PRACTICING DENTAL HYGIENISTS’ KNOWLEDGE, ATTITUDES AND COMFORT LEVEL IN TREATING PATIENTS WITH DENTAL ANXIETY

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A thesis submitted to the faculty at the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Science in Dental Hygiene Education in the Department of Dental Ecology in the School of Dentistry.

Chapel Hill
2017

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ABSTRACT

(Under the direction of Rebecca Wilder)

**Background:** Dental anxiety is ranked the 5th most common general population fear. It is a common cause of delayed care, resulting in worsened oral health-related quality of life. The purpose of this study was to assess knowledge on how anxiety affects patients’ responses to preventive treatment, assess confidence with anxiety patients, assess attitudes regarding utilizing dental anxiety management, and their opinions on the dental hygiene curriculum regarding treatment of anxiety patients. **Methods:** A paper-based research survey was distributed at the Annual Dental Hygiene CE course in 2016. The survey was developed by investigators and tested for validity. **Results:** One-hundred and fifty-three of the participants met the inclusion criteria. Considering participants’ confidence levels, 92.1% were confident in their ability to perceive stress in patients. Only 21.7% said their dental hygiene education prepared them for treating severe anxiety patients. **Conclusion:** Dental hygiene programs should incorporate anxiety management content for dental anxiety patients.
ACKNOWLEDGEMENTS

To complete this thesis, it has required the collaboration and support of several individuals. I would like to thank Professor Rebecca Wilder for her wisdom, encouragement, time and commitment in helping me succeed with my research thesis; Dr. Margot Stein and Professor Lynne Hunt for their knowledge and expertise on the subject of dental anxiety. I want to thank Dr. Ceib Phillips for her statistical contributions and data management expertise. Your advice has been invaluable and I am forever grateful for the opportunity.

To my friends and classmates, who have encouraged me for the past two years. To my friend who graduated before me: Beth; your wisdom, constant helpful advice, and encouragement to go above and beyond has enabled me to successfully complete this program.

To my mother and father, thank you for supporting me in spirit to achieve this goal. My mother, who has always listened to my troubles when it felt as though I would never reach this point, I cannot tell you enough how invaluable your guidance has been to me.
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>ADA</td>
<td>American Dental Association</td>
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<tr>
<td>ADHA</td>
<td>American Dental Hygienists’ Association</td>
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<td>CBT</td>
<td>Cognitive Behavioral Therapy</td>
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<td>CDT</td>
<td>Current Dental Terminology</td>
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<td>CODA</td>
<td>Commission on Dental Accreditation</td>
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<td>DAS</td>
<td>Dental Anxiety Scale</td>
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<td>DFS</td>
<td>Dental Fear Survey</td>
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<td>DMFS</td>
<td>Decayed, Missing, Filled Surfaces</td>
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<td>MDAS</td>
<td>Modified Dental Anxiety Scale</td>
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<td>OHIP</td>
<td>Oral Health Impact Profile</td>
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<td>UNC</td>
<td>University of North Carolina</td>
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CHAPTER I: INTRODUCTION

According to the Surgeon General’s Report released in 2000, the majority of Americans have common characteristics of periodontal disease (Chapter 4 63). Unfortunately, less than two-thirds of these adults have reported visiting the dentist within the last year (Chapter 4 63). There are several reasons for this, with one of the most common reasons is experiencing anxiety about dental treatment.

Dental anxiety, or feeling stressed or uneasy of the thought of dental treatment, is a multifaceted disorder that involves the patient’s somatic, cognitive, and emotional behavior responses (Gordan 374, Guzeldemir 2248, Colgate 1). Common physiological symptoms of dental anxiety include shortness of breath, racing heartbeat, insomnia, nausea, trembling, and dizziness (Gordan 373). The severity of dental anxiety is related to the patient’s demographical characteristics, such as their gender, age, amount of education obtained, income, and overall oral health (Gordan 373). There are countless dental problems involved in dental anxiety, related to the avoidance or postponement of treatment. Research has reported links to fewer restorations, higher rates of edentulism, increased tooth decay, tendency to have more severe treatment needs, and insufficient oral health and oral health-related quality of life in patients with dental anxiety (Gordan 373, Hmud 70, Newton 1453, Gisler e294). Dental providers will oftentimes use “anxiety” and “phobia” interchangeably to patients who present with dental fear. Although dental anxiety and dental phobia are both very common, they are actually two separate conditions (Colgate 1). A patient with dental anxiety feels stressed or uneasy being in the dental chair (Colgate 1). Sometimes, however, the mere thought of a dental procedure to a patient with
dental phobia is enough to make them avoid dental treatment (Colgate 1). Dental phobia is a more serious condition and can lead to a higher risk of gingivitis, premature bone loss, and other serious conditions (Colgate 1).

In the United States, 60-80% of adults have experienced some level of fearfulness before having dental treatment, 4-31% suffer from a specific type of dental anxiety; and, the remaining 5% of the adult population are so fearful they avoid dental treatment altogether (Gordan 371, Hmud 72, Newton 1453, Gilser e295, Armfield 394). It is important for the dental provider to be able to identify this condition in order to recommend and provide the best treatment. Because dental anxiety appears to be a common occurrence in the dental office, dental hygienists need to be properly trained to recognize the symptoms as well as the possible causes and treatment options available. Unfortunately, the current adoption of dental anxiety treatment in clinical dental practices is extremely limited (Gordan 372). In order for anxiety treatment to improve, there will need to be a substantial change in provider treatment knowledge and implementation.

Currently there is no identified published research that has investigated the knowledge level, attitudes, and comfort level of dental hygienists in treating patients with dental anxiety. Because of the prevalence of dental anxiety and its effect on the oral health status of patients, dental hygienists should be trained in screening, treatment and referral options for this condition. The purpose of this study was to identify the knowledge, attitudes, and comfort level of practicing dental hygienists regarding the treatment of patients with dental anxiety.
CHAPTER II: REVIEW OF THE LITERATURE

Dental Anxiety

Patients that have dental anxiety believe that something wrong is going to happen during a dental procedure (Gezeldemir 2251). Dental anxiety has been found to be commonly related to patients’ demographic characteristics, such as their gender, age, amount of education obtained, socioeconomic status, and their overall oral health status (Gordan 374). It has also been associated with fewer restorations, a higher rate of edentulism, increased tooth decay, a tendency to have more severe treatment needs, and an insufficient oral health and oral health-related quality of life due to avoidance or postponement of treatment (Gordan 374, Hmud 70, Newton 1453, Gisler e294). When anxious patients receive dental treatment, they are more likely to overestimate the pain that they will feel prior to the appointment as well as overestimate the pain experienced after the dental procedure (Hmud 73, Diercke 1527). Providing treatment to a patient with dental anxiety is extremely stressful for clinicians as well (Armfield 393). For example, KB Hill found that over 45% of providers want additional training, with a special focus on psychological treatment methods (Hill 3). The relationship between anxiety and pain perception is very applicable to dental hygiene providers and proper care for dental anxiety is needed in retaining these challenging patients (Armfield 393). Knowledge concerning the prevalence within the population and considerable effects on oral health status is vital for dental hygienists to be able to identify the classic characteristics of a patient with dental anxiety in addition to treating the patient’s condition.
Being able to identify the difference between fear, anxiety, and phobia is the first step in understanding the anxious patient. Fear is the response to a known danger (Rubin 647, Gow 38, Skaret 3). Fear is a natural reaction that the body creates to help the mind comprehend and protect itself from harm (Hoem 3). Anxiety, is the response to the unknown that is perceived to be something dangerous (Rubin 647, Gow 38, Skaret 2). Anxiety is similar to fear in the way that it responds to a stimulus, but the differences between them is in the nature of the stimulus that triggers the response (Hoem 3). Dental phobia, or odontophobia, is the persistent, unrealistic, and extreme fear of a specific stimulus (Gow 38, Skaret 3). Patients struggling with odontophobia go out of their way to avoid dental treatment until they are in an emergency situation (Rubin 647, Leischner 250, Carter 642). Unlike the other forms of dental anxiety, phobia is classified and diagnosed by a psychologist or psychiatrist (Hoem 4). The line of distinction between severe anxiety and mild phobia is not well delineated (Rubin 647).

The constructs within dental anxiety can be separated into three additional types: mild, moderate and severe. A patient with mild dental anxiety senses within themselves that something is different and it needs further attention (Leischner 243). Oftentimes for these patients, mild anxiety is associated with everyday functioning (Unit3 219). Moderate dental anxiety is when the patient can only focus on what is happening to them in that moment (Unit3 219). They frequently have a disturbing feeling that something is definitely not right, but can still learn and process new information (Leischner 243). Severe dental anxiety can be described as a patient having a significant reduction in their perceptional ability (Leischner 243, Unit3 219). With patients experiencing various levels of dental anxiety, it is very important to know the common characteristics that are associated with each type mentioned above.
Characteristics and Management of Dental Anxiety

There are multiple contributing factors that make a patient more susceptible to dental anxiety procuration. According to Jason Armfield, approximately one out of every three adult women will become anxious before, during or after dental treatment (390). Although the prevalence of dental anxiety is reported to decline with age, V Gisler found that older men are much more likely to be fearful of dental visits than younger men (291). The JM Armfield and colleagues found that traumatic dental experiences during childhood, family or media influences, certain psychological conditions, higher generalized level of fear, low income, poor oral health literacy, and a deficient perception on one’s oral health status have been associated with dental anxiety (Hmud 66, Armfield 402, Diercke 1526, Sohn 61). Raghad Hmud and colleagues found that pre-procedural anxiety can develop hours or even days before the appointment and it has been associated with higher levels of pain experienced during the appointment, during tooth pulp stimulation, after oral surgery, and after the dental appointment (Hmud 43, Diercke 1526, Glaesmer e1113). K Diercke also reported that heightened anxiety during an appointment can result in delayed wound healing, more severe oral inflammatory diseases, and is considered to be a contributing factor of oral lichen planus (1526). Adults who are considered to have higher levels of dental anxiety are 30% less likely to visit the dentist regularly and avoid any additional dental procedures until emergency treatment is needed (Sohn 63). Raghad Hmud found that avoidance of dental treatment increased the susceptibility of caries morbidity and DMFS scores, decreased the amount of restored teeth, and patients with anxiety were missing significantly more teeth than patients without dental anxiety (66). In the dental chair, these patients typically appear to be irritable, uncooperative, have higher blood pressure, experience a heightened pain sensitivity, impaired social or cognitive function ability, and provide negative commentary (Gordan 374, Hmud 66). Patients with dental anxiety can also become fearful or cry without
warning, become aggressive, have a greater chance of being self-medicated, and will frequently cancelling, delaying, or rescheduling appointments (Rubin 64, Gow 38). In addition to these findings, Raghad Hmud found that these patients are more self-conscious and critical of the overall aesthetic appearance of their dentition. They also found that these patients will also have heightened expectations of procedures performed during their dental visit (6). Although these characteristic commonalities of a dentally-anxious patient are seen in the vast majority, they are not always found in every patient. These characteristics, however, can be effectively utilized as a guide when trying to determine if a patient has undiagnosed dental anxiety.

**The Role of the Dental Hygienist in the Dental Office**

The American Dental Hygienist Association (ADHA) defines the dental hygiene profession as, “The science and practice of recognition, prevention and treatment of oral diseases and conditions as an integral component of total health” (Bowen 6). The dental hygienists’ overall mission is to further progress the dental hygiene profession by providing access to oral health care, promote more cost-effective ways of receiving care, advocating high standards or oral health education, licensure and practice, and being a dental hygiene model representative (Bowen 7). Standard four of the “Standards for Clinical Dental Hygiene Practice” that was published by the ADHA states that, “Care should be delivered in a manner that minimizes risk; optimizes oral health; and recognizes issues related to patient comfort including pain, fear, and/or anxiety” (ADHA 32). Through this implementation standard, the dental hygienist can sustain a therapeutic and ethically sound relationship with the patient, including patients with dental anxiety (ADHA 32). In order for dental hygienists to meet the standards of our profession’s mission statement, they need to be able to effectively treat and educate various types of patients, including patients with dental anxiety.
How Dental Anxiety Plays a Role in Dental Hygiene

Not only does dental anxiety negatively affect the patient, it also impacts the dental health provider. A 2010 study identified types of occupational stressors to dental hygienists (Sanders 461). The results found that dental hygienists feel anxiety due to dental hygiene treatment causing sensitivity in patients and it is an occupational stressor for the clinicians. Significant positive correlations were found among hygienists that felt badly about inflicting any discomfort during the patient’s dental hygiene appointment (Sanders 461). The reported muscle tension that dental hygienists developed from treating patients with dental anxiety also was correlated to personal psychological, interpersonal, and vocational strain (Sanders 461).

Dental Hygienists are healthcare providers whose main goal is to promote total health through prevention of disease; this includes prevention of dental anxiety. Deborah Hofer reported that approximately one-third of their patient sample reported substantial pre-treatment anxiety while waiting for their dental hygiene recall appointment (4). The results of the study conclude that aside from age, gingivitis was the only pre-existing factor found to be related to increased dental anxiety in patients (Hofer 3). In a similar study, patients that scored higher on the Modified Dental Anxiety Scale (MDAS) had a higher calculus index than those with a lower score (Kanaffa-Kilijanska 226). Of the preventive procedures that dental hygienists do on a daily basis, the most painful procedure that resulted in the highest levels of dental anxiety was periodontal probing and scaling (Tripp 344). When asked about who is to be feared the most in the dental office, results showed that patients have a tendency to fear dentists more than dental hygienists (Ohm 209).

One important way that a dental hygienist can help a patient who is possibly experiencing some of the symptoms of dental anxiety is to utilize a dental anxiety questionnaire. There are several types that can be used, by the most common are: Corah’s Dental Anxiety Scale (DAS),
Modified Dental Anxiety Scale (MDAS), Oral Health Impact Profile (OHIP), and Kleinknecht’s Dental Fear Survey (DFS). The DAS was designed to measure dental fear and comprises of four questions with a five-scale answering system (Corah 596, Corah 817). The first question asks what would a patients’ feelings be if they had to go to the dentist tomorrow; the second question asks what a patients’ feelings be if they were waiting in the dental lobby about to get their teeth worked on; the third question asks what the patients’ feelings might be like if they were waiting in the dental chair to get a dental procedure done that involved using a drill; the fourth and final question asks the patient what their feelings would be if they were waiting in the dental chair for the dental hygienist to start cleaning their teeth (Corah 596, Corah 817). The DAS was tested for reliability and validity by the Corah et al. study in 1978 (Corah 817). The MDAS is extremely similar to the DAS, only it includes a fifth question on local anesthesia (Humphris 369). The MDAS also asks the patient questions about sitting in the waiting room, having their teeth scaled and polished, and have a “tooth drill” used on their teeth (Humphris 369). The OHIP is more complicated than the first two previously mentioned (Kleinknecht 846). OHIP is a scaled index that shows the social impact that oral disorders can have on the overall body (Kleinknecht 846). The OHIP contains a forty-nine item measure of oral health related quality of life that measures patients’ perceptions of the outcomes of their oral disorders on their overall well-being (Kleinknecht 846). And lastly, the DFS asks patients to rate their anxieties on twenty-seven specific situations on a five-point Likert scale (Slade 9). Within these twenty-seven situations, there are three main dimensions that emerge, which are: avoidance of dental treatment, somatic symptoms of anxiety, and anxiety caused by dental stimuli (Andersson 880). R Kleinknecht reported reliability and validity of the DFS through their study (846). One questionnaire form that is intended for patients with dental hygiene anxiety is the Dental Hygiene Anxiety Scale
(DHAS) (Kleinknecht 846). The DHAS contains a four-item test that adds up to a score range between four and twenty, with twenty being extreme fearfulness of dental anxiety procedures (Andersson 880). Zuhal Yetkin Ay utilized the DHAS scale during their study to test its reliability and validity and concluded that more women experience dental hygiene anxiety than males (192). None of the five questionnaires can guarantee to identify every patient that is suffering from some form of dental anxiety, but they can help the dental hygienist to understand the patient’s needs more clearly.

Almost 70% of all dentists in the United States believe that treating a patient with dental anxiety is an arduous challenge to their everyday practice (Hmud 46). Attempting to provide treatment for a patient with dental anxiety is a cause of extensive physical, mental and emotional stress for 91% of dental providers (Armfield 393, Hill 4). According to K Dierke, 95% of American dentists’ credit dental anxiety to either “strongly” or “very strongly” affecting the patient’s level of pain perception (1527). Twenty percent of American dentists also believe that the success of wound healing can be estimated by the level of anxiety that the patient exhibits (Diercke 1527). Although Armfield et al. considers it the responsibility of the dental healthcare professional to provide complete care to an anxious patient, KB Hill and colleagues found that 65% of dentists believe that what was taught in dental school was far below competency and do not feel as though they are adequately prepared to treat patients with dental anxiety (Armfield 393, Hill 3). KB Hill reported that 53% of dentists said that they were “dissatisfied” or “very dissatisfied” with the quality of care that they were giving to their patients with dental anxiety (Hill 3).

Unfortunately, there are limited opportunities given within dental and dental hygiene programs to gain clinical experience in identifying, assessing, and utilizing effective treatment
measures on fearful patients (Hill 2). Forty-six percent of dentists from the KB Hill study indicated their interest in further training and believed that psychological treatment approaches could be proven successful in treating patients with dental anxiety (3). With 85% of dentists from the Hill et al. study understanding their responsibility to treat all types of dental anxiety, it is critical to provide clinicians with multiple approaches to provide care to this population (Hill 3).

A study performed by DM King sought to determine the type and amount of instruction on behavioral management of anxious patients that was being taught in the dental hygiene curriculum, any instructional differences between the associate and baccalaureate programs, and the opinions of the educators regarding behavioral management (285). The results of the study found that 86% of the dental hygiene programs that were surveyed taught some form of anxiety management to their students (King 285). The most commonly taught dental anxiety management strategies were: informational provision (96%), distraction (51%), modeling (51%), relaxation (62%), and hypnosis (7%) (King 285). There were not any significant relationships found between the dental hygiene student having their associates or baccalaureate degrees in relation to their type of anxiety method instruction, but the baccalaureate degree programs spent more time teaching the material (King 285). The study concluded that even though the majority of dental hygiene educators felt as though they knew how to teach dental anxiety management methods to their students, only 28% had actually received any sort of education on the topic.

**Approaches for Clinicians When Treating Patients with Dental Anxiety**

Having anxiety towards dental treatment is both a challenge for the patient as well as for the dental clinician. Fortunately, there are several forms of treatment that can help lessen or negate dental anxiety challenges. First, it very important that the clinician is able to understand the reasoning behind a patient’s dental anxiety. There are two types of anxiety that all other types
stem from; trait and state anxiety. Trait anxiety refers to a patient whose personal characteristics lead them to be more anxiety-prone in nature.\textsuperscript{24,36} State anxiety refers to a patient who expresses the immediate sense of anxiousness without prior acknowledgement.\textsuperscript{24,36} Knowing the difference between these two categories can help the dental hygiene clinician better understand and alter treatment for a patient with dental anxiety.

The next crucial step is being able to identify a patient exhibiting the classic signs that are associated with each type of dental anxiety (Armfield 398). Then the clinician and patient can agree on the appropriate method of dental anxiety treatment and management of care. There are several different types of techniques that can be used with variation in success, depending on the severity of the disease (i.e. mild anxiety vs. severe anxiety). Identifying the different levels of dental anxiety in a patient will precept what treatment methods should be utilized (Armfield 398).

In general when one is treating a patient with more trait-anxiety tendencies, having shorter appointment times, making the patient feel comfortable, and providing more anesthesia if or when necessary for pain can be effective (Hmud 68, Armfield 402). Another possible way that dental clinicians can help patients with dental anxiety is by minimizing known triggers or the 4 “S’s” (Hmud 66). The 4 “S” rule for reducing anxiety triggers are: Sights (i.e. needles, sharp instruments, etc.), Sounds (i.e. drilling), Sensations (i.e. high frequency vibrations), and Smells (i.e. odors from bonding agents, etcetera) (Hmud 66).

Additional options for treating a patient with mild dental anxiety are rapport building, voice/movement control, distraction, modeling, guided imagery, enhancing the sense of control, and environmental change (Newton 271). The feel of the dental atmosphere can play a huge role in the level of anxiety that a patient has during treatment (Newton 271). It is very important for
the dental clinician to develop a strong relationship with the patient so they feel more comfortable and can trust their dental care provider. It is also suggested for providers to avoid sudden movements or any loud noises to avoid startling the anxiety patient (Newton 272). A distraction technique can be performed by simply distracting the patient’s attention away from what is causing the anxiety symptoms (Armfield 398, Newton 272). Modeling is done by letting the patient observe the same dental treatment prior to the start of their dental appointment (Armfield 398, Newton 272). Guided imagery consists of the patient being in a dream-like state of mind that utilizes all of their senses to create an overall state of relaxation (Armfield 398, Newton 272). Enhancing control is making the patient feel that they are “in control” of what is happening during their dental appointment (Armfield 398). It consists of the dental hygienist explaining the procedure, what to expect, and how they are taking measures to ensure the safety of the patient (Armfield 398, Newton 272). Oftentimes this will involve the “Tell-Show-Do” method to help decrease uncertainty about the dental treatment. The “Tell-Show-Do” method involves explaining each of the steps of the procedure, showing the patient the procedure being performed, and then finally completing it on the patient (Newton 272).

There are additional treatment methods that can be used on a patient with moderate levels of dental anxiety. Some of those methods include: biofeedback, acupuncture, systematic desensitization, Cognitive Behavioral Therapy (CBT), and hypnosis. Biofeedback utilizes instruments that can measure, amplify, and give feedback on the patient’s physiological status (Appukuttan 39). Biofeedback can help patients struggling with dental anxiety by regulating the body’s process towards anxiety/fear (Appukuttan 39). Although rarely used, acupuncture is another form of treatment that can be used to treat dental anxiety (Newton 272). M Karst found that patients who received auricular acupuncture were significantly less anxious and their
compliance to dental treatment was significantly improved (279). Systematic desensitization, or exposure therapy, consists of three main steps; first, encourage the patient to talk about their dental anxiety; second, teach the patient some basic relaxation techniques; third, gradually expose the patient to the item that is causing the anxiety (Armfield 393, McMaster e8, Newton 273). CBT is the combination of cognitive therapy and behavioral therapy. It utilizes the ability to change negatively configured thoughts, or conditions, and their actions, or behaviors (Armfield 393, McMaster e8, Newton 273). CBT is used to assist patients in altering the actual meaning behind their fears and to reprogram them into positives ones (Armfield 394, Karst 297).

Hypnosis is a non-invasive form of treatment that helps promote deep relaxation in patients with dental anxiety (Armfield 399, Glaesmer e1113). Hypnotherapy has been statistically proven to demonstrate decisive, long-lasting effects on a patient’s dental anxiety status (Allidin 383). Patients can also easily receive dental treatment under hypnosis (Karst 297). When patients undergo hypnosis, it is possible to make suggestions and eliminate their fear of dental treatment (Montgomery 146). H Glaesmer and William Gordan both found that hypnosis can revoke the need for local anesthesia (e1113, Golden 264).

Treatment methods for moderate dental anxiety can also be used successfully on patients with severe dental anxiety. In addition to moderate dental anxiety treatment methods, pharmacological management, conscious sedation, and general sedation have been used. Benzodiazepines are the most commonly used drug class for the temporary treatment of dental anxiety (Abdeshahi 312). Benzodiazepines are the ideal drug class for use in dentistry due to its anxiolytic, sedative, and amnesic qualities (Abdeshahi 312). These drugs work by promoting binding of the major inhibitory neurotransmitter, gamma amino butyric acid (Abdeshahi 312). Nitrous oxide gases are used to produce conscious sedation during dental treatment. Patients feel
as though they are in a state of sedation and go through various degrees of analgesia that is caused by inhaling a mixture of nitrous-oxide gases (Donaldson 120, Berge 484). During general anesthesia, the patient is unconscious and cannot be easily awakened. Most methods used for severe dental anxiety are not recommended as long-term solutions and should be considered a temporary fix until the patient can seek other treatment.

There are a number of complications that can occur with a patient using anesthetic agents as a method of long-term treatment for severe dental anxiety, including nerve damage or pseudoaneurysm of the facial artery, etcetera (Armfield 393). KB Hill believes that the least invasive treatment type should be employed for use on a patient with dental anxiety before considering using anesthetic agents (1). According to the JM Armfield study, a form of behavioral treatment, such as systemic desensitization, cognitive behavioral therapy, or hypnosis can be equally as effective in treating mild, moderate, and severe dental anxiety patients (395).

If given the education and experience in dental hygiene school, dental hygienists should be able to identify if an individual is suffering from dental anxiety. Currently, there are not any published research studies that identify dental hygienists’ knowledge level, attitudes, and comfort level in treating patients with dental anxiety. This information is needed to understand practicing dental hygienists’ dental anxiety knowledge, confidence in treating patients with dental anxiety, and where the dental hygiene curriculum is currently lacking in content related to dental anxiety.

**Purpose of this Study**

The purpose of this study was to assess dental hygienists’:

- Knowledge concerning the degree to which anxiety affects their patients’ responses to preventive treatment.
- Confidence in their abilities to recognize patients with dental anxiety.
- Attitudes regarding utilizing dental anxiety management methods
- Opinions of dental hygiene curriculum regarding the treatment of patients with dental anxiety.
CHAPTER III: INTRODUCTION AND LITERATURE REVIEW

According to the Surgeon General’s Report released in 2000, the majority of Americans have common characteristics of periodontal disease (Ch 4 63). Unfortunately, less than two-thirds of these adults have reported visiting the dentist within the last year (Ch 4 63). There are several reasons for this, one of the most common reasons is anxiety about dental treatment.

Dental anxiety, or feeling stressed or uneasy of the thought of dental treatment, is a multi-faceted disorder that involves the patient’s somatic, cognitive, and emotional behavior responses (Gordan 66, Guzeldemir 2248, Colgate 1). Common physiological symptoms of dental anxiety include shortness of breath, racing heartbeat, insomnia, nausea, trembling, and dizziness (Gordan 66). The severity of dental anxiety is related to the patient’s demographical characteristics, such as the patient’s gender, age, amount of education obtained, income, and overall oral health (Gordan 66). There are countless dental problems involved in dental anxiety, related to avoiding or postponing treatment. Research has reported links to fewer restorations, higher rates of edentulism, increased tooth decay, tendency to have more severe treatment needs, and insufficient oral health and oral health-related quality of life in patients with dental anxiety (Gordan 38, Hmud 70, Newton 1453, Gisler 294). Dental providers will oftentimes use “anxiety” and “phobia” interchangeably to patients who present with dental fear. Although dental anxiety and dental phobia are both very common, they are actually two separate conditions (Colgate 1). A patient with dental anxiety feels stressed or uneasy being in the dental chair (Colgate 1). Sometimes, however, the mere thought of a dental procedure to a patient with dental phobia is enough to make them avoid dental treatment (Colgate 1). Dental phobia is a more serious
condition and can lead to a higher risk of gingivitis, premature bone loss, and other serious conditions (Colgate 1).

In the United States, 60-80% of adults have experienced some level of fearfulness before having dental treatment, 4-31% suffer from a specific type of dental anxiety; and, the remaining 5% of the adult population are so fearful they avoid dental treatment altogether (Gordan 371, Hmud 72, Newton 1453, Gisler e295, Armfield 392). It is important for the dental provider to be able to identify this condition in order to recommend and provide the best treatment. Because dental anxiety appears to be a common occurrence in the dental office, dental hygienists need to be properly trained to recognize the symptoms as well as the possible causes and treatment options available. Unfortunately, the current adoption of dental anxiety treatment in clinical dental practices is extremely limited (Gordan 372). In order for anxiety treatment to improve, there will need to be a substantial change in provider treatment knowledge and implementation.

Because dental anxiety appears to be a common occurrence in the dental office, dental hygienists need to be properly trained to recognize the symptoms as well as the possible causes and treatment options available. Unfortunately, the current adoption of dental anxiety treatment in clinical dental practices is extremely limited. In order for management of dental anxiety patients to improve; there will need to be a substantial change in provider treatment methodology.

Dental hygienists are in the pivotal position to discuss the risks, characteristics, psychological referrals, and treatment options for dental anxiety. Dental health providers should also be able to detect if an individual has dental anxiety through various questionnaires that can be completed prior to or during a dental hygiene visit. Dental hygienists need to equip
themselves with the appropriate knowledge on patients with dental anxiety and should be well
versed in the disorder to educate their patients.

If given the education and experience in dental hygiene school, dental hygienists should
be able to identify if an individual is suffering from dental anxiety. Currently, there are not any
published research studies that identify dental hygienists’ knowledge level, attitudes, and
comfort level in treating patients with dental anxiety. This information is needed to understand
practicing dental hygienists’ dental anxiety knowledge, confidence in treating patients with
dental anxiety, and where the dental hygiene curriculum is currently lacking in content related to
dental anxiety.

Currently there is not any published research about the knowledge level, attitudes, and
comfort level in treating patients with dental anxiety for dental hygiene providers. The purpose
of this research study is to identify the already-acquired knowledge, attitudes, and comfort level
of practicing dental hygienists in order to better equip them with the proper armamentarium to
successfully treat patients with dental anxiety.
CHAPTER IV: MATERIALS AND METHODS

Study Population

This study was approved by the University of North Carolina (UNC) Biomedical Institutional Review board with exemption status (IRB #16-0992). Attendees at the UNC Annual Dental Hygiene Lecture continuing education course on April 22nd, 2016 who were 18 years of age or older, currently practicing dental hygiene, and had an active dental hygiene license in the United States were invited to participate. Surveys were included in attendees’ course packets, the purpose of the survey was explained verbally prior to the beginning of the course, and attendees were asked to return the surveys at the end of the meeting. The survey did not contain any personal identifiers, however, the first couple of questions asked the participants about their licensure and age to make sure that they meet all of the inclusion criteria. Respondents were given the opportunity to include open-ended comments concerning the treatment of patients with dental anxiety at the end of the survey. Surveys were stored in a locked cabinet and shredded after data entry was completed. The survey took approximately ten minutes to complete.

Survey Instrument

The survey was developed by the research team and consisted of five main domains:

1) Demographics (6 questions) including age, gender, certificates/degrees earned; state from which their degree was earned, and whether the respondent was currently practicing dental hygiene (Appendix A).

2) Practice Setting (7 questions) including hours per week providing patient care, type of dental practice, location of current practice, and types of patients commonly seen in
practice (multiple responses allowed), and percentage of patients in a typical week that exhibit mild, moderate, or severe dental anxiety (Appendix A).

3) Practice Behaviors (17 questions) including how often they’re screening patients, what kind of questionnaire is being used, reasons for not using questionnaires; this section also asks how often the participants were offering dental anxiety treatment methods (i.e. control counseling, distraction, modelling, CBT, systematic desensitization, hypnosis, general sedation, etcetera) (Appendix A).

4) Dental Anxiety Awareness (17 questions) including the naming all of the common symptoms of dental anxiety as well as to answer true/false to some knowledge-based questions (i.e., “Dental anxiety affects oral health care.”, etcetera) (Appendix A).

5) Opinions and Attitudes (13 questions) including how they feel about their confidence level in treating patients with various levels of dental anxiety as well as how their education prepared them to deal with those patients (Appendix A).

Each domain was designed to address one of the study’s specific aims. Prior to the Dental Hygiene Annual continuing education course, practicing dental hygienists at the UNC School of Dentistry and the UNC hospital dental clinic pilot tested the survey and provided feedback on the wording of the items and on the face validity of each domain. Time required for completion was recorded by the dental hygienists and reported to the principal investigator.

Data Analysis

Responses from each respondent were entered by the principal investigator in an excel spreadsheet. Descriptive statistics were used to identify mis-codes and to report the findings.
CHAPTER V: RESULTS

Demographics

Of the 157 respondents, 153 met the inclusion criteria. The majority of the participants had an Associate’s degree in Dental Hygiene (69.1%; n=96); 25.2% have a bachelor’s and 5.8% have their master’s degree. Approximately 1/3 of the participants had been practicing for less than ten years (30.3%) and 23.7% for over 30 years (n=36). Seventy-eight percent of the participants were between the ages of 30-60 years old and the majority worked 31-40 hours per week (58.8%; n=90).

Practice Setting

The majority of participants worked in private practice (83.7%). Slightly more than a third reported working in a small-town and another third in a moderately sized city. When asked to respond to the specific types of patients they treated in a typical week, 96% reported working with adults and 67.8% included geriatric patients. Almost seventy percent (69.9%) worked with children, 49.7% with special needs patients, 23.5% with terminally-ill patients, and 32% with immunocompromised patients.

Practice Behaviors

All 153 of the respondents reported treating patients with some type of dental anxiety. Almost thirty-four percent (33.8%) of respondents indicated that over 30% of their patients exhibit mild dental anxiety. Respondents indicated that patients exhibiting moderate or severe dental anxiety are treated less frequently: 41% stated that they treated patients with moderate
levels of dental anxiety 1-10% of the time and 61% treated patient patients with severe dental anxiety 1-10% of the time (Table 1).

Only 19.7% reported screening patients “Often” or “Always” using dental anxiety questionnaires. Of these, 17.1% utilize the Dental Anxiety Scale (n=6) (Table 2). Of the 80.3% (n=118) of participants that answered “Never” or “Rarely” to using dental anxiety questionnaires, 60.3% of participants stated that they were not familiar with dental anxiety questionnaires (Figure 1).

The most frequently reported service or counseling method offered by the participants was patient control (80.1%; n=117). The most rarely used methods of treatment were hypnosis (1.4%; n=139) and acupuncture (2.8%; n=137) (Figure 2).

A participant from the study wrote, “I would be very interested in learning more about dental anxiety and options for treating this condition, especially hypnosis.”

**Dental Anxiety Awareness**

When identifying all of the possible signs and symptoms of dental anxiety, only 43.1% of the participants answered the question correctly. However, 100% of the participants agreed that shortness of breath and fidgetiness/physical restlessness are symptoms of dental anxiety.

Over 95% of respondents agreed that “Dental anxiety affects oral health care” (99% n=150); “Anxiety disorders can significantly impair daily functioning” (96.1%; n=147) and “One of the leading causes of delayed dental care is dental anxiety” (98%; n=150). Only 30.9% of participants knew that females experience more dental anxiety than males (n=47) and less than sixty percent of participants understood that wound healing is impacted by dental anxiety (58.6%; n=89) (Table 3).
When considering the participant’s knowledge about dental anxiety and their years of experience, there was not a significant percentage of participants who answered correctly and their years of experience (43.5%; 39.1%; 44.4%; 44.4%).

When taking into consideration the participant’s portion of the knowledge-based questions and their degrees, the results concluded that while the majority of the participants have their associate’s degree (n=94), the percentage of each that answered correctly were not significantly different (43.6%; 40.9%; 40%). Several of the participants agreed that, “Not enough information is available to hygiene students in their dental hygiene curriculum.”

**Opinions and Attitudes**

Approximately 98% participants (n=146) agreed completely and 0% (n=0) participants disagreed with the statement, “Anxiety about dental treatment is a challenge for both the patient and the dental clinician.” A participant added that, “Anxiety in patients can cause anxiety in clinicians. Managing dental anxiety can help us treat patients better—we just need to know how to best treat these patients.”

When asked if, “The number of patients with dental anxiety seems to be increasing”, 39.5% (n=60) agreed, 35.5% (n=54) were neutral, and 25% (n=38) disagreed. When asked if, “All degrees of dental anxiety respond to the same intervention”, approximately 91.3% (n=137) disagree. Over 95 percent of participants agree that dental hygienists are in a key position to screen and identify patients with dental anxiety (Table 4).

Only 58.3% (n=88) of the participants believed that their dental hygiene education prepared them for treating patients with mild levels of anxiety; 37.5% (n=57) for moderate levels of anxiety; and 21.7% (n=33) for severe dental anxiety. One hundred and eighteen (77.6%) of the participants are interested in learning more about dental anxiety questionnaires and 120 (9%) would like to take additional continuing education courses on treating patients with dental
anxiety. A majority of the participants would like to learn more about treatment options for patients with severe dental anxiety as well as where to refer them (82.2%).

One hundred and forty participants (92.1%) stated that they are confident in their ability to perceive when their patient feels stressed. One hundred and forty-eight of the participants (98%) are confident in their ability to work with mild dental anxiety and 117 of the participants (77%) are confident in their ability to work with moderate to high levels of dental anxiety. However, a participant of the study wrote, “I honestly prefer not to work on patients with high anxiety, but sometimes I have to. They seem to make me nervous and give me anxiety when working on them.”

Taking a closer look at a participant’s education status and their confidence levels, the results of the study concluded that the more education that the participant obtained, the less confident they felt in their ability to perceive if their patient feels stressed. These participants also were less confident in working with patients experiencing moderate to high levels of dental anxiety.
CHAPTER VI: DISCUSSION

Two similar studies to this one are investigations by K Dierke and KB Hill. The K Dierke study utilized a questionnaire format to study German dentists’ knowledge about psychosomatic medicine (1525). The results from the study showed that 18.8% of the participants believed that treating a patient with dental fear is difficult (n=65). Ninety-eight percent of the participants from the current study believe that anxiety about dental treatment is a challenge for both the patient and the dental clinician (n=146). The most preferred treatment methods that the dentists from the K Dierke study used were: reduced waiting times (100%), local anesthesia (99%), patient control (96%), shorter appointments (93%), and communication on fear (93%) (1525). The methods that were used the least was relaxation (53%) and hypnosis (19%) (Diercke 1525). The current study also found that hypnosis was the least used technique (1.4%). In the K Dierke study, 95% of the dentists believed that dental fear “strongly” or “very strongly” affected pain perception and 20% believed that anxiety predicted wound healing (1525). The current study more dental hygienists understood that wound healing is impacted by high anxiety levels (58.6%). Thirty-one percent “never” and 44% “rarely” and “hardly” participated in continuing education courses (Diercke 1525). One hundred and twenty of the participants from this study were interested in learning more about continuing education courses on treating patients with dental anxiety. K Dierke concluded the study by stating that the dentists who attended more continuing education courses (6%) claimed to have less of a challenge in treating patients with dental fear (1525).
The KB Hill study looked at practicing dental clinicians to determine the views and experience levels of qualified dentists in their current use of dental anxiety management techniques and to identify what was taught in their dental programs (Hill 4). Fifty-one percent of the participants reported to have received some form of dental anxiety management training. However, the quality of the management training was reported to be less than adequate in hypnosis (75%) and psychological techniques (65%) (Hill 2). Eighty-eight participants from the current study believe that their dental hygiene education prepared them in being able to treat mild dental anxiety (58.3%), 37% in treating moderate dental anxiety, and 21.7% in treating patients with severe dental anxiety. Eighty-five percent of the participants also believe that it was their responsibility to help the dentally-anxious patient (Hill 3). In the current study, most participants believe that it is the dental provider’s responsibility to treat the dentally-anxious patient (95%). From the KB Hill study, psychological techniques, sedation, and hypnosis were reported not having been used due to the lack of time available, lack of confidence, and the lack of fees available (Hill 3). For the current study, 60.3% reported not using questionnaires because they were not familiar with them; 16% stated that they were not sure which type to use; 14% did not have the time; 4.7% did not feel as though they were necessary; and, 4% stated that it was not their responsibility. Fifty-three percent of the participants from the KB Hill study were “dissatisfied” or “very dissatisfied” with the quality of care they were giving to patients and 81% expressed a desire to have further training for patients with dental anxiety (Hill 3).

Being able to identify a patient suffering from a type of dental anxiety is an important skill for the dental clinician. A patient with mild dental anxiety can be described as a patient who can detect that something is different, but will oftentimes not draw attention to this fact nor themselves (Leischner 243). Moderate dental anxiety patients feel as though something is clearly
wrong and will start to show more definite signs of anxiety, such as being uncooperative, irritable, self-medicated, etcetera (Unit3 221). Patients with severe dental anxiety can be identified by having significant reductions in their ability to understand and respond to what is happening around them (Leischner 243).

A participant of this study wrote that, “A large population of people experience some form of dental anxiety. I was not prepared for this when I began working in a dental office.” With the majority of participants treating each type every week, it is paramount for clinicians to be able to identify and successfully treat anxiety patients. Knowledge describing the different methods to treat patients with dental anxiety should begin in the dental hygiene curriculum.

While the majority of participants stated that they felt as though their education prepared them for treating patients with mild dental anxiety, almost the opposite was reported for moderate and high levels of dental anxiety. The American Dental Hygienists’ Association’s Curriculum Guidelines on Dental Hygiene suggests that dental hygiene programs should teach their students to, “Assess the need for and apply pain and anxiety management strategies” (Allied Dental Education Programs). The Commission on Dental Accreditation (CODA) Standard 2-12 states that, “[Dental hygiene] graduates must be competent in assessing the treatment needs of patients with special needs” (Commission on Dental Accreditation). The written intent behind this standard was to make sure that students experienced a larger range of patient types, including those, “Whose medical, physical, psychological, or social situations may need additional necessary treatment” (Commission on Dental Accreditation). This CODA standard includes the treatment for patients struggling with dental anxiety. Competency and exceptional knowledge in psychology and mental health is vital in being able to identify and treat a patient with dental anxiety. Almost all of the practicing dental hygienists from this study
believe that dental anxiety affects oral health care (99%). The majority indicated that anxiety about dental treatment is a challenge for both the patient and the clinician (98%). Several participants of the study agreed that not enough information was available to them during their dental hygiene program. An extension or revision to the dental hygiene curriculum may help practicing clinicians to be the key personnel for the prevention and successful management of a dental anxiety patient.

Utilizing dental anxiety questionnaires is a mechanism for the clinician to be able to identify a patient suffering from dental anxiety. Very few of the participants use a questionnaire to identify the level of dental anxiety that their patient may be experiencing. When participants were asked their reasoning behind not using a questionnaire, they reported not having the knowledge or knowing which type to use, not having the time, and not feeling as though it was necessary nor their responsibility. The survey that was used the most by participants was the DAS. The DAS is a four-item scale that ranks the levels of anxiety, with the highest scores indicating more severe levels of dental anxiety (Gordan 371). The MDAS is a modified “DAS” scale that includes a fifth question about fear of local anesthetic (Gordan 371). In this study, MDAS was reported to have been used even less than DAS (0.7%). The OHIP was the third type of questionnaire that could be used to identify patients with dental anxiety. Only 1.3% of the participants use the OHIP in their practice. The reasoning behind this could be that this survey is longer than the other two surveys mentioned (14-item questionnaire). However, OHIP’s success rate has been proven to work based off of a theoretical model developed by the World Health Organization (Gordan 372). The last questionnaire on this study’s survey was the DFS that was used by 2% of the participants. The DFS is even longer than the OHIP, containing twenty items;
it assesses the fear of specific dental procedures, avoidance, and physiological challenges related to dental treatment (Gordan 372).

For the fourteen percent of the participants who said that they did not have enough time to use questionnaires, it should be known that the ADA recently published additional Current Dental Terminology (CDT) codes. As of early 2017, three new CDT codes were created that incorporate dental anxiety identification and management strategies that could possibly be used to charge patients’ insurance providers. Code D9992, “Dental Care Management-Core Coordination” was established to assist the decision in coordinating oral health care services with multiple interdisciplinary providers (CDT Codes 1). This code can help with the additional time that is needed for the dental clinician as well as the resources needed by the patient that goes beyond the expertise of the dental clinician (CDT Codes 1). Code D9993, “Dental Case Management-Motivational Interviewing” was designed to help the oral health care provider give patient-centered, personalized counseling to identify and modify behaviors that could interfere with the outcome of dental treatment (CDT Codes 1). The last CDT code is D9994, “Dental Case Management-Patient Education to Improve Oral Health Literacy” (CDT Codes 1). This code was created to help establish an individualized patient education forum to assist the patient in making appropriate health decisions that would help improve their oral health literacy (CDT Codes 1). This code also includes the expenditure of time and resources beyond what the dental health care provider can perform (CDT Codes 1). Dental hygienists are under considerable time constraints in order to complete patients and meet the monetary goals for the day. For these dental anxiety patients that need the extra time, one of the three codes could be used to justify the additional time spent with the patient.
The last reason why the participants of the study did not use dental anxiety questionnaires is because they believe that they are not necessary nor their responsibility; these participants believe that it is the responsibility of the dentist. However, 95.4% of participants believe that dental hygienists are in the key position to screen and identify patients with dental anxiety. Dental hygienists are typically the first health care provider that the patient sees and are typically the clinician that the patient sees the most often. For these reasons, it is paramount for dental hygienists to have the ability to identify and manage patients with dental anxiety.

Considering the participants’ confidence levels, 92.1% felt confident in their ability to perceive if a patient feels stressed. When asked about their confidence levels in managing these patients, the most commonly used treatment methods by participants were patient control (80.1%) and modeling (55%). The least commonly utilized treatment methods were hypnosis (1.4%) and acupuncture (2.8%). Speculation could conclude that this is true because of the mystique behind these methods and the lack of knowledge on how to use them in practice.

The phrase “hypnosis” originated from the Greek word “hypnos”, which in English translates to mean “sleep” (Elkins 482). Hypnosis is a non-invasive form of treatment that helps promote deep relaxation in patients with various mental, emotional, and behavioral challenges (Glaesmer e1114). Common hypnotic mythologies date back as far as 4000 B.C., with the most common being, “A hypnotist can take over a person’s mind” (Abdeshahi 312, Elkins 483). A hypnotist cannot control a person’s thoughts nor their actions; they can only help in revising a patient’s unfavorable feelings into positive ones (Elkins 483). Hypnotherapists employ various types of treatment that can be amalgamated to best accommodate the needs of the patient (Golden 273, Elkins 483).
Acupuncture has been an important part of traditional Chinese medicine for thousands of years. It works by encouraging the natural healing process through the insertion of a filiform needles at a specific skin pressure points (McIntyre 3). Through this method, the body naturally produces endorphins, whose job is to help regulate and balance the body’s systems (McIntrye 3). Some of the reasons why the media sheds negative light on this treatment form is because it is believed to be expensive and seen as something that couldn’t possibly help. Understanding this, one has to conclude that not every treatment method is going to work for every patient, but it is certainly better than avoiding dental treatment until it is too late.

**Limitations of Study and Future Research**

Because the Annual Dental Hygiene continuing education course took place in North Carolina, most of the dental hygienists were from one state therefore it cannot be generalized to a larger population. While the study received almost one hundred percent responses from the participants, it was still a small sample size. However, it is the first of its kind to be reported in the dental hygiene population. This study could be utilized in future studies containing a larger sample size. For example, the findings could be used in an observational setting to find out how practicing dental hygienists are managing patients with dental anxiety. It could also be used to begin a conversation about increasing content in dental hygiene curricula regarding the treatment of dentally anxious patients.
CHAPTER VII: CONCLUSION

Dental hygienists should play a vital role in discussing the risks, characteristics, psychological referrals, and treatment management options for patients with dental anxiety. Although most dental hygienists feel confident in their ability to perceive if their patient is feeling stressed, a majority did not know the common signs and symptoms of patients experiencing dental anxiety; most did not use questionnaires to identify dental anxiety and most did not believe they were prepared to treat and manage patients with severe dental anxiety based on what they learned in their dental hygiene curriculum. Increased content and education is needed in the dental hygiene curriculum to equip students to successfully treat patients with various levels of dental anxiety.
TABLES AND FIGURES

Table 1: Levels of Dental Anxiety Seen in Patients by the Participants Each Week.

<table>
<thead>
<tr>
<th></th>
<th>0 Percent (N)</th>
<th>0 Percent (%)</th>
<th>1-10 Percent (N)</th>
<th>1-10 Percent (%)</th>
<th>11-20 Percent (N)</th>
<th>11-20 Percent (%)</th>
<th>21-30 Percent (N)</th>
<th>21-30 Percent (%)</th>
<th>Over 30 Percent (N)</th>
<th>Over 30 Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild Dental Anxiety</td>
<td>0</td>
<td>0%</td>
<td>27</td>
<td>17.88%</td>
<td>32</td>
<td>21.19%</td>
<td>41</td>
<td>27.15%</td>
<td>51</td>
<td>33.77%</td>
</tr>
<tr>
<td>Moderate Dental Anxiety</td>
<td>9</td>
<td>5.96%</td>
<td>62</td>
<td>41.06%</td>
<td>47</td>
<td>31.13%</td>
<td>16</td>
<td>10.60%</td>
<td>17</td>
<td>11.25%</td>
</tr>
<tr>
<td>Severe Dental Anxiety</td>
<td>33</td>
<td>21.85%</td>
<td>92</td>
<td>60.92%</td>
<td>14</td>
<td>9.27%</td>
<td>6</td>
<td>3.97%</td>
<td>6</td>
<td>3.97%</td>
</tr>
</tbody>
</table>

Table 2: Dental Anxiety Questionnaire Usage and Type Reported by Participants.

<table>
<thead>
<tr>
<th>Type of Questionnaire:</th>
<th>(N)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental Anxiety Scale</td>
<td>6</td>
<td>17.14%</td>
</tr>
<tr>
<td>Modified Dental Anxiety Scale</td>
<td>1</td>
<td>2.86%</td>
</tr>
<tr>
<td>Oral Health Impact Profile</td>
<td>2</td>
<td>5.71%</td>
</tr>
<tr>
<td>Dental Fear Survey</td>
<td>3</td>
<td>8.57%</td>
</tr>
<tr>
<td>Other</td>
<td>23</td>
<td>65.72%</td>
</tr>
<tr>
<td>Total (Out of 153):</td>
<td>35</td>
<td>22.88%</td>
</tr>
</tbody>
</table>
Table 3: Dental Anxiety Awareness of Participants.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Correct (N)</th>
<th>(%)</th>
</tr>
</thead>
</table>
| Females experience dental anxiety more than males.                        | 47          | 30.92%
| Prevalence of dental anxiety decreases with age.                          | 52          | 34.44%
| Red-haired patients may be more sensitive to pain, harder to anesthetize, and more anxious than other patients. | 53          | 34.87%
| Inflammatory diseases are more severe in dental anxiety patients.          | 58          | 38.41%
| Patients with dental anxiety express higher levels of pain perception compared to patients without it. | 65          | 42.76%
| Wound healing is impacted by high anxiety levels.                         | 89          | 58.55%
| Anxiety disorders typically surface in adolescence or early adulthood.    | 89          | 58.55%
| Anxiety disorders commonly run in families.                               | 94          | 62.25%
| Patients who suffer from untreated anxiety disorder often suffer from other psychological disorders. | 103         | 67.76%
| Dental anxiety and pain perception vary with education and income levels, smoking, and oral health status. | 104         | 67.97%
| Patients who suffer from dental anxiety have a higher tendency to abuse alcohol and other drugs. | 106         | 69.74%
| Patients with dental anxiety are nearly five times more likely to need immediate treatment and are missing more teeth than the average patient. | 113         | 74.34%
| Dental anxiety can affect a patient’s physical, mental, and emotional status. | 144         | 95.36%
| Anxiety disorders can significantly impair daily functioning.             | 147         | 96.08%
| One of the leading causes of delayed dental care is dental anxiety.        | 150         | 98.04%
| Dental anxiety affects oral health care.                                   | 150         | 98.04%  |
Table 4: Opinions and Attitudes of Participants regarding Dental Anxiety.

<table>
<thead>
<tr>
<th>Statement:</th>
<th>Agree (N)</th>
<th>(%)</th>
<th>Neutral (N)</th>
<th>(%)</th>
<th>Disagree (N)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident in my ability to work with patients who may be experiencing mild levels of dental anxiety.</td>
<td>148</td>
<td>98.01%</td>
<td>2</td>
<td>1.32%</td>
<td>1</td>
<td>0.66%</td>
</tr>
<tr>
<td>Anxiety about dental treatment is a challenge for both the patient and dental clinician.</td>
<td>146</td>
<td>97.99%</td>
<td>3</td>
<td>2.01%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Dental hygienists are in a key position to screen and identify patients with dental anxiety.</td>
<td>145</td>
<td>95.39%</td>
<td>6</td>
<td>3.95%</td>
<td>1</td>
<td>0.66%</td>
</tr>
<tr>
<td>I am confident in my ability to perceive that my patient feels stressed.</td>
<td>140</td>
<td>92.11%</td>
<td>11</td>
<td>7.24%</td>
<td>1</td>
<td>0.66%</td>
</tr>
<tr>
<td>I would like to learn more about treatment options for patients with severe dental anxiety as well as where to refer them.</td>
<td>125</td>
<td>82.24%</td>
<td>25</td>
<td>16.45%</td>
<td>2</td>
<td>1.32%</td>
</tr>
<tr>
<td>I would like to take additional continuing education courses on treating patients with dental anxiety.</td>
<td>120</td>
<td>78.95%</td>
<td>27</td>
<td>17.76%</td>
<td>5</td>
<td>3.29%</td>
</tr>
<tr>
<td>I am interested in learning more about dental anxiety questionnaires for screening dental patients.</td>
<td>118</td>
<td>77.63%</td>
<td>31</td>
<td>20.39%</td>
<td>3</td>
<td>1.97%</td>
</tr>
<tr>
<td>I am confident in my ability to work with patients who may be experiencing moderate to high levels of dental anxiety.</td>
<td>117</td>
<td>76.97%</td>
<td>22</td>
<td>14.47%</td>
<td>13</td>
<td>8.55%</td>
</tr>
<tr>
<td>Statement</td>
<td>N</td>
<td>58.28%</td>
<td>32</td>
<td>21.19%</td>
<td>31</td>
<td>20.53%</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>----</td>
<td>--------</td>
<td>----</td>
<td>--------</td>
<td>----</td>
<td>--------</td>
</tr>
<tr>
<td>My dental hygiene education prepared me for treating patients with mild dental anxiety.</td>
<td>88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The number of patients with dental anxiety seems to be increasing.</td>
<td>60</td>
<td>39.47%</td>
<td>54</td>
<td>35.53%</td>
<td>38</td>
<td>25.00%</td>
</tr>
<tr>
<td>My dental hygiene education prepared me for treating patients with moderate dental anxiety.</td>
<td>57</td>
<td>37.50%</td>
<td>39</td>
<td>25.66%</td>
<td>56</td>
<td>36.84%</td>
</tr>
<tr>
<td>My dental hygiene education prepared me for treating patients with severe dental anxiety.</td>
<td>33</td>
<td>21.71%</td>
<td>34</td>
<td>22.37%</td>
<td>85</td>
<td>55.92%</td>
</tr>
<tr>
<td>All degrees of dental anxiety respond to the same intervention.</td>
<td>5</td>
<td>3.33%</td>
<td>8</td>
<td>5.33%</td>
<td>137</td>
<td>91.33%</td>
</tr>
</tbody>
</table>
Of the 118 participants that answered "Never" or "Rarely"

- Not familiar with dental anxiety questionnaires: 60%
- Not sure which type to use: 17%
- Do not have time: 14%
- Not necessary: 5%
- Not their responsibility: 4%

Figure 1. Participants’ Reasons for not Utilizing Dental Anxiety Questionnaires.
Figure 2. Frequency of Services Offered in Practice for Dental Anxiety.
APPENDIX: THE SURVEY QUESTIONNAIRE

UNC DEPARTMENT OF DENTAL ECOLOGY SURVEY
Practicing Dental Hygiene: Dental Anxiety

Thank you for taking the time to complete this survey. Please answer the following questions to the best of your ability, checking boxes and filling in blanks as indicated. If for any reason you feel uncomfortable answering any of the following questions, you are free to leave them blank.

Please use a pen to complete this survey.

**Demographics**

1. Are you currently practicing clinical dental hygiene? (check one)

   - Yes
   - No

   **IF YOU CHECKED ‘NO,’ PLEASE STOP HERE AND RETURN THIS SURVEY.** Thank you for your time.

2. In which state did you earn your dental hygiene degree? __________________________

3. What certificates/degrees you have earned? (check all applicable)

   - Certificate in Dental Hygiene
   - Bachelor’s Degree in Dental Hygiene
   - Master’s Degree (in any discipline)
   - Associate’s Degree in Dental Hygiene
   - Bachelor’s Degree in another discipline
   - Doctoral Degree (in any discipline)

4. How many years of experience do you have practicing dental hygiene? _________

5. What is your gender? (check one)

   - Male
   - Female

6. What is your age? (check one)

   - under 30
   - 30-40
   - 41-50
   - 51-60
   - over 60

**Practice Setting**

7. Approximately how many hours per week do you provide patient care? (check one)

   - less than 5 hrs
   - 5-10 hrs
   - 11-20 hrs
   - 21-30 hrs
   - 31-40 hrs
   - over 40 hrs

8. Which of the following describe the type of dental practice(s) in which you work currently? (check all applicable)

   - private dental practice
   - prison facility
   - community clinic
   - nursing home
   - hospital
   - grade school
   - university-based dental clinic
   - other (specify)
9. Which of the following best describes the location of the practice in which you work currently? (check all applicable)

- □ rural (population less than 5,000)
- □ small-town (population 5,000–24,999)
- □ moderately sized city (population 25,000–250,000)
- □ large city (population over 250,000)

10. Which of the following types of patients do you commonly treat in your practice? (check all applicable)

- □ pediatric (aged 0–16 years)
- □ adult (aged 17–65 years)
- □ geriatric (aged 66 years or older)
- □ periodontal
- □ special-needs
- □ terminally-ill
- □ immunocompromised (HIV/AIDS)
- □ other (specify)

11. Approximately how many of your patients in a typical week exhibit mild dental anxiety (they are stressed about the dental procedure but are able to receive treatment)? (check one)

- □ 0%
- □ 1–10%
- □ 11–20%
- □ 21–30%
- □ 31–40%
- □ 41–50%
- □ over 50%

12. Approximately how many of your patients in a typical week exhibit moderate dental anxiety (they display some signs of dental anxiety and may be sedated to receive treatment)? (check one)

- □ 0%
- □ 1–10%
- □ 11–20%
- □ 21–30%
- □ 31–40%
- □ 41–50%
- □ over 50%

13. Approximately how many of your patients in a typical week exhibit severe dental anxiety (they must be sedated to receive treatment)? (check one)

- □ 0%
- □ 1–10%
- □ 11–20%
- □ 21–30%
- □ 31–40%
- □ 41–50%
- □ over 50%

**Practice Behaviors**

14. How often do you screen patients with a dental-anxiety questionnaire? (check one)

- □ Never
- □ Rarely
- □ Often
- □ Always

IF YOU CHECKED ‘NEVER,’ SKIP TO QUESTION 16.

15. If you do utilize a dental anxiety questionnaire in your practice, which kind do you use? (check all applicable)

- □ Dental Anxiety Scale
- □ Dental Fear Survey
- □ Modified Dental Anxiety Scale
- □ McGill Pain Questionnaire
- □ Oral Health Impact Profile
- □ other (specify)

16. If you do not utilize a dental anxiety questionnaire in your practice, why not? (check all applicable)

- □ not familiar with dental anxiety questionnaires
- □ don’t feel they’re necessary
- □ don’t have the time
- □ not my responsibility
17. How commonly do you offer the following services or counseling to your patients if patient assessment or a dental anxiety questionnaire suggest they would be useful? (check one box in each row)

<table>
<thead>
<tr>
<th>Service</th>
<th>Frequently</th>
<th>Regularly</th>
<th>Occasionally</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient control (i.e. tell-show-do, rest breaks, signal to finish)</td>
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<td>Distraction (i.e. audiovisual)</td>
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<td>Diaphragmatic or relaxation breathing / guided imagery</td>
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<tr>
<td>Modelling</td>
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<tr>
<td>Cognitive restructuring / cognitive behavioral therapy</td>
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<tr>
<td>Systematic desensitization</td>
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<tr>
<td>Hypnosis</td>
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<td>General sedation</td>
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<td>Nitrous oxide sedation</td>
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<td>Voice control</td>
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<td>Referral for treatment of anxiety</td>
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<td>Prescription of medication</td>
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<tr>
<td>Acupuncture</td>
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<tr>
<td>Biofeedback</td>
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</tbody>
</table>

Dental Anxiety Awareness

18. Which of the following are possible symptoms of dental anxiety? (check all applicable)

- Shortness of breath
- Fidgetiness/physical restlessness
- Other psychological conditions
- History of broken/canceled appointments
- Insomnia
- Racing heart beat
- Nausea
- Dizziness
- Jitters
- Other (specify)

19. Please indicate whether you believe each of the following statements is true or false. (check one box in each row)

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental anxiety affects oral health care.</td>
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<tr>
<td>One of the leading causes of delayed dental care is dental anxiety.</td>
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<tr>
<td>Patients who suffer from untreated anxiety disorder often suffer from other psychological disorders.</td>
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<tr>
<td>Prevalence of dental anxiety increases with age.</td>
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<td>Anxiety disorders can significantly impair daily functioning.</td>
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<tr>
<td>Dental anxiety can affect a patient’s physical, mental, and emotional status.</td>
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<tr>
<td>Dental anxiety and pain perception vary with education and income levels, smoking, and oral health status.</td>
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<tr>
<td>Patients with dental anxiety express lower levels of pain perception compared to patients without it</td>
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</tr>
</tbody>
</table>
Males experience dental anxiety more than females. □ □ □
Inflammatory diseases are more severe in dental anxiety patients. □ □ □
Patients who suffer from dental anxiety have a lesser tendency to abuse alcohol and other drugs. □ □ □
High anxiety levels do not impair wound healing. □ □ □
Anxiety disorders typically surface in adolescence or early adulthood. □ □ □
Patients with dental anxiety are nearly five times more likely to need immediate treatment and are missing more teeth than the average patient. □ □ □
Anxiety disorders do not commonly run in families. □ □ □
Red-haired patients may be more sensitive to pain, harder to anesthetize, and more anxious than other patients. □ □ □

Opinions and Attitudes

20. Indicate the extent to which you agree with each of the following statements. (check one box in each row)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety about dental treatment is a challenge for both the patient and clinician.</td>
<td>□</td>
<td>□</td>
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<tr>
<td>All degrees of dental anxiety respond to the same intervention.</td>
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<td>□</td>
<td>□</td>
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<td>□</td>
</tr>
<tr>
<td>Dental hygienists are in a key position to screen and identify patients with dental anxiety.</td>
<td>□</td>
<td>□</td>
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</tr>
<tr>
<td>I am confident in my ability to perceive that my patient feels stressed.</td>
<td>□</td>
<td>□</td>
<td>□</td>
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<td>□</td>
</tr>
<tr>
<td>I am confident in my ability to work with patients who may be experiencing mild levels of dental anxiety.</td>
<td>□</td>
<td>□</td>
<td>□</td>
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</tr>
<tr>
<td>I am confident in my ability to work with patients who may be experiencing moderate to high levels of dental anxiety.</td>
<td>□</td>
<td>□</td>
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</tr>
<tr>
<td>My dental hygiene education prepared me for treating patients with mild dental anxiety.</td>
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<td>□</td>
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<td>□</td>
</tr>
<tr>
<td>My dental hygiene education prepared me for treating patients with moderate dental anxiety.</td>
<td>□</td>
<td>□</td>
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<td>□</td>
<td>□</td>
</tr>
<tr>
<td>My dental hygiene education prepared me for treating patients with severe dental anxiety.</td>
<td>□</td>
<td>□</td>
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<td>□</td>
</tr>
<tr>
<td>I am interested in learning more about dental anxiety questionnaires for screening dental patients.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The number of patients with dental anxiety seems to be increasing.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I would like to take additional continuing education courses on treating patients with dental anxiety.</td>
<td>□</td>
<td>□</td>
<td>□</td>
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<td>□</td>
</tr>
<tr>
<td>I would like to learn more about treatment options for patients with severe dental anxiety as well as where to refer them.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
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</tr>
</tbody>
</table>

Do you have any additional thoughts concerning the treatment of patients who experience dental anxiety?

__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________

Thank you very much for participating in this study
REFERENCES


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