned by a team member in home-visits for the added safety of all (116, 136). Dental team members must also show consideration as they are guests; it is important to respect patients' culture, principles and property throughout the visit (17).

As for providing care in a long-term care facility where multiple patients have cognitive impairments, a human factor to consider is correctly identifying each patient to prevent catastrophic events such as treating the wrong individual. To address this, Sjogren and colleagues recommend that clinicians follow strict identification protocols and double-check the patient's identity with the relevant nurses or caregivers (131).

The next step in any setting is obtaining consent from the patient (116), a process that may be challenging as some homebound people are not competent to make informed decisions (130). In such cases, consent is typically obtained from a family member who holds the power of attorney (132). Otherwise, it is the dental professional's responsibility to liaise with the relevant people and, if necessary, ask for the patient's court appointed deputy (116).

2.2.2 Non-human factors:

The setting of a typical portable dentistry service is “the patients’ own room, with them lying in bed or sitting comfortably in a chair, or in a wheelchair” (131). Whether this occurs in a patient’s house or an institution, the dental professional has limited authority and control over the environment (136). To gain the minimum required control over this new setting, it is useful to start by asking for a room with proper lighting and good access to water and electricity. The dental team could then use simple but effective measures, such as switching off loud televisions or radios and removing all potential obstacles for better manoeuvrability (17). Fiske and colleagues recommend additional safety measures, such as using a circuit-breaker on all electrical appliances and avoiding the use of naked flames (17, 136).

The next step includes setting up the equipment and preparing a clean work area (17, 120, 122). As for any other type of dental practice, dentists should try to establish and maintain all necessary infection control procedures (116, 138). To facilitate this and protect the surfaces, McHugh and colleagues suggest that the dental team carry or ask for a supply of clean sheets, blankets and towels (135).

2.2.3 Financial factors:

Travelling cost is cited as a potential financial burden at this stage, particularly for the dentists who offer services in multiple locations (116, 134). Insurance of the transport vehicle is another point to consider (116). Clinicians could develop a remuneration system that is able to respond to these extra travelling costs (136). For example, Morreale suggests that dentists ask for an additional transportation fee (134). Others suggest charging additional fees depending on the distance travelled for home visits (136, 137). From a broader point of view, dentists could minimize travelling by choosing one nursing center as their main location of practice and considering other nursing homes only if needed (134).

2.3 Delivery of the service:

At this final stage of portable dentistry, the dental professional starts the examination, decision-making and treatment procedures. The following sections discuss human, non-human, and financial factors affecting this stage.

2.3.1 Human factors:

From a very basic point of view, the first challenge of this stage is dentists' lack of training to provide portable dentistry, which leads to fear and lack of confidence in treating medically compromised patients (104, 115, 121). Many authors highlight this, suggesting dental schools add portable dentistry and geriatrics components to their undergraduate programs (104, 115, 116, 121), post-graduate training (137) or continuing education (120). They specifically refer to the knowledge and understanding of conditions leading to impairments and disabilities and how they can affect oral health, as an essential topic to cover in such courses (136).

Another human factor related to this stage is limited emergency back-up in a portable dentistry setting (such as experienced nursing staff and emergency drugs/facilities) (17, 136). As mentioned earlier, senior home-bound patients are more likely to have complex medical conditions and, therefore, to experience a medical emergency (116). It is the dental professional's duty to ensure all team members are properly trained in potential emergency scenarios, administration of emergency drugs, and resuscitation. These skills must be routinely practiced in a simulated emergency. It is also important to keep up with all the relative guidelines provided by authorized organizations such as WHO (116, 120).

Other points to consider at this stage are the physical challenges of providing care in a portable setting (139). Many senior patients suffer from neuromuscular weakness and disorders, and have a limited ability to tolerate treatment procedures (140). Consequently, dental professionals should adjust to be able to deliver care in less than optimal ergonomic conditions (7). It is thus important to be constantly aware of working posture and to correct it. One author recommends dentists "treat patients in a straight-backed chair whenever possible" and modify their routine postures to minimize such occupational hazards; for instance, he suggests that dentists kneel to one side of the patient during denture fabrication procedure instead of standing in front of the patient, which is the standard method (122, 141).

2.3.2 Non-human factors:

Lack of comprehensive equipment is a non-human factor that might entail some limitations in the provision of dental care at this stage (130). For instance, portable x-ray machines may be prohibited in certain contexts, leading to difficulties in diagnosis of certain oral and dental

conditions. According to some authors, portable units have limited facilities for specialized treatments, such as oral surgeries (117), and have a lower capacity for saliva ejectors as well as weaker air compressors when compared to fixed models (7). Another problem is lack of laboratory facilities for construction or repair of prostheses, such as complete or partial dentures, which are in high demand in the senior population (20, 120, 142).

To address these issues, authors suggest that dentists "adapt their treatment level to the available equipment" (130), emphasizing "the goal is not to restore oral function to perfection" but, rather, to employ a minimally invasive method, so that seniors' lives are not further complicated by dental treatments (132). This might not sound ideal, but treatment shortcomings should be balanced against the risk of providing no care at all (131).

When certain treatments are impossible in the portable setting, clinicians could establish referrals to a regular dental office (129). Even in such cases, portable dentistry is still beneficial as it limits the number of visits to a regular dental office (20). In addition, one author suggests that only about 10% of patients might need such referrals (20).

Management of clinical waste is another non-human factor at this stage. Packing the contaminated instruments and clinical waste at the end of each treatment session is more challenging in a portable setting compared to a regular dental office (116, 122, 137). To facilitate and organize this process, the dental team could carry clinical waste bags, polyethylene bags, and dedicated containers for waste and sharps for every visit (137).

2.3.3 Financial factors:

Poor remuneration is a significant financial concern at this stage for dentists (17, 53, 104, 115, 122, 136, 137, 142). This is understandable since portable dentistry generally targets seniors who do not have a reliable source of income. Nevertheless, clinicians could address this issue with a flexible financial approach. For instance, in the private oral health systems such as the US, dentists could develop a monthly payment system and split the total treatment fees into a number of affordable instalments (104).

It is possible that insurance companies also complicate or refuse remuneration. Indeed, some insurance companies may refuse to insure dentists who provide only portable dentistry services because of potentially poor financial incentives for this type of practice (117).

3. Societal level:

At this level, we will discuss the potential availability and growth of portable dentistry through legislative, cultural, and financial factors.

3.1 Legislative factors:

Disability discrimination acts were introduced in the late 20th. According to several authors, such legislation could potentially lead to an increased demand for portable dentistry. In other words, they may be interpreted as mandating dental professionals to adopt flexible approaches that facilitate access to care for people with disability, such as portable dentistry (17, 104, 122). On the other hand, legislation could also act as a barrier in this regard; in Canada, for instance, only some provinces allow the use of portable radiography units (134). Another example is the US, where dental professionals must obtain a special permit to practice portable dentistry. Such permits are expensive, adding to the initial set-up cost of the service (133).

3.2 Cultural factors:

Societal attitudes toward seniors, people with disabilities and the importance of oral healthcare problems are reflected in every household and long-term care institution. In some cases, management and staff might be reluctant to acknowledge the importance of portable dental services (134). This reluctance is partly due to related responsibilities, such as entering into a financial contract with the dental team (104). However, it also stems from the institution's culture. In brief, portable dentistry rests on an appreciation among management and staff of oral health as a priority for residents. Without it, the dental team will not receive the necessary institutional cooperation and commitment (120, 132, 134, 143).

3.3 Financial factors:

From a financial viewpoint, governments have a key role to play in accessibility and promotion of portable dentistry (144). In Japan, for instance, public long term care (LTC) insurance is a mandatory program that offers free or highly subsidized portable dentistry services for its home-bound beneficiaries twice a month (121). Presumably, portable services are more accessible in Japan compared to the US, where only 2% of Medicaid dollars are allocated to oral healthcare

(115). One author even suggested that in the US, approximately 90% of patients pay directly for some or all of their portable dental treatment costs (20).

As Lundqvist and colleagues suggest, "successful implementation of portable dental services requires interaction and collaboration between stakeholders in the dental market, as well as systems providing continuity of dental care for elderly nursing home residents"; a phrase that concisely summarizes the societal level presented here (130).

Discussion:

We used the findings of this scoping review to develop a model that represents portable dentistry on three levels: patient, dental, and the societal. The "patient level" at the heart of this model depicts benefits, drawbacks, and financial aspects of portable dentistry for patients. The surrounding "dental level" delineates three stages of the portable dentistry process: 1) *organization of the service;* 2) *arrival and set up of the service*; and 3) *delivery of the service.* Each of these three stages includes human, non-human, and financial factors. Finally, both patient and dentist levels are embedded in the "societal level", which encompasses cultural, legislative, and financial factors affecting portable dentistry in each society. Dentists who are inclined to adopt portable dentistry practices could use our model as an outline to guide them in every stage. In addition, dental schools could use this outline for educational purposes.

Although two studies describe the process of planning and delivering portable dentistry (134, 135), neither presents a general model since they were tailored to a predefined legal, cultural, or financial context. Significantly, our study addresses this issue by reviewing the available literature on portable dentistry and developing the proposed model. This was possible through careful examination of available data, which was mainly fragmented and scattered through the literature.

We also identified two significant knowledge gaps in the literature. First, we lack information on economic aspects of portable dentistry for dentists or governments that might be inclined to foster these services. Although we discussed the financial aspects of portable dentistry on every level in our model, we believe that additional research is required to assess the economic aspects of portable dentistry and provide strategies to optimize its cost-effectiveness.

The second knowledge gap is related to social responsibility, and how this principle may affect dentists' view of portable practices. Social responsibility refers to the duty of the profession to

provide all groups of the population with an optimal level of healthcare services (104, 145). On this subject, Bee et al. considered that dentists had the social responsibility to ensure the availability of dental care for all groups, and adapt to the demographic changes of our societies (104). It would be pertinent to know if the reinforcement of dentists' sense of social responsibility would encourage them to adjust their practices and start providing portable services; also, to what extent do they consider portable dentistry as a way to fulfil their social responsibilities as a dental professional.

One challenge we faced in this literature review was organizing controversial findings from the reviewed articles. As we mentioned before, portable dentistry is highly dependent upon the legal, cultural, and financial norms of each country; as a result, the findings of some articles opposed to others. To address this issue and include the voice of all authors in our review, we took two steps; first, we excluded the data that was only applicable to a specific setting or timeline, such as the cost of portable equipment or the income of professionals in a certain year/ place; second; we presented controversial topics by first addressing an issue raised by a group of authors, then immediately addressing what other authors recommended to mitigate that issue.

Conclusions:

We presented a synthesis of the literature and proposed a model for portable dentistry that dentists and dental educators interested in this practice may find useful. This said, we invite other researchers to further elaborate on this model and address the knowledge gaps we identified: 1- lack of scientific evidence on economic aspects of portable dentistry for dentists or governments; 2- lack of knowledge on how dentists' sense of social responsibility may encourage them to provide portable services.

Additionally, we believe that researchers should study legislative bodies in their jurisdictions and find out how about their potential roles and plans facilitate portable practices. Indeed, these essential services favor the inclusion of vulnerable groups, such as seniors and people with disability, and are thus a priority for many governments.

Table 1: Characteristics of 18 articles retained for quality analysis

Number	Author	Year	Country	Type of article	Quality assessment score	Main message
1	**Fiske, J**	1999	UK	Review	4/12 *	Draws attention to the likely increase in demand for portable dentistry [1] services and highlights skills and issues associated with it
2	**Strayer, M**	1999	US	Review	5/12 *	Discusses the rapid growth of the older adults population, the barriers they face in receiving dental care, and the objectives for provision of that care.
3	**Fiske, J**	2000	UK	Review	5/12 *	Discusses knowledge, skills, and equipment required for portable dentistry, benefits, and challenges of portable dentistry for providers and patients
4	**Lee, EE**	2001	US	Review	4/12 *	Explains about portable dental systems and advantages/disadvantages of them
5	**Longhurst, RH**	2002	UK	Original	2/9 **	Studies availability of portable dentistry in the studied area and willingness of dentists to adopt such services
6	**Bee, JF**	2004	US	Review	4/12 *	Challenges ethical and moral obligation of dentists towards homebound patients, discusses barriers and opportunities associated with portable dentistry
7	**Morreale, JP**	2005	Canada	Original	6/12 *	Describes his experience in practicing portable dentistry as an adjunct to the regular office practice, also discusses the challenges and issues involved
8	**Charlton, D**	2007	US	Review	6/12 *	Describes a variety of portable equipment and their features
9	**Sweeney, MP**	2007	Scotland	Original	6/9 **	Estimates the amount, barriers, and types of portable dentistry in Scotland
10	**Stevens, A**	2008	Ireland	Original	3/9 **	Estimates the amount, barriers, and types of portable dentistry in new & west Belfast, examines dentists' attitudes towards portable dentistry
11	**Shahidi, A**	2008	US	Original	6/9 **	Describes a portable dentistry program and reports on the demographics, needs and services provided to 195 home-bound patients
12	**Lewis, D**	2011	UK	Review	4/12 *	Describes challenges and barriers associated with portable dentistry, provides information about equipment and skills required for portable dentistry and discusses role of commissioning
13	**Othman, AA**	2014	Malaysia	Original	6/9 **	Assesses Malaysian government dentists' experience, willingness, and barriers in providing portable care
14	**Sjogren, P**	2015	Sweden	Original	4/9 **	Analyses patient safety in portable dentistry settings, using data from a quality registry.
15	**Geddis-Regan, A**	2018	UK	Original	7/9 **	Analyses NHS payment claim data for portable dentistry to determine whether age or deprivation are associated with levels of portable dentistry provided

16	**Ishimaru, M**	2019	Japan	Original	9/9 **	Examines the proportion of home dwelling LTC service beneficiaries who receive portable dentistry, also factors affecting the use of portable dentistry
17	**Chung, J**	2019	Canada	Original	5/12*	Discusses challenges and benefits of portable dentistry based on personal experience
18	**Gupta, S**	2019	US	Review	10/12*	Summarizes opportunities and limitations in delivering and receiving care through portable and mobile dentistry

* SANRA scale (the Scale for the Assessment of Narrative Review Articles)

** New-Castle Ottawa scale

Table 2: distribution of reviewed articles across the categories of analysis

Patient Level (n=14)		**Dentist Level**						**Societal Level (n=12)**	
		Organization of the service (n=13)		**Travelling and set up of service (n=12)**		**Delivery of the service (n=19)**			
Strayer	1999	Fiske	1999	Fiske	1999	Strayer	1999	Fiske	2000
Fiske	2000	Fiske	2000	Fiske	2000	Fiske	1999	Bee	2004
Lee	2001	Lee	2001	Meyer	2002	Fiske	2000	Morreale	2005
Naditz	2003	Bee	2004	Morreale	2005	Lee	2001	Shahidi	2008
Morreale	2005	Morreale	2005	Stevens	2008	Longhurst	2002	Lewis	2011
Shahidi	2008	ASTDD*	2007	BSDH*	2009	Naditz	2003	Othman	2014
BSDH*	2009	Shahidi	2008	McHugh	2011	Gil Montoya	2004	Sullivan	2014
Sjogren	2010	Stevens	2008	Lewis	2011	Bee	2004	Lundqvist	2015
Lewis	2011	BSDH**	2009	Othman	2014	Sweeney	2007	Geddis-Regan	2018
Stillhart	2011	McHugh	2011	Lundqvist	2015	ASTDD*	2007	Ishimaru	2019
Sjogren	2015	Othman	2014	Sjogren	2015	Shahidi	2008	Chung	2019
Lundqvist	2015	Lundqvist	2015	Chung	2019	Stevens	2008	Gupta	2019
Chung	2019	Ishimaru	2019			BSDH*	2009		
Gupta	2019					Lewis	2011		
						Othman	2014		
						Sjogren	2015		
						Lundqvist	2015		
						Ishimaru	2019		
						Chung	2019		

* ASTDD: Association of State and Territorial Dental Directors (US)

** BSDH: British Society for Disability and Oral Health

Table 3: Study Quality assessment using Newcastle-Ottawa scale for case-control studies

Study, year	Adequate definition of case	Representativeness of cases	Selection of controls	Definition of controls	Comparability	Control for important factor or additional factor	Exposure assessment	Same method of ascertainment for cases and controls	Nonresponse rate	Total score / 9
Ishimaru 2019	★	★	★	★	★	-	★★	★	★	9

Table 4: Study Quality assessment using Newcastle-Ottawa scale for cross-sectional studies

Number	Study, year	Representativeness of the sample	Sample size	Ascertainment of exposure	Non-respondents	Comparability	Assessment of outcome	Follow-up	Total score / 9
1	**Sweeney 2006**	★	★	★	-	★	★	★	6
2	**Othman 2012**	★	★	★	-	★	★	★	6
3	**Shahidi 2008**	-	-	-	-	-	★	-	1
4	**Geddis-Regan 2018**	★	★	★	★	★	★	★	7
5	**Sjögren 2015**	-	★	-	-	★	★	★	4
6	**Stevens 2008**	-	-	★	-	★	★	-	3
7	**Longhurst 2002**	-	-	★	-	-	★	-	2

Table 5: Study Quality assessment using SANRA* for narrative reviews

Number	Study, year	Justification of the article	Statement of concrete aims	Description of the literature search	Referencing	Scientific reasoning	Appropriate presentation of data	Total score /12
1	**Fiske 1999**	2	0	0	2	0	0	4
2	**Strayer 1999**	2	1	0	2	0	0	5
3	**Fiske 2000**	2	1	0	2	0	0	5
4	**Lee 2001**	2	0	0	2	0	0	4
5	**Bee 2004**	2	0	0	2	0	0	4
6	**Morreale 2005**	2	2	0	2	0	0	6
7	**Charlton 2007**	2	2	0	2	0	0	6
8	**Lewis 2010**	2	0	0	2	0	0	4
9	**Chung 2019**	2	2	0	1	0	0	5
10	**Gupta 2019**	2	2	1	2	2	1	10

* the Scale for the Assessment of Narrative Review

Figure 1: Final Search Strategy (Ovid Medline)

1. Exp dental care for disabled/
2. Exp dental care for aged/
3. Disabled persons/ or exp amputees/ or exp disabled children/
4. (disable? Or handicap* or spinal cord* or disabilit* or wheelchair? Or frail or aged or elderly or old age or geriatric* or gerodont* or ((impair* or reduce? Or reduction? Or limited) adj3 mobilit*)).tw,kf.
5. Exp wheelchairs/
6. (physical* challenge* or (special adj1 (need? Or care))).tw,kf.
7. (limit* adj3 (independ* or access)).tw,kf.
8. Special care dentistry.tw,kf.
9. Or/1-8
10. Exp health services accessibility/
11. Exp "facility design and construction"/
12. (accessibility or accessible).tw,kf.
13. "universal access".tw,kf.
14. Model? Of access*.tw,kf.
15. ((mobile or dental) adj1 (unit? Or van?)).tw,kf.
16. Exp telemedicine/
17. (telemedicine or teledentistry).tw,kf.
18. Alternative model?.tw,kf.
19. Or/10-18
20. 9 and 19
21. Exp dentistry/
22. Exp dentists/
23. Exp dental education/
24. (dental or dentist? Or oral).tw,kf,mp.
25. Or/21-24
26. 20 and 25
27. Limit 26 to (English or French)
28. Limit 27 to last 25 years

Figure 2: Articles selection process using the preferred reporting items for systematic reviews and meta-analyses (PRISMA)

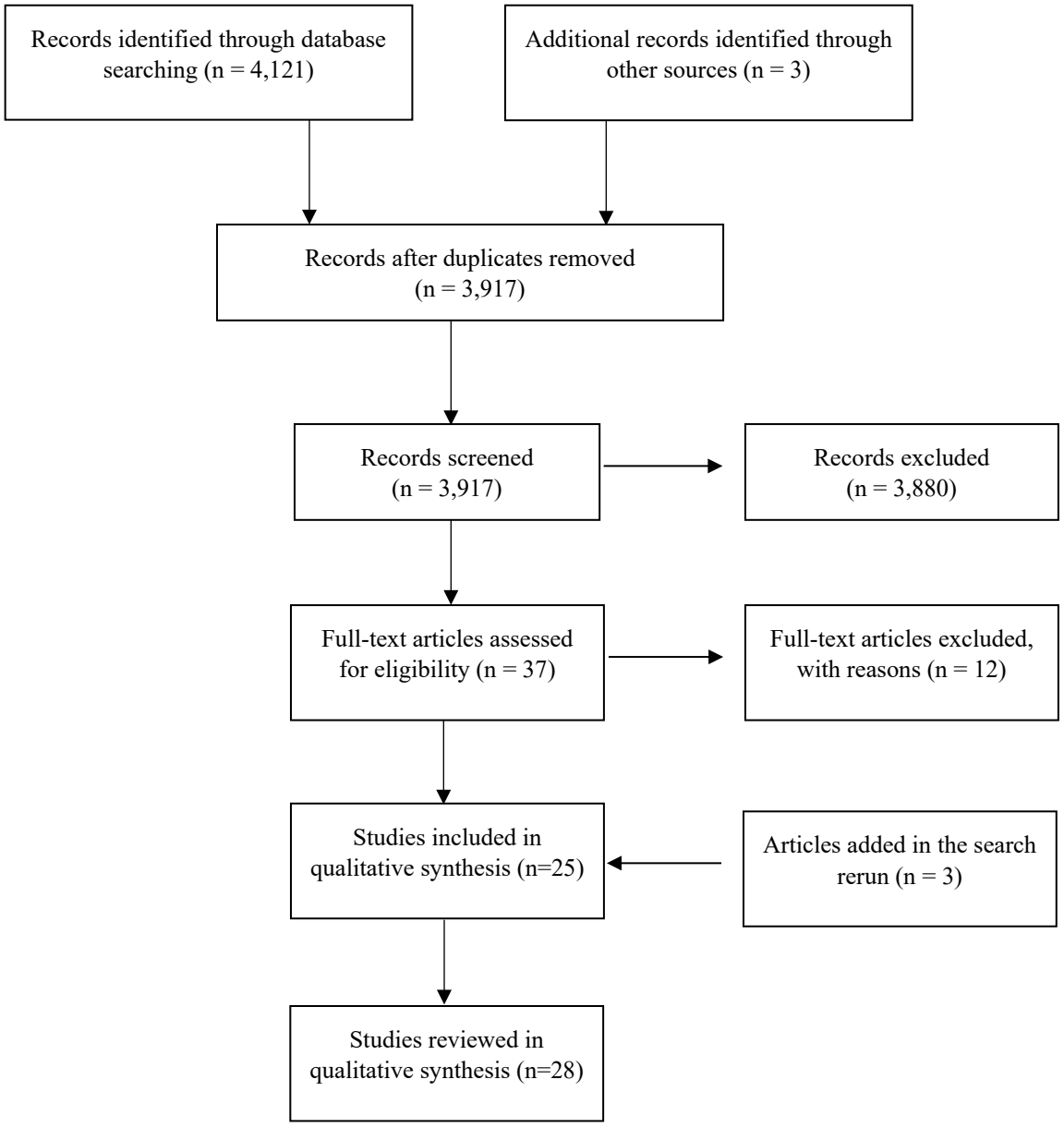
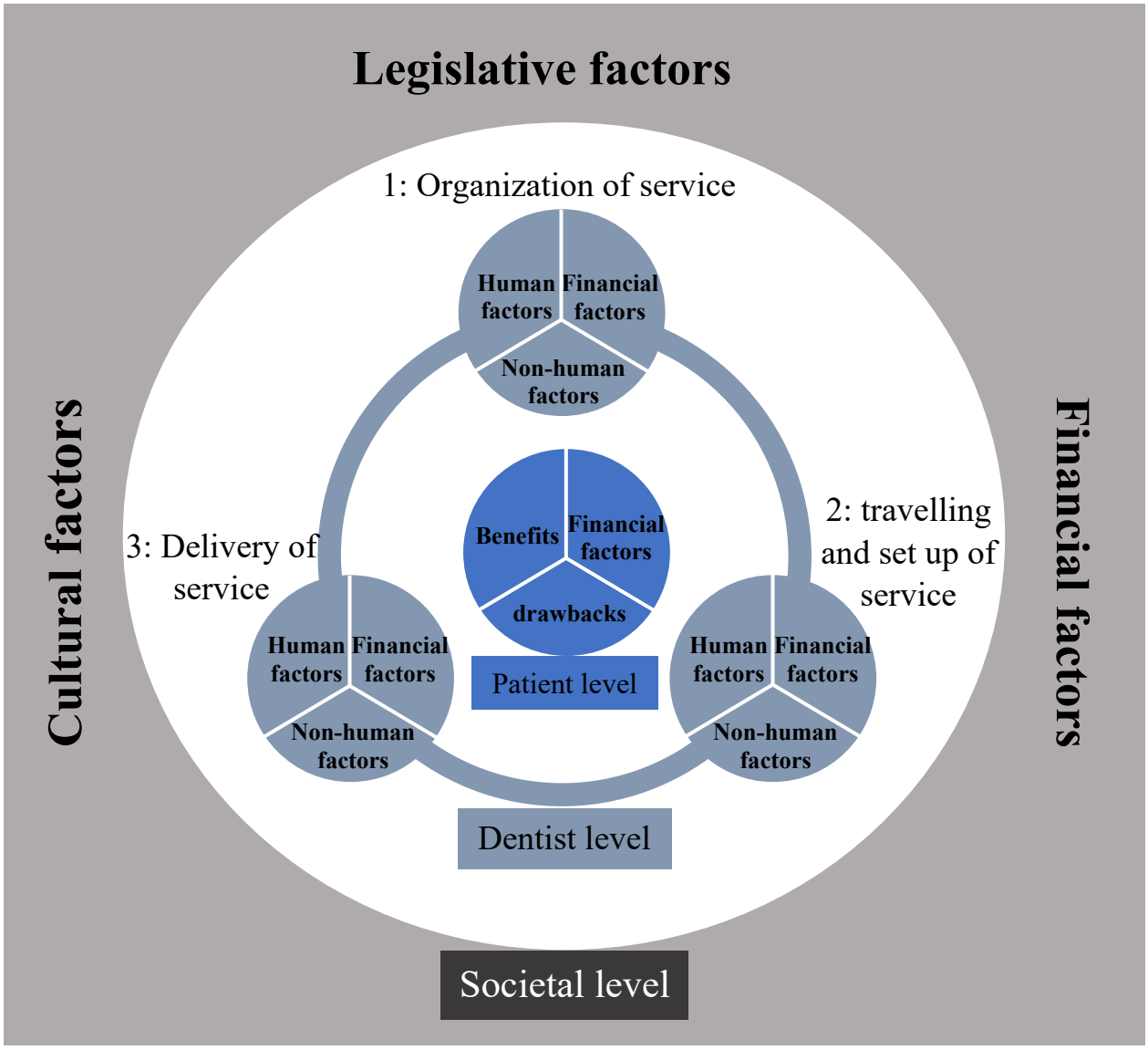


Figure 3: Portable Dentistry Model



2-10 Summary of the literature review

For centuries, the education and practice of medicine has been based on the biomedical model, an approach that solely focuses on the biological causes of diseases ignores patients' experiences, expectations, and knowledge regarding their condition. It also ignores the impact of pychosocial factors in the development, progress, and alleviation of diseases (1). That is why scientists introduced more holistic approaches such as patient-centered care and social medicine (51). While the former is mostly focused on patients' experiences and expectations, the "social medicine" approach highlights the importance of learning about and addressing the social causes of health and illness (80).

Dentistry also adopted the biomedical model since attainment of its professional status at the beginning of the 20th century (31). Recognizing this model's shortcomings, and inspired by medicine, dentistry reserachers started to propose dentistry-specific patient-centered models by tailoring this concept into the profession's specific needs at the beginning of the 21st century (63). Moreover, dentistry joined the social medicine movement when, in 2018, Bedos et al. proposed a social dentistry model that encourages dentists to address the social determinants of health (10).

Furthermore, Bedos et al. also proposed in 2020 a more holistic model named "the Montreal-Toulouse model", a famework that could guide dentists to take three types of actions (understanding, decision-making, intervening) on three overlapping levels (individual, community, societal) (12). The individual level corresponds to the provision of person-centered care, while the next two levels mostly include components of the social dentistry model.

One example of how the Montreal-Toulouse model could be applied is portable dental services. Defined by Fiske as "a service that reaches out to care for those who cannot reach a service themselves" (116), portable dentistry comes with many advantages for both patients and practitioners. Unfortunately, the number of dentists in Canada who provide such services is insufficient to meet the needs of the population (119, 120).

Since the Montreal-Toulouse model has only recently been proposed, there is still no information about how dentists perceive this model and its usefulness. More specifically, we lack knowledge on how dentists perceive portable dentistry and why so few of them adopt this approach despite the growing needs of the population.

3- Aims and objectives

The objective of this thesis was to understand the perspectives of dentists towards the Montreal-Toulouse model. In particular, we wanted to know:

a) How dentists perceived the Montreal-Toulouse model as a framework to the practice of dentistry.

b) What parts of this model they were ready to adopt in their own practice.

Since this model had only recently been introduced to the literature, we assumed that most participants would not be familiar with it. To address this and make the model more tangible for participants, we provided them with a concrete application of the Montreal-Toulouse model, portable dentistry, and explored their perception of this particular approach. This is why, in addition to better understand their general perspectives of the Montreal-Toulouse model, we aimed at understanding:

a) How dentists perceived portable dentistry as an approach to serve people with limited mobility.

b) What challenges they envisioned for the adoption and implementation of this approach in private dental clinics.

4 Methodology

4-1 Design

We conducted a qualitative descriptive study to understand dentists' viewpoints on the Montreal-Toulouse model. This methodology is appropriate to obtain “straight and largely unadorned (i.e., minimally theorized or otherwise transformed or spun) answers to questions of special relevance to practitioners and policy makers” (146); it also seeks to capture the different aspects of “truth” about the phenomenon (147) and provide a comprehensive summary by accounting for the meanings that participants attributed to it (146).

4-2 Participants, sampling and recruitment

The population of interest comprised general dentists working in the province of Quebec. We decided to focus on dental educators because dental schools are the primary place to teach and promote novel approaches. General dentists working as academic or clinical instructors in dental faculties thus represented our population of interest. We adopted a maximum variation sampling strategy as it increased “the likelihood that the findings [would] reflect differences or different perspectives—an ideal in qualitative research” (147). We therefore diversified the sample in terms of participants’ age, gender, work experience, and type of practice (office owner or associate dentist).

To complement our sampling strategy, we also used a snowball sampling technique by asking each interviewee to suggest people who might have a similar perspective (2). This helped us locate information-rich participants who understood or were opinionated about portable dentistry, person-centered care, and social dentistry. In the end, we recruited five female and nine male dentists with clinical experiences between one to 43 years; eight participants were practice owners while six worked as an associate dentist in a private dental office or hospital (See table 5).

Table 5: Presentation of the participants (all names are fictional)

	Name	Gender	Clinical experience (years)	Professional profile
1	Hisham	Man	1	Associate dentist in a private dental clinic
2	Nancy	Woman	30	Associate dentist in a private dental clinic

3	Anissa	Woman	11	Owner dentist
4	Martin	Man	43	Owner dentist
5	Richard	Man	25	Owner dentist
6	Edward	Man	7	Associate dentist in a hospital
7	Antoine	Man	3	Associate dentist in a private dental clinic
8	Kevin	Man	31 *	Owner dentist
9	Sarah	Woman	5	Associate dentist in a private dental clinic
10	William	Man	20	Owner dentist
11	David	Man	11	Associate dentist in a private dental clinic
12	Simon	Man	31	Owner dentist
13	Katie	Woman	24	Owner dentist
14	Kimia	Woman	42 *	Owner dentist

** Three years at McGill as instructors; the rest of their experience comprised private practice as owner dentists.*

4-3 Data collection

I conducted semi-structured interviews with open-ended questions after obtaining the approval of McGill's Institutional Review Board (IRB). In this process, I used an interview guide based on the conceptual model we had proposed in our scoping review (112), as well as the Montreal-Toulouse model and its associated Q-list (12) (see appendix 2).

Before starting the conversation, I asked participants to read and sign a consent form approved by McGill University's IRB. I then invited the participants to openly share their perspectives on the subject and, to obtain vivid and rich descriptions, encouraged them to elaborate on iconic moments or experiences. I used open-ended questions and adjusted them or change their order depending on the participant and the dynamic of the discussion. This facilitated the conversation flow and also allowed me to increase data's depth and breadth by asking probing questions when needed (148).

In total, I interviewed 14 participants from June 2020 to July 2021. Following the Covid-19 pandemic, public health instructions forbade in-person meetings for most of the data collection period; I therefore conducted 13 interviews through the Zoom application and only one in-person interview. I stopped data collection after 14 interviews as we reached what Patton calls 'data saturation', the point at which new data does not generate new codes or themes (147).

A technology-based communication method, Zoom application, was appropriate for this research as it enabled in-depth interaction between the participants and I, while protecting our health and safety (149). The interviews were in English and lasted approximately two hours. More specifically, I spent half an hour minutes on learning about participants' perspectives about portable dentistry, and dedicated the last one hour and half on participants' perspectives about the Montreal-Toulouse model.

4-4 Data analysis

All interviews were audio-recorded using the Zoom application recording option or a separate recorder. For privacy and confidentiality purposes, I avoided pre-recording the conversation on the Zoom cloud spaces. I then transcribed interviews verbatim using precise punctuation marks and symbols; this facilitated the future read of the data and helped me transfer participants' feelings through text. (See table 6). Besides, the transcription process allowed me to repeatedly listen to the various parts of interviews and familiarize myself with the data.

Table 6: symbols used in transcripts	
Punctuation mark / symbol	Indication
(? time)	Indicating the exact timing of a word or sentence I could not understand due to the poor quality of the audio
…	Indicating a prolonged pause or a sudden change of sentence
( )	Indicating a word that I added to the sentence to better convey the participant's point
" "	Indicating a direct quotation made by the participant
Capital words	Indicating a word expressed loaded with emotions in a meaningfully raised volume

In parallel with data collection, I analyzed the data using a thematic content analysis approach. According to Green (148), this approach aims to "provide a map of the contents and topics" across the data set and summarize the "variations and regularities within the data". After analyzing each interview, we held debriefing sessions to validate the codes and the coding process (150). For instance, we identified topics that needed to be explored deeper in future interviews and refined the coding process at every step of the analysis.

During these sessions, Dr. Bedos and Dr. Rousseau provided feedback to me and decided how to move forward; they also challenged my assumptions and interpretations, and reflected on how my background might influence the data collection and analysis process: I was a 29-year-old student with a background in dentistry during the data collection and analysis phase of this study. More specifically, I completed my undergraduate dental studies in Iran and practiced dentistry there in both public and private sectors for three years. I was always interested in the oral public health field and also had mobile dentistry work experience.

This was an important information for Dr. Bedos and Dr. Rousseau, who reflected on my personal interest and experience in oral public health and mobile dentistry and how it may have encouraged me to convince participants about the pertinence of social dentistry instead of trying to understand their perspectives. They also sensitized me on the differences between the Iranian and Canadian dental education and practice, and guided me on how to remain open and curious about participants' beliefs and experiences.

To conduct the thematic content analysis, I followed six phases suggested by Braun and Clarke's (151, 152) (see table 7). More specifically, I began the analysis by immersing myself in the data through reading and re-reading the transcriptions. I then began the coding process, that is, using "tags or labels for assigning units of meaning to the descriptive or inferential information compiled during the study. Codes usually are attached to "chunks" of varying size words, phrases, sentences or whole paragraphs… [and] are used to retrieve and organize the chunks…"(153).

Table 7: Phases of thematic analysis suggested by Braun and Clarke (151)

	Phase	Description of the process
1	Familiarizing oneself with data	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.

2	Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code
3	Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme
4	Reviewing themes	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5	Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme
6	Producing the report	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

I used a combination of inductive and deductive coding methods. More specifically, I drew the primary codes from concepts suggested by the Montreal-Toulouse model and its associated Q-list, as well as the portable dentistry conceptual framework (deductive coding); however, I also generated some codes using my own interpretation of the data (inductive coding). This was possible through "close reading of the data, without trying to fit the data to pre-existing concepts or ideas from theory" (148).

I then organized the codes into categories and tried to find themes, that are, "the recurrent concepts which can be used to summarize and organize the range of topics, views, experiences or beliefs voiced by participants" (148). These themes were iteratively reviewed and validated through the group's debriefing sessions, and the group refined their specific details and names multiple times. Eventually, I produced the final reports by categorizing the results into two sections: a) findings on dentists' perspectives about portable dentistry; and b) findings on dentists' perspectives about the Montreal-Toulouse model.

To improve the credibility of codes and the coding process, I employed the 'disconfirming evidence' strategy by repeating the coding process a second time. More precisely, I used a combination of deductive and inductive coding strategies at my first round of analysis; I then used the generated codes to analyse the dataset for a second time. This allowed me to examine the codes

again and look for evidence that was either consistent with themes or disconfirmed them. In the end, I found more confirming rather than disconfirming evidence, which further highlights the credibility of our analysis and results (154). In addition, I included multiple quotations in the results section; this should allow readers to assess the credibility of the findings and help them understand how I linked the 'raw data with interpretations' and created relevant themes (148).

4-5 Ethical considerations

We took multiple steps to ensure the participants of this study were treated with the highest ethical standards. I first obtained approval of all steps of the study from the McGill University Faculty of Medicine's Institutional Review Board (IRB). (see appendices 3 and 4)

I presented the participants with a detailed consent form that included a summary of the study and its objectives, the study procedure, potential benefits and risks of participation, the measures taken to ensure the confidentiality of data, and the contact information of the study team and an IRB representative (see appendix 5). All participants had enough time to read this consent, reflect on it, and ask further questions about it. I also obtained their verbal consent before each interview, and reminded them they can withdraw from the study at anytime without consequences.

Participants' personal information remained completely confidential as I replaced their names with numbers. In addition, I omitted any phrases/comments in the transcription that could potentially disclose participants' identity. For privacy and confidentiality purposes, I saved thee recording on my personal computer, which is password-secured and solely accessible to me, and avoided using the Zoom cloud spaces.

In line with the McGill IRB guidelines (155), all digital recordings, consent forms, written transcriptions and their later analysis are stored on my account in the McGill University's OneDrive network (developed by Microsoft), which is password secured. Only the research team members have access to this account. After my graduation, the dataset will be transferred to Dr. Christophe Bedos' OneDrive account. It will finally be destroyed after seven years, according to the University's policy.

5- Results

The results of this study are presented in the format of two journal articles on participants' perspectives regarding portable dentistry and the Montreal-Toulouse model, respectively. As expected, dentists' perspectives on the former mirrored their thoughts on the latter.

We identified two themes after analysing the data on participants' perspectives regarding the Montreal-Toulouse model: 1- Participants were interested in model's individual level (encounter with the patient) and argued they already practiced person-centered care; 2- Participants were open to understanding the community and the society, but thought that conducting social actions was not dentists' duty.

Furthermore, four themes emerged after analysisng the data on participants' perspectives regarding portable dentistry: 1- Providing portable dentistry should be a personal choice rather than a professional duty; 2- Implementing portable dentistry is the duty of governments and dentistry's governing bodies; 3- Portable dentistry practices are inherently challenging and demanding; and 4- Integrating portable dentistry into daily practice is unrealistic.

These findings answered our research questions as they showed dentists are not ready to adopt biopsychosocial approaches such as portable dentistry or the Montreal-Toulouse model. More specifically, they acknowledge these models' usefulness for improving the populations' oral health, particularly vulnerable groups such as people with mobility disabilities; however, they do not consider fostering these models their professional duty. Furthermore, the organizational challenges imposed on dentists by the private healthcare system deepened their reluctance to adopt these models. We have presented the manuscripts in the next section.

5-1 Journal article 2: Moving Towards Social Dentistry: How Do Dentists Perceive the Montreal-Toulouse Model?

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(To be submitted in the BMC Open journal by the end of January 2022)

Abstract:

Objectives: This study aimed to understand the perspectives of dentists towards the Montreal-Toulouse model, an innovative approach that encompasses person-centeredness and social dentistry. This model invites dentists to take three types of actions (understanding, decision-making, intervening) on three overlapping levels (individual, community, societal). More specifically, we wanted to know a) How dentists perceived the Montreal-Toulouse model as a framework to the practice of dentistry; and b) What parts of this model they were ready to adopt in their own practice.

Methods: We conducted a qualitative descriptive study based on semi-structured interviews with a sample of dentists in the Province of Quebec, Canada. We employed a combination of maximum variation and snowball sampling strategies and recruited 14 information-rich participants. The interviews were conducted and audio-recorded through Zoom and lasted approximately one hour and half. After transcribing the interviews verbatim, we performed a thematic analysis with a combination of inductive and deductive coding.

Results: The participants explained they valued person-centred care and tried to put the individual level of the Montreal-Toulouse model into practice. However, they expressed little interest in the social dentistry aspects of the model. They acknowledged not knowing how to organize and conduct upstream interventions and were not comfortable with social and political activism. According to them, advocating for better health-related policies, while a noble act, “was not their job”. They also highlighted the structural challenges that dentists face for fostering biopsychosocial approaches such as the Montreal-Toulouse model.

Conclusions: To promote the adoption of biopsychosocial approaches in dentistry, dental schools need to reject the biomedical, disease and sometimes dentist-oriented model of practice and abandon their narrow definition of professionalism. We also invite dentistry’s governing bodies to

shift their focus from a market-based healthcare system to a socially oriented one, but also support dentists' involvement in social actions.

Introduction

Although the 'biomedical model' has been highly criticized in the literature (1, 2), it still dominates the education and practice of dentistry (2). This model focuses on eliminating the biological causes of dental diseases (2, 3) and ignores the psychosocial factors that might cause, contribute to, and maintain them. It is also dentist-centered and prioritizes dentists' expertise over patients' perspectives. Consequently, the biomedical patient-dentist interaction tends to be paternalistic with a communication that is mostly one-way, from the dentist to the patient, and may lead to patient dissatisfaction (4, 5).

In response to these shortcomings, researchers have proposed 'person- and patient-centered care' models that balance power between the dentist and the patient and emphasize on the patient's experiences, concerns, and expectations (6-8). They also include a shared decision-making process that respects patients' values and choices (4). More recently, researchers have advocated for social dentistry approaches in which dentists may tackle patients' social determinants of health through social prescription and upstream actions (9-11).

Our research team, in particular, has developed the 'Montreal-Toulouse model' (12), a social dentistry framework that incorporates patient-centeredness and social dentistry, amalgamating their foremost values and principles. This model encourages dentists to take three types of actions (understanding, decision-making, intervening) on three overlapping levels (individual, community, societal). The individual level corresponds to the provision of person-centered care, while the next two levels mostly include components of the social dentistry model.

At the individual level, dentists should provide person-centered care and try to address patients' social determinants of health by providing social prescription – that is, "connecting patients with various support resources within and beyond the health system" (13) when necessary. At the community level, dentists should adapt their clinics to the needs of the underprivileged groups and partner up with local leaders for the improvement of community's oral health. At the societal level, dentists should learn about the social, political, and economic structures that could directly or

indirectly influence the population's oral health and advocate for better policies and programs through social activism and upstream actions (12).

In brief, the adoption of the Montreal-Toulouse model by dentists could contribute to the improvement of the population's oral health. At this stage, however, we do not know if dental professionals are ready to adopt this model and, more generally, biopsychosocial approaches that redefine the way they have practiced dentistry so far. Therefore, the objective of this research was to understand dentists' perspectives towards the Montreal-Toulouse model. More specifically, we wanted to know a) How dentists perceived the Montreal-Toulouse model as a framework to the practice of dentistry; and b) What parts of this model they were ready to adopt in their own practice.

Methods:

Design and participants: We conducted a qualitative descriptive study, a methodology that is appropriate to obtain "straight and largely unadorned" description of phenomena about which very little is known (14). Our goal was to understand how general dentists perceived the Montreal-Toulouse model, but we decided to focus on dental educators because dental schools are the primary place to teach and promote novel approaches. General dentists working as instructors in dental faculties was thus our population of interest.

Sampling strategy: We conducted our sampling within a faculty of dentistry located in the province of Quebec, Canada. We adopted a maximum variation sampling strategy as it increased "the likelihood that the findings will reflect differences or different perspectives—an ideal in qualitative research" (15). We therefore diversified the sample in terms of participants' age, gender, work experience, and type of practice (office owner or associate dentist).

To complement this strategy, we also used a snowball sampling technique by asking each interviewee to suggest people who might have a similar perspective (15). This helped us locate information-rich participants who understood or were opinionated about person-centered care and/or social dentistry. In the end, we recruited five female and nine male dentists with clinical experiences between one to 43 years; eight participants were practice owners while six worked as an associate dentist in a private dental office or hospital (See table 1).

Table 1: Presentation of the participants (all names are fictional)

	Name	Gender	Clinical experience (years)	Professional profile
1	Hisham	Man	1	Associate dentist in a private dental clinic
2	Nancy	Woman	30	Associate dentist in a private dental clinic
3	Anissa	Woman	11	Owner dentist
4	Martin	Man	43	Owner dentist
5	Richard	Man	25	Owner dentist
6	Edward	Man	7	Associate dentist in a hospital
7	Antoine	Man	3	Associate dentist in a private dental clinic
8	Kevin	Man	31 *	Owner dentist
9	Sarah	Woman	5	Associate dentist in a private dental clinic
10	William	Man	20	Owner dentist
11	David	Man	11	Associate dentist in a private dental clinic
12	Simon	Man	31	Owner dentist
13	Katie	Woman	24	Owner dentist
14	Kimia	Woman	42 *	Owner dentist

** Three years at McGill as instructors; the rest of their experience comprised private practice as owner dentists.*

Data collection and analysis: After obtaining the approval of McGill University Faculty of medicine's Institutional Review Board (IRB), the first author (HF) conducted one-on-one, semi-structured interviews with the participants. Following the Covid-19 pandemic, public health instructions forbade in-person meetings for most of the data collection period; The interviewer therefore conducted 13 interviews through the Zoom application and only one in-person interview. The interviews were in English and lasted approximately one hour and half. We stopped data collection after 14 interviews as we had reached what Patton calls ‘data saturation’, the point at which new data does not generate new codes or themes (15).

Before starting the discussion, the interviewer asked participants to read and sign a consent form approved by McGill University's IRB. Then, she used an interview guide with open-ended questions that was based on the Montreal-Toulouse model and its associated Q-list (12); she then invited the participants to openly share their perspectives on the subject and, to obtain vivid and rich descriptions, encouraged them to elaborate on iconic moments or experiences; when necessary, she also asked probing questions to increase data's depth and breadth (16).

We transcribed the interviews verbatim and, supported by MaxQDA software, performed a thematic content analysis with a combination of inductive and deductive coding. After analyzing each interview, we held debriefing sessions to validate the codes and the coding process (17). During these sessions, two authors (CB and JR) provided feedback to HF who was conducting and analyzing interviews; this included supporting her, but also challenging her assumptions and interpretations and deciding how to move forward; for instance, they identified topics that needed to be explored deeper in future interviews and refined the coding process at every step of the analysis.

Results:

Two major themes emerged from the analyses: 1- Participants were interested in model's individual level (encounter with the patient) and argued they already practiced person-centered care; 2- Participants were open to understanding the community and the society, but thought that conducting social actions was not dentists' duty.

1- Participants were interested in model's individual level (encounter with the patient) and argued they practiced person-centered care

Participants found the model's individual level pertinent and believed that they already practiced person-centered care in their daily clinical work. They were, however, reluctant to inquire about patients' social determinants of health and did not consider providing social prescription a professional duty. Following the Montreal-Toulouse model, we categorized this theme into three sections: 1-understanding; 2- decision-making; and 3- intervening.

1-1 Individual level: understanding the person

The participants valued the first action – understanding patients' expectations, concerns, and explanatory models – and considered it was a key part of any treatment process. According to them, understanding was a basic requirement in the dentist-patient relationship because it paved the way towards establishing rapport, building trust, and patients' active participation in the treatment process.

> *My job is to be the best possible dentist I can be for my patients, and I think part of that involves a connection… there's a lot more to being an appropriate practitioner than just execution with my hands. We try and learn as much about our patients, their well-being. I've always said that I treat a person, I don't treat a mouth; and I think by treating the person I do much better treating the mouth. (Richard)*

Participants explained that active listening helped them understand patients' explanatory models and their oral health-related beliefs and behaviours; this in turn allowed them, when pertinent, to "educate" patients and provide them with "scientifically-correct" information about oral health and diseases as well as treatment options. According to them, this exchange of information allowed both dentists and patients reach a "middle ground" and work towards the same goal. This said, and while participants genuinely seemed interested in understanding patients, their focus on "educating patients" indicated a communication style more aligned with the biomedical model rather than person-centered care.

> *If you're going to be ethical and appropriate, you have to listen to your patients and you have to understand their point of view; and if I disagree with my patients' philosophes or understandings, it's my job to try and educate them to what I perceive to be appropriate and for us to meet somewhere in common ground. (Martin)*

Participants also valued learning about patients' social determinants of health and considered it helped them understand people in a holistic way; for instance, they explained that gaining information about patients' diet and socioeconomic status was necessary as it allowed dentists to discover the root causes of oral problems and take them into account when planning treatment. Several participants also believed that the process of inquiring about people's life had a positive impact on the latter, who felt that their wellbeing "truly" mattered to the dentist, and ultimately improved the therapeutic relationship.

> *They could be an immigrant working as a security guard and they have a few kids… you'll see how some kids are more affected based on their ages… and it's like "OK, well, we have to address what's the cause of this. I mean, what was your diet where you're from and what is it now" (Antoine)*

Despite acknowledging these benefits, several participants were reluctant to fully explore patients' social determinants of health, unless this information was absolutely necessary to understand people's symptoms and expectations, arguing that their busy schedule did not allow enough time and energy for such broad-natured inquiries. They added that some patients felt uncomfortable and grew reserved when asked very personal questions, recognising it required soft skills that dentists sometimes lacked. Furthermore, this process, according to them, required long-term involvements, as patients would share about their personal life gradually over several sessions or care episodes. In addition to these arguments, a few participants expressed prudence in interpreting patients' words, suspecting they may emphasize on unfavorable life circumstances to trigger dentists' sympathy and get financial discounts.

> *If Mr. Smith comes in and… let's call him an 85-year-old gentleman in perfect health, that already tells me a lot about him. If, on the other hand, Mr. Smith … comes in the wheelchair and he's wearing a denture that's full of plaque and debris and it's partially broken, well that tells me another thing about him and then we have to dive in a little deeper to see whether or not it's due to anything from elder abuse, to financial neglect of the patient if they're dependent upon somebody, (or) just the lack of understanding of the importance of their oral health. (William)*

1-2 Individual level: decision-making with the person

The participants considered that being involved in a shared decision-making process was patients' natural right as they were the ones affected by the decisions in the first place: it affected their health and impacted them financially as they would pay for treatments. They also believed that it was dentists' professional obligation to involve patients in co-constructing treatment plans that would respect their values and priorities. Some also considered this process part of their legal binding towards patients, highlighting the risks of professional litigation if dentists were the sole decision-makers.

> *I don't feel like I know what's right for them. if I didn't have their experience, I wouldn't be able to do anything; because I don't know what they want and I want to give them what they want; or not what they want, but what they need or like what they're there for. So, for me it's like my fuel. If you don't give me input, I can't have any output. (Sarah)*

Furthermore, the participants considered that shared decision-making improved the therapeutic relationship as it encouraged an egalitarian therapeutic relationship. According to them, it empowered patients as it allowed them to voice their opinions and partake in the treatment process,

which would in turn improve patients' satisfaction and strengthen their role in treatment maintenance. The participants also considered that the shared decision-making process provided a safe space for people to discuss the financial aspects of care and evaluate their ability to pay.

> *They will say: "you know, I feel very more comfortable to come back to the dentist". They don't feel pressured. I think [shared decision-making] improves trust between the professional and the patient and results in a more equal relationship; like, they don't feel like, you know, you're the boss. (Kimia)*

However, the participants' descriptions seldom included co-constructing the treatment plan in a shared process, and their terminology indicated a communication style that tended to be one-way, revealing an alignment with the biomedical rather than with the person-centered framework; for instance, some dentists explained that patients needed to "cooperate" and accept their "ideal" treatment plans, seemingly disregarding patients' preferences. In several participants' perspective, patients' role and involvement was thus limited and consisted in choosing among various therapeutic options suggested by the dentist.

> *When you keep them involved in the treatment plan and they see how organised the steps are, they'd be more inclined to be cooperative and finish the treatment and maintain their health status. (Hisham)*

> *[At the beginning of my career,] I was a little too lax, or at least maybe in the patients' eyes. They didn't necessarily see why I think one reason is better than the other; and so, they would always go for the cheaper option, I guess. The cheaper option is never, is almost never the better option. I mean, when do you ever tell a person to do a cheaper option which is better for them, you know what I mean? (Antoine)*

Furthermore, the participants highlighted the challenges of the shared decision-making process, explaining that dentists' education did not equip them with skills required for this approach, namely being able to "decorticate" patients' requests and discover their "true" concerns and expectations. They also explained that patients sometimes asked for treatment options that clashed with scientific evidence and could even result in detrimental clinical outcomes; they thus found challenging to reach a balance between patient empowerment and providing proper clinical care.

> *[Sometimes] they point, and they say what's wrong and they tell me how to do the technical part and then I try to be like "OK, this is how decision making will go; you tell me exactly what your experience is in your mouth and what you don't like, and what you would like to have, and I will tell you what my tools are, but don't tell me what my tools are"… I think shared decision making is tough for both parties and there should be clear ground rules before starting it. (Sarah)*

1-3 Individual level: intervening

The participants had varying opinions on social prescription, an approach that most had no prior knowledge about. Indeed, some argued that their patients seldom had a "screaming need" for such referrals, having already, in most cases, adequate access to community resources and being able to address their social needs by themselves. Furthermore, and more importantly, they considered that social prescription was beyond their professional duty.

> *I feel like there's a certain amount of responsibility I should have and then there's this another amount of responsibility the patient should have… this extra involvement, like: "oh yeah, there is a cooking class given here, it could help you [with your diet]", I just feel like, that's beyond my responsibility as a dentist. (David)*

Other participants, however, favoured social prescription for personal and professional reasons. From a personal perspective, they thought that helping a person in need was every individual's duty regardless of their professional status. According to some, prescribing social services could evoke dentists' sense of altruism as they were "doing patients a favor" by addressing their health unrelated issues. Furthermore, a few participants argued that dentists were professionally obliged to provide social prescription, suggesting this allowed them to care holistically for patients and address the root causes of their oral diseases.

> *It is a little called professionalism; I call it being a human being as well. You know, being a, uh, a person that cares... Dentistry is a service profession, but it goes beyond drilling teeth. We gotta look at the whole patient, their family, their surroundings. And you gotta keep your ears to the ground to see what can be done to help patients. (William)*

Participants also mentioned that social prescribing could be challenging for dentists; first, because dental school did not prepare them to explore and address patients' social determinants of health and do social prescription; most, for instance, acknowledged learning about these terms incidentally and outside dental school. They also mentioned that social prescription required information about social resources, which they usually lacked, and was an unpaid, time-consuming service that could affect the profitability of their clinic. Some also expressed skepticism regarding the acceptance of dentists' social referrals, arguing that social or community organizations may disregard and even distrust dental professionals.

> *When you are a private Clinic owner and you go to the community and try to make links for social referrals, sometimes they're a little bit suspicious, you know? they are like "What is your interest in this?". I think because people are not used to working in partnerships with*

dentists, and dentists are not used to working in partnerships. Like it's not in the system. (Anissa)

In brief, participants valued the approach proposed in the model's individual level and, despite some challenges, tried to implement it in their daily clinical work. They believed person-centered care led to patient satisfaction, improved treatment outcomes and, for some, was advantageous from a business perspective. Nevertheless, participants experienced difficulty in understanding and implementing this approach, and their beliefs and actions were sometimes more aligned with the biomedical model. They also had varying opinions regarding social prescription, with some not considering it as their professional duty and showing little interest in addressing patients' social determinants of health, and others assuming that providing social prescription was dentists' personal and professional duty.

2- Participants were open to understanding the community and the society, but believed conducting social actions was not dentists' duty

The participants valued learning about the communities in which they practiced and were also open to understanding the policies that directly affected their profession or the population oral health. However, they did not consider social activism and taking upstream actions as part of dentists' professional duties. Following the Montreal-Toulouse model, we categorized this theme into two sections: 1-understanding; and 2- decision-making and intervening. We did not separate the two latter actions as participants' opinions and perceptions were very similar regarding both.

2-1 Community and societal levels: understanding

On the community level, the participants valued understanding for both personal and professional reasons. First, they considered it was each citizen's responsibility to learn about their community and be informed about its various resources. As dental professionals, it was also important to know the demographic and social characteristics of the community to better respond to people's needs; for instance, learning about the community's cultural characteristics could help dentists understand patients' oral health-related beliefs and behaviours and deepen their therapeutic relationship. Besides, participants thought that grasping on the community's socioeconomic characteristics allowed them to anticipate patients' financial situation and better adapt their practice to the community's financial abilities and needs.

I think that you're very odd if you're opening a clinic in, say, a welfare group, and you're like selling crowns, and the Hollywood smile. Also, as a professional, you're adapting... Like I said, I go through more [continuing education] courses on the kids, as I have a lot of immigrant kids... I think it's not only your business aspect, but [also] how you match your community, because finally everybody has their own values, and it's your career, it's what you do every day, and I think that you have to be somewhere that you're comfortable and your values can get along with this community. (Nancy)

This said, participants acknowledged that understanding their community was a challenging process. First, they perceived it as a gradual process that required investment in terms of time and energy to "pick up on the community patterns". The participants that were part-time associate dentists emphasized this point because they spent a limited amount of time in the community and thus struggled to know it well and develop a "sense of belonging". Besides, they considered it unlikely for a dentist to grasp the complexity of certain multicultural, commercial, and metropolitan districts, suggesting they were too heterogenous to be called a single community.

[As] for downtown, it's not a community really… it's a destination (laughing). People don't live there… and there's no specific pattern amongst them. (Antoine)

As for the societal level, participants considered that dentists might benefit form learning about policies that directly affected their profession or the population oral health. More specifically, this would allow them to voice their opinion and advocate for better policies, but also inform their conversations with patients on dentistry's "hot topics" such as "water fluoridation" or "mercury usage in amalgam restorations". Learning about policies around professional litigation might also inform dentists' actions in potential legal incidents such as malpractice allegations. Participants, however, did not feel professionally obliged to learn about the sociopolitical structures that might indirectly affect the population health, arguing dentists' duty was not necessarily different from a regular citizen in this regard.

When you're knowledgeable about what's going on around you, you can use the resources more efficiently and be a better counsel to your patients… As far as laws go, sure some laws affect us more than others; but I'm not sure knowing the intricacies of how and why are really that important for us. (Sarah)

In terms of like other organizations that might affect poverty, education, etc. and government, I think as a citizen people should be aware of those kinds of things anyway. I don't think that that's a dental issue necessarily… I'll be very honest with you, I never really think of "OK, the government that's in power, how is that affecting policy that might affect my patients' oral health?" I don't really think along that line. (Edward)

2-2 Community and societal levels: decision-making and intervening

The participants' opinions varied regarding the necessity as well as the possibility of dentists taking upstream actions. Indeed, a group of participants believed that dentists' duties finished at the individual level, arguing it was dental and public health governing bodies' role to conduct upstream actions and, if necessary, involve dentists by offering them paid positions. They also argued that dentists lacked training and competencies for social activism and that their initiatives might overlap and even conflict with actions from dental and public health's governing bodies. Some also thought that political activism was outside many dentists' comfort zone and could also subject them to criticism among family and friends.

> *One of my friends, [X], is very political, very out there, very what you perceive to be on appropriate agenda; and [X] can be, I don't want to use the word "attacked", it's harsh, but that's what I mean. I mean, [X] is criticized openly in many places. Again, I'm using [X] as an example; I could never be [X]; I could never put myself out there and subject myself to that type of scrutiny and perhaps criticism. I really only have one person to satisfy, and that's myself. (Martin)*

A second group of participants, though, supported community and societal activism and argued that upstream actions allowed dentists to voice their patients' needs and advocate for better policies and programs. Some also considered activism as a way to be socially responsible and give back to the society. Furthermore, they thought that dentists' active engagement in their community was good business practice as it improved their image in the community and favored acceptance and trust.

> *They're like my family. They are people that rely on me to provide them with dental care. I'm there to make sure that their needs are delivered, whether I'm the one delivering them or if it's a community that has to deliver it, it makes an important difference. That's called being socially responsible. (Richard)*

Despite acknowledging the values and potential benefits of social activism, the latter group did not consider it a professional obligation as well, but rather a side activity that some dentists might do in their spare time because of personal interests or values. According to them, taking upstream actions "was not for everyone" as it required particular personality traits and skills, namely leadership and political shrewdness. As it also necessitated time, these participants remarked that even dentists interested in social actions might not undertake any because working in the private

sector left them with little time and energy and because financial concerns would absorb most of their focus.

> *It's more personal. You're not paid to do that [community actions]; It's like your time … I think dentists, if they do it, they have to do it in their own time; and you know, I don't think you can make it in obligation for them to do it. (Anissa)*

The participants also mentioned several organizational challenges would discourage 'social dentists' from taking upstream actions and even make them question the possibility of change; for instance, they thought that the dental profession did not favor upstream actions as dentistry's governing bodies offered limited involvement opportunities to those interested. Some participants, having experienced administrative bureaucracy when trying to promote social change through these organizations, considered that one must be a "superhuman" to constantly push for social change in such an unsupportive professional environment.

> *I've gone in the past and I've spoken to my MP [Member of Parliament] about dental care, a national dental care program, and he of course passed the buck and says health care is a provincial matter. And then I contact my provincial MNA [Member of The National Assembly] and he says oh, but it's under Health Canada and that's a federal matter (laugh). So, you get the buck passed both ways between the provincial and federal governments. (William)*

In brief, participants found some pertinence in understanding the community as well as the regulations related to their profession, but thought that conducting social actions was not dentists' duty. Several participants were against social activism and considered upstream actions beyond their duty; others, for personal reasons, valued social activism but considered that dentists were not professionally obliged to do so. Participants also reported various organizational challenges that might discourage socially active dentists from taking upstream actions.

> *As I said, I sort of feel like I do a lot of aspects of it already in my own life. Do I do it down to a T? Probably not. I definitely have a background of the old school [biomedical model] … so I think it's good to be aware of the model; But to take this cookie cutter and, you know, stick it on every dentist and tell them you must take this shape; I don't think that's gonna happen." (Edward)*

Discussion:

Our study shows that dentists' understanding of, and interest in, the Montreal-Toulouse model decreases as they move towards its distal layers, i.e., from the individual towards the societal level, and from understanding towards intervening on each level. As the model's distal layers are mainly

concerned with addressing the social determinants of health (12), our findings show that dentists are not ready to adopt the Montreal-Toulouse model's social aspects and, more importantly, think of social accountability as an individualistic value rather than a core aspect of professionalism.

We postulate that this is a consequence of the biomedical model's lingering dominance over dentistry's structures: dental education, for instance, fails to sensitize dentists on the importance of recognizing the social determinants of health, and does not equip them with knowledge and competence required for taking upstream actions (2, 11); as Apelian et al. deplored, "academic programs [have] remained almost unchanged in the last decades and still [prepare] dentists to be disease-centered and surgically oriented" (18). This also echoes Noushi et al.'s remarks about the lack of emphasis on dentists' social responsibility in dental education (19).

Moreover, working in a private system contributes to dentists' reluctance towards taking upstream actions. First, they have no financial incentives to do so, and our findings suggest that dentists may be more interested in social actions that improve their practice's business aspects. As Ocek considered, "the dominance of market mechanisms in dentistry inevitably forces dentists to adopt the characteristics of a business person and prevents them from fulfilling the basic requirements of professionalism" (20). Second, business concerns are always at the forefront of dentists' thoughts and leave little time and energy for upstream actions. This echoes Dharamsi et al.'s remarks about the structural challenges that dentists face for fulfilling their social responsibilities in a market-based system (21).

Our study reveals that the dental profession, guided by the biomedical model, does not favor upstream actions and continues to reproduce a narrow definition of professionalism that does not comprise social accountability as a core value. We therefore believe that there is an urgent need for a 'paradigm shift' in dentistry's education and governance; accordingly, we invite dental schools to reject the biomedical, disease/dentist-oriented model of dentistry, and instead foster biopsychosocial approaches. For this purpose, dentistry could follow healthcare professions that have already started their transition towards biopsychosocial approaches.

Indeed, medicine (13, 22, 23) and nursing (24-26), have regained interest in the social aspects of their practice in the last decades, reviving the vision of 19th century's pioneers, such as Rudolf Virchow (27) and Louis-René Villermé (28). Some medical schools, for instance, have fully integrated social medicine in their curriculum, while others are offering elective or required

courses on the social aspects of care (10, 29-32). Their experiences highlight the importance of replacing traditional "banking education" with transformative learning approaches that enable students to become "critically conscious"; i.e., "reflect on their assumptions related to social structures, analyze the ways that these structures influence health, and imagine actions to address them"(10).

There is also a movement towards social accountability in health sectors worldwide (33, 34). We invite dentistry's governing bodies to join this movement by shifting their focus from a market-based healthcare system to a socially oriented one, but also by recognizing their role in supporting dentists' social actions. As Brown and Zavestoski consider (35), challenging "medical policy, public health policy and politics, belief systems, research and practice" is not possible without the collective effort of "an array of formal and informal organizations [and] supporters".

The readers should be careful in interpretation of our finding as this study had some limitations. First, due to Covid-19 pandemic public health instructions, Quebec dental schools were almost completely shut down during the data collection phase of this study. This limited our access to potential participants in dental schools other than McGill, where we already had a strong network among educators. Moreover, we had to conduct interviews virtually instead of meeting participants in-person; this restricted our ability in probing and picking up on nonverbal cues and thus, might have affected our "methodological rigor" (36).

Another limitation of this study is that our findings are not generalizable since we used a qualitative descriptive methodology with a small sample of participants; nevertheless, our sample size conformed to the standards in our field (37) and was adequate as we reached data saturation. Besides, our findings are transferable to other settings depending upon their degree of similarity with our context. It should also be noted that this study provides useful insights into subjects that cannot be directly explored through quantitative methods, namely the way dentists perceive the human and social aspects of care.

Conclusions:

This study shows that dentists' understanding of, and interest in, the Montreal-Toulouse model decreases as they move towards its distal layers. More specifically, dentists are not ready to adopt the Montreal-Toulouse model's social aspects, but also, and more importantly, perceive social

accountability as an individualistic value rather than a core aspect of professionalism. We postulate that this is a result of the biomedical model's lingering dominance over the dental profession, which is entranched in a narrow definition of professionalism. Our study also highlights the organizational challenges that the private healthcare system imposes on socially active dentists.

To conclude, we believe that there is an urgent need for a 'paradigm shift' in dentistry's education and governance, and invite dental schools to foster biopsychosocial approaches. We also invite dentistry's governing bodies to shift their focus from a market-based healthcare system to a socially oriented one, and support dentists' involvement in social actions. As Brown and Zavestoski consider (35), such endeavor is not possible without the collective effort of "an array of formal and informal organizations [and] supporters".

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5-2 Journal article 3: How do dentists perceive portable dentistry? A qualitative study conducted in Quebec

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Abstract:

Objectives: This study aimed to understand the perspectives of dentists towards the Montreal-Toulouse model, an innovative approach that encompasses person-centeredness and social dentistry. This model invites dentists to take three types of actions (understanding, decision-making, intervening) on three overlapping levels (individual, community, societal). More specifically, we wanted to know a) How dentists perceived the Montreal-Toulouse model as a framework to the practice of dentistry; and b) What parts of this model they were ready to adopt in their own practice.

Methods: We conducted a qualitative descriptive study based on semi-structured interviews with a sample of dentists in the Province of Quebec, Canada. We employed a combination of maximum variation and snowball sampling strategies and recruited 14 information-rich participants. The interviews were conducted and audio-recorded through Zoom and lasted approximately one hour and half. After transcribing the interviews verbatim, we performed a thematic analysis with a combination of inductive and deductive coding.

Results: The participants explained they valued person-centred care and tried to put the individual level of the Montreal-Toulouse model into practice. However, they expressed little interest in the social dentistry aspects of the model. They acknowledged not knowing how to organize and conduct upstream interventions and were not comfortable with social and political activism. According to them, advocating for better health-related policies, while a noble act, "was not their job". They also highlighted the structural challenges that dentists face for fostering biopsychosocial approaches such as the Montreal-Toulouse model.

Conclusions: To promote the adoption of biopsychosocial approaches in dentistry, dental schools need to reject the biomedical, disease/dentist-oriented model of practice and abandon their narrow definition of professionalism. We also invite dentistry's governing bodies to shift their focus from

a market-based healthcare system to a socially oriented one, but also support dentists' involvement in social actions

Introduction

Although the 'biomedical model' has been highly criticized in the literature (1, 2), it still dominates the education and practice of dentistry (2). This model focuses on eliminating the biological causes of dental diseases (2, 3) and ignores the psychosocial factors that might cause, contribute to, and maintain them. It is also dentist-centered and prioritizes dentists' expertise over patients' perspectives. Consequently, the biomedical patient-dentist interaction tends to be paternalistic with a communication that is mostly one-way, from the dentist to the patient, and may lead to patient dissatisfaction (4, 5).

In response to these shortcomings, researchers have proposed 'person- and patient-centered care' models that balance power between the dentist and the patient and emphasize on the patient's experiences, concerns, and expectations (6-8). They also include a shared decision-making process that respects patients' values and choices (4). More recently, researchers have advocated for social dentistry approaches in which dentists may tackle patients' social determinants of health through social prescription and upstream actions (9-11).

Our research team, in particular, has developed the 'Montreal-Toulouse model' (12), a social dentistry framework that incorporates patient-centeredness and social dentistry, amalgamating their foremost values and principles. This model encourages dentists to take three types of actions (understanding, decision-making, intervening) on three overlapping levels (individual, community, societal). The individual level corresponds to the provision of person-centered care, while the next two levels mostly include components of the social dentistry model.

At the individual level, dentists should provide person-centered care and try to address patients' social determinants of health by providing social prescription – that is, "connecting patients with various support resources within and beyond the health system" (13) when necessary. At the community level, dentists should adapt their clinics to the needs of the underprivileged groups and partner up with local leaders for the improvement of community's oral health. At the societal level, dentists should learn about the social, political, and economic structures that could directly or

indirectly influence the population's oral health and advocate for better policies and programs through social activism and upstream actions (12).

In brief, the adoption of the Montreal-Toulouse model by dentists could contribute to the improvement of the population's oral health. At this stage, however, we do not know if dental professionals are ready to adopt this model and, more generally, biopsychosocial approaches that redefine the way they have practiced dentistry so far. Therefore, the objective of this research was to understand dentists' perspectives towards the Montreal-Toulouse model. More specifically, we wanted to know a) How dentists perceived the Montreal-Toulouse model as a framework to the practice of dentistry; and b) What parts of this model they were ready to adopt in their own practice.

Methods:

Design and participants: We conducted a qualitative descriptive study, a methodology that is appropriate to obtain "straight and largely unadorned" description of phenomena about which very little is known (14). Our goal was to understand how general dentists perceived the Montreal-Toulouse model, but we decided to focus on dental educators because dental schools are the primary place to teach and promote novel approaches. General dentists working as instructors in dental faculties thus comprised our population of interest.

Sampling strategy: We conducted our sampling within a faculty of dentistry located in the province of Quebec, Canada. We adopted a maximum variation sampling strategy as it increased "the likelihood that the findings will reflect differences or different perspectives—an ideal in qualitative research" (15). We therefore diversified the sample in terms of participants' age, gender, work experience, and type of practice (office owner or associate dentist).

To complement this strategy, we also used a snowball sampling technique by asking each interviewee to suggest people who might have a similar perspective (15). This helped us locate information-rich participants who understood or were opinionated about person-centered care and/or social dentistry. In the end, we recruited five female and nine male dentists with clinical experiences between one to 43 years; eight participants were practice owners while six worked as an associate dentist in a private dental office or hospital (See table 1).

Table 1: Presentation of the participants (all names are fictional)

	Name	Gender	Clinical experience (years)	Professional profile
1	Hisham	Man	1	Associate dentist in a private dental clinic
2	Nancy	Woman	30	Associate dentist in a private dental clinic
3	Anissa	Woman	11	Owner dentist
4	Martin	Man	43	Owner dentist
5	Richard	Man	25	Owner dentist
6	Edward	Man	7	Associate dentist in a hospital
7	Antoine	Man	3	Associate dentist in a private dental clinic
8	Kevin	Man	31 *	Owner dentist
9	Sarah	Woman	5	Associate dentist in a private dental clinic
10	William	Man	20	Owner dentist
11	David	Man	11	Associate dentist in a private dental clinic
12	Simon	Man	31	Owner dentist
13	Katie	Woman	24	Owner dentist
14	Kimia	Woman	42 *	Owner dentist

** Three years at McGill as instructors; the rest of their experience comprised private practice as owner dentists.*

Data collection and analysis: After obtaining the approval of McGill University Faculty of medicine's Institutional Review Board (IRB), the first author (HF) conducted one-on-one, semi-structured interviews with the participants. Following the Covid-19 pandemic, public health instructions forbade in-person meetings for most of the data collection period; The interviewer therefore conducted 13 interviews through the Zoom application and only one in-person interview. The interviews were in English and lasted approximately one hour and half. We stopped data collection after 14 interviews as we had reached what Patton calls ‘data saturation’, the point at which new data does not generate new codes or themes (15).

Before starting the discussion, the interviewer asked participants to read and sign a consent form approved by McGill University's IRB. Then, she used an interview guide with open-ended questions that was based on the Montreal-Toulouse model and its associated Q-list (12); she then invited the participants to openly share their perspectives on the subject and, to obtain vivid and rich descriptions, encouraged them to elaborate on iconic moments or experiences; when necessary, she also asked probing questions to increase data's depth and breadth (16).

We transcribed the interviews verbatim and, supported by MaxQDA software, performed a thematic content analysis with a combination of inductive and deductive coding. After analyzing each interview, we held debriefing sessions to validate the codes and the coding process (17). During these sessions, two authors (CB and JR) provided feedback to HF who was conducting and analyzing interviews; this included supporting her, but also challenging her assumptions and interpretations and deciding how to move forward; for instance, we identified topics that needed to be explored deeper in future interviews and refined the coding process at every step of the analysis.

Results:

Two major themes emerged from the analyses: 1- Participants were interested in model's individual level (encounter with the patient) and argued they already practiced person-centered care; 2- Participants were open to understanding the community and the society, but thought that conducting social actions was not dentists' duty.

1- Participants were interested in model's individual level (encounter with the patient) and argued they practiced person-centered care

Participants found the model's individual level pertinent and believed that they already practiced person-centered care in their daily clinical work. They were, however, reluctant to inquire about patients' social determinants of health and did not consider providing social prescription a professional duty. Following the Montreal-Toulouse model, we categorized this theme into three sections: 1-understanding; 2- decision-making; and 3- intervening.

1-1 Individual level: understanding the person

The participants valued the first action – understanding patients' expectations, concerns, and explanatory models – and considered it was a key part of any treatment process. According to them, understanding was a basic requirement in the dentist-patient relationship because it paved the way towards establishing rapport, building trust, and patients' active participation in the treatment process.

> *My job is to be the best possible dentist I can be for my patients, and I think part of that involves a connection… there's a lot more to being an appropriate practitioner than just execution with my hands. We try and learn as much about our patients, their well-being. I've always said that I treat a person, I don't treat a mouth; and I think by treating the person I do much better treating the mouth. (Richard)*

Participants explained that active listening helped them understand patients' explanatory models and their oral health-related beliefs and behaviours; this in turn allowed them, when pertinent, to "educate" patients and provide them with "scientifically-correct" information about oral health and diseases as well as treatment options. According to them, this exchange of information allowed both dentists and patients reach a "middle ground" and work towards the same goal. This said, and while participants genuinely seemed interested in understanding patients, their focus on "educating patients" indicated a communication style more aligned with the biomedical model rather than person-centered care.

> *If you're going to be ethical and appropriate, you have to listen to your patients and you have to understand their point of view; and if I disagree with my patients' philosophes or understandings, it's my job to try and educate them to what I perceive to be appropriate and for us to meet somewhere in common ground. (Martin)*

Participants also valued learning about patients' social determinants of health and considered it helped them understand people in a holistic way; for instance, they explained that gaining information about patients' diet and socioeconomic status was necessary as it allowed dentists to discover the root causes of oral problems and take them into account when planning treatment. Several participants also believed that the process of inquiring about people's life had a positive impact on the latter, who felt that their wellbeing "truly" mattered to the dentist, and ultimately improved the therapeutic relationship.

> *They could be an immigrant working as a security guard and they have a few kids… you'll see how some kids are more affected based on their ages… and it's like "OK, well, we have to address what's the cause of this. I mean, what was your diet where you're from and what is it now" (Antoine)*

Despite acknowledging these benefits, several participants were reluctant to fully explore patients' social determinants of health, unless this information was absolutely necessary to understand people's symptoms and expectations, arguing that their busy schedule did not allow enough time and energy for such broad-natured inquiries. They added that some patients felt uncomfortable and grew reserved when asked very personal questions, recognising it required soft skills that dentists sometimes lacked. Furthermore, this process, according to them, required long-term involvements, as patients would share about their personal life gradually over several sessions or care episodes. In addition to these arguments, a few participants expressed prudence in interpreting patients' words, suspecting they may emphasize on unfavorable life circumstances to trigger dentists' sympathy and get financial discounts.

> *If Mr. Smith comes in and… let's call him an 85-year-old gentleman in perfect health, that already tells me a lot about him. If, on the other hand, Mr. Smith … comes in the wheelchair and he's wearing a denture that's full of plaque and debris and it's partially broken, well that tells me another thing about him and then we have to dive in a little deeper to see whether or not it's due to anything from elder abuse, to financial neglect of the patient if they're dependent upon somebody, (or) just the lack of understanding of the importance of their oral health. (William)*

1-2 Individual level: decision-making with the person

The participants considered that being involved in a shared decision-making process was patients' natural right as they were the ones affected by the decisions in the first place: it affected their health and impacted them financially as they would pay for treatments. They also believed that it was dentists' professional obligation to involve patients in co-constructing treatment plans that would respect their values and priorities. Some also considered this process part of their legal binding towards patients, highlighting the risks of professional litigation if dentists were the sole decision-makers.

> *I don't feel like I know what's right for them. if I didn't have their experience, I wouldn't be able to do anything; because I don't know what they want and I want to give them what they want; or not what they want, but what they need or like what they're there for. So, for me it's like my fuel. If you don't give me input, I can't have any output. (Sarah)*

Furthermore, the participants considered that shared decision-making improved the therapeutic relationship as it encouraged an egalitarian therapeutic relationship. According to them, it empowered patients as it allowed them to voice their opinions and partake in the treatment process,

which would in turn improve patients' satisfaction and strengthen their role in treatment maintenance. The participants also considered that the shared decision-making process provided a safe space for people to discuss the financial aspects of care and evaluate their ability to pay.

> *They will say: "you know, I feel very more comfortable to come back to the dentist". They don't feel pressured. I think [shared decision-making] improves trust between the professional and the patient and results in a more equal relationship; like, they don't feel like, you know, you're the boss. (Kimia)*

However, the participants' descriptions seldom included co-constructing the treatment plan in a shared process, and their terminology indicated a communication style that tended to be one-way, revealing an alignment with the biomedical rather than with the person-centered framework; for instance, some dentists explained that patients needed to "cooperate" and accept their "ideal" treatment plans, seemingly disregarding patients' preferences. In several participants' perspective, patients' role and involvement was thus limited and consisted in choosing among various therapeutic options suggested by the dentist.

> *When you keep them involved in the treatment plan and they see how organised the steps are, they'd be more inclined to be cooperative and finish the treatment and maintain their health status. (Hisham)*

> *[At the beginning of my career,] I was a little too lax, or at least maybe in the patients' eyes. They didn't necessarily see why I think one reason is better than the other; and so, they would always go for the cheaper option, I guess. The cheaper option is never, is almost never the better option. I mean, when do you ever tell a person to do a cheaper option which is better for them, you know what I mean? (Antoine)*

Furthermore, the participants highlighted the challenges of the shared decision-making process, explaining that dentists' education did not equip them with skills required for this approach, namely being able to "decorticate" patients' requests and discover their "true" concerns and expectations. They also explained that patients sometimes asked for treatment options that clashed with scientific evidence and could even result in detrimental clinical outcomes; they thus found challenging to reach a balance between patient empowerment and providing proper clinical care.

> *[Sometimes] they point, and they say what's wrong and they tell me how to do the technical part and then I try to be like "OK, this is how decision making will go; you tell me exactly what your experience is in your mouth and what you don't like, and what you would like to have, and I will tell you what my tools are, but don't tell me what my tools are"… I think shared decision making is tough for both parties and there should be clear ground rules before starting it. (Sarah)*

1-3 Individual level: intervening

The participants had varying opinions on social prescription, an approach that most had no prior knowledge about. Indeed, some argued that their patients seldom had a "screaming need" for such referrals, having already, in most cases, adequate access to community resources and being able to address their social needs by themselves. Furthermore, and more importantly, they considered that social prescription was beyond their professional duty.

> *I feel like there's a certain amount of responsibility I should have and then there's this another amount of responsibility the patient should have… this extra involvement, like: "oh yeah, there is a cooking class given here, it could help you [with your diet]", I just feel like, that's beyond my responsibility as a dentist. (David)*

Other participants, however, favoured social prescription for personal and professional reasons. From a personal perspective, they thought that helping a person in need was every individual's duty regardless of their professional status. According to some, prescribing social services could evoke dentists' sense of altruism as they were "doing patients a favor" by addressing their health unrelated issues. Furthermore, a few participants argued that dentists were professionally obliged to provide social prescription, suggesting this allowed them to care holistically for patients and address the root causes of their oral diseases.

> *It is a little called professionalism; I call it being a human being as well. You know, being a, uh, a person that cares... Dentistry is a service profession, but it goes beyond drilling teeth. We gotta look at the whole patient, their family, their surroundings. And you gotta keep your ears to the ground to see what can be done to help patients. (William)*

Participants also mentioned that social prescribing could be challenging for dentists; first, because dental school did not prepare them to explore and address patients' social determinants of health and do social prescription; most, for instance, acknowledged learning about these terms incidentally and outside dental school. They also mentioned that social prescription required information about social resources, which they usually lacked, and was an unpaid, time-consuming service that could affect the profitability of their clinic. Some also expressed skepticism regarding the acceptance of dentists' social referrals, arguing that social or community organizations may disregard and even distrust dental professionals.

> *When you are a private Clinic owner and you go to the community and try to make links for social referrals, sometimes they're a little bit suspicious, you know? they are like "What is your interest in this?". I think because people are not used to working in partnerships with*

dentists, and dentists are not used to working in partnerships. Like it's not in the system. (Anissa)

In brief, participants valued the approach proposed in the model's individual level and, despite some challenges, tried to implement it in their daily clinical work. They believed person-centered care led to patient satisfaction, improved treatment outcomes and, for some, was advantageous from a business perspective. Nevertheless, participants experienced difficulty in understanding and implementing this approach, and their beliefs and actions were sometimes more aligned with the biomedical model. They also had varying opinions regarding social prescription, with some not considering it as their professional duty and showing little interest in addressing patients' social determinants of health, and others assuming that providing social prescription was dentists' personal and professional duty.

2- Participants were open to understanding the community and the society, but believed conducting social actions was not dentists' duty

The participants valued learning about the communities in which they practiced and were also open to understanding the policies that directly affected their profession or the population oral health. However, they did not consider social activism and taking upstream actions as part of dentists' professional duties. Following the Montreal-Toulouse model, we categorized this theme into two sections: 1-understanding; and 2- decision-making and intervening. We did not separate the two latter actions as participants' opinions and perceptions were very similar regarding both.

2-1 Community and societal levels: understanding

On the community level, the participants valued understanding for both personal and professional reasons. First, they considered it was each citizen's responsibility to learn about their community and be informed about its various resources. As dental professionals, it was also important to know the demographic and social characteristics of the community to better respond to people's needs; for instance, learning about the community's cultural characteristics could help dentists understand patients' oral health-related beliefs and behaviours and deepen their therapeutic relationship. Besides, participants thought that grasping on the community's socioeconomic characteristics allowed them to anticipate patients' financial situation and better adapt their practice to the community's financial abilities and needs.

I think that you're very odd if you're opening a clinic in, say, a welfare group, and you're like selling crowns, and the Hollywood smile. Also, as a professional, you're adapting... Like I said, I go through more [continuing education] courses on the kids, as I have a lot of immigrant kids... I think it's not only your business aspect, but [also] how you match your community, because finally everybody has their own values, and it's your career, it's what you do every day, and I think that you have to be somewhere that you're comfortable and your values can get along with this community. (Nancy)

This said, participants acknowledged that understanding their community was a challenging process. First, they perceived it as a gradual process that required investment in terms of time and energy to "pick up on the community patterns". The participants that were part-time associate dentists emphasized this point because they spent a limited amount of time in the community and thus struggled to know it well and develop a "sense of belonging". Besides, they considered it unlikely for a dentist to grasp the complexity of certain multicultural, commercial, and metropolitan districts, suggesting they were too heterogenous to be called a single community.

[As] for downtown, it's not a community really… it's a destination (laughing). People don't live there… and there's no specific pattern amongst them. (Antoine)

As for the societal level, participants considered that dentists might benefit form learning about policies that directly affected their profession or the population oral health. More specifically, this would allow them to voice their opinion and advocate for better policies, but also inform their conversations with patients on dentistry's "hot topics" such as "water fluoridation" or "mercury usage in amalgam restorations". Learning about policies around professional litigation might also inform dentists' actions in potential legal incidents such as malpractice allegations. Participants, however, did not feel professionally obliged to learn about the sociopolitical structures that might indirectly affect the population health, arguing dentists' duty was not necessarily different from a regular citizen in this regard.

When you're knowledgeable about what's going on around you, you can use the resources more efficiently and be a better counsel to your patients… As far as laws go, sure some laws affect us more than others; but I'm not sure knowing the intricacies of how and why are really that important for us. (Sarah)

In terms of like other organizations that might affect poverty, education, etc. and government, I think as a citizen people should be aware of those kinds of things anyway. I don't think that that's a dental issue necessarily… I'll be very honest with you, I never really think of "OK, the government that's in power, how is that affecting policy that might affect my patients' oral health?" I don't really think along that line. (Edward)

2-2 Community and societal levels: decision-making and intervening

The participants' opinions varied regarding the necessity as well as the possibility of dentists taking upstream actions. Indeed, a group of participants believed that dentists' duties finished at the individual level, arguing it was dental and public health governing bodies' role to conduct upstream actions and, if necessary, involve dentists by offering them paid positions. They also argued that dentists lacked training and competencies for social activism and that their initiatives might overlap and even conflict with actions from dental and public health's governing bodies. Some also thought that political activism was outside many dentists' comfort zone and could also subject them to criticism among family and friends.

> *One of my friends, [X], is very political, very out there, very what you perceive to be on appropriate agenda; and [X] can be, I don't want to use the word "attacked", it's harsh, but that's what I mean. I mean, [X] is criticized openly in many places. Again, I'm using [X] as an example; I could never be [X]; I could never put myself out there and subject myself to that type of scrutiny and perhaps criticism. I really only have one person to satisfy, and that's myself. (Martin)*

A second group of participants, though, supported community and societal activism and argued that upstream actions allowed dentists to voice their patients' needs and advocate for better policies and programs. Some also considered activism as a way to be socially responsible and give back to the society. Furthermore, they thought that dentists' active engagement in their community was good business practice as it improved their image in the community and favored acceptance and trust.

> *They're like my family. They are people that rely on me to provide them with dental care. I'm there to make sure that their needs are delivered, whether I'm the one delivering them or if it's a community that has to deliver it, it makes an important difference. That's called being socially responsible. (Richard)*

Despite acknowledging the values and potential benefits of social activism, the latter group did not consider it a professional obligation as well, but rather a side activity that some dentists might do in their spare time because of personal interests or values. According to them, taking upstream actions "was not for everyone" as it required particular personality traits and skills, namely leadership and political shrewdness. As it also necessitated time, these participants remarked that even dentists interested in social actions might not undertake any because working in the private

sector left them with little time and energy and because financial concerns would absorb most of their focus.

> *It's more personal. You're not paid to do that [community actions]; It's like your time … I think dentists, if they do it, they have to do it in their own time; and you know, I don't think you can make it in obligation for them to do it. (Anissa)*

The participants also mentioned several organizational challenges would discourage 'social dentists' from taking upstream actions and even make them question the possibility of change; for instance, they thought that the dental profession did not favor upstream actions as dentistry's governing bodies offered limited involvement opportunities to those interested. Some participants, having experienced administrative bureaucracy when trying to promote social change through these organizations, considered that one must be a "superhuman" to constantly push for social change in such an unsupportive professional environment.

> *I've gone in the past and I've spoken to my MP [Member of Parliament] about dental care, a national dental care program, and he of course passed the buck and says health care is a provincial matter. And then I contact my provincial MNA [Member of The National Assembly] and he says oh, but it's under Health Canada and that's a federal matter (laugh). So, you get the buck passed both ways between the provincial and federal governments. (William)*

In brief, participants found some pertinence in understanding the community as well as the regulations related to their profession, but thought that conducting social actions was not dentists' duty. Several participants were against social activism and considered upstream actions beyond their duty; others, for personal reasons, valued social activism but considered that dentists were not professionally obliged to do so. Participants also reported various organizational challenges that might discourage socially active dentists from taking upstream actions.

> *As I said, I sort of feel like I do a lot of aspects of it already in my own life. Do I do it down to a T? Probably not. I definitely have a background of the old school [biomedical model] … so I think it's good to be aware of the model; But to take this cookie cutter and, you know, stick it on every dentist and tell them you must take this shape; I don't think that's gonna happen." (Edward)*

Discussion:

Our study shows that dentists' understanding of, and interest in, the Montreal-Toulouse model decreases as they move towards its distal layers, i.e., from the individual towards the societal level, and from understanding towards intervening on each level. As the model's distal layers are mainly

concerned with addressing the social determinants of health (12), our findings show that dentists are not ready to adopt the Montreal-Toulouse model's social aspects and, more importantly, think of social accountability as an individualistic value rather than a core aspect of professionalism.

We postulate that this is a consequence of the biomedical model's lingering dominance over dentistry's structures: dental education, for instance, fails to sensitize dentists on the importance of recognizing the social determinants of health, and does not equip them with knowledge and competence required for taking upstream actions (2, 11); as Apelian et al. deplored, "academic programs [have] remained almost unchanged in the last decades and still [prepare] dentists to be disease-centered and surgically oriented" (18). This also echoes Noushi et al.'s remarks about the lack of emphasis on dentists' social responsibility in dental education (19).

Moreover, working in a private system contributes to dentists' reluctance towards taking upstream actions. First, they have no financial incentives to do so, and our findings suggest that dentists may be more interested in social actions that improve their practice's business aspects. As Ocek considered, "the dominance of market mechanisms in dentistry inevitably forces dentists to adopt the characteristics of a business person and prevents them from fulfilling the basic requirements of professionalism" (20). Second, business concerns are always at the forefront of dentists' thoughts and leave little time and energy for upstream actions. This echoes Dharamsi et al.'s remarks about the structural challenges that dentists face for fulfilling their social responsibilities in a market-based system (21).

Our study reveals that the dental profession, guided by the biomedical model, does not favor upstream actions and continues to reproduce a narrow definition of professionalism that does not comprise social accountability as a core value. We therefore believe that there is an urgent need for a 'paradigm shift' in dentistry's education and governance; accordingly, we invite dental schools to reject the biomedical, disease/dentist-oriented model of dentistry, and instead foster biopsychosocial approaches. For this purpose, dentistry could follow healthcare professions that have already started their transition towards biopsychosocial approaches.

Medicine (13, 22, 23) and nursing (24-26), for instance, have regained interest in the social aspects of their practice in the last decades, reviving the vision of 19th century's pioneers, such as Rudolf Virchow (27) and Louis-René Villermé (28). Some medical schools, for instance, have fully integrated social medicine in their curriculum, while others are offering elective or required

courses on the social aspects of care (10, 29-32). Their experiences also highlight the importance of replacing traditional "banking education" with transformative learning approaches that enable students to become "critically conscious"; i.e., "reflect on their assumptions related to social structures, analyze the ways that these structures influence health, and imagine actions to address them"(10).

There is also a movement towards social accountability in health sectors worldwide (33, 34). We invite dentistry's governing bodies to join this movement by shifting their focus from a market-based healthcare system to a socially oriented one, but also by recognizing their role in supporting dentists' social actions. As Brown and Zavestoski consider (35), challenging "medical policy, public health policy and politics, belief systems, research and practice" is not possible without the collective effort of "an array of formal and informal organizations [and] supporters".

The readers should be careful in interpretation of our finding as this study had some limitations. First, due to Covid-19 pandemic public health instructions, Quebec dental schools were almost completely shut down during the data collection phase of this study. This limited our access to potential participants in dental schools other than McGill, where we already had a strong network among educators. Moreover, we had to conduct interviews virtually instead of meeting participants in-person; this restricted our ability in probing and picking up on nonverbal cues and thus, might have affected our "methodological rigor" (36).

Another limitation of this study is that our findings are not generalizable since we used a qualitative descriptive methodology with a small sample of participants; nevertheless, our sample size conformed to the standards in our field (37) and was adequate as we reached data saturation. Besides, our findings are transferable to other settings depending upon their degree of similarity with our context. It should also be noted that this study provides useful insights into subjects that cannot be directly explored through quantitative methods, namely the way dentists perceive the human and social aspects of care.

Conclusions:

This study shows that dentists' understanding of, and interest in, the Montreal-Toulouse model decreases as they move towards its distal layers. More specifically, dentists are not ready to adopt the Montreal-Toulouse model's social aspects, but also, and more importantly, perceive social

accountability as an individualistic value rather than a core aspect of professionalism. We postulate that this is a result of the biomedical model's lingering dominance over the dental profession, which is entranched in a narrow definition of professionalism. Our study also highlights the organizational challenges that the private healthcare system imposes on socially active dentists.

To conclude, we believe that there is an urgent need for a 'paradigm shift' in dentistry's education and governance, and invite dental schools to foster biopsychosocial approaches. We also invite dentistry's governing bodies to shift their focus from a market-based healthcare system to a socially oriented one, and support dentists' involvement in social actions. As Brown and Zavestoski consider (35), such endeavor is not possible without the collective effort of "an array of formal and informal organizations [and] supporters".

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6- Discussion

6-1 Summary of objectives

This study aimed to understand dentists' perspectives regarding a biopsychosocial approach for dentistry, the Montreal-Toulouse model. To facilitate the participants' understanding and interpretation of the model, which has only recently been introduced to the literature, we invited them to reflect on and discuss about portable dentistry, a way of delivering services that adheres to the core principles of the Montreal-Toulouse model. This concrete application of the model helped participants grasp a deeper understanding of the approach and better elaborate on their perspectives about it.

6-2 Summary of findings

Our study also shows that dentists clearly value the individual level of the Montreal-Toulouse model and person-centered care in particular; their perspectives, however, are sometimes aligned with the biomedical model of practice. Furthermore, they are not ready to adopt the social dentistry aspects of the Montreal-Toulouse model, which are, recognizing patients' social determinants of health and providing social prescription on the individual level, but also all three actions on the community and societal levels. More specifically, they consider social activism and upstream actions, although pertinent, beyond their professional duties.

Our study also shows that dentists are reluctant to adopt portable dentistry and may lack a sense of professional responsibility towards vulnerable groups such as older adults and people with mobility disabilities. More specifically, dentists are concerned about these groups' unmet dental needs, but more on a personal rather than a professional level, and mainly think of portable dentistry as charity work. Our findings highlight that lack of proper education as well as organizational challenges, such as time and financial constraints, contribute to dentists' reluctance towards portable dentistry and make them question the possibility of adding this model to their current "fixed" practice.

6-3 Interpretation

Dentists' understanding of and interest in the biopsychosocial approach decreases as they move towards the distal layers of the Montreal-Toulouse model, i.e., from the individual towards the societal level and, on each level, from "understanding" towards "intervening". In other word, as

these distal layers mainly focus on the social determinants of health (12), dentists are not ready to extend the boundaries of their practice towards social aspects of health; besides, and maybe more importantly, they are inclined to conceive social accountability as an individual value of exceptional dentists rather than a core aspect of professionalism.

The way dentists perceive portable dentistry reinforces our interpretations. Their sincere concerns about the unmet dental needs of older adults and people with mobility disabilities seem to stem from their own personal and humanistic values rather than the perception of their professional obligations. Instead of feeling professionally obliged to provide portable dental services, they consider that this model of practice is under the responsibility of governental institutions.

We postulate that dentists' reluctance to adopt the Montreal-Toulouse model, and social dentistry approaches in general, is a consequence of the biomedical model's lingering dominance over dentistry's education and governance (2, 156). As Noushi et al. remarked, there is a lack of emphasis on dentists' social responsibility in dental education (157). Apelian et al. also deplored that "academic programs [have] remained almost unchanged in the last decades and still [prepare] dentists to be disease-centered and surgically oriented" (158). The literature on portable dentistry also supports this, suggesting that dentists are not encouraged to provide home-bound people with dental care services (104).

It is important to mention that we recognize dental schools' efforts to incorporate humanistic and social aspects of dental care in their curriculum (33, 97, 159); we nevertheless believe that sensitizing dentists to the social determinants of health and the needs of underprivileged groups in particular, begs for a 'paradigm shift' in dental education and governance. More specifically, we believe that dental schools should dismantle patterns that perpetuate a biomedical, disease and dentist-oriented model of dentistry, and instead foster biopsychosocial approaches. For this purpose, dentistry could follow healthcare professions that have already started transiting to biopsychosocial approaches.

Indeed, there is a movement towards social accountability in health education worldwide (160, 161). medicine (87, 98, 99) and nursing (162-164), for instance,have regained interest in the social aspects of their practice in the last decades, reviving the vision of their pioneers of the 19th century, such as Rudolf Virchow (77) and Louis-René Villermé (165). Their experiences highlight the importance of integrating social medicine into the healthcare programs' curricula, also, replacing

traditional “banking education” methods with transformative learning approaches that allow students to “critically reflect on their assumptions related to social structures, analyze the ways that these structures influence health, and imagine actions to address them”(11, 80, 166-168).

Dental curricula's difficulties to adopt biopsychosocial approaches means that dentists tend to neglect the human and social aspects of care and emphasise on technical skills and high-tech equipment or procedures (169). Indeed, our findings on dentists’ perspectives regarding portable dentistry revealed that dentists might consider high-tech treatment modalities more professionally stimulating than serving people with mobility disabilities.

The private dental care system also contributes to dentists’ reluctance for adopting biopsychosocial approaches; not only dental professionals have no financial incentives to do so, but business concerns are always at the forefront of their preoccupations and leave them with little time and energy for social aspects of care. This is illustrated by the fact that some participants showed interest in social actions because they may improve business aspects of their practice.

Dentists’ perspectives regarding portable dentistry support our interpretations and suggest that the financial challenges to administrate a dental clinic make the integration of portable dentistry and the development of an “hybrid practice” (134) challenging and maybe unrealistic. As Bee considered, “dentists must be compensated for their time and should expect to be able to make a living that justifies their investment and education” (170).

In brief, our findings echoe Dharamsi et al.’s remarks about the structural challenges that dentists face for fulfilling their social responsibilities in a market-based system (171). As Brown and Zavestoski consider (172), challenging “medical policy, public health policy and politics, belief systems, research and practice” is not possible without the collective effort of “an array of formal and informal organizations [and] supporters”.

6-4 Limitations

The readers should be careful in interpretation of our findings as this study had some limitations. First, the data collection phase of this study synchronized with the beginning of the Covid-19 pandemic and the almost total shot down of Quebec dental schools; this had two implications for our study. First, we only managed to recruit participants from only dental school out of three, where we already had a strong network among dental educators. Nevertheless, some of our

participants had graduated from the other two schools and could elaborate on their overall educational strategies and agenda.

Second, we conducted most interviews through Zoom instead of meeting participants in person. To ensure the confidentiality of data, we audio-recorded the sessions only on our personal computers and avoided using cloud-space storages. We also made sure that both the interviewer and the interviewee were in a private room where no one could hear their conversation. While we sometimes faced technical issues such as unstable internet connection or voice cuts, the overall virtual setting did not undermine our data collection. On the contrary, we believe that participants felt more at ease and confident in their familiar surroundings and therefore, more willing to share their thoughts and experiences, as suggested by Tremblay, et al. (149)

Another limitation of this study was that since the Montreal-Toulouse model has been recently introduced to the literature, our participants had no previous knowledge about it or its main constructs – namely the social determinants of health, social prescription, or social and political activism in healthcare; we therefore had to explain the meaning of each concept before inquiring about how they perceived it. This was possible through using vignettes in our interview guide and elaborating on each action with multiple examples; nevertheless, dentists' lack of understanding towards the model might have affected the way they answered our research questions.

We must also mention that our findings are not generalizable since we used a qualitative descriptive methodology with a small number of participants; nevertheless, we consider that our sample size conformed to the standards in our field (173) and was adequate as we reached data saturation. We also consider that our findings are transferable to other settings depending upon their degree of similarity with our context.

Finally, we would like to emphasize the pertinence of our methodological approach; our study offered rich and detailed insights on dentists' perception of the human and social aspects of care that quantitative methods could not have provided.

6-5 Recommendations

We invite dentistry's governing bodies to recognize the need for changing the biomedical model's lingering dominance and fostering biopsychosocial approaches that could respond to the population's needs. This includes dismantling the mechanisms through which the biomedical

model perpetuates a definition of professionalism that is too narrow and does not comprise social accountability as a core value.

We also ask dentistry's governing bodies to shift their focus from a market-based healthcare system to a socially oriented one. This is possible through acknowledging the private system's limitations for addressing the population oral healthcare needs, but also the financial challenges that such a system imposes on dentists who aim to address the social determinants of health. They should also acknowledge and address the organizational barriers that dentists face for fostering biopsychosocial approaches and fulfill their role in supporting dentists' social actions.

Furthermore, we recommend that dental schools shift paradigm and replace the biomedical model of dentistry by biopsychosocial approaches. This, of course, will require radical curricular changes considering that social aspects of care should be integrated in every step of students' training. We also suggest that dental schools incorporate educational components necessary for addressing the underprivileged populations, especially older adults and people with disabilityies.

In addition to curricular reform, we suggest that dental schools replace their current traditional "banking education" methods with transformative learning approaches that would enable students to become "critically conscious"; i.e., "reflect on their assumptions related to social structures, analyze the ways that these structures influence health, and imagine actions to address them"(11).

Finally, we invite researchers to guide dentistry's governing bodies and dental schools in transforming their current structure: first, we invite them to learn from, and build on, the medical and nursing schools' experiences in adopting biopsychosocial approaches and develop educational tools, frameworks and guidelines in particular, that could help training socially oriented dentists; second, we invite them to study the structures and systems through which dentistry's governing bodies function; this should be followed by identifying patterns that favor the biomedical dominance in dentistry, and finding feasible ways for replacing them with biopsychosocial approaches.

7- Conclusion

This study aimed to understand dentists' perspectives regarding the Montreal-Toulouse model, a relatively new biopsychosocial model whose adoption could improve the population's oral health.

More specifically, we wanted to understand: a) how dentists perceived the Montreal-Toulouse model; and b) what parts of this model they were ready to adopt.

We showed that dentists' interest in the Montreal-Toulouse model, and biopsychosocial approaches in general, decreases as they move towards its distal aspects. Dentists do not seem ready to adopt the social aspects of the model and do not perceive social accountability as a core aspect of professionalism. We postulate that this is the consequence of the biomedical model's lingering dominance, which produces a narrow definition of professionalism and restrict the boundaries of dentists' actions. Our study also highlighted the organizational challenges that the private healthcare system imposes on socially engaged dentists.

We thus believe that there is an urgent need for a 'paradigm shift' in dentistry's education and governance; this is why we invite dental schools to dismantle patterns that perpetuate a biomedical, disease/dentist-oriented model of dentistry, and instead, foster biopsychosocial approaches. We also invite dentistry's governing bodies to shift their focus from a market-based healthcare system to a socially oriented one, but also acknowledge their role in supporting dentists' social actions. As Brown and Zavestoski consider (172), such endeavor is not possible without the collective effort of "an array of formal and informal organizations [and] supporters".

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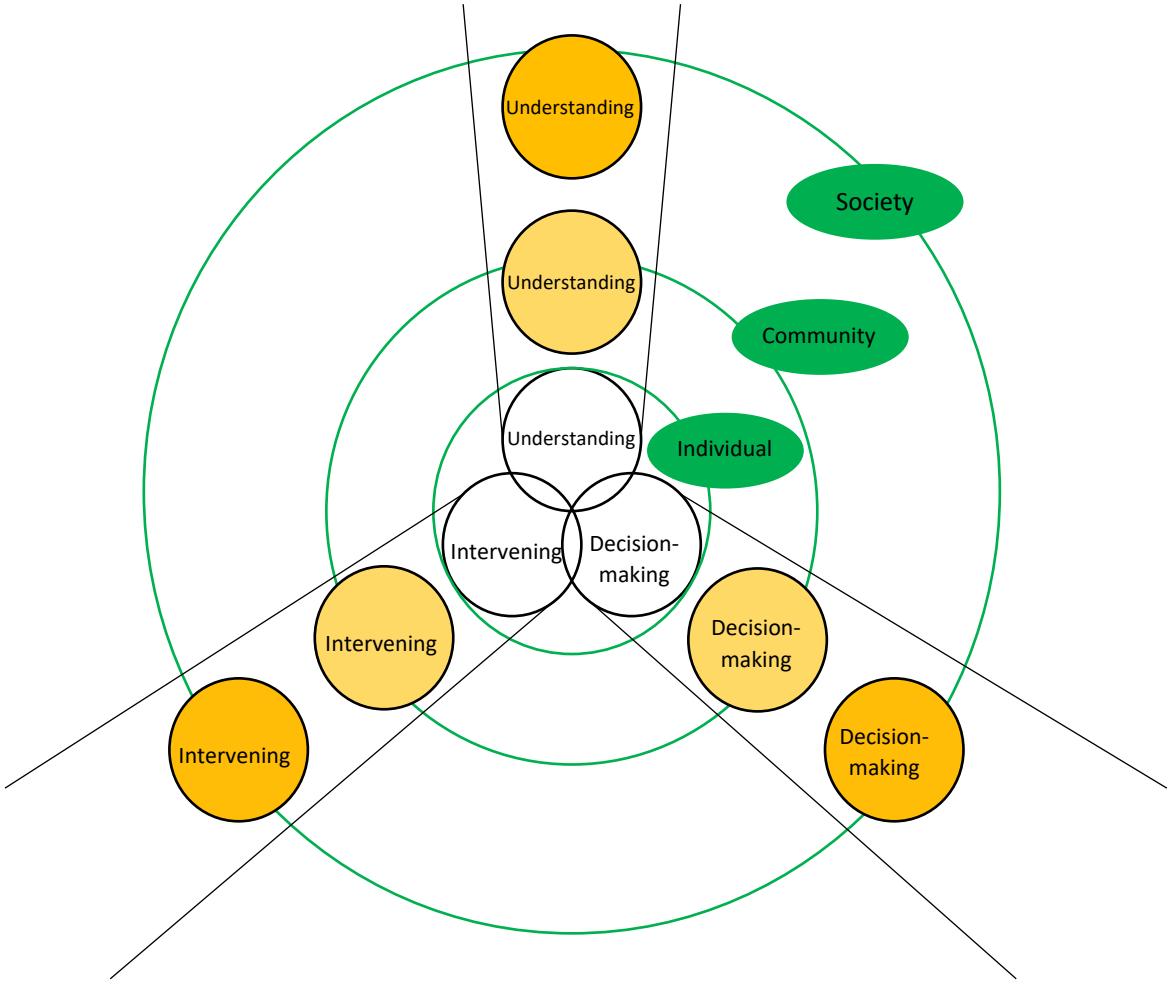
9- Appendices

9-1 Appendix 1: The Montreal-Toulouse Model (Bedos, et al.)



9-2 Appendix 2: The interview guide

Hello, my name is Homa and I am a graduate student at the McGill University, Faculty of Dentistry. I would like to thank you for reading and signing the informed consent form, also for taking the time to meet and discuss with me online today. As you know, the aim of this research is to understand the views of dental professionals about a new clinical approach developed by clinicians and researchers from Montreal and Toulouse, in France: the Montreal-Toulouse model. I know you have read the information provided in the consent form; however, feel free to ask any questions regarding the research or the interview before we get started. I will be happy to answer them. You should know that there are no right or wrong answers in this interview; in fact, understanding your perspectives on the topic is all that matters to me.

- **INTRODUCTION/SOCIO-DEMOGRAPHIC QUESTIONS:**

To start with…

  - Could you introduce yourself and tell me briefly who you are?
  - Could you tell me about your pathway and your life before dental school?
  - Could you tell me what were the main reasons you chose to become a dentist in the first place?

- **PRACTICE APPROACH:**

Thank you for sharing this information with me. Now I would like to know more about your dental practice after graduation.

  - where do you work? (neighbourhood's age, socioeconomic status, ethnical features)
  - what kind of practice do you have? (cosmetic, pain and infection elimination, surgery)
  - what kind of patients do you welcome? (age, socioeconomic status, ethnicity)
  - what kind of community do you serve? (old, minority groups, rich, poor)

- **THE MODEL:**

Now, I would like us to talk about the Montreal-Toulouse model. Based on this model, dental professionals should take three types of actions (understanding, decision-making, intervening) on three overlapping levels (individual, community, societal).

  - **Individual level:**

- The model mentions that the clinician should try to understand the way patients perceive their oral health problems and their risk factors. What do you think of this?
    - follow up: Is this something you do? (or something you may consider doing?)
- The model mentions that the clinician should try to understand patients' social conditions that could directly or indirectly affect their oral health (example: employment, addiction, relationships, etc. I could give example on each of these to make the participant understand social determinants of health). What do you think of this?
- The model also suggests that the clinicians should share the decision-making process with patients. What do you think of this?
    - Follow-up: how do you feel about sharing the decision-making power with the patients?
- The model also emphasizes on non-surgical treatments, such as social prescription. This means establishing referrals to the relevant supportive social bodies that could address underlying social causes of patients' poor oral conditions. For instance, imagine this scenario:

Your patient is a single mother of two children; one is two years old, and the other is five months old. She is a cashier in a supermarket currently on maternity leave, so she keeps her two children at home. She comes to you because of toothache; she has little social and family support and consequently brings her children with her to your clinic. You are not able to perform the treatment because the two children are impatient and cry.

Based on MT model, you could provide her with information about a local community organisation that offers free drop-off day-care. You could also offer to contact them in order to book the next appointment.

- What do you think about providing social prescription?

- Follow-up: some people say social prescription is more a favour rather than a professional duty. What do you think about that?

❖ **Community level:**

Let's now move to the next level of actions in MT model: community level.

- The model mentions that clinicians should understand the community they serve (demographics, culture and health profile of the local community). Do you think this is important?
  - follow up: do you know the profile and needs of their community, the local resources, etc. And if not why not?
- The model also suggests that the clinicians should adapt their clinic to the specific needs of the population and make it as welcoming as possible. Imagine this scenario: you have a lot of elderlies in your local neighbourhood, therefore based on this model, you need to make your clinic accessible to them. For instance, you will rent an office on the ground floor, or you make sure your clinic has enough space for manoeuvre of wheelchair. What do you think about this?
  - Follow-up: which aspect of dentistry affects your point of view in this regard, business or professional duty? In other words, do you think it is better for your business if you adapt your clinic to the local needs or it is merely your professional duty?
    - Probe: please expand on your answer.
- The model also mentions that clinicians should be involved in the decision making at the community level. I'm going to refer to the previous scenario again: imagine you have a lot of nursing homes full of elderlies in your community. You could go to these nursing homes and suggest a dentist visit the residences once a month. What do you think about such involvements in decision-making processes?
  - Follow-up: are you involved in the decisions at the community level? Etc.

- The model also stipulates that clinicians could sometimes advocate and intervene at the community level. For instance, you could contact the city's mayor, or your political party's representative, and ask for better dental care for the elderly, or water fluoridation. What do you think of this?"
    - Follow-up: some people say this is more an extracurricular activity rather than a professional duty. What do you think about that?

❖ **Portable dentistry:**

So far, we have discussed two levels of MT model: individual and community. Before we go to the societal level, I want us to discuss a bit deeper about the oral health needs of the elderly. People over the age of 65 make up around one fifth of our population right now. Old age comes with various types of disability that might prevent the elderly patients from travelling to a dental clinic. This makes me wonder what you think about a specific kind of dental practice for the elderly. Having this in mind…

- How do you think dental professionals could best respond to the oral healthcare needs of the elderly population who cannot reach the service themselves?
- What do you think about portable dentistry? (here, if the participant is not familiar with this method, I will briefly explain and continue the questions)
    - Follow-up: What would be the benefits of this service for you? What about your patients?
    - Follow-up: What are the challenges of this service for you? What about your patients?
- How do you think you could incorporate portable dentistry into your practice?
    - Follow-up: what about other dental professionals?
- There is a provincial program in CHSLDs in which dentists would be invited to provide dental care in CHSLDs. Dentists will have to purchase the equipment, but all the services will be reimbursed by the government. Would you be interested to join this program? Why?

❖ **Societal level:**

Thank you for sharing your view on domiciliary dental care with me. Now, as the last part of the interview, I would like us to talk about the societal level of Montreal-Toulouse model.

- This model stipulates that dentists should learn about the social, political and economic structures that directly or indirectly, influence people's oral health. What do you think about this?
  - Follow-up: Some people say learning such information is more a personal preference rather than a professional duty. What do you think about that?
- The model also mentions that dentists should participate in *decision-making* processes related to the population's oral health policies; this is possible through engagement in professional and non-professional organizations that influence legislative bodies; but also by contacting elected representatives. What do you think about this?
  - Follow-up: some people say this is more an extracurricular activity rather than a professional duty. What do you think about that?
- This model also suggests that dentists should advocate for better oral healthcare policies, such as universal dental coverage, water fluoridation, and so on. What do you think about this?
  - Follow-up: Are there any specific topics for which you would consider advocating?
  - Follow-up: some people say this is more an extracurricular activity rather than a professional duty. What do you think about that?
- What do you think about the power and authority of the dental profession in making changes on the society levels?
- How do you think dental professionals could get involved in policy-making processes related to oral healthcare?
- Due to the pandemic, millions of Canadians lost their job and will not be able to afford dental services in the next years. How do you think this new situation could affect:
  i. the oral health of the population
  ii. The dentists' business

- To what extent would you be interested in this model, and how useful do you think it may be?
- Do they think this model may be appropriate for certain/other contexts? Why?
- Would this model be useful in dental schools as an educational tool?
- What are the drawbacks of this model in your opinion?
- Are there any aspects that this models fails to consider? If yes, what aspects?
- To promote social prescription, dental professionals have to form partnerships with experts in other fields, such as social workers, lawyers, free community groups, family physicians, etc. What do you think about that?
    - Follow-up: What do you think about recruiting some of these experts in the faculty as a stable social resource for patients?
- In most cases, dentists work singly, or with other dentists in a merely dental clinic. What do you think about working with these experts as a team instead, preferably in the same building?

I think that's basically everything I had to ask you to talk about. Have you got anything else you'd like to say or any topics you'd like to follow up that I haven't asked you?

Am I allowed to contact you again in the future if I need further clarification or have problems with transcription?

Am I allowed to send you a summary of what we have discussed today to check if I got it straight?

If you would like to add anything in the future, please feel free to contact me. Thank you once again for participating in this interview.

9-3 Appendix 3: The McGill IRB initial approval

McGill | Faculty of Medicine and Health Sciences | Faculté de médecine et des sciences de la santé

3655 Sir William Osler #633 Montreal, Quebec H3G 1Y6
3655, Promenade Sir William Osler #633 Montréal (Québec) H3G 1Y6
Tél/Tel: (514) 398-3124

May 11, 2021

Dr. Christophe Bedos
Faculty of Dentistry
2001 avenue McGill-College
Montreal QC H3A 1G1

RE: IRB Study Number A05-B32-20B (20-05-041)
Taking Dentistry to The Social Level: Are Quebec Dental Professionals Ready?

Dear Dr. Bedos,

Thank you for submitting an application for Continuing Ethics Review for the above-referenced study.

The study progress report was reviewed and full Board re-approval was provided on May 10, 2021. The ethics certification renewal is valid until **May 12, 2022**.

The Investigator is reminded of the requirement to report all IRB approved protocol and consent form modifications to the Research Ethics Offices (REOs) for the participating hospital sites. Please contact the individual hospital REOs for instructions on how to proceed. Research funds may be withheld and / or the study's data may be revoked for failing to comply with this requirement.

Should any modification or unanticipated development occur prior to the next review, please notify the IRB promptly. Regulation does not permit the implementation of study modifications prior to IRB review and approval.

Regards,

Roberta M. Palmour, PhD
Chair
Institutional Review Board

cc: Homa Fathi
A05-B32-20B (20-05-041)

- A delay of more than 12 months in the commencement of the research project, and;
- Termination or closure of the research project.

The Principal Investigator is required to submit an annual progress report (continuing review application) on the anniversary of the date of the initial approval (or see the date of expiration).

The Faculty of Medicine IRB may conduct an audit of the research project at any time.

If the research project involves multiple study sites, the Principal Investigator is required to report all IRB approvals and approved study documents to the appropriate Research Ethics Office (REO) or delegated authority for the participating study sites. Appropriate authorization from each study site must be obtained before the study recruitment and/or testing can begin at that site. Research funds linked to this research project may be withheld and/or the study data may be revoked if the Principal Investigator fails to comply with this requirement. A copy of the study site authorization should be submitted the IRB Office.

It is the Principal Investigator's responsibility to ensure that all researchers associated with this project are aware of the conditions of approval and which documents have been approved.

The McGill IRB wishes you and your colleagues every success in your research.

Sincerely,

Roberta Palmour, PhD
Chair
Institutional Review Board

cc: Homa Fathi
Dr. S. Baillet, Associate Dean Research
A05-B32-20B (20-05-041)

9-4 Appendix 4: The McGill IRB approval for continuation of study

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
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May 14, 2020

Dr. Christophe Bedos
Faculty of Dentistry
2001 avenue McGill-College
Montreal QC H3A 1G1

RE: IRB Review Number: A05-B32-20B (20-05-041)

Taking Dentistry to The Social Level: Are Quebec Dental Professionals Ready?

Dear Dr. Bedos,

Thank you for submitting the above-referenced study for an ethics review. This study was reviewed on behalf of your Master's student, Homa Fathi.

As this study involves no more than minimal risk, and in accordance with Articles 2.9 and 6.12 of the 2nd Edition of the Canadian Tri-Council Policy Statement of Ethical Conduct for Research Involving Humans (TCPS 2 2018) and U.S. Title 45 CFR 46, Section 110 (b), paragraph (1), we are pleased to inform you that approval for the study, study instruments and consent form (IRB dated May 8, 2020) was provided by an expedited/delegated review on 14-May-2020, valid until **13-May-2021**. The study proposal will be presented for corroborative approval at the next meeting of the Committee.

The Faculty of Medicine Institutional Review Board (IRB) is a registered University IRB working under the published guidelines of the Tri-Council Policy Statement 2, 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 (**FWA 00004545**). The IRB working procedures are consistent with internationally accepted principles of good clinical practice.

The Principal Investigator is required to immediately notify the Institutional Review Board Office, via amendment or progress report, of:

- Any significant changes to the research project and the reason for that change, including an indication of ethical implications (if any);
- Serious Adverse Effects experienced by participants and the action taken to address those effects;
- Any other unforeseen events or unanticipated developments that merit notification;
- The inability of the Principal Investigator to continue in her/his role, or any other change in research personnel involved in the project;

9-5 Appendix 5: The consent form

Title of the study: Taking Dentistry to The Social Level: Are Quebec Dental Professionals Ready?

Researchers:

Principal Investigator:

* Dr. Christophe Bedos, DDS, PhD, Associate Professor, McGill University, Faculty of Dentistry
* Dr. Jacqueline Rousseau, PhD, Professor, School of Rehabilitation, Université de Montréal

Student Investigator:

* Dr. Homa Fathi, DDS, McGill University, Faculty of Dentistry

Co-researcher:

* Dr Nora Makansi, DDS, PhD, Research Associate, McGill University, Faculty of Dentistry

Introduction:

We invite you to take part in our research project. Before you make a decision please read this consent form carefully: it describes the purpose of this study, the nature of your participation and highlights your rights. If you have any additional questions, please discuss with one of our researchers. You can also discuss with your colleagues and family members to get their advice. Participation in this study is voluntary. You can withdraw your consent at your will.

Study purpose:

This study aims at understanding your perspectives on a biopsychosocial model of dental practice: the Montreal-Toulouse model. According to this model, dentists should not only be person-centered on an individual level, but also try to understand and address the social causes of oral diseases.

Study procedure:

We anticipate conducting individual interviews with 12-15 dentists and 12-15 dental hygienists from the province of Quebec. Upon your agreement, the research procedure will follow as described below:

1- A student investigator (Homa Fathi) will interview you about your perspectives on the Montreal-Toulouse model.
2- To do so, you will both use Zoom, Facetime, or Skype, while both sitting in a quiet room.
3- Should the Covid-19 crisis lift, the interview could also take place in a quiet room at the Faculty of Dentistry, McGill University, or in a place of your choice, as long as it is quiet and allows a confidential discussion.
4- You will choose the interview time based on your convenience.
5- The interview will be in English and last approximately 60-90 minutes. If you find the interview too long, the interviewer will offer to split it in two parts at your convenience.
6- With your permission, the interview will be digitally recorded, transcribed and then analysed.
7- You will be free to ask the interviewer to stop recording if you feel uncomfortable or need a break.
8- You will be free to refrain from answering any questions that make you uncomfortable.

Potential risks and their mitigation strategies:

You will be exposed to little or no risk in this study, as all you will do is sharing your opinions and views on the Montreal-Toulouse model. The only potential risk is feeling uncomfortable about questions that may somewhat challenge the way you practice dentistry. Should this happen, you could ask the interviewer to skip the question or the subject, pause the interview or postpone it to another time. You could also withdraw your decision to participate at any point, whether before, during, or even after the interview.

Potential benefits:

Through your participation, you will have an opportunity to share your views and opinions on the study subject. On a broader scale, however, you will contribute to the development and the implementation of the Montreal-Toulouse model, a rather unstudied concept.

Confidentiality:

Your personal information will remain completely confidential, as the student investigator will replace your name with codes/numbers. In addition, she will omit any phrases/comments in the interview that could potentially disclose your identity.

Homa Fathi will delete the digital recordings from the cloud space of Zoom, Facetime or Skype immediately after the interview. She will transcribe the interview verbatim and analyse it later. All the digital recordings, written transcriptions and their later analysis will be stored on McGill University's OneDrive network (developed by Microsoft), which is password secured. All members of the research team will have access to this OneDrive file.

After the student investigator's graduation, the anonymized transcripts will be transferred to Dr. Christophe Bedos' OneDrive account. This database will be destroyed after seven years, according to the University's policy. Consent forms will be transferred to a locked filing cabinet in a designated secure location in McGill University, accessible only to Dr. Christophe Bedos. Should the student investigator paper-print the anonymized transcribts for analysis purposes, she would destroy them after the study is finalized; meanwhile, she would keep them in a locked cabinet at her house, accessible only to her.

The student investigator will use the results of this study to develop her master's thesis. These results will also be published in scientific journals and national/international conferences. This said, the anonymity of your information will be assured all the time using the measures mentioned before; therefore, the readers and conference attendees will not be able to recognize your identity.

Please be informed that a representative of the McGill Institutional Review Board, or a person designated by this Board, may access the study data to ascertain its ethical conduct.

Compensation:

You will not receive compensation for participating in this study.

Contact Information for questions about the study:

Dr. Homa Fathi: MSc Dental Science Student, McGill University, Faculty of Dentistry, 2001 Ave McGill College, Montreal, QC, H3A 1G1. Tel: 438-933-8416.

Email: Homa.fathi@mail.mcgill.ca

Dr. Christophe Bedos: Associate Professor, McGill University, Faculty of Dentistry, 2001 Ave McGill College, Montreal, QC, H3A 1G1. Tel: 514-398-7203 ext. 0129#

Email: christophe.bedos1@mcgill.ca

Contact information for questions about your legal rights:

For further questions or concerns regarding your rights or welfare as a participant in this study, you could contact:

- Ms. Ilde Lepore: Ethics Officer for the McGill Institutional Review Board, McGill University, Faculty of Medicine, McIntyre Building, #633-3655 Promenade Sir William Osler, Montreal, Quebec H3G 1Y6. Tel: (514) 398-8302.

Email: ilde.lepore@mcgill.ca

Please note that you could ask for a copy of this signed consent form.

CONSENT:

Please mark your choice in one of the following boxes:

I agree to be interviewed: YES ☐ NO ☐

I agree to be digitally recorded via zoom: YES ☐ NO ☐

Please confirm the following statement by signing in the blank space. You should know that by signing this consent form, you are not giving up any of your legal rights.

I have fully read and understood the information in this consent form. By signing this form, I agree to participate in the mentioned study under the conditions highlighted in above sections.

Name of the participant: ……. Date: ……

Signature of the participant: ……

Person who obtained consent: ……. Date: ……

Signature of person who obtained consent: ……