

March 31 2017
University of Manitoba
College of Dentistry

Perceptions and tendencies of Manitoba dentists in relation to
fearful patients and sedation

Final Report for the BSc Dent

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INTRODUCTION

A substantial and long-standing barrier to dental patients is dental fear (Smith *et al.*, 2003). Fear regarding dental appointments has been shown to affect 15.3% of Canadians (Chanpong *et al.*, 2005). Dental fear is a leading cause of missed, cancelled or avoided dental appointments in anxious patients (Chanpong *et al.*, 2005; Hakeberg *et al.*, 1992), which can lead to impaired oral health (Armfield *et al.*, 2007; Milgrom *et al.*, 2010; Schuller *et al.*, 2003). In dentistry, sedation is the alleviation of anxiety prior to or during appointments by administering sedative pharmaceuticals. Wider spread use of sedation could help overcome the barrier of fear and anxiety in dental patients (Chanpong *et al.*, 2005; Gordon *et al.*, 1998).

Boyle *et al.* (2009) determined that 100 consecutive new patients had been referred for sedation due to anxiety and concluded that “referring general practitioners are able to identify these patients.” However, the authors did not examine whether practitioners failed to refer fearful patients for sedation or how early in the patient-practitioner relationship such patients were typically referred. This is a general trend in the literature and an important gap to fill in future research. It is well-known that there is a great demand for sedation services and that sedation is generally being recommended to very fearful patients, but there is little known on how dentists assess dental fear in patients or select patients for sedation.

Although one study found that dental anxiety and dental appointment frequency did not improve with the use of nitrous oxide and intravenous sedation, there is a lack of information on when and how dentists offer sedation to their patients (Aartman *et al.*, 2000). In this same study, patients reported a reduction in anxiety following treatment with sedation. Additionally, there is evidence of a lack of communication or miscommunication between dentists and patients about dental fear and sedation. In a study by Allen *et al.* (2005), 19% of respondents were both highly anxious and unaware of the availability of conscious sedation in dentistry. Whether this is because practitioners are failing to identify anxious patients or whether practitioners are hesitant to offer sedation to anxious patients must be determined to address this underserved population.

The purpose of this study was to determine what signs in patients prompt dentists to offer sedation or otherwise manage dental fear and thereby determine why there is an unmet demand for sedation dentistry. Our hypotheses were that dentists are inconsistent in how to identify fearful or anxious patients and therefore failing to identify many of these patients and that dentists are offering sedation to a proportion of patients which falls below the demand reported in the literature. This would highlight a simple and inexpensive means of improving these patients’ oral health by raising public awareness of sedation options in dentistry and creating standard criteria for offering sedation. It may also be reason for change in the teaching approach to anesthesia and sedation and the management of fearful or anxious patients at the University of Manitoba’s College of Dentistry and possibly other Canadian dental schools.

METHODS

Participants

The target population was Manitoban general dentists currently practicing. The survey was submitted to the Bannatyne Research and Ethics Board and approved for distribution on August 13 2015 (expiry July 2 2016). An invitation to complete the survey was e-mailed by the Manitoba Dental Association (MDA) to all registered dentists. All responses were recorded anonymously in an electronic spreadsheet.

Materials

A survey in English was developed containing 16 items. Each item consisted of a stem question and answer sets of multiple choice, yes—no, or open-ended. The items pertained to how dentists recognize fearful patients, which patient circumstances prompt dentists to offer sedation, reasons for which patients may refuse sedation and the types of sedation available in dentists' own dental practices. The estimated time to complete the survey was 5-10 minutes. The key questions of this survey were:

1. How do you identify dental fear in your patients?
Please list each indicator on a separate line, up to 10 (may include explicit disclosure) (open ended)

4. What non-medicinal (i.e. behavioural) anxiolytic techniques do you employ with anxious or fearful patients"
 - Politeness and mindfulness of patient's apprehension
 - Minimizing cues/triggers for fear
 - Positive reinforcement
 - Familiarization ("tell-show-do")
 - Progressive muscle relaxation
 - Systematic desensitization or other exposure therapy
 - Flooding/Imagery flooding
 - Hypnosis
 - Other: _____

8. Approximately to what percentage of your current patients have you ever OFFERED sedation?
(open ended)

15. Would you offer sedation to a normal healthy patient under any of the following circumstances?
(multiple select)
 - Patient has mild-moderate dental fear and minimal caries or periodontal concerns
 - Patient has mild-moderate dental fear and mild-moderate caries and/or periodontal concerns
 - Patient has mild-moderate dental fear and moderate-severe caries and/or periodontal concerns
 - Patient has moderate-severe dental fear and minimal caries or periodontal concerns
 - Patient has moderate-severe dental fear and mild-moderate caries and/or periodontal concerns
 - Patient has moderate-severe dental fear and moderate-severe caries and/or periodontal concerns

Question 1 was left open-ended so that respondents did not have answers provided to them in order to gauge how confident and consistent dentists are in identifying fear and anxiety.

The full survey is included in the Appendix.

Procedure

The survey was sent to all MDA-registered dentists first on October 21st 2015 and again on December 18th 2015. 61 were received after the first send-out and 39 were received after the second send-out for a total of 100. 2 of these responses identified the respondents as dental specialists as opposed to general dentists and these were not included in this report.

Design

After collecting responses, the raw data for Question 1 was submitted to a categorization process. The identifiers of fear listed by respondents were grouped under 11 categories of Fear Indicators (FIs). Table 1 shows a description of each FI. Indicators were termed Vague if they did not refer to observable signs specific to fear or anxiety. For example, "crossed arms" is an observable sign of anxiety and would fall under Closed Posture, but "body language" is not specific to anxiety and would be termed Vague.

Table 1. Description of categories of Fear Indicators.

Fear Indicator (FI)	Abbreviation	Examples
Disclosure	D	"Listed question on health questionnaire," "They express it in the chair," "staff inform me the patient told them they were fearful"
Muscle Tenseness	MT	"white knuckle," "fidgety," "rigid extremities"
Overreactions	OV	"everything hurts," "they are 'jumpy,'" "they wince or tear up even though no pain stimulus"
Sympathetic Response	SR	"perspiring," "Pallor," "rapid heart rate"
Talkativeness (excessive/minimal)	T	"abnormally quiet," "talks quickly," "overly talkative"
Hostility	H	"Patient is angry, rude," "threaten doctor,"
Patient's Gaze (overactive/avoidant)	PG	"moving the head around to left and right following my every little movement," "lack of eye contact," "Patient looks away a lot"
Obstructiveness	OB	"won't open mouth," "Frequent bathroom breaks," "excessive suctioning to halt the procedure"
Closed Posture	P	"Crossed arms," "Closed body position,"
Evasiveness	E	"Long time between appointments," "Cancelled/missed appts." "Multiple no shows for appointments"
Vague	V	"Their attitude," "observation of physical state," "nervousness"

The frequency of each FI was calculated as a percentage of respondents.

The distributions of responses to multiple choice and yes—no questions were and described as percentages. The associations between FIs are represented by odds ratios calculated with 95% confidence intervals. Values of $P < 0.05$ were considered statistically significant. The odds ratios express the likelihood that a certain answer will be reported given that another certain answer was reported in the same respondent's survey. For example, if there is an odds ratio of 2 between FI(A) and FI(B), this means that a respondent who reported FI(A) is twice as likely to also report FI(B) as compared to someone who did not report FI(A).

RESULTS

The percentage of respondents who listed each FI are shown in Figure 1.

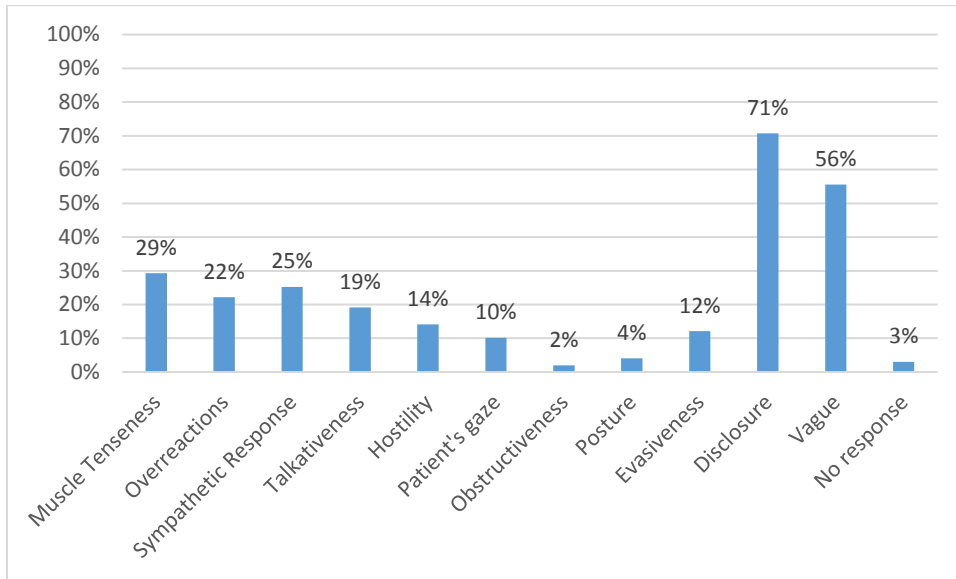


Figure 1. Frequency of Fear Indicators listed by respondents

The overall average number of non-Vague FIs listed was 2.2. The average was 1.7 for Vague respondents and 2.8 for non-Vague respondents, 1.6 times higher.

Disclosure was the most commonly listed FI as this requires the least in the way of interview skills, observational skills, or intuition. This was also the only indicator which was specifically prompted as an example in Survey Question 1, likely inflating the frequency with which this indicator appeared in responses. Disclosure was followed by Vague with 55.6% of respondents. The next closest was Muscle Tenseness with only 29.3% of respondents.

The odds ratios between pairs of FIs are shown in Table 2. Values which were statistically significant ($p < 0.05$) are bolded.

Table 2. Odds ratios with 95% confidence intervals for pairs of Fear Indicators (FIs) reported by respondents

	MT	OV	SR	T	H	PG	OB	P	E	D	V
MT	*	3.28 (1.2-8.8)	8.34 (3.0-23.0)	3.57 (1.3-10.1)	4.06 (1.3-13.1)	1.71 (0.4-6.6)	2.46 (0.1-40.8)	2.52 (0.3-18.8)	1.24 (0.3-4.5)	3.47 (1.1-11.1)	0.36 (0.1-0.9)
OV		*	2.64 (1.0-7.3)	4.64 (1.6-13.6)	4.67 (1.4-15.3)	0.86 (0.2-4.4)	3.62 (0.2-60.3)	3.75 (0.5-28.3)	2.94 (0.8-10.4)	1.60 (0.5-4.8)	0.26 (0.1-0.8)
SR			*	3.60 (1.3-10.3)	1.81 (0.5-6.0)	5.53 (1.4-21.6)	3.04 (0.2-50.5)	0.99 (0.1-9.9)	1.57 (0.4-5.7)	1.43 (0.5-4.0)	0.43 (0.2-1.1)
T				*	1.18 (0.3-4.7)	3.29 (0.8-13.1)		4.59 (0.6-34.9)	2.40 (0.6-9.0)	0.87 (0.3-2.6)	0.39 (0.1-1.1)
H					*	0.65 (0.1-5.6)		2.10 (0.2-21.8)	1.25 (0.2-6.4)	1.04 (0.3-3.6)	0.55 (0.2-1.7)
PG						*		0	0	0.96 (0.2-4.0)	0.30 (0.1-1.3)
OB							*		7.82 (0.5-134.1)	Div/0	0
P								*	2.55 (0.2-26.7)	1.25 (0.1-12.6)	0.73 (0.1-5.4)
E									*	0.56 (0.2-1.9)	1.14 (0.3-3.9)
D										*	0.28 (0.1-0.8)
V											*

Nearly every odds ratio involving Vague (including both statistically significant values) expressed a negative relationship with the other FI.

The following trios of FIs were found to be associated with one another: MT-O-H, MT-T-SR, MT-T-O. These are all concrete observable indicators of fear. Listing one of these FIs is predictive for listing more. In other words, practitioners who know to look for one of these FIs will most likely know to look for others. Muscle Tenseness was associated with the greatest number of other FIs, namely Overreactions, Sympathetic Response, Talkativeness, Hostility and Disclosure. All these statistically significant odds ratios with Muscle Tenseness are greater than 3, suggesting those dentists who do mention Muscle tenseness are at least 3-times more likely to also mention SR, T, H or D than a dentist not recognizing Muscle Tenseness a FI.

Figure 2 shows the percent respondents who employ each of the NMATs listed in Question 4 in order of increasing skill intensiveness, in other words, from least to most advanced. Regrettably, the authors overlooked “Distraction” as an NMAT. As this was not included in the given options, only 6 respondents reported using this technique under “Other”. This was presumed not to be representative of the actual prevalence of this practice and so it was not included or discussed in this paper.

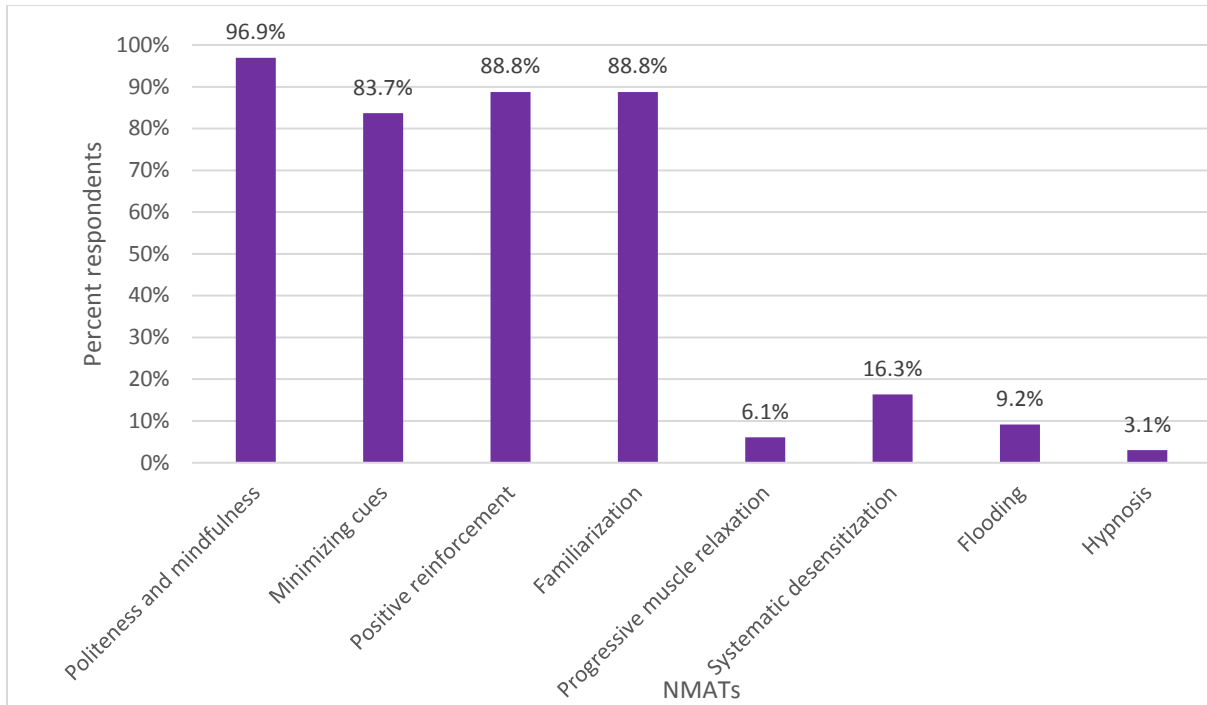


Figure 2. Proportion of dentists who utilize given non-medical anxiety techniques (NMATs) in practice

Note the marked drop off from “Familiarization” to “Progressive muscle relaxation.” The large majority of dentists are using the 4 less advanced techniques on the left whereas only a small minority of dentists are using the more advanced techniques listed on the right. In accordance with the above data, the NMATs were divided into 2 categories: Basic NMATs, which includes Politeness and mindfulness, Minimizing cues, Positive reinforcement, and Familiarization, and Advanced NMATs, which includes Progressive muscle relaxation, Systematic desensitization, Flooding, and Hypnosis

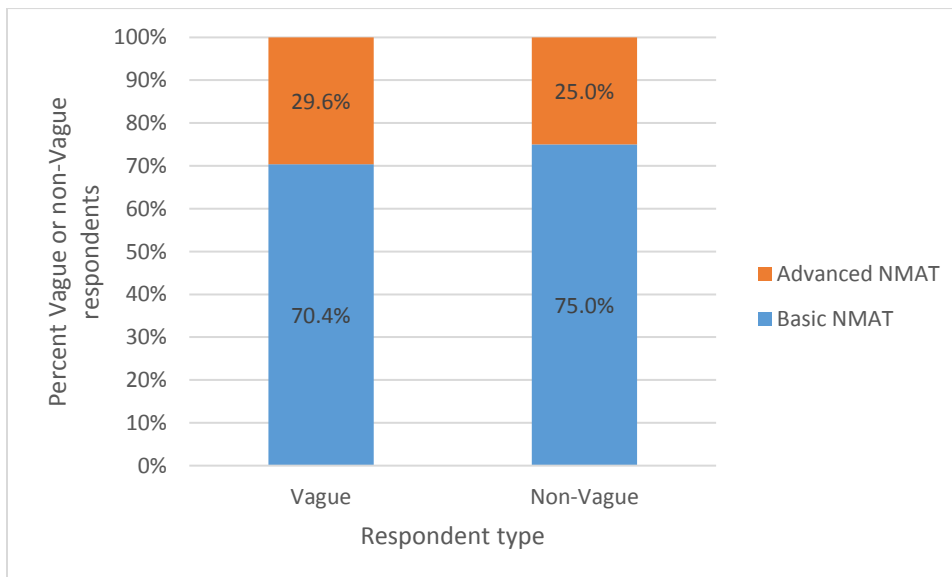


Figure 3. Distribution of the most advanced NMAT used by Vague and Non-Vague respondents

Figure 3. shows that Vague respondents use Advanced NMATs in a slightly greater proportion than non-Vague respondents by 4.6%.

On average, dentists reported that they had offered sedation to 12.6% with a standard deviation of 23.4% of their patients, indicating the responses varied widely. Note that this referred to sedation for any reason, not only dental fear. Vague respondents offer sedation to 8.0% of patients on average. Non-Vague respondents offer to 18.5% on average, more than double.

Table 3. Relative likelihood of offering sedation for given treatment needs and level of fear

Level of fear	Treatment needs		
	Minimal	Mild-moderate	Moderate-severe
Mild-moderate	18.2%	25.3%	44.4%
Moderate-severe	44.4%	55.6%	73.7%

Table 3 shows the percentage of respondents who would offer sedation in six scenarios. The scenarios describe circumstances involving varying levels of fear, ranging from mild to severe, and varying treatment needs, ranging from minimal to severe. Moderate-severe fear and mild-moderate treatment needs was the point at which respondents who would offer sedation reaches a little over half at 55.6%. This serves as an indication of the “median” dentist’s threshold for offering sedation.

Figure 4 shows the percent respondents who offer each type of sedation in their practice. 80% of dentists offer oral sedation, while less than 20% offer nitrous oxide, IV sedation and/or general anesthetic.

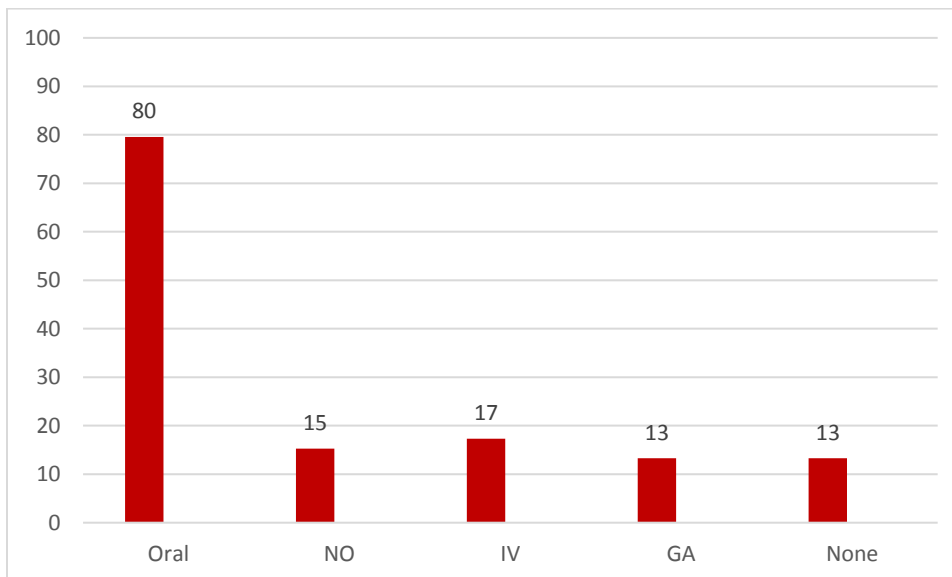


Figure 4. Proportion of dental practices offering different types of sedation

Figure 5 shows how commonly respondents reported one of the reasons listed as the main reason for which patients refuse sedation. Cost was the most commonly listed reason at 52%, the next most common reason being that they feel sedation is too risky at 23%.

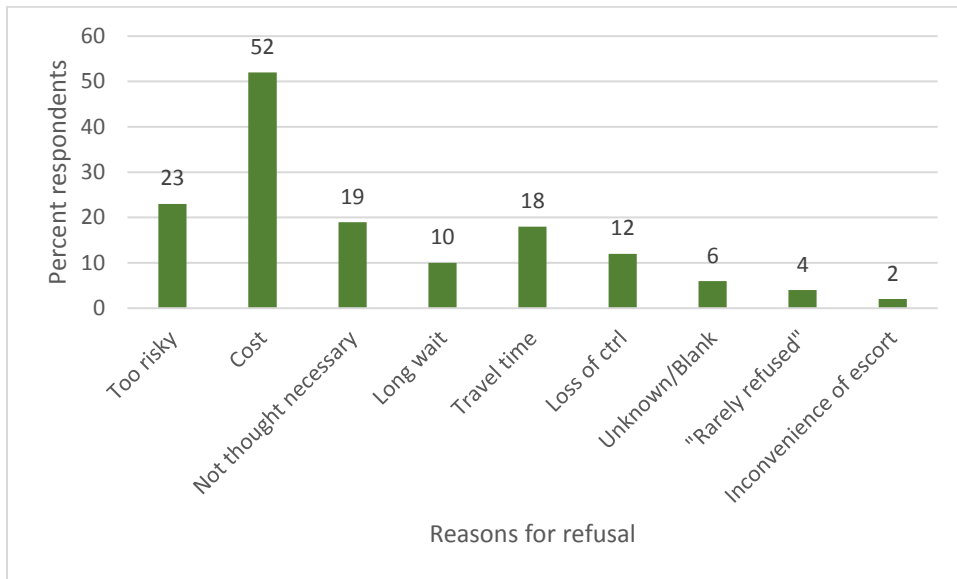


Figure 5. Reasons patients refuse sedation by frequency

When asked if they would be comfortable offering sedation to more patients than they presently do, 13 respondents answered "Not at all," 33 answered less than 5% more, 14 answered 5-15% more, 4 answered 25-50% more, 4 answered 50-100% more, and 2 answered over 3 times more. The average here is between <5% and 5-15%, and the median dentist answered <5% more.

DISCUSSION

The purpose of this study is to determine whether sedation can be better used to improve the oral health of those with dental fear or anxiety. A Canadian survey found that 7.6% of respondents had avoided dental visits due to fear or anxiety (Chanpong *et al.*, 2005). Unfortunately, survey Question 9 in this study which specifically asked about prescribing sedation for dental fear was largely misunderstood by respondents and could not be included in this analysis. Our data does reveal that the average dentist is offering sedation (for any reason) to 12.6% of patients. It also indicates that the median dentist is only willing to offer sedation to less than 5% more patients as shown in Table 3. This does not match the reported 7.6% who are not being well managed by NMATs or sedation, not to mention the 42.3% of Canadians who would be interested in sedation depending on cost and should at least be having a conversation with their dentist about sedation dentistry (Chanpong *et al.*, 2005). We also know that dentists are very inconsistent in how they prescribe sedation since the standard deviation on the 12.6% figure was 23.4%. Dentists' personal preferences, years of clinical experience, patient pool, etc. likely contribute to this variability, but perhaps the development of a systematic approach to patient selection for sedation would help to achieve more consistent and diligent use of sedation in anxious and fearful patients.

As stated previously, Question 1 was left open-ended to gauge how confident and consistent dentists are in identifying anxious patients. Vague FIs suggest that these respondents do not have the signs of anxiety on the tips of their fingers, and therefore are likely not noticing such signs and overlooking dental fear or anxiety in patients. Respondents listed 2.2 FIs on average although fear and anxiety manifests themselves in a much wider variety of signs (Weiner 2011, p. 7-8). Non-Vague respondents listed 1.6 times more FIs than Vague respondents. The odds ratios for Vague FIs were also negatively associated with non-Vague indicators. This supports the presumption that Vague respondents, 55.6% of this population sample, are less adept at identifying fear and anxiety, although even non-Vague respondents listed less than 3 FIs on average. This and the fact that responses varied so greatly indicates that there is less than ideal competency and consistency among Manitoban dentists in identifying fearful or anxious patients.

It may be that experienced practitioners identify anxious patients by intuition, and find it difficult to define or quantify any signs these patients exhibit. However, Vague respondents are offering sedation to less than half as many patients as non-Vague respondents. Although 4.6% more Vague respondents reported using Advanced NMATs, it is not enough to balance the huge discrepancy in the prescription of sedation. Their lower usage of sedation is likely because they are not identifying as many fearful or anxious patients, and therefore do not offer sedation to these undiagnosed patients.

We have highlighted some potential ways to improve in this respect. First, since Disclosure is the method on which practitioners most commonly rely, it is important for dentists to *prompt* all new patients to disclose any dental fear or anxiety. Second, as the third most commonly listed FI and the most strongly associated with other indicators, Muscle Tenseness may serve as a good starting point for teaching purposes and for practitioners trying to improve their ability to identify fearful patients.

Cost was the most commonly reported reason for patient refusal of sedation at 52%. For patients with third party insurance from an employer, with Employment Insurance, with Income Assistance, or with Pharmacare coverage, oral sedation could serve as a good low- to no-out-of-pocket-cost sedation option. 80% of respondents reported already using oral sedation in their practice. It does not require any additional training, certification, or special equipment and so can be prescribed by any

general practitioner. Oral sedation is also the safest modality, especially if titrated systematically, starting at 0.5mg Lorazepam for the first appointment for example, and increasing the dose by 0.5mg increments until the desired level of sedation is achieved, which also addresses 3 of the next most common reasons for refusal – risk, long wait time, and travel time (Dionne *et al* 2006).

There were many different iterations of Question 15 before the survey was distributed. The goal with this question was to determine the point on a sliding scale of fear and treatment invasiveness where dentists typically offer sedation. The final iteration was still rather confusing and yielded noisy data from the fact that it did not ask only for the threshold point but all points where respondents would offer sedation. As such, it is not as clear an indication of the threshold for the “median” dentist. Perhaps asking something like “What is the lowest level of fear and treatment needs for which you would offer sedation to a patient?” might have yielded data with less noise, although this style of leading question might cause respondents to report offering sedation more readily than in reality. It would also have been more useful to separate fear and treatment needs by mild, moderate, and severe, rather than mild-moderate and moderate-severe, though this would have complicated the answer set even further.

Another problem with our results is that no definitions of mild, moderate or severe fear were provided to respondents to provide calibrated answers to Question 15. Many different assessment tools exist for this purpose and one should have been included alongside Question 15 for reference, such as Milgrom’s anxiety scale (2010):

“How do you rate your own feelings toward dental treatment?”

- 1 – not at all afraid
- 2 – a little afraid
- 3 – somewhat afraid
- 4 – very afraid
- 5 – terrified

Examples of procedures which would fall under each of minimal, moderate and severe treatment needs should also have been provided. As it were, it was left up to respondents’ judgment to define these terms and likely added to the variability of responses.

Designing and distributing the survey before deciding on the statistical analysis to be done was a regrettable oversight and limits the strength of the conclusions drawn from this study. Nevertheless, no such study has been published to date, and as an exploratory study, this provides us some insight on general trends in how Manitoban dentists manage fearful or anxious patients. Respondents are widely inconsistent in how they identify fear and anxiety. Respondents are widely inconsistent and, on average, overly conservative in prescribing sedation. Patients are not aware of oral sedation as a low-cost sedation option. This suggests that dentists are inadequately vigilant in identifying patients who would benefit from sedation and NMATs. These issues must be further investigated and addressed to better serve the anxious and fearful dental patients who are caught in a vicious cycle of worsening oral health and worsening dental anxiety and fear. Of course reaching this population would also help dentists to retain patients and build their practice.

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APPENDIX

Perceptions and tendencies of Manitoba dentists in relation to fearful patients and sedation

Dear Survey Participant,

Thank you for accessing this online survey. My name is Stephani Cooney. I am a dental student at the University of Manitoba conducting a survey as part of a research project for my Bachelor of Science in Dentistry to assess how dentists approach sedation dentistry for patients with dental fear in Manitoba. It is important to know how dentists like yourself identify and manage fearful patients to determine whether wider spread use of sedation as therapy for dental fear could improve these patients' oral health.

Dentists in a variety of dental offices are being asked to complete the following short survey which will ask you a series of questions. The survey takes approximately 5 minutes to complete. The survey is not intended to test your knowledge and there are no right or wrong answers. No personal information is required and you don't have to answer any questions you don't want to. There are no foreseeable risks to survey participants or their patients.

Your participation in this online survey is completely voluntary. You may refuse to participate or withdraw at any time. This is an anonymous and confidential study. The survey system will not record your e-mail address or IP address. Please note that when you submit your responses, you will not be able to withdraw them as we cannot link the survey responses back to you.

Your participation and insight is essential to the success of this project and is greatly appreciated.

If you have any questions about this survey study, please do not hesitate to e-mail me at cooneysr@myumanitoba.ca.

By continuing on and completing the online survey you are consenting to participate in this study.

Version date - June 26 2015

In this survey, "sedation" refers to any kind of sedation method, including oral, inhalation, intravenous, and referrals for sedation, unless otherwise specified

1. How do you identify dental fear in your patients?

Please list each indicator on a separate line, up to 10 (may include explicit disclosure)

2. Has a patient's dental fear ever been brought to your attention by a dental hygienist, a dental assistant, or another dentist?

Mark only one oval.

- Yes
- No (proceed to Question 4)

3. Approximately what percentage of your current fearful patients were identified as such by a dental hygienist, a dental assistant, or another dentist?

4. What non-medical (i.e. behavioural) anxiolytic techniques do you employ with anxious or fearful patients?

Select all that apply

- Minimizing cues/triggers for fear
- Positive reinforcement
- Familiarization ("tell-show-do")
- Progressive muscle relaxation
- Systematic desensitization or other exposure therapy
- Flooding/Imagery flooding
- Hypnosis
- Other:

5. What kind of sedation do you offer in your dental practice?

Select all that apply

- Oral
- Nitrous oxide
- Intravenous
- General anaesthesia
- Other:

6. What kind of sedation do you prescribe most often?

Mark only one oval.

- Oral
- Nitrous oxide
- Oral sedation combined with nitrous oxide
- Intravenous
- General anesthesia
- Other:

7. What are the circumstances which prompt you to offer the sedation modality from Question 6?

Select all that apply

- Patient preference of this modality
- Mild to moderate dental fear
- Moderate to severe dental fear
- Basic preventative/restorative treatment required
- Endodontic treatment required
- Other major restorative treatment is required
- Other:

8. Approximately to what percentage of your current patients have you ever OFFERED sedation?

9. How often was sedation offered due to dental fear?

Please express as a percentage of patients offered sedation

10. Have you ever referred a patient for sedation dentistry?

Mark only one oval.

- Yes
- No (proceed to Question 12)

11. Approximately how many patients have you referred for sedation dentistry?

Mark only one oval.

- One patient
- 2-5 patients
- 5-10 patients
- One patient per year
- 2-5 patients per year
- 5-10 patients per year
- Other:

12. What would you say is the main reason that most patients will refuse sedation?

- Too much risk or fear
- Cost
- Not perceived as necessary
- Long wait time (in case of referral)
- Travel distance or travel time (in case of referral)
- Feeling of loss of control
- Other:

13. Do you notice a change in frequency of appointments with patients who undergo sedation?

Mark only one oval.

- Decreased frequency
- No change in frequency
- Slightly increased frequency (1-1.5X)
- Moderately increased frequency (1.5-2X)
- Greatly increased frequency (2X or more)
- Other:

14. Given appropriate circumstances, would you be comfortable offering sedation to more patients than you presently do?

Mark only one oval.

- Not at all

- Maybe, less than 5% more
- Yes, 5-15% more
- Yes, 15-25% more
- Yes, 25-50% more
- Yes, 50-100% more
- Yes, 2-3 times more
- Yes, over 3 times more

15. Would you offer sedation to a normal healthy patient under any of the following circumstances?

Select all that apply

- Patient has mild-moderate dental fear and minimal caries or periodontal concerns
- Patient has mild-moderate dental fear and mild-moderate caries and/or periodontal concerns
- Patient has mild-moderate dental fear and moderate-severe caries and/or periodontal concerns
- Patient has moderate-severe dental fear and minimal caries or periodontal concerns
- Patient has moderate-severe dental fear and mild-moderate caries and/or periodontal concerns
- Patient has moderate-severe dental fear and moderate-severe caries and/or periodontal concerns

16. OPTIONAL - In what area(s) of Winnipeg or Manitoba do you practice?

Version date - August 5 2015