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# The Anxiolytic Effects of Self-Selected Music Among Primary Care Patients

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Philadelphia College of Osteopathic Medicine

Department of Psychology

THE ANXIOLYTIC EFFECTS OF SELF-SELECTED MUSIC AMONG PRIMARY  
CARE PATIENTS

Jennifer West-Gavin

Submitted in Partial Fulfillment of the Requirements of the Degree of

Doctor of Psychology

May 2015

**PHILADELPHIA COLLEGE OF OSTEOPATHIC MEDICINE  
DEPARTMENT OF PSYCHOLOGY**

**Dissertation Approval**

This is to certify that the thesis presented to us by **Jennifer West-Gavin** on the 13<sup>th</sup> day of May, 2015, in partial fulfillment of the requirements for the degree of Doctor of Psychology, has been examined and is acceptable in both scholarship and literary quality.

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## Abstract

The primary care setting is commonly referred to as the first line of medical treatment sought for health related services. Anxiety is one of the most frequently encountered mental health issues in primary care. The purpose of this study was to examine the level of state anxiety experienced among primary care patients, attending for routine and non-routine appointments; its further purpose was to examine if self-selected relaxing music accounts for the greatest reductions in state anxiety among primary care patients, as compared with investigator-selected (classical) music, audio commercials, or no music. Patients included a primarily underserved primary care population between the ages of 19 and 76, attending for scheduled examinations at the Philadelphia College of Osteopathic Medicine Family Medicine Center. Patients were given self-report measures, which included demographic questions and measures of state anxiety, trait anxiety, musical preference, and satisfaction. The hypotheses for this study included: (1) patients attending for routine appointments will experience state anxiety, with those attending for non-routine appointments experiencing the most significant levels and (2) self-selected music will account for the greatest reductions in state anxiety, when compared with the other group conditions. The results indicate that there were no significant differences in primary care patients' levels of pre-state anxiety, whether they attended for routine or for non-routine appointments. The group conditions revealed that no significant mean differences exist on levels of post-state anxiety among the group conditions. Future research should continue to examine the anxiolytic effects of self-selected music among medical populations.

*Keywords:* primary care, state anxiety, self-selected music, satisfaction

## Table of Contents

Chapter 1 .....	1
Introduction .....	1
Statement of the Problem .....	1
Purpose of the Study.....	3
Literature Review .....	4
The Cognitive-Behavioral Model.....	4
Anxiety .....	5
Consequences of State Anxiety.....	10
Music and State Anxiety .....	16
Musical Intervention in Medical Settings.....	26
Conclusions .....	38
Chapter 2: .....	41
Hypotheses .....	41
Chapter 3: .....	42
Methodology.....	42
Design and Design Justification .....	42
Participants .....	43
Measures.....	45
Procedure.....	49
Chapter 4: .....	54
Results .....	54
Group Assignment and Listening Time .....	61
Hypothesis One .....	62

Hypothesis Two.....	63
Chapter 5: .....	66
Discussion.....	66
Limitations.....	69
Suggestions for Future Work.....	71
References.....	74
Appendix A: <i>Personal Information Questionnaire</i>	
Appendix B: <i>Musical Preference Form</i>	

## List of Tables

Table 1: Frequency and Percent of Ineligibility Reasons .....	55
Table 2: Frequency and Percent of Current Medication Usage .....	56
Table 3: Frequency and Percent of Illicit Drug and Alcohol Usage.....	56
Table 4: Frequency and Percent of Medical Characteristics and Appointment.....	56
Table 5: Frequency of Appointment Characteristics .....	57
Table 6: Frequency and Percent of New Patients .....	57
Table 7: Frequency and Percentage of Responses of “Very Good” to “Good” on the Patient Experience Survey .....	60
Table 8: Frequency and Percent of Patients Experience with Visit and General Questions .....	61
Table 9: Group Assignment Means for Age, Pre/Post State Anxiety and Trait Anxiety .....	62
Table 10: ANCOVA on Post-State Anxiety by Group Assignment.....	65

## Chapter 1

### Introduction

#### Statement of the Problem

The primary care setting is commonly referred to as the first line of medical treatment sought for health related services. Anxiety is one of the most frequently encountered mental health issues in primary care, with community estimates of 19.5% of patients experiencing symptoms (Kertz & Woodruff-Borden, 2011; Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007; Posmontier & Breiter, 2012). Anxiety experienced in medical settings may be the result of the patient's reaction to having a medical illness, to life stressor, effect of a substance or substance withdrawal, or to a secondary side effect of a medical condition (Hicks, Cumming, & Epstein, 2010). Furthermore, research indicates various predictors of situational anxiety among primary care patients in the waiting area before consulting with their physicians; these include possessing a passive or dependent attitude toward the visit, feeling uncertain about their health, anticipating potential physical discomfort, embarrassment or an invasion of privacy, experiencing short wait periods, and/or having limited prior experience with the office, procedure or physician (Gerdes & Guidi, 1987). Primary care patients tend to worry about their symptoms, their illnesses and potential causes for their complaint before consultation with a physician (Laakso, Niemi, Grönroos, & Karlsson, 2008; Laakso, Niemi, Grönroos, Aalto, & Karlsson, 2005); this is a central characteristic of anxiety (Ormrod, 2004; Shearer & Gordon, 2006). Primary care patients who experience anxiety before examination may feel uncomfortable and not return for care, jeopardizing future health outcomes (Gerdes & Guidi, 1987). Due to the various anxiety provoking factors

experienced by primary care patients, they may be more prone to experience state anxiety in the primary care setting.

State anxiety, a component of anxiety, is defined as a temporary, fluctuating emotional condition that is characterized by feelings of worry, apprehension, tension and heightened autonomic nervous system arousal (Spielberger, Gorsuch, & Lushene, 1970). State anxiety is experienced in response to a perceived stressor, such as experiencing symptoms of an illness or medical outcomes associated with the healthcare setting (Barnes, Harp, & Jung, 2002; Court, Greenland, & Margrain, 2010; Gadberry, 2011). To date, only one research study has examined state anxiety among a primary care population, prior to their routine and non-routine medical appointments, with non-routine patients experiencing the most significant levels of state anxiety (Court et al., 2010). In order to improve the patient's healthcare experience associated with anxiety, this study intends to examine the anxiolytic effectiveness of music in the primary care setting.

The use of self-selected music has demonstrated reductions in state anxiety among patients in various medical settings, such as before, during or after minor and invasive operative and surgical procedures (Bringman et al., 2009; Buffum et al., 2006; Cooke, Chaboyer, Schluter, & Hiratos, 2005; El-Hassen, Mckeown, & Mullen, 2009; Hayes et al., 2003; Li, Zhou, Yan, Wang, & Zhang, 2012; O'Callaghan et al., 2012; Pothoulaki et al., 2008; Twiss, Seaver, & McCaffrey, 2006; Vachiramon, Sobanko, Rattanaupawan, & Miller, 2013). The use of self-selected music in various medical settings has proven effective in facilitating a calming and relaxing atmosphere it has led to improvements in patient well-being and outcomes (El-Hassen et al., 2009; Pittman & Kridli, 2011) and has been associated with patient satisfaction (Botti & Iyengar, 2004).

Alternatively, investigator-selected music, typically soothing and sedative music, has demonstrated effectiveness in reducing state anxiety among patients before and during surgery and during dental care procedures (Chi & Young, 2011; DeMarco, Alexander, Nehrenz, & Gallagher, 2012; Haun, Mainous, & Looney, 2001; Lai et al., 2008; Ni, Tsai, Lee, Kao, & Chen, 2012; Weeks & Nilsson, 2011). However, some patients have reported feeling distracted after listening to music (Scheufele, 2000). Although the benefits of self-selected and investigator-selected music have been established in various medical settings, research has yet to examine their effectiveness among a primary care population.

### **Purpose of the Study**

The purpose of this study was two-fold. First, it aims to examine the level of state anxiety experienced among primary care patients attending for routine and non-routine appointments, as measured by the 6-item State-Trait Anxiety Inventory-State Anxiety Scale (Court et al., 2010; Marteau & Bekker, 1992; Spielberger et al., 1970). Second, this study investigated whether or not self-selected relaxing music accounts for the greatest reductions in state anxiety among primary care patients who are attending for routine and non-routine appointments in the primary care examination room, as compared with investigator-selected (classical) music, audio commercials, or no music.

Although various studies have demonstrated music's effectiveness in reducing patient's level of state anxiety in a variety of medical settings, no study at this time has examined music's effectiveness in reducing state anxiety among a primary care population. In order to augment the current literature regarding music's anxiolytic effects, the current study aimed to provide evidence of the beneficial effects of self-selected

music within the primary care setting. Additionally, given the potential negative health outcomes associated with anxiety among primary care patients, greater knowledge of the anxiolytic benefits of musical preference may provide mental health professionals and physicians with a valuable technique for reducing state anxiety. Overall, this study was designed to gain a better understanding of the levels of state anxiety experienced among a primary care population and also to provide medical staff with a useful and easy to administer anxiolytic strategy for reducing primary care patient's state anxiety.

## **Literature Review**

### **The Cognitive-Behavioral Model**

When encountering any situation, humans tend to make appraisals of the environment and determine the significance of events around them, thus cognition play a key role in human behavior (Wright, Basco, & Thase, 2006, p. 4). The cognitive-behavioral model proposes that one's emotions, behaviors, and physiology are influenced by how they perceive that situation (Beck, 2011, p. 30). Of great importance is the fact that it is not the event that directly relates to one's emotions and behaviors, but the way in which one views it (Beck, 2011, p. 31). For instance, a primary care patient may have preconceived thoughts and assumptions of his or her health or of the healthcare setting in general; some of these may include predictors of negative outcomes or fears of the unknown, which may influence their emotions and behaviors. The patients' anxious thoughts may become associated with problematic behaviors, such as avoidance. Avoidance of the feared experience may reinforce their negative thinking, and ultimately becomes part of a vicious cycle of thoughts, emotions, and behaviors (Wright, Basco, & Thase, 2006, p.4-5).

**Anxiety**

Anxiety is an adaptive feature that is universally experienced (Zinbarg, Craske, & Barlow, 1993, p.15). Anxiety is commonly regarded as a reaction to a perceived situation or that involves an appraisal of threat to personal safety. Anxiety is generally defined as a change in one's emotional state and includes feelings of uneasiness or apprehension, typically experienced when the outcome of a situation is unknown (Ormrod, 2004). As an individual encounters an unfamiliar situation or event, he or she may perceive it as threatening. As a threat is detected, the neuropsychological system becomes activated, detecting danger and preparing the body to cope with the situation (Zinbarg et al., 1993, p.15). As one senses an approaching threat, even if not yet imminent, excitation and inhibition of the fight-or-flight mechanism becomes activated (Zinbarg et al., 1993, p. 15). During preparation of the flight-or-flight mechanism, associated aspects of anxiety, such as tension are experienced (Zinbarg et al., 1993, p.15). However, individuals differ in their perceptions of danger and sensitivity to the anxiety activating system, which may be the result of biological components (Zinbarg et al., 1993, p. 15).

**Adaptability and consequences of anxiety.**

Anxiety is a typical emotional reaction that has been experienced by most individuals; however, the symptoms tend to vary among different persons (Sadock & Sadock, 2003). Anxiety tends to have adaptive features that prevent one from encountering threatening or dangerous situations. For instance, anxiety warns the body of impending threats, such as bodily damage (Sadock & Sadock, 2003) Therefore, anxiety may motivate an individual to engage in specific behaviors intended to reduce the risk of

threat, such as seeking medical care (Sadock & Sadock, 2003). Because of this, anxiety possesses important and necessary qualities required for human survival.

Although anxiety serves many adaptive functions for survival, it can affect aspects of cognition, perception, learning, and attention (Sadock & Sadock, 2003). Anxiety may affect one's cognition and lead to confusion or distortions in reality, including time or perceptions of an event (Sadock & Sadock, 2003). Distortions in thinking may interfere with learning, ultimately impacting one's ability to concentrate or recall information (Sadock & Sadock, 2003). Individuals who are anxious may be more easily prone to attend to certain information in their environment, in some cases proving that their fear or worry is necessary in the situation (Sadock & Sadock, 2003). As a result, the anxious individual may justify his or her feelings of threat and experience an increase in anxiety, leading to future experiences of anxiety in the environment or during a situation (Sadock & Sadock, 2003). Although anxiety has adaptive features that prevent an individual from encountering dangerous situations, as well as the motivation to reduce bodily threats, anxiety also affects various aspects of psychological functioning. In the primary care setting, a patient may feel worried about his or her symptoms or potential diagnosis and feel anxious before the exam, impacting the ability to concentrate on important medical instructions or recall important information about his or her symptoms, medication, or family history.

### **Worry.**

In many cases, individuals who experience anxiety typically respond by feeling worried or emotionally reactive (Zinbarg et al., 1993, p.18). Worry is most commonly associated with thought, whereas emotion is the affective component that includes

physiological reactions, such as sweating, increased heartbeat, muscle tension, and troubled breathing (Ormrod, 2004; Zinbarg et al., 1993, p.18). A central characteristic of anxiety is worry, which is a typical cognitive response to uncertainty (Ormrod, 2004; Shearer & Gordon, 2006). Worry comprises distressing thoughts and beliefs about one's ability to cope (Ormrod, 2004). Primary care patients tend to experience worry before consultation with a physician regarding their symptoms, illness, and possible causes for their complaints (Laakso, Niemi, Grönroos, & Karlsson, 2008; Laakso, Niemi, Grönroos, Aalto, & Karlsson, 2005). However, worried patients are unlikely to disclose their feelings unless the physician specifically inquires (Shearer & Gordon, 2006). Additionally, primary care patients with complaint-related worry may not experience relief even after consultation with the physician, thus continuing feelings of threat (Laakso et al., 2008).

Although worry tends to be associated with non-sudden threats, including awareness of the threat in advance (scheduling an appointment), the worried patient may perceive an immediate threat (other patients in the waiting room or thoughts about a possible diagnosis) and begin to experience anxiety in the setting (Stöber & Muijus, 2001). Although some regard the primary care setting as relatively non-threatening (Gerdes & Guidi, 1987), individual characteristics may predict situational anxiety among primary care patients. Gerdes and Guidi (1987) demonstrated the fact that certain groups of patients were more likely to experience anxiety; these include patients who anticipated a loss of control and were less likely to ask questions or provide information about their health, felt uncertain about their health, anticipated potential physical discomfort, embarrassment or an invasion of privacy, experienced short wait periods, and/or had

limited prior experience with the office, procedure, or physician. Although one may think that shorter wait periods would result in lower anxiety, the researchers concluded that patients may require time after arriving for their appointments to cope with their thoughts regarding the visit, or to habituate to the environment (Gerdes & Guidi, 1987). These predictors of anxiety while awaiting examination may cause the primary care patients to feel uncomfortable and potentially prevent them from returning for care, thus jeopardizing their future health (Gerdes & Guidi, 1987).

Patients seek health care services for various reasons, including routine care, screening, preventive care, emergency appointments, but most commonly after having experienced a health-related symptom (Weinman, 1998). Jackson, Chamberlin, & Kroenke (2003) found commonalities among patients who experienced a recent stressful event and those who reported feeling worried that their symptoms represented a serious illness. Primary care patients who report recent emotional distress require significantly longer encounters with the physician, as compared with those who have not suffered emotional distress (Callahan et al., 1998). Patients who report feeling distressed or who worry that their symptoms may be indicative of a serious illness may feel threatened and perceive the health care setting as threatening, leading to an increase in one's level of anxiety. Because primary care visits are not always routine, it is important to understand that individual patients may be experiencing high levels of stress and exhibit increased levels of state anxiety in the setting.

#### **State and trait anxiety.**

Anxiety can be divided into two main components, state or trait anxiety (Spielberger, Gorsuch, & Lushene, 1970). Based on the definition by Spielberger et al.

(1970), state anxiety is generally defined as a temporary emotional condition that is experienced in response to a situation or setting (Spielberger et al., 1970). Spielberger et al. (1970) suggested that state anxiety is a subjective experience that includes feelings of worry, tension, apprehension, and augmented activity of the autonomic nervous system. State anxiety differs from trait anxiety, which is a persistent individual characteristic of one's general proneness to experience anxiety (Spielberger et al., 1970). State anxiety and trait anxiety, although differential measures of anxiety, are similar in some ways (Spielberger et al., 1970).

Spielberger et al. (1970) described state and trait anxiety as similar to kinetic and potential energy in physics. In this respect, state anxiety resembles kinetic energy, or a reaction that occurs at a specific point in time and at a specific level of intensity (Spielberger et al., 1970). Alternatively, trait anxiety models potential energy, because the strengths of one's disposition may enable a particular type of response to a situation (Spielberger et al., 1970). More specifically, trait anxiety suggests that differences exist among individuals' dispositions to respond to perceived stressors, with varying levels of state anxiety experienced (Spielberger et al., 1970). Because trait anxiety may contribute to increased levels of state anxiety among primary care patients, this study examined state anxiety experienced among patients, as well as traits of anxiety.

State anxiety tends to increase in response to a stressful or feared situation or event, such as experiencing symptoms of an illness or medical outcomes associated with the healthcare setting (Barnes et al., 2002; Court et al., 2010; Gadberry, 2011) and tends to decrease in relaxing situations, such as during exposure to relaxing music (Spielberger et al., 1970). Although state and trait anxiety are similar in some respects, state anxiety is

short-lived, fluctuating in intensity as the situation or setting change. State anxiety has been shown to have a negative impact on cognitive functioning, perceptions of symptoms, symptom severity, and satisfaction with medical care (Court, Greenland, & Margrain, 2009; Johnson, Steward, Rosenfield, Steeves, & Zvolensky, 2012; Spruill et al., 2007; Tohill & Holyoak, 2000; Vendetti, Knowlton, & Holyoak, 2012).

### **Consequences of State Anxiety**

#### **Analogical reasoning.**

Within the primary care setting, patients tend to receive medical information from physicians as a part of routine treatment. In order to apply the medical information obtained, patients must understand the information and process the potential health implications of their illnesses or diagnoses. When encountering a novel situation such as an examination or consultation with a physician, analogical reasoning is a necessary cognitive process required to compare the new situation with past or familiar situations, in order to understand the unfamiliar situation on a deeper level (Tohill & Holyoak, 2000). State anxiety is a factor that affects every-day analogical reasoning (Tohill & Holyoak, 2000).

Tohill and Holyoak (2000) induced anxiety among 22 UCLA undergraduate students by administering a speeded subtraction task, before an analogy task. Anxious students were more likely to produce simpler analogy responses and fewer relational responses, as compared with non-anxious students (Tohill & Holyoak, 2000). Tohill and Holyoak (2000) concluded that state anxiety impacts higher-cognitive processing and may lead to less complex decision-making strategies in everyday situations. Similarly, Vendetti et al. (2012) demonstrated that participants, who experienced a mild stressor,

reported significantly higher levels of state anxiety and tended to use simpler or non-analogical decision-making strategies. For instance, anxious participants choose analogies based on semantic relationships even when the analogical relationship among the items was not valid. Overall, when patients experienced an increase in state anxiety, a shift was noted in their reasoning abilities (Vendetti et al., 2000).

This important shift in reasoning ability has potential implications for primary care patients who are experiencing state anxiety. For instance, physicians may provide primary care patients with important information regarding their medical symptoms, health-related behaviors, or overall health by using similarities or comparisons with other things. If the primary care patients experiences anxiety in the exam room, they may have a difficult time understanding the analogy between their health and the information provided by the physician, jeopardizing their current and future health behaviors. Research has demonstrated that increased state anxiety interferes with individuals' cognitions, as well as with patients' perceptions of their symptoms, symptom severity, and satisfaction with the physician (Court et al., 2009; Johnson et al., 2012; Spruill et al., 2007).

#### **Perception of symptoms.**

State anxiety may be associated with how one perceives his or her symptoms and can lead to perceived increases in physiological signs, such as high blood pressure (Spruill et al., 2007). Spruill et al. (2007) investigated the association among perceptions of hypertension, state anxiety, and the 'white coat effect'. They examined 214 normotensive and mildly hypertensive patients at three outpatient hypertension clinics at Weill Cornell. Spruill et al. (2007) demonstrated that patients who thought they were

hypertensive were more anxious during the visit, regardless of their actual levels of blood pressure. Furthermore, they indicated that state anxiety was associated with perceived hypertension and the ‘white coat effect’, which has been associated with increased blood pressure in the examination setting (Spruill et al., 2007). The relationship between state anxiety and symptom perception is important for accurate symptom reporting and treatment outcomes. Primary care patients, who experience state anxiety, may be more likely to misreport symptoms, increasing the possibility of a misdiagnosis.

### **Symptom severity.**

The level of state anxiety that one experiences has demonstrated predictive qualities in one’s experience of symptoms (Johnson et al., 2012). Johnson et al. (2012) investigated the effects of anxiety sensitivity and state anxiety in predicting nicotine withdrawal symptoms. The researchers examined 123 adult smokers undergoing a 14-day treatment for smoking cessation. They concluded that state anxiety was significantly related to the severity of withdrawal symptoms. Furthermore, during the initial days of treatment, participants experienced simultaneous fluctuations in levels of state anxiety and nicotine withdrawal symptoms. In the primary care setting, patients who experience state anxiety may report an increase in symptom severity, which may lead to aggressive symptom management, misdiagnosis, or unnecessary diagnostic testing.

### **Satisfaction.**

Higher levels of anxiety before an examination have demonstrated associations with reduced satisfaction at the end of the examination (Court et al., 2009). Court et al. (2009) examined 197 patients to determine if patients experiencing increased levels of pre-consultation anxiety before an eye examination reported lower levels of satisfaction

at post examination. Patients were recruited from the Cardiff University Eye Clinic as they arrived for their appointments; the reasons for their appointments varied from routine (74%), problem (24%), and emergency (2%). The researchers demonstrated that higher levels of anxiety prior to the examination were associated with lower satisfaction at the end of the examination; however, the type of appointment was not related to the patient's level of satisfaction (Court et al., 2009). Court et al. (2009) concluded that anxiety contributes to reduced patient satisfaction and suggested implementing interventions to decrease the intensity of patient anxiety. Primary care patients experiencing higher levels of anxiety may feel unsatisfied with their examination and fail to seek future healthcare, jeopardizing their health outcomes. Therefore, the current study examined patients' satisfaction at the conclusion of their participation.

#### **State anxiety in medical settings.**

State anxiety occurs in various settings and has been examined extensively in a variety of medical settings. For instance, state anxiety is experienced among dental patients attending routine appointments, having oral surgery, and while undergoing root canal procedures (Lamb & Stand, 1980; Kritsidima, Newton, & Asimakopoulou, 2010; Lai et al., 2008; Michalek-Sauberer, Gusenleitner, Gleiss, Tepper, & Deusch, 2012; Muglali & Komerik, 2008). State anxiety is experienced among patients during preoperative and postoperative procedures. More specifically, those patients awaiting or undergoing a biopsy (Haun, Mainous, & Looney, 2001), having vascular angiography (Buffum et al., 2006) or undergoing a surgical procedure often experience state anxiety (Bringman et al., 2009; Cooke et al., 2005; Ni, Tsai, Lee, Kao, & Chen, 2012). Also, state anxiety is experienced among patients after undergoing cardiovascular surgery (Twiss et

al., 2006) and radial mastectomy (Li, Zhou, Yan, Wang, & Zhang, 2012). Patients experience state anxiety immediately before receiving a medical diagnosis (Van Esch, Roukema, Ernst, Nieuwenhuijzen, & De Vries, 2012). Additionally, patients tend to experience state anxiety before and during less invasive medical procedures, such as during a gastrointestinal endoscopy or colonoscopy (Andrada et al., 2004; El-Hassen, McKeown, & Muller, 2009; Hayes, Buffum, Lanier, Rodahl, & Sasso, 2003; Jones et al., 2004; Kola & Walsh, 2012), hysterosalpingography (Agwu & Okoye, 2007), hemodialysis treatment (Cantekin & Tan, 2013; Pothoulaki et al., 2008), and oncological care (Karagozogu, Tekyasar, & Yilmaz, 2013; Lin, Hsieh, Hsu, Fetzer, Hsu, 2011; O'Callaghan et al., 2012; Smith, Casey, Johnson, Gwede, & Riggin, 2001). Likewise, state anxiety is experienced among women during and after pregnancy. For instance, women experience state anxiety during pregnancy (Chang, Chen, & Huang, 2008), when suffering from hyperemesis gravidarum (McCarthy et al., 2011) and during post-partum hospitalization (Paul, Downs, Schaefer, Beiler, & Weisman, 2013).

Other research studies have indicated that patients experience increased levels of anxiety before a primary care examination, comparable with examinations in other medical settings (Ferris et al., 2003). Ferris et al. (2003) examined 150 women attending for a colposcopy examination and 201 women awaiting a scheduled routine primary care visit in the Family Medicine Center, Comprehensive Cancer Center Colposcopy Clinics, and Obstetrics and Gynecology Clinic at the Medical College of Georgia. Ferris et al. (2003) indicated that women attending for both types of appointments experienced similar "mild" anxiety. In the same way, patients attending for scheduled routine and non-routine appointments in a primary care setting have demonstrated anxiety as well.

Court et al. (2010) examined state anxiety among a rural primary care population. They revealed that primary care patients attending for non-routine appointments exhibited significantly higher levels of state anxiety, as compared with those attending for routine appointments. Although only one study up to this time has explicitly examined state anxiety among a primary care population, research in this area is required to augment the current literature and implement techniques to improve patient anxiety.

State anxiety is experienced not only among the general population but is also commonly experienced in a variety of situations and events. Studies have revealed that individuals experience state anxiety in occupational environments (Polat, Küçük Alemdar, Gürol, 2013; Smith, 2008; Shulman & Jones, 1996; Sketchley-Kaye, Jenks, Miles, & Johnson), in educational settings (Marshall & Jones, 2003), when exposed to emotionally arousing pictures (Smith, 2013), during dichotic listening tasks (Roup & Chiasson, 2010) and prior to exercising or being physically active (Guszkowska, 2009). Although state anxiety is commonly experienced among various medical and general populations, only one study at this time has examined state anxiety exclusively among a primary care population. In order to expand upon the current literature among medical populations, this study examined the levels of state anxiety among a primary care population attending for routine and non-routine appointments.

#### **Primary care, culture and state anxiety.**

The primary care setting is commonly referred to as the first line of medical treatment sought for health related services. The primary care setting includes continuity and multidisciplinary care and functions as a source of referral for other medical services and specialists, which is utilized by the majority of the population for health care needs

(Fitzgerald & Evans, 2009). Culture is an important aspect of patient care that must be taken into consideration when providing healthcare to the general population. Because patients of all ethnic and cultural backgrounds require medical care, there is an increased chance of encountering patients from various cultural and ethnic backgrounds in the primary care setting (Reiter & Runyan, 2013). A primary care patient's cultural background may impact his or her reported medical symptoms, jeopardizing his or her health outcome (Pratt & Apple, 2007). For instance, cultural minority patients may not feel safe disclosing symptoms or health concerns, because they feel misunderstood or undervalued by the health care physician. In a broad sense, misunderstandings between patients and physicians, physician implicit or explicit biases, and a lack of integrated health care services may lead to distress or deter cultural minorities from accessing necessary and appropriate health care services (Pratt & Apple, 2007). As a result, culturally diverse patients who are affected by these types of biases or communication barriers may experience increased levels of state anxiety before examination with a primary care physician. Due to the increasing percentage of culturally diverse individuals utilizing primary care services, and the lack of empirical research examining this population, it is imperative to explore the levels of state anxiety experienced among a culturally diverse population. The current study specifically examined an urban-based and typically underserved primary care population.

### **Music and State Anxiety**

#### **Basis of music.**

Listening to music enables individual and cultural expression (McCaffery, 2008). Music is composed of specific sounds that are grouped together artistically to create

various melodies (McCaffery, 2008). Music comprises eight specific attributes, including pitch, rhythm, timbre, tempo, meter, contour, loudness, and spatial location, which are grouped together and facilitate various categories of music (Levitin & Tirovolas, 2009). Some aspects of music, such as beat, play an important role in reducing state anxiety (Gadberry, 2011). Gadberry (2011) demonstrated that healthy participants experienced reductions in state anxiety after listening to a steady beat of sub-contra C bass tone bar for two minutes, as compared with a silence group. Gadberry (2011) concluded that a steady beat can reduce state anxiety and provide individuals with means to self-regulate when experiencing high state anxiety. Various aspects of music are related to the processes that occur within the human brain and have been related to the emotions that one experiences (Ferguson & Sheldon, 2012).

The neural systems within the human body perceive and process sound. As music is perceived, various structures are activated and begin the process of recognizing sounds. This process begins with structures in the inner ear and ultimately reaches the auditory cortex of the human brain. Sound waves are perceived as they enter the auditory canal and strike the tympanic membrane (Kalat, 2009, p.191). This striking causes the inner ear structures (hammer, anvil, and stirrup) to augment the sounds waves in the cochlea, causing the displacement of hair cells, activating cells of the auditory nerve, and sending messages to the auditory cortex of the brain (Kalat, 2009, p.191). The auditory cortex is specifically organized so that each cell responds to a specific tone, allowing for the perception of musical tones (Kalat, 2009, p. 195). As the brain processes some types of music, such as upbeat music, one may experience an improved mood and feelings of happiness (Ferguson & Sheldon, 2012). Similarly, some music may actually lead to an

arousal of cortical responses and emotions, such as music with words or lyrics (Krout, 2007). Today, listening to music plays a fundamental role in human life and is evident in one's daily activities, such as when driving, sitting in a waiting room, working, and shopping in stores. Essentially, listening to music is an important aspect of human life and culture (Lin et al., 2011).

Music is widely accepted as being relaxing among various cultures (Loomba, Shah, Chandrasekar, Arora, & Molnar, 2012). Some regard music as a means of understanding and explaining a cultural or subcultural value and sentiment; however, this idea remains controversial (Shafron & Karno, 2013). While listening to music, an individual may experience a variety of emotions and mood states (Hunter, Schellenberg, & Griffith, 2011). For instance, Hunter et al. (2011) examined undergraduate students' moods and preferences for music. They revealed the fact that after inducing a sad mood, students were less likely to prefer happy-sounding music and even perceived sadness within ambiguous music. The interaction of musical selection and mood are especially important when selecting music for relaxation purposes.

### **Psychological versus physiological responses.**

Music is commonly thought to influence mood or the cognitive processes of psychological functioning (Stratton & Zalanowski, 1984). Researchers who have examined music and its effects on relaxation have found that different types of music result in altered feelings (McCraty, Barrios-Choplin, Atkinson, & Tomasino, 1998). McCraty et al. (1998), after listening for 15 minutes, examined the effects of four different genres of music, including grunge rock, classical, New Age, and designer music on mood, tension, and mental clarity. Designer music comprised musical selections that

included upbeat instrumental compositions, a steady beat and bass, repeated melodies, and chord patterns specifically intended to induce relaxation (McCarty et al., 1998). Among the 144 members of church study groups, local community members, and teenagers from a summer camp, researchers concluded that grunge rock music increased self-reported feelings of hostility, sadness, tension, and fatigue, with reductions noted in caring, relaxation, mental clarity, and vigor. Classical and New Age music, however, provided mixed results, whereas designer music was most effective in increasing positive feelings, such as caring, relaxation, mental clarity, and vigor (McCarty et al., 1998).

Although many studies have demonstrated music's anxiolytic effect on self-reported relaxation, few studies have investigated music's effect on physiological arousal. Self-selected music has been found to reduce autonomic nervous system activity and improve task performance among participants (Allen & Blascovich, 1994). Similarly, Smolen, Topp, and Singer (2002) indicated that patients who listened to self-selected music demonstrated significant reductions in physiological signs of anxiety, including heart rate, systolic and diastolic blood pressure. However, other studies have concluded that individuals may have experienced a decrease in physiological signs after exposure to music; however, other variables may have contributed to the reduction in arousal, such as the distracting effects of music (Scheufele, 2000). Interestingly, researchers have indicated differences in one's perception of relaxation and his or her actual physiological arousal (Burns, Labbé, Williams, & McCall, 1999). Burns et al. (1999) examined both physiological responses and perceptions of relaxation, suggesting that although participants reported feeling relaxed after listening to music, no significant effect was

noted physiologically. As a result of inconclusive evidence among the current literature, this study investigated the psychological responses among participants.

### **Musical selection.**

Among studies investigating the effects of music on state anxiety, researchers tended to examine one of two approaches in musical selection: patient-centered or investigator-selected (Elliot, Polman, & McGregor, 2011). Studies that examined the effectiveness of music utilized either a patient-centered approach, in which a participant self-selected his or her musical preference, or an investigator-selected approach, in which the researcher choose (Elliot et al., 2011). Researchers who have examined music and its effects on anxiety and relaxation have demonstrated the fact that both experimenter-chosen and participant-selected music are efficacious (Thaut & Davis, 1993). Thaut and Davis (1993) suggested that music that was chosen, based on its ability to relieve tension and increase relaxation, whether experimenter-selected or self-selected, can increase self-reported relaxation and reduce state anxiety. More specifically, researchers have indicated that classical and self-selected relaxing music reduces state anxiety (Labbé, Schmidt, Babin, & Pharr, 2007). Labbé et al. (2007) examined 56 college students from a southeastern university after they had undergone a stressful task. The students were randomly assigned to receive classical music, heavy metal music, self-selection, or silence. Participants were instructed to bring a compact disc containing music that they believed was relaxing; most participants brought country music, soft jazz, or easy listening rock musical selections (Labbé et al., 2007). The researchers concluded that listening to classical or self-selected music, which was deemed relaxing, reduced state anxiety, as compared with the groups who were listening to the other various choices.

Furthermore, listening to classical music, self-selected music, or sitting in silence increased feelings of relaxation, as compared with the listeners of the heavy metal music, who reported greater levels of state anxiety and were more anxious after listening to the music (Labbé et al., 2007). The increase in state anxiety among the heavy metal group may have been related to the degree of liking for the music. This study provides further evidence of the benefits of self-selecting music that is deemed relaxing; however, other studies indicate that investigator-selected music is more efficacious.

#### **Investigator-selected music.**

The use of investigator-selected music has been found to reduce patient anxiety in medical settings. Chi and Young (2011) reviewed 31 studies examining the effectiveness of music in increasing both physiological responses and perceived relaxation among patients. The review indicated that specially designed soothing or sedative music may be more effective at increasing relaxation, suggesting that investigator-selected music should be utilized when examining changes in levels of anxiety (Chi & Young, 2011). DeMarco, Alexander, Nehrenz, and Gallagher (2012) evaluated the effectiveness of pre-selected music in reducing state anxiety among 26 patients before they underwent elective cosmetic surgery. The study used New Age instrumental genre that was chosen by a music therapist. Results indicated that pre-selected music chosen by a music therapist was effective in reducing state anxiety among a primarily female patient population. Weeks and Nilsson (2011) examined the use of specially designed calming music among 98 patients undergoing elective coronary angiogram and/or percutaneous coronary intervention. They concluded that specially designed, calming music reduced self-reported anxiety among patients during coronary angiographic procedures; the music also

increased wellbeing. Lai et al. (2008) examined a pre-selected variety of soothing piano music among patients undergoing root canal treatment. Among 44 adult patients in a dental department, those patients who listened to investigator-selected music showed significant reductions in state anxiety, as compared with those who listened to no music. Furthermore, Gooding, Swezey, and Zwischenberger (2012) indicated that, based on research literature, investigator-selected music is most efficacious in reducing anxiety, due to its incorporation of musical parameters such as tempo, rhythms, and melody; however, they also suggest that preference is an important aspect of secondary importance.

Among the various studies utilizing investigator-selected music, many opted for relaxing music that was composed of soothing or sedative, calming, instrumental, or piano music, including Baroque or Romantic to induce relaxation (Chi & Young, 2011; Harmat, Takács, & Bódizs, 2008). Classical music has been associated with reductions in tension and activity of the autonomic nervous system among surgeons (Allen & Blaskovich, 1994). Similarly, researchers have demonstrated that classical music resulted in significant, self-reported reductions in fatigue, sadness, and tension (McCraty et al., 1998). Other researchers have utilized classical music for inducing relaxation among participants (Harmat et al., 2008; Labbé et al., 2007). Labbé et al. (2007) examined classical music, specifically Baroque style with a moderate to slow constant tempo, suggesting that classical music resulted in significant reductions in state anxiety and increased feelings of relaxation. However, other researchers have suggested that one's liking for the music is more effective in increasing self-reported relaxation (Stratton & Zalanowski, 1984).

**Self-selected music.**

Researchers have suggested that one's musical preference is essential when examining the anxiety-reducing effects of music, due to individual preferences differing across generations and cultures (Rentfrow, Goldberg, & Levitin, 2011). Rentfrow et al. (2011) suggest that one's preference for music is associated with personality dispositions, influences from social media, and cultural factors. Due to the individual differences that exist, it seems imperative to provide patients with the opportunity to self-select their musical preference. The use of relaxing, self-selected music has demonstrated efficacious results in reducing anxiety (Smith, 2008). Walworth (2003) measured differences in genre selection, as compared with preferred song selection among 90 anxiety-induced individuals. The results suggested that participants who listened to music, either a preferred musical genre or a specifically selected song, demonstrated significantly less anxiety, as compared with those who listened to no music. Walworth (2003) concluded that participants who selected a preferred relaxing musical genre or artist demonstrated similar reductions in self-reported anxiety, as compared with those who selected a preferred song. Although relaxing self-selected music has demonstrated decreases in state anxiety, the effects may be due to autonomy in deciding or having a choice in the type music to listen to (Walworth, 2003).

**Choice, preference, and satisfaction.**

Autonomy in decision making or having the option to choose is highly valued in many societies and may lead to feelings of control (Roets, Schwartz, & Guan, 2012). El-Hassen, McKeown, and Mullen (2009) suggest that patients who have control or choice in their musical selection may feel less anxious before undergoing a procedure, due to

restoring the loss of control that is sometimes experienced in medical settings. One might think that having more options may lead to more benefits (Roets et al. 2012). However, too many choices can lead to detrimental consequences in satisfaction among individuals. Polman (2012) demonstrated the fact that participants who make a selection for themselves are less satisfied when deciding among many choices, as compared with making fewer choices. Self-selecting among preferred choices is an important aspect of satisfaction among participants (Botti & Iyengar, 2004). Botti and Iyengar (2004) examined the benefits of self-selecting from preferred choices among 60 college students. They revealed that participants were more satisfied when selecting from alternatives they preferred, and reported less satisfaction when selecting from fewer preferred items (Botti & Iyengar, 2004). Alternatively, those who were not given the option to choose were more satisfied with less preferred choices. Botti and Iyengar (2004) indicated that when faced with options that are preferred or less preferred, individuals desire to make their own choices even if they will be less satisfied with the outcome. Although self-selecting from preferred options has demonstrated associations with greater levels of satisfaction, those who were not given the option to choose were more satisfied when fewer preferred options were available.

### **Relaxation and satisfaction.**

Relaxation has demonstrated associations with individual satisfaction. Kasperen (2012) examined the effectiveness of relaxation training on perceived stress and life satisfaction among high school teachers and staff members. The relaxation training group experienced meditation, deep breathing, and relaxing music, as compared with the group who had no training. The experimental groups were exposed to the relaxation training for

4 weeks for 30-45 minutes per week. Kaspereen (2012) indicated that participants in the relaxation group reported a reduction in stress, work related stress, and a greater perception of life satisfaction (Kaspereen, 2012). Kaspereen (2012) suggested that relaxation training is a useful and effective technique for individuals who experience stress, feel tense or anxious, ultimately leading to stress management and overall satisfaction. Similarly, Smith, Levett, Collins, and Crowther (2011) reviewed eleven randomized controlled trials investigating relaxation techniques for labor management. Smith et al. (2011) concluded that a limited number of studies indicated that patients experiencing relaxation instruction reported increased satisfaction with pain reduction, and other patients engaging in Yoga experienced reductions in reported pain level, increased satisfaction with their pain reduction, and overall satisfaction with childbirth. These studies further support the importance of relaxation on individual experiences of satisfaction.

#### **Alternative anxiolytic effects of music.**

Although many studies indicate that participants who listen to music will experience increases in perceived relaxation, some researchers have demonstrated that participants who sat in silence experienced similar increases in perceived relaxation (Burns et al., 1999). Burns et al. (1999) examined the effectiveness of classical music, hard rock music, self-selected relaxing music, and no music on perceived relaxation. They randomly assigned 56 undergraduate students to one of four conditions and measured their reported levels of relaxation at pre-and-post exposure. Burns et al. (1999) indicated that participants assigned to the classical, self-selected, or no music group reported significant increases in perceived relaxation. Interestingly, individuals who self-

selected relaxing music or were not exposed to music reported the greatest increase in perception of relaxation, as compared with the classical music group.

Some researchers have suggested that music increases relaxation, yet others have indicated that listening to music interferes with one's thought processes and may be distracting (Harmat et al., 2008; Scheufele, 2000). Scheufele (2000) examined self-reported and physiological responses of 77 normal male volunteers who were exposed to a stressful task and then assigned them to one of four groups, including two 15 minute relaxation groups (Progressive Relaxation or Classical Music) and two control groups (Attention Control or Silence). Participants in the Progressive Relaxation group self-reported the greatest increases in relaxation, followed by the Music group, and the Silence group (Scheufele, 2000). The Silence group demonstrated physiological reductions in heart rate, but did not report feeling relaxed or distracted; the Music and Attention Control (auditory memory task) experienced a decrease in heart rate and reported being more distracted (Scheufele, 2000). The Music group experienced a greater decrease in heart rate, as compared with all other groups, but was more distracted (Scheufele, 2000). Scheufele (2000) concluded that listening to relaxing music or engaging in an auditory memory task seemed to distract participants, resulting in decreased arousal.

### **Musical Intervention in Medical Settings**

The anxiolytic effects of music have been empirically supported as being effective in various medical settings (Haun, Mainous, & Looney, 2001). Both self-selected and investigator-selected music have been utilized as a strategy to reduce state anxiety among patients in various stages of medical procedures (Cooke et al., 2005).

Within medical settings, anxiety experienced before undergoing medical procedures may increase as a result of aspects of the procedure (Hayes, Buffum, Lanier, Rodahl, & Sasso, 2003). More specifically, gastrointestinal procedures, such as a colonoscopy or esophagogastroduodenoscopy, may produce increased levels of state anxiety among patients (Hayes et al., 2003). Music, in particular, has demonstrated reductions in state anxiety among minor procedural, operative, oncological, and dental care patients.

### **Minor procedures.**

Patients tend to experience anxiety before undergoing minor medical procedures, such as endoscopies or esophagogastroduodenoscopies (El-Hassan et al., 2009; Hayes et al., 2003). Hayes et al. (2003) examined 198 patients' levels of state anxiety before undergoing gastrointestinal procedures. Patients were randomly assigned either to a 15 minute self-selected music group or to care as usual. State anxiety was measured by the State-Trait Anxiety Inventory. Hayes et al. (2003) concluded that self-selected music reduced pre-procedural state anxiety among gastrointestinal patients. A second study replicated the Hayes et al. (2003) findings, examining the effectiveness of music before undergoing an endoscopic procedure (El-Hassan et al., 2009). El-Hassan et al. (2009) examined 180 patients' levels of state anxiety immediately before undergoing an upper or lower endoscopic procedure. Patients were divided randomly into a music group or into a silence group. Patients in the music group listened to 15 minutes of self-selected music, including a wide range of musical genres including classical, jazz, rock, country, and western, administered through a CD player with headphones. The researchers concluded that the levels of state anxiety experienced by patients prior to both procedures were significantly reduced after listening to self-selected music. While undergoing

gastroenterological procedures, self-selected music has demonstrated anxiolytic effects in the patients' levels of state anxiety, as compared with having no music.

Research has also indicated that patients awaiting vascular angiography procedures benefit from the use of self-selected music. Buffum et al. (2006) examined the effects of self-selected music on state anxiety among patients before undergoing a vascular angiography procedure. One hundred and seventy patients were randomly assigned to an experimental group, which consisted of listening to 15-minutes of self-selected music (classical, jazz, rock, country western, and easy listening) or a control group, which included standard care as usual. The State-Trait Anxiety Inventory was used to assess patient anxiety before and after entering the procedure area. Patients who listened to self-selected music showed a statistically significant reduction in their levels of state anxiety, as compared with those who listened to no music. Self-selected music has demonstrated reductions in state anxiety, when compared with care as usual. This important finding indicates that care as usual in medical settings may benefit from an additional patient-selected musical intervention.

Self-selected music has also been found to reduce the levels of state anxiety among renal failure patients undergoing hemodialysis treatment. Pothoulaki et al. (2008) examined the effects of preferred music among 60 patients undergoing hemodialysis. Patients in the experimental group listened to preferred music (popular music, Greek folk music, ethnic music, jazz, classical, soundtracks from films, and new age music), but the control group did not listen to music and engaged in usual behavior (reading, sleeping and watching TV), during a 45 minute treatment session. The researchers suggested that

preferred music is empirically supported in reducing state anxiety and perceived pain among hemodialysis patients.

Minor procedures tend to be less invasive, although patients tend to feel anxious before undergoing the procedure. Patients undergoing minor procedures, who were instructed to self-select music, demonstrated significant reductions in levels of state anxiety. Furthermore, some patients who listened to self-selected music reported less pain. Similar to minor procedural medical settings, the primary care setting tends to be less invasive although researchers have demonstrated that patients experience state anxiety (Court et al., 2010). Although minor procedures may be regarded as less intrusive, patients undergoing operations or surgeries have demonstrated similar reductions in state anxiety after exposure to self-selected or investigator-selected music.

#### **Operative/surgical care.**

Patients may experience anxiety while thinking about the outcome of surgery or potential complications that may occur (Johnson, Raymond, & Goss, 2012). Investigator-selected music has been examined in medical settings as an intervention to reduce state anxiety experienced by patients awaiting surgery. Patients awaiting a breast biopsy tend to experience high levels of anxiety, due to the possibility of breast cancer (Haun, Mainous, & Looney, 2001). Haun et al. (2001) examined the effects of music on anxiety among patients awaiting a breast biopsy by randomly assigning 20 female patients to receive 20 minutes of music or to receive preoperative care as usual, in a large suburban medical facility. The music group was provided a selection of New Age music, without musical preferences solicited. The State-Trait Anxiety Inventory was used to measure state anxiety before and after admittance into the preoperative holding area. The

researchers concluded that post-test state anxiety and respiratory rates among patients in the music group were significantly reduced, as compared with the control group.

Although the outcome of surgery may create anxiety among surgical patients, investigator-selected music has demonstrated efficacious results in reducing state anxiety.

Similarly, patients undergoing elective surgeries experience anxiety and discomfort from the unfamiliar setting and perceived risks of complications (Ni, Tsai, Lee, Kao, & Chen, 2012). Investigator-selected music has demonstrated effectiveness in further reducing low levels of state anxiety among surgical patients. Ni et al. (2012) investigated the effects of music among 183 outpatients who were undergoing elective surgeries. They randomly assigned participants to a music group or control group. The music group listened to 20 minutes of investigator-selected music, Chinese and Minan Taiwanese Pop songs; the control group, however, engaged in relaxing activities in the waiting area. The participants experienced a low-moderate level of state anxiety at the beginning of the study; however the music group reported significantly lower anxiety on the State-Trait Anxiety Inventory (Chinese version), as compared with the control group (Ni et al., 2012). Although patients experienced low levels of state anxiety before their surgery, investigator-selected music effectively reduced the patients' levels of anxiety further. These findings provide evidence that patients experiencing low to moderate levels of state anxiety may further reduce their anxiety after listening to music.

Self-selected music has demonstrated similar anxiolytic effects among surgical patients before surgery. Cooke et al. (2005) used a pre-and post-test design to examine the effects of music on patient anxiety among 180 day surgery patients in an adult surgical care unit. The State-Trait Anxiety Inventory was used to measure the levels of

state anxiety among the patients. Patients were randomly assigned to a self-selected music group (classical, jazz, country and western, new age, easy-listening, and contemporary artists) with headphones, to a placebo group with headphones but no music, or to a control group with care as usual (Cooke et al., 2005). The researchers concluded that listening to 30 minutes of self-selected music significantly reduced patients' preoperative levels of state anxiety, as compared with care as usual. These findings further demonstrate the effectiveness of self-selected music among patients before undergoing surgery, similar to findings using investigator-selected music.

Bringman et al. (2009) examined the effects of music among 372 patients prior to undergoing elective surgery, in comparison to using anxiolytic drugs. Participants were randomly assigned to receive relaxing music or to receiving 0.05-0.1 mg/kg of midazolam orally before surgery. Participants in the music group were instructed to select one of six musical genres (classical music, soft pop/film music, soft jazz, music with sounds from nature, combination of piano, harp, flute, and panflute, and a mixed CD) delivered through a portable CD player with earphones for 42 minutes. The results indicated that patients exposed to the musical intervention reported significantly lower state anxiety, measured by the State-Trait Anxiety Inventory, as compared with the control group (Bringman et al., 2009). Bringman et al. (2009) demonstrated the effectiveness of self-selected relaxing music as compared with care as usual, using anxiolytic medication. This study's findings further demonstrated the profound effects that self-selected relaxing music has on a patient's level of anxiety and health.

Anxiety among patients in postoperative care can impact their surgical outcome and length of stay in the hospital (Twiss et al., 2006). Twiss et al. (2006) investigated the

effects of music on postoperative state anxiety and the period of incubation required among 60 older adult patients undergoing cardiovascular surgery. The participants were randomly assigned either to a music group or to a treatment as usual group. The music group had the opportunity to select one of six CDs with different types of music, selection based on relaxing qualities, to listen to during surgery and while recovering in the intensive care room. Patients in both groups completed the state portion of the State-Trait Anxiety Inventory the night before the surgical procedure and three days after postoperative surgery. Although the duration of music was not recorded, the researchers concluded that patients who listened to music during and after operative care demonstrated a reduction in state anxiety and spent less time in postoperative incubation, as compared with those in the standard protocol group (Twiss et al., 2006). This study highlights the importance of music, specifically self-selected relaxing music, in reducing state anxiety and time spent in recovery.

Similarly, state anxiety may increase among patients diagnosed with cancer after undergoing an operative procedure. In one study, music was found to reduce state anxiety among 120 patients after undergoing a mastectomy. Li, Zhou, Yan, Wang, and Zhang (2012) investigated the effects of self-selected music on state anxiety among female breast cancer patients after a mastectomy. The music selected included Chinese classical folk music, famous world music, music recommended by The American Association of Music Therapy (AAMT), and Chinese relaxation music. Patients received music therapy, twice a day for 30 minutes, in addition to routine nursing care or only routine nursing care at an oncology department of a hospital. Patients in both groups completed the State-Trait Anxiety Inventory (Chinese version), which was administered before undergoing a

radical mastectomy and at three separate postoperative periods. Results indicated that patients experienced moderate to severe state anxiety at pretest and that their levels of state anxiety was significantly lower in the music group following the radical mastectomy operation (Li et al., 2012). This study demonstrated the effectiveness of self-selected music as an additional technique when combined with routine postoperative care.

Patients may also become apprehensive before undergoing invasive surgeries or operations due to anticipating the outcome of surgery. Self-selected and investigator-selected music have demonstrated anxiolytic effects among patients undergoing various surgeries. Researchers have demonstrated that investigator-selected music further reduced levels of state anxiety among participants experiencing low to moderate anxiety. Other researchers have demonstrated that self-selected music was more efficacious at reducing state anxiety, as compared with an anxiolytic medication (Bringman et al., 2009). The effects of both self-selected and investigator-selected music have important implications for primary care patients. Because primary care patients may feel apprehensive before or after receiving a medical diagnosis, referral for surgery, or results from a surgery or operation, they may benefit from relaxing self-selected or investigator-selected music in the examination room.

### **Oncological care.**

The diagnosis of cancer may cause physical and psychological suffering among patients and can impact their social support systems (Zhang et al., 2012). Zhang et al. (2012) conducted a meta-analysis of studies examining the effectiveness of music interventions on state anxiety among cancer patients. Relevant to the current study, the meta-analysis included studies that examined listening to music over the duration of one

treatment session, varying in time from 15 minutes to 90 minutes of exposure. The researchers examined eight studies that utilized the State-Trait Anxiety Inventory. Zhang et al. (2012) concluded that music is an effective intervention in reducing state anxiety before, during, and after cancer procedures (Zhang et al., 2012). More specifically, self-selected music has demonstrated anxiolytic effects among patients undergoing oncological procedures (O'Callaghan et al., 2012; Vachiramon et al., 2013).

Patients undergoing dermatologic surgery for skin cancer experience higher levels of state anxiety (Vachiramon et al., 2013). Vachiramon et al. (2013) examined the effects of self-selected music among 100 patients undergoing Mohs micrographic surgery (MMS) for skin cancer. State anxiety was measured using the State-Trait Anxiety Inventory (STAI). Patients selected their musical preference, utilizing Pandora (genre, artist, or track), which was projected through a speaker while patients waited in the examination room for the physician. The duration of the music exposure varied from 15 minutes to 60 minutes, dependent on the individual's specific surgery. Vachiramon et al. (2013) concluded that self-selected music significantly reduced anxiety among patients undergoing MMS.

Patients with cancer may receive radiation therapy, a type of cancer treatment commonly associated with anxiety (Lin, Hsieh, Hsu, Fetzer, & Hsu, 2011; Smith, Casey, Johnson, Gwede, & Riggin, 2001). O'Callaghan et al. (2012) examined state anxiety among 100 outpatients during radiotherapy treatment. Patients were assigned either to listening to 27 minutes of self-selected music or to not listening to music. Patients were administered the State-Trait Anxiety Inventory at pre-and post-radiotherapy. The researchers concluded that patients were not highly anxious before receiving

radiotherapy; however, anxiety levels decreased in both groups. Additionally, patients in the music group were significantly more likely to want music during future radiotherapy treatments; they also reported feeling supported, distracted, or they felt that time passed faster (O'Callaghan et al., 2012). This study further highlights the benefits of self-selected music in reducing state anxiety among patients who are experiencing low levels of anxiety. Patients who received self-selected music experienced reductions in anxiety, and were more likely to want music in future radiotherapy sessions.

Patients undergoing procedures for cancer treatment experience state anxiety in the medical setting. Although some patients undergoing radiotherapy treatments experienced lower levels of state anxiety, they reported reductions in state anxiety after listening to self-selected music. Some patients reported that self-selected music was distracting, and other reported feeling more highly supported or believed that time passed more quickly. Due to the important implications associated with distraction, the current study used a commercial audio group that served as a distractor group, comparing it with the other groups.

### **Dental care.**

Investigator-selected music has demonstrated anxiolytic effects among dental patients. Patients undergoing dental procedures tend to experience anxiety, which may be due to the perceived, potential physical discomfort produced by the procedure (Lai, Hwang, Chen, Chang, Peng, & Chang, 2008). As a result, the effects of music have been examined among patients undergoing dental procedures. Lai et al. (2008) examined the effects of investigator-selected soothing piano music during root canal procedures among 44 patients. Patients in the music group listened to 60 minutes of sedative music through

headphones during the root canal treatment procedure. The State-Trait Anxiety Inventory (Chinese version) was used to measure state anxiety. The researchers concluded that patients in the music group demonstrated a decrease in state anxiety, as compared with the no music group (Lai et al., 2008). Lai et al. (2008) demonstrated the effectiveness of investigator-selected soothing piano music in reducing state anxiety among dental patients. Similarly, the current study will use investigator-selected classical music in order to examine its anxiolytic benefits among primary care patients, as compared with self-selected relaxing music, commercial audio, or no music.

**No effect.**

Although a plethora of studies have indicated that self-selected music reduces state anxiety among medical patients, some studies have differed in their findings. Smith et al. (2001) examined whether or not music moderated state anxiety among 42 male patients receiving radiation therapy in an urban radiation oncology center. Patients were assigned to listen to 15 minutes of self-selected music or receive standard care, both before and during their five-week radiation treatment. They concluded that no significant differences were evident between the groups. However, trends were noted among patients with higher state anxiety scores, suggesting that music may have beneficial effects during radiation therapy. Additionally, the researchers indicated that patients may have failed to experience a significant reduction in anxiety, due to a lack of available preferred music selections (Smith et al., 2001). Although the researchers demonstrated that patients who self-select their musical preference experienced similar reductions in anxiety, as compared with care as usual, a greater reduction trend was noted among those who self-selected music.

Vanderboom et al. (2012) examined the effects of standard care versus standard care plus self-selected music. Forty-eight patients suffering from a cerebral aneurysm or arteriovenous malformation, undergoing cerebral angiography were randomly assigned to receive either standard care or standard care with self-selected music. Patients were instructed to self-select among various musical genres, including classical, jazz, new age, country, pop, rock, folk, acoustic and meditative trance (Vanderboom et al., 2012). Patients listened to their selected genre of music throughout the cerebral angiography procedure; however, the duration of music listening was not recorded. Patients' state anxiety was measured by the State-Trait Anxiety Inventory before and after undergoing the procedure. Vanderboom et al. (2012) concluded that those who received self-selected music with standard care failed to demonstrate a significant reduction in state anxiety, but that patients in the standard care only group had significantly less state anxiety at posttest. Although it was expected that primary care patients would experience a reduction in state anxiety after listening to self-selected music, the current study utilized a no music group intended to simulate care as usual.

Furthermore, researchers have suggested that music did not significantly decrease state anxiety among patients undergoing colonoscopies. Smolen, Topp, and Singer (2002) examined physiological signs and state anxiety among 32 ambulatory patients during a colonoscopy. The researchers examined the effects of self-selected music or of no music during the procedure, which lasted an average of 26 minutes. Patients were instructed to select music from a variety of genres, including classical, jazz, pop rock, and easy listening music, based on the type of music that would relax them (Smolen et al., 2002). They indicated that no significant effects were evident among the patients who listened to

self-selected music deemed relaxing (Smolen et al., 2002). However, a significant reduction in heart rate, and systolic and diastolic blood pressure was noted, demonstrating music's potential to reduce physiological signs of anxiety among patients (Smolen et al., 2002). Although this study indicates that self-selected relaxing music did not reduce state anxiety among patients, physiological reductions were noted in anxiety.

Although various studies have indicated that self-selected music reduces state anxiety, some studies have differed in their findings. Some researchers have indicated that music is less effective or is comparable to care as usual. It is important to note that among the few studies suggesting music's minimum effect, some researchers have suggested evidence of an anxiolytic trend. Additionally, each of the studies that failed to demonstrate music's anxiolytic effects examined a small sample of medical patients. In order to augment the literature, the current study examined the anxiolytic effects of self-selected relaxing music among a large primary care population.

### **Conclusions**

State anxiety is a temporary and fluctuating experience that is reactive during certain situations or events (Spielberger et al., 1970). Patients may experience state anxiety in response to a perceived stressor, such as experiencing symptoms of an illness or medical outcomes related to the health care setting (Barnes et al., 2002; Court et al., 2010; Gadberry, 2011). To date, only one research study has examined primary care patients' experiences of state anxiety before routine and non-routine medical appointments (Court et al., 2010) with emergency patients experiencing the most significant levels of state anxiety. Although many research studies have investigated state anxiety among a variety of medical patients, research has indicated that primary care

patients tend to experience levels of anxiety similar to those undergoing more invasive procedures (Ferris et al. 2003). The purpose of this study was to examine the levels of state anxiety experienced among a primary care population attending for routine and non-routine appointments and to investigate the efficacy of self-selected relaxing music, as compared with other types of music, audio commercials, or no music. This study intended to gain a better understanding of the levels of state anxiety experienced by primary care patients attending for routine and non-routine appointments and to provide medical staff with a useful and easy to administer anxiolytic strategy. Further, some the various studies that have investigated the anxiolytic effects of music among a variety of medical patients have used small medical samples of patients and have included culturally homogenous populations. The current study utilized an urban based primary care center with the purpose of generalizing the study results.

The use of music has proven effective in reducing state anxiety among medical patients, although research is mixed regarding the greater benefit of investigator-selected or self-selected music. As a result, the current study will examine self-selected relaxing music, as compared with investigator-selected music, commercial audio, or no music among a primary care population. Although some studies have failed to demonstrate the anxiolytic benefits of self-selected music, further exploration of the anxiolytic effects of music among general medical populations was required (Smith et al., 2001; Smolen et al., 2002; Vanderboom et al., 2012). Therefore, this study examined the level of state anxiety experienced among a primary care population attending for routine and for non-routine appointments and hoped to demonstrate the anxiolytic effectiveness of self-selected relaxing music, as compared with other groups. Overall, in order to improve the patients'

healthcare experiences associated with anxiety, this study intended to examine the anxiolytic effectiveness of music in the primary care setting.

## Chapter 2

### Hypotheses

#### **Hypothesis 1.**

Primary care patients attending for routine appointments will experience state anxiety, with those attending for non-routine appointments experiencing the most significant levels of state anxiety upon arrival at the primary care center, as measured by the Pre-6-item State-Trait Anxiety Inventory - State Anxiety scale.

#### **Hypothesis 2.**

Self-selected music will account for the greatest reductions in state anxiety among primary care patients, followed by investigator-selected (classical) music, commercial audio, or no music, which is predicted to account for the lowest reductions in state anxiety, as measured by the Post-6-item State-Trait Anxiety Inventory - State Anxiety scale.

#### ***Hypothesis 2a.***

Pending significant results, this study will explore whether or not primary care patients attending for routine or non-routine appointments will experience the greatest reductions in state anxiety, as measured by the post 6-item State-Trait Anxiety Inventory - State Anxiety scale.

## Chapter 3

### Methodology

#### Design and Design Justification

This research study examined the levels of state anxiety experienced among patients attending for routine and non-routine appointments, as well as the anxiolytic effects of self-selected relaxing music, as compared with investigator-selected (classical) music, commercial audio, and no music among primary care patients attending scheduled appointments. This study employed a randomized, controlled clinical experimental design with between group comparisons. Primary care patients were assessed upon arrival to their scheduled appointment, utilizing the Personal Information Questionnaire, the 6-item State-Trait Anxiety Inventory-State Anxiety scale, State-Trait Anxiety Inventory-Trait Anxiety scale, the Musical Preference Form, a post-assessment of the 6-item State-Trait Anxiety Inventory-State scale, and the Patient Experience Survey.

State anxiety among various medical populations is well supported in the literature, although only one study to date has examined state anxiety among a primary care population. Court et al. (2010) demonstrated that primary care patients attending for non-routine appointments experienced the highest levels of state anxiety, as compared with those attending for routine appointments. Currently, the use of music has demonstrated effective anxiolytic benefits in reducing medical patients' levels of state anxiety; however, the effectiveness of self-selected relaxing music among a primary care population was yet to be examined. Overall, the goal of this research study aimed to augment the current literature regarding state anxiety among a primary care population,

and to examine the anxiolytic effects of self-selected relaxing music among primary care patients attending for scheduled appointments.

### **Participants**

Primary care patients in the present study were selected from the PCOM Family Medicine center affiliated with the Philadelphia College of Osteopathic Medicine (PCOM). The PCOM health care center at City Avenue is located within the northeastern section of Philadelphia. This study included a primarily underserved primary care population.

### **Inclusion and exclusion criteria.**

For this study, all primary care patients who were scheduled for a primary care appointment were given the opportunity for participation in the study. Excluded from this study were primary care patients under the age of 18, those who identified as suffering medical symptoms that required emergency care, those with children present, and those scheduled for an obstetrics and gynecology examination.

The inclusion eligibility was determined through self-report with the research assistant. Eligible patients were provided informed consent forms indicating participation in the study.

### **Recruitment.**

Prior to patient recruitment and investigation, approval was obtained from the Philadelphia College of Osteopathic Medicine Institutional Review Board. In order to avoid investigator effects, research assistants served to collect the data. The research assistants consisted of 3 Clinical Psy.D students in the second or third year cohort at the Philadelphia College of Osteopathic Medicine. The research assistants were recruited

through the PCOM student email and were compensated for their time with a gift card. Each of the research assistants was stationed at the City Avenue Health Care Center one day per week. They collected data from 1:15 p.m. until 4:00 p.m. during each week for 8 months. Before data collection began, the research assistants attended a 2-hour mandatory training, which provided an overview of the research project, expectations of the research assistants, compensation information, a detailed explanation of the specific steps necessary for collecting data, assessment of their data collection, and administration proficiency. Additionally, research assistants received information regarding their specific duties and roles in the project, information about how to address unexpected complications, time required to serve, the duration of the research project, ethical guidelines, and a discussion of ways to be dismissed from the project. The research assistants were provided with details of the data collection process, including the research groups, how to administer and file the informed consents and assessment forms, how to utilize the Hewlett Packard laptop, the Pandora website, the commercial audio recording, ethical guidelines of research collection (confidentially and informed consent), and how to discuss the research study with patients, using a checklist and verbal script. During the extent of the research study, the experimental hypotheses were not disclosed to the research assistants. In order to begin the collection of data, all research assistants were required to submit verification of their passing scores on the CITI training with a certificate, were deemed to be proficient in administering each of the study assessments, as determined by the investigator, as well as attending a 2-hour training session.

In order to assure standardization of this research study, the research assistants were provided a checklist with a verbal script for recruiting patients in the primary care

center. During the training sessions, a role-play with the investigator was completed to ensure the research assistants were proficient and understood the data collection process. During the role-plays, the investigator provided appropriate and necessary verbal feedback. Additionally, throughout the data collection process, the investigator communicated with each of the research assistants, and discussed any complications; she also monitored the progress and integrity of data collection through reviewing “Completed” patient folders. The research assistant’s main duties were to recruit patients for participation in the study, determine if they met inclusion criterion, administer all assessment forms, and provide the appropriate group condition for each patient. In addition, they maintained open communication with all medical staff, and abided by the ethical and confidentiality standards of research data collection.

## **Measures**

### **Personal Information Questionnaire.**

The Personal Information Questionnaire is a 17-item self-report form used to gather patient information. The Personal Information Questionnaire, asked personal history questions regarding the patient’s age, gender, ethnicity, race, current use of anti-anxiety medications, depression medications or sleep aids, non-prescribed medication use, current use of recreational drugs or alcohol, hearing difficulties, current experience of a headache, questions related to the seriousness and reason for the appointment, and months since their last appointment. The personal history was used to analyze the individual characteristics and behaviors that related to the anxiety-reducing effects of music among primary care patients. See Appendix A.

**6-item State-Trait Anxiety Inventory - State Anxiety scale.**

The full-length version of the State-Trait Anxiety Inventory is a self-evaluation anxiety questionnaire, which has been utilized extensively in research studies (Spielberger et al., 1983). The STAI-S Anxiety scale is the most commonly referenced assessment for state anxiety, with norms available for medical and surgical patients (Groth-Marnat, 2009). The STAI-S Anxiety scale assesses the patient's feelings of apprehension, tension, nervousness, and worry in the current moment (Spielberger et al., 1983). The STAI-S Anxiety scale consists of 20 statements that are rated on a 4-point Likert scale, describing the intensity of the patient's feelings as: (1) not at all; (2) somewhat; (3) moderately so; (4) very much so (Spielberger et al., 1983). The scale consists of a range of scores from 20 to 80, the minimal signifying low anxiety and the maximum suggesting high anxiety; thus the higher the score the greater level of state anxiety that is being experienced (Newman & Rucker-Reed, 2004; Spielberger et al., 1983). Higher scores on the STAI-S Anxiety scale indicate an increase in perceived danger or psychological distress, and decrease with when one is exposed relaxation training (Spielberger et al., 1983). However, the lengthy 20-item STAI form may be inappropriate in fast paced medical settings and may cause additional burden for the patient (Tluczek, Henriques, & Brown, 2009). Due to time constraints within fast-paced primary care settings, the shortened version of the STAI-S Anxiety scale was employed for this study. The 6-item Spielberger State Anxiety scale has been utilized in medical settings as a replacement of the STAI-S Anxiety scale for health care research (Court et al., 2010; Marteau & Bekker, 1992; Tluczek et al., 2009; Qureshi, Standen, Hapgood, & Hayes, 2001). The 6-item Spielberger State Anxiety scale consists of items 1, 3, 6, 15, 16,

and 17 from the full length 20-item STAI-S Anxiety scale (Marteau & Bekker, 1992).

The six statements require the patient to indicate: “How you feel right now, that is, at this moment” (1) “I feel calm”, (3) “I feel tense” (6) “I feel upset” (15) “I am relaxed” (16) “I feel content” and (17) “I am worried.” The shortened version is rated on a four-point Likert scale and the total score is readjusted to reflect a score that is equivalent to the 20-item scale, with higher scores indicating higher reported anxiety (Qureshi et al., 2001). The scores may range from 6 to 24 points, with 6 points indicating no state anxiety and 24 points indicating the highest level of anxiety (Nilsson, Buchholz, & Thunberg, 2012). The 6-item Spielberger State Anxiety scale has good internal consistency reliability ( $\alpha=0.82$ ) and is highly correlated with the 20-item STAI (ranging from  $r = .92$  to  $.95$ ) (Marteau & Bekker, 1992; Tluczek et al., 2009).

#### **Musical Preference Form.**

The Musical Preference Form is a self-report form developed by the investigator. The Musical Preference Form does not consist of any psychometric properties because its creation is intended for the current research study only. All patients indicated their musical genre selection based on the type of music they deem most relaxing. The participants selected one the following genres of music; alternative, blues, classical, Christian & gospel, country, dance, easy listening, hip hop, Indi, jazz, Latin, love songs, Mexican, new age, oldies, pop, R&B, reggae, or rock. The patients were asked: “Please circle the ONE type of music you think is the most relaxing to you and that you like to listen to in order to relax.” The patients were then asked to “Please rate on a scale of 1 to 5 the music you think is the most relaxing to you and that you like to listen to in order to relax” on a 5-point Likert scale with each item scored as: (1) Not at all relaxing (3)

Somewhat relaxing; (5) Very relaxing. Only patients in the self-selected music group listened to their musical genre selections. See Appendix B.

### **State-Trait Anxiety Inventory Trait-Anxiety Scale.**

The State-Trait Anxiety Inventory Trait-Anxiety Scale (STAIT-Anxiety scale) assesses the patient's relatively stable proneness to anxiety (Spielberger et al., 1983). The STAIT-Anxiety scale consists of 20 statements that are rated on a 4-point Likert scale, describing how the patient generally feels: (1) almost never; (2) sometimes; (3) often; (4) almost always (Spielberger et al., 1983). The scale consists of a range of scores from 20 to 80, the minimal signifying low anxiety and maximum suggesting high anxiety; thus the higher the score the greater level of state anxiety that is being experienced (Spielberger et al., 1983). The twenty statements required the patient to indicate: "How you generally feel" (21) "I feel pleasant", (23) "I feel satisfied with myself", (33) "I feel secure", (36) "I am content", and (39) "I am a steady person". This study utilized the State-Trait Anxiety Inventory Trait-Anxiety scale to determine the levels of anxiety that patients generally experience, which may relate to their potential increases in state anxiety.

### **Patient Experience Survey.**

The Patient Experience Survey is a 40-item self-report form designed for use in the health center. The patients were asked, "We want to know how you feel about the care you get at our health center. Please take a few minutes to complete this survey and then return it to us. Let us know your feelings about today's visit and any visits during the last year or so. Safe and effective care is our goal. Your answers are important to us." Patients were asked to indicate questions related to each one's age, race, general health, ease of getting care, features of the facility, front desk staff, nurses and medical

assistants, providers, experience with today's visit, and general questions. This study utilized the Patient Experience Survey to report the patients' satisfaction within this study.

### **Procedure**

Upon the research assistant's arrival to the PCOM Family Medicine Healthcare Center at 1:00 pm, but before recruiting potential patients, the research assistant retrieved one unidentified patient's manila folder from the locked file box. Each unidentified patient's manila folder contained two informed consents, the Personal Information Questionnaire, the Pre/Post State-Trait Anxiety Inventory-State Anxiety scale (Questionnaire Y1), the State-Trait Anxiety Inventory-Trait Anxiety scale (Questionnaire Y-2), Musical Preference Form, the Patient Experience Survey, and indicated the patient's group assignment on the inside cover; it also contained one raffle ticket. The research assistant asked the front desk receptionist for a copy of the appointment roster and waited in back of the front desk receptionist area. After the front desk receptionist completed the check-in process with the patient, the receptionist informed patients with a 1:15 pm appointment or later that a study was being conducted in the center and handed each a research flier. The research assistant approached patients who had been checked-in and were seated in the waiting area, using the verbal script on the procedures checklist. Patients who declined participation were thanked for their time and consideration, and their refusal was noted on the research assistant's clipboard refusal form, indicating the time, date, and gender of the patient. If the patient agreed to participate in the study, the research assistant would determine if he or she was eligible to participate. If the patient was not eligible to participate, the research assistant noted the patient's ineligibility

reason, time, date, and gender on the clipboard ineligibility form. If the patient met the eligibility requirements, the research assistant opened the unidentified patient's manila folder and began reading the informed consent aloud as the patient followed, reading along. After the consent forms were signed, the research assistant administered the Personal Information Questionnaire, Pre-6-item State-Trait Anxiety Inventory-State Anxiety scale (6 circled items only), and State-Trait Anxiety Inventory-Trait Anxiety scale. After completing the forms, the research assistant walked the patient out to the waiting area. The research assistant then walked to the preceptor room to look for the patient's designated exam room, as indicated by the patient's last name on the electronic board. The research assistant then walked to the patient's designated exam room, entered, and reviewed the inside of the unidentified patient's manila folder to determine the patient's group assignment. The research assistant pre-set or did not pre-set the Hewlett-Packard laptop, based on the patient's group assignment (Self-selected Music, Classical Music, Commercial Audio, or No Music), which was played through Pandora One Radio or the public radio Commercial Audio recording on the computer. The Hewlett-Packard laptop was not pre-set for those in the No Music group. For patients assigned to the Self-Selected Music group, the research assistant took out the Musical Preference Form and pre-set the patient's musical genre selection on Pandora One, which included a pre-selected genre station. For those in the Classical Music group, the research assistant took out the Musical Preference Form and examined whether or not the patient had selected Classical music. If not, the research assistant pre-set Pandora with the pre-selected genre station for Classical music. If a patient in the Classical Music group selected Classical music, the research assistant preset the computer with the Classical music genre station,

opened the unidentified patient's manila folder, crossed out Classical Music, wrote "Self-Selected " on the inside cover, and placed the form back into the unidentified patients manila folder. After the Hewlett-Packard laptop was pre-set with the designated selection, if applicable, the research assistant took out the completed State-Trait Anxiety Inventory-Trait Anxiety scale and State-Trait Anxiety Scoring Key. The research assistant scored the State-Trait Anxiety Inventory-Trait Anxiety scale, using the State-Trait Anxiety Scoring Key and added the score totals together. After the scoring was complete, the research assistant took note of a Trait Anxiety score over 40 points, which indicates moderate to severe trait anxiety. After the patient had been transitioned into the exam room, the research assistant continued to wait in the hallway. After the medical staff exited the examination room, the research assistant knocked on the door and entered, if appropriate. If the patient scored 40 or above on the Spielberger Trait Anxiety Inventory, the research assistant asked the patient if it would be all right to share the information with the attending physician. The research assistant then pressed play on the Hewlett-Packard laptop, and if necessary, turned the laptop backward facing the exam room wall, and indicated that she would return in a few minutes. The research assistant then exited the exam room, closed the door, pressed "start" on his or her stopwatch, and placed the "Research In Progress" sign on the exam room door. If the 15 minutes of time had not elapsed, but the physician was ready to enter the exam room, the research assistant entered the exam room and stopped the music or public radio commercials, if required and noted the listening time. If 15 minutes of time elapsed without interruption, the research assistant knocked on the exam room door, stopped the music or public radio commercial audio recording, and retrieved the Post-6-item State-Trait Anxiety Inventory-

State Anxiety scale (6 circled items only) and began asking the questions. The research assistant waited in the hallway until the physician entered the room. As the physician exited the exam room the research assistant entered the exam room and administered the Patient Experience Survey. The research assistant took the raffle ticket out of the unidentified patient's manila folder and handed it to the patient for entrance in the drawing and thanked the patient for participating in the study.

The group assignments included:

**Self-selected music group.**

In the exam room, patients assigned to the self-selected music group listened to their self-selected relaxing musical genre, which they had selected from a variety of musical genres including: alternative, blues, classical, Christian & gospel, country, dance, easy listening, hip hop, Indi, jazz, Latin, love songs, Mexican, new age, oldies, pop, R&B, reggae, or rock, for the maximum of 15 minutes. After the 15-minute time period had elapsed or the medical physician needed to enter the exam room, patients filled out the post-6-item State-Trait Anxiety Inventory-State Anxiety scale.

**Investigator-selected music group.**

Patients assigned to the investigator-selected music group listened to the investigators selection of relaxing classical music for the maximum of 15-minutes in the exam room. The music included a variety of relaxing classical music, including popular pieces from Johann Pachelbel, Johann Sebastian Bach, and Wolfgang Amadeus Mozart. After the 15-minute time period had elapsed or the medical physician entered the exam room, patients filled out the post-6-item State-Trait Anxiety Inventory-State Anxiety scale.

**Commercial audio group.**

Patients assigned to the commercial audio group listened to radio commercials for the maximum of 15-minutes in the exam room. The radio commercial consisted of a range of commercials recorded on a CD from local radio stations, and created by the investigator. Radio commercials included a mix of entertainment and consumer product advertisements. After the 15-minute time period had elapsed or the medical physician entered the exam room, patients filled out the post-6-item State-Trait Anxiety Inventory-State Anxiety scale.

**No music group.**

Patients assigned to the control group remained in the exam room for a maximum of 15 minutes without music or commercials. After the 15-minute time period had elapsed or the medical physician entered the exam room, patients filled out the post-6-item State-Trait Anxiety Inventory-State Anxiety scale.

## Chapter 4

### Results

This chapter provides the statistical analyses for the current study, which consists of two parts. Part one provides a detailed description of patient participation and ineligibility, as well as the frequency and percentage of patient demographics in the study; this is presented in Tables 1 to 6. In the second part of this chapter, each measure will be described with frequency data. In addition, the statistical analyses for the main study variables are presented; these examined the level of pre-state anxiety among primary care patients attending for routine and non-routine appointments (problem, follow-up treatment, illness, and other); they also examined the effects of self-selected music, as compared with investigator-selected music (classical music), commercial audio, and no music on post-state anxiety levels, among primary care patients. Furthermore, patient satisfaction was examined. The chapter will conclude with the Independent Samples T-test data for hypothesis 1, as well as the Analysis of Covariance (ANCOVA) data for hypothesis 2 in Table 10.

#### **Patient recruitment.**

One hundred and twenty-six primary care patients were approached for participation in the study; 23 patients were ineligible; 57 refused participation, and 46 agreed to participate; 38 completed the post-6-item State-Trait Anxiety Inventory-State Anxiety scale. Ineligible patients ( $N = 23$ ; Males = 4, Females = 19) were excluded from participating and were thanked for their consideration by the research assistant. Table 1 depicts the ineligibility reasons for patients excluded from the study.

Table 1

<i>Frequency and Percent of Ineligibility Reasons</i>		
<b>Variable</b>	<b>Frequency</b>	<b>Percent</b>
Age (under 18)	3	13.0%
Emergency Care	12	52.2%
Insurance Decline	1	4.3%
OB/GYN	3	13.0%
With Children	4	17.4%

### **Personal Information Questionnaire.**

The current study included information from 46 primary care patients (Male = 12, 26.1%; Female = 34, 73.9%) attending for scheduled examinations. The patients were between the ages of 19 and 76 ( $M = 43.00$ ,  $SD = 15.15$ ). Patients identified their ethnicity as African American (54.3%); Caucasian (non-Hispanic) (28.3%); Middle Eastern (2.2%), and 15.2% identified as “Other” (Multiracial). Patients identified their races as African American/Black (58.7%); Caucasian/White (28.3%); Multiracial (10.9%), and Other (2.2%). Patients reported the highest level of education achieved was High school or Equivalent (30.4%); Community College (15.2%); 4-year College (26.1%); Graduate School (17.4%); and Other (10.9%).

Of the patients who participated in the current study, 10 were currently taking anxiety medication (21.7%) and 36 were not taking anxiety medication (78.3%). Eight patients (17.4%) reported currently taking depression medication and 38 (82.6%) were not taking depression medication. See Tables 2, 3 and 4 for a description of sleep and non-prescribed medication usage, illicit drug usage, alcohol usage, and medical characteristics. See Tables 5 and 6 for the frequency and percentage of the patients’ type appointments.

Table 2

<i>Frequency and Percent of Current Medication Usage</i>					
<b>Variable</b>	<b>Yes</b>		<b>No</b>		<b>N</b>
	<b>Frequency</b>	<b>Percent</b>	<b>Frequency</b>	<b>Percent</b>	
Sleep Medications?	7	15.2%	38	82.6%	45
Non-prescribed or "OTC medications?"	18	39.1%	27	58.7%	45

Table 3

<i>Frequency and Percent of Illicit Drug and Alcohol Usage</i>					
<b>Variable</b>	<b>Yes</b>		<b>No</b>		<b>N</b>
	<b>Frequency</b>	<b>Percent</b>	<b>Frequency</b>	<b>Percent</b>	
Current illicit drugs or alcohol?	0	0%	45	100%	45
In the past month, have you taken illicit drugs or alcohol to calm your nerves?	3	6.5%	42	91.3%	45

Table 4

<i>Frequency and Percent of Medical Characteristics and Appointment</i>					
<b>Variable</b>	<b>Yes</b>		<b>No</b>		<b>N</b>
	<b>Frequency</b>	<b>Percent</b>	<b>Frequency</b>	<b>Percent</b>	
Difficulty hearing?	4	8.7%	40	87.0%	44
Headache?	5	10.9%	39	84.8%	44

Table 5

<i>Frequency of Appointment Characteristics</i>			
<b>Variable</b>	<b>Frequency</b>	<b>Percent</b>	<b>N</b>
<b>Description of Appointment</b>			45
Not Serious at all	21	45.7%	
Moderately Serious	19	41.3%	
Serious	4	8.7%	
Very Serious	1	2.2%	
<b>Reason for Appointment</b>			45
Routine	20	43.5%	
Non-Routine	25	54.3%	
Problem	6	13.0%	
Follow-up Treatment	11	23.9%	
Illness	4	8.7%	
Other	4	8.7%	
<b>Last Appointment with Primary Care</b>			41
Less than 6 months ago	32	69.6%	
6-12 months ago	7	15.2%	
1-2 years ago	1	2.2%	
More than 2 years ago	1	2.2%	

Table 6

<i>Frequency and Percent of New Patients</i>					
<b>Variable</b>	<b>Yes</b>		<b>No</b>		<b>N</b>
	<b>Frequency</b>	<b>Percent</b>	<b>Frequency</b>	<b>Percent</b>	
New Patient	12	26.1%	33	71.7%	45

**6-item State-Trait Anxiety Inventory - State Anxiety scale (Pre/Post).  
State-Trait Anxiety Inventory Trait-Anxiety Scale.**

Patients who were missing data on the dependent variable (i.e. post state-anxiety) were excluded from the statistical analyses. Due to the exclusion of patients, based on the post-state anxiety data, the total sample size was decreased to 38 patients. Primary care patients' levels of pre state-anxiety, post-state anxiety, and trait anxiety were analyzed to determine the mean level experienced by patients. Statistical analyses indicated that

patients reported experiencing a minimum level of pre-state anxiety ( $M = 10.36$ ,  $SD = 4.96$ ,  $N = 38$ ), post-state anxiety ( $M = 10.10$ ,  $SD = 5.36$ ,  $N = 38$ ), and minimum features of trait anxiety ( $M = 37.8$ ,  $SD = 13.49$ ,  $N = 38$ ). A separate analysis was conducted to examine whether or not the patient characteristics of those excluded from the final analysis were characteristically different from those included in the study. Overall, the sample of patients who were excluded demonstrated comparable levels of pre-state anxiety ( $M = 9.85$ ,  $SD = 3.48$ ,  $n = 7$ ) and trait anxiety ( $M = 33.5$ ,  $SD = 9.39$ ,  $n = 6$ ); therefore, those excluded from the analyses were not different from those included in the study.

#### **Musical Preference Form.**

The patients who completed the Musical Preference Form ( $N = 38$ ) selected the one type of music that they thought was most relaxing and would like to listen to in order to relax. The types of music selected by patients were Christian & Gospel ( $n = 7$ ; 18.4%); Rhythm & Blues ( $n = 6$ ; 15.8%); Easy Listening ( $n = 5$ ; 13.2%); Oldies ( $n = 4$ ; 10.5%), Alternative ( $n = 3$ ; 7.9%); Jazz ( $n = 3$ ; 7.9%); Love Songs ( $n = 2$ ; 5.3%); Country ( $n = 2$ ; 5.3%); Blues ( $n = 1$ ; 2.6%); Classical ( $n = 1$ ; 2.6%); Dance ( $n = 1$ ; 2.6%); Mexican ( $n = 1$ ; 2.6%); Pop ( $n = 1$ ; 2.6%); and Rock ( $n = 1$ ; 2.6%).

Patients reported the following genres of music as “Very Relaxing”: Love Songs (60.2%); Classical (57.8%); Jazz (55.2%); Easy Listening (52.6%); Rhythm & Blues (52.6%); Oldies (47.3%); Christian & Gospel (44.7%); Blues (29%); Pop (28.9%); Reggae (23.7%); Dance (21%); Country (18.5%); Rock (18.4%); New Age (15.8%); Alternative (13.2%); Latin (13.2%); Hip Hop (13.2%); Mexican (2.6%); and Indi (0%).

**Patient Experience Survey.**

Because of a large number of missing data on this measure, patient satisfaction was excluded as a variable examined within the statistical analyses of other study variables. A frequency analysis was conducted to examine the patients' satisfaction with the health care experience. Of the patient responses rated as "Very Good" or "Good", twenty-two (73.4%) patients reported their general health as Very good to Good; 31 patients (100%) rated the lobby, waiting room and exam room as comfortable and clean; 31 (100%) patients rated the front desk staff as friendly and helpful; 31 patients (100%) patients felt the nurses and medical assistants listened to them; 29 (100%) patients felt that the provider(s) listened to them; 29 (100%) patients felt that the provider(s) spent enough time with them, and 29 (100%) patients felt that the provider(s) gave good advice and treatment.

Of the patients who responded regarding their experiences with the visit, 19 patients (73.1%) reported that someone talked with them regarding the goals of their health; 17 (63%) patients indicated that someone asked if they had problems with the medications they take; 29 (100%) would send their family or friends to the medical center; 29 (100%) feel helped in making healthy lifestyle choices, and when asked "What one thing could we do to make the visits with us better?", one patient (2.2%) reported "Nothing-I love this office and everyone who works here!". See Table 7 and 8 for the frequency and percentage of satisfaction responses.

Table 7

<i>Frequency and Percentage of Responses of "Very Good" to "Good" on the Patient Experience Survey</i>			
<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>	<b>N</b>
<b>Ease of Getting Care</b>			
Able to get appointments for checkups	30	96.8%	31
Able to make same day appointment	20	83.4%	24
Health center hours work for me	31	100%	31
Phone calls get through easily	29	93.5%	31
I get called back quickly	23	85.2%	27
Able to get medical advice when office closed	12	66.6%	18
Length of time waiting at the clinic	22	71.0%	31
<b>Facility</b>			
Ease to find clinic	30	96.8%	31
Handicap accessible	22	100%	22
<b>Nurses and Medical Assistants</b>			
Friendly and helpful to you	30	100%	30
Answers your questions	30	100%	30
<b>Provider(s)</b>			
Answers your questions	29	100%	29
Friendly and helpful to you	29	100%	29
Gives you information you can understand	29	100%	29
Considers your personal and family beliefs	19	82.6%	23
Involves other doctors and caregivers	26	100%	26

Table 8

*Frequency and Percent of Patients Experience with Visit and General Questions*

Variable	<u>Yes</u>		<u>No</u>		N
	Frequency	Percent	Frequency	Percent	
<b>Experience with Today's Visit</b>					
Problems getting medication?	2	7.1%	21	75.0%	28
Get a copy of your care plan?	21	80.8%	3	11.5%	26
Visits with other providers?	20	74.1%	6	22.2%	27
Were you helped with making appointments to see other providers?	16	57.1%	0	0.0%	28
<b>General</b>					
Given information on what it means to have a "medical home?"	8	28.6%	20	71.4%	28
If yes, are we your medical home?	11	47.8%	2	4.3%	23
Have we helped you find other services you need?	21	72.4%	2	6.9%	29
Do you understand what you pay?	27	90.0%	1	3.3%	30
Do you feel what you pay is reasonable?	26	86.7%	1	3.3%	30

### Group Assignment and Listening Time

Thirty-eight (30 females/8 males) patients were included in the group conditions, which consisted of self-selected ( $n = 12$ ; 3 males/9 females); investigator selected (classical music) ( $n = 7$ ; 2 males/5 females); commercial audio ( $n = 8$ ; 2 males/6 females), and no music ( $n = 11$ ; 1 male/10 females). In regard to each condition, group exposure time for each patient ranged from 0 minutes to 15 minutes. Patients listening time/exposure varied within the groups; self-selected music group ( $M = 13.48$ ;  $SD = 2.96$ ); investigator selected (classical music) group ( $M = 8.79$ ;  $SD = 5.69$ ); commercial audio group ( $M = 13.02$ ;  $SD = 2.98$ ), or no music group ( $M = 10.96$ ;  $SD = 4.04$ ) varied, with an overall listening time of 11.79 minutes ( $SD = 4.14$ ). The group assignment means for age, pre/post state anxiety and trait anxiety are detailed in Table 9. The table includes

the group assignment variable: Self-Selected, Classical Music, Commercial Audio, and No Music group.

Table 9

<i>Group Assignment Means for Age, Pre/Post State Anxiety, and Trait Anxiety</i>				
<b>Variable</b>	<b>Age</b>	<b>Pre-State Anx.</b>	<b>Post-State Anx.</b>	<b>Trait Anx.</b>
Self-Selected	49.5	11.7	10.9	39.6
Classical Music	40.7	10.4	10.0	39.7
Commercial Audio	52.5	7.5	7.0	32.2
No Music	32.8	10.9	11.4	38.7
Total	43.7	10.3	10.1	37.8

### **Hypothesis One**

In order to determine if patients attending for non-routine appointments would experience the most serious significant levels of pre-state anxiety, an Independent Samples T-test was conducted. The independent variable was the type of appointment (routine or non-routine) and the dependent variable was the patients' levels of pre-state anxiety. The Independent Samples T-test was used to determine if a significant mean difference existed between the routine and non-routine groups. The routine group ( $M = 10.43$ ,  $SD = 5.62$ ,  $n = 16$ ) and non-routine group ( $M = 10.31$ ,  $SD = 4.57$ ,  $n = 22$ ) were associated with minimum pre-state anxiety. To test the hypothesis that routine and non-routine appointments were associated with statically significant mean differences, an Independent Samples T-test was conducted. The assumption of homogeneity was conducted and satisfied through the Levene's F test,  $F(36) = .68$ ,  $p = .41$ . The independent samples t-test indicated that the  $p$  value was above the significance level set for the study; therefore, there was no statically significant difference in the level of pre-state anxiety,  $t(36) = 0.72$ ,  $p = .943$  ( $p > .05$ ). The findings indicated that there were no

significant differences in primary care patients' levels of pre-state anxiety, whether they attended for routine or for non-routine appointments.

### **Hypothesis Two**

In order to test the hypothesis that self-selected music accounts for the greatest reductions in state-anxiety among primary care patients, as well as the hypothesis that self-selected music and classical music accounts for greater levels of satisfaction among primary care patients; an Analysis of Covariance (ANCOVA) was computed in SPSS. The independent variable, group condition, involved four different levels: self-selected relaxing music ( $N = 12$ ); investigator-selected (classical) music ( $N = 7$ ); commercial audio ( $N = 8$ ), and no music ( $N = 11$ ). The dependent variable was the post-test levels of state anxiety, and the covariate was pre-state anxiety level. An ANCOVA was used to determine if a significant difference exists between the various group conditions on post-level of state anxiety. The assumption of homogeneity was conducted and satisfied through the Levene's F test,  $F(3) = .32$ ,  $p = .81$ . In order to test the main and interaction effects of group condition on level of post-state anxiety, the pre-level of state anxiety was controlled. A post-test state anxiety scale was used to determine significant differences among the groups. This analysis evaluated individual differences in the anxiolytic effects on four groups, yet controlled for the effects of the covariate that was not of primary interest. There was no significant effect of group assignment on mean level of post-state anxiety, even after controlling for the effects of pre-state anxiety,  $F(3,33) = .655$ ,  $p = .585$ , because the  $p$  value was above the significance level set for the current study. A Post hoc analysis revealed that the observed power was .17, suggesting a low level of

statistical power. These findings indicate that there were no significant mean differences of post-state anxiety among the group conditions.

*Hypothesis 1:* Primary care patients attending for routine appointments will experience state anxiety, with those attending for non-routine appointments experiencing the most significant levels of state anxiety upon arrival at the primary care center.

Independent variable: Type of Appointment (Routine or Non-Routine)

Dependent Variable: Pre-State Anxiety

Analysis: Independent Samples T-Test

Results: Does not support hypothesis 1; no significant mean difference exists between the two groups.

*Hypothesis 2:* Self-selected music will account for the greatest reductions in state anxiety among primary care patients, followed by investigator-selected music, commercial audio, or no music, which is predicted to account for the lowest reductions in state anxiety.

Independent variable: Group Condition (self-selected music; investigator-selected (classical music) music, commercial audio, or no music.

Dependent variable: Post-State Anxiety

Covariate: Pre-State Anxiety

Analysis: ANCOVA; test of between-subjects effects

Results: Does not support hypothesis 2; no significant differences exist.

Table 10

<i>ANCOVA on Post-State Anxiety by Group Assignment</i>			
<i>(Self-Selected; Investigator-Selected; Commercial Audio; No Music)</i>			
	<i>df</i>	<i>F</i>	<i>p</i>
Group Assignment	3	.655	.585
Error	33	(7.059)	

*Note:* The Error value in the parenthesis is the mean square error.

## Chapter 5

### Discussion

The intent of this study was to examine the anxiolytic effects of self-selected music among a primary care population attending for routine and non-routine appointments. This study aimed to augment the current literature, providing support for music's anxiolytic effect among a generalized primary care population. The study was designed to support Court, Greenland, and Margrain's (2010) findings that primary care patients experience state anxiety, as measured by the 6-item State-Trait Anxiety Inventory- State Anxiety scale, which they suggest may be useful for primary care physicians to utilize for patient care. It was anticipated that results of this study would provide primary care physicians with additional information about the patients' emotional states before a primary care appointment. Because only one study to date has examined state anxiety among primary care patients, this study was intended to augment the current literature and provide further support for higher levels of state anxiety experienced among those attending for non-routine appointments.

The primary care setting serves many functions including the critical task of identifying and managing patient mental health, such as anxiety (Tarricone, et al., 2012). Primary care has undergone various changes, most notably, a collaborative relationship with the field of mental health. Integrated healthcare settings, which comprise behavioral and medical health professionals, are necessary due to the inception of the patient-centered medical home model (PCMH) and recent legislative healthcare reforms (Beacham, Kinman, Harris, & Masters, 2012). Within the integrated healthcare setting, mental health professionals utilize empirically supported techniques and interventions

aimed at reducing patient anxiety and distress (Kelly & Coons, 2012). In many cases, mental health professionals are required to utilize time-limited and flexible interventions (Kelly & Coons, 2012). Because of this, the use of self-selected music in the primary care setting was the main purpose of this study, with the anticipation of providing mental health professionals with an individualized and efficacious strategy for reducing patient state anxiety among those attending for routine and non-routine appointments in the primary care setting. In addition, it was expected that the study would augment the literature suggesting that self-selected music is effective in reducing state anxiety among a general medical population. Repeat administrations of the 6-item State-Trait Anxiety Inventory-State Anxiety scale at the initial consent to participate and after exposure to one of four group conditions was examined to determine if self-selected music had a significant effect on post-level of state anxiety. An ANCOVA analysis indicated that no significant difference existed between or among any of the groups, even after controlling for the pre-level of state anxiety.

There are a few possible reasons that may have contributed to the lack of significant findings. First, the original sample of patients was 46; however, patients were unable to complete the Post-6-item State-Trait Anxiety Inventory-State Anxiety scale, due to providers entering the exam room before the patients were exposed to the experimental condition or patients who terminated participation and were excluded from the final analysis. The lack of significant findings in the current study may be explained by the small sample size ( $N = 38$ ), and low level of observed power. Next, after a review of the individual items on the Patient Experience Survey, patients reported overall satisfaction with the primary care center, staff and with providers. Because of this,

primary care patients at the PCOM Family Medicine center may have not experienced increases in state anxiety, due to positive experiences at the center in the past (Returning Patients;  $N = 45$ ; 71.7%).

The first hypothesis aimed to determine if patients attending for non-routine appointments would experience the most significant levels of pre-state anxiety upon arrival at the primary care center. The results revealed that there was no significant mean difference in the primary care patients' levels of pre-state anxiety if they were attending for routine or for non-routine appointments. This result is inconsistent with Court et al., 2010 findings that primary care patients experience state anxiety before routine and non-routine medical appointments, with non-routine patients experiencing the most significant levels of state anxiety.

The second hypothesis aimed to examine if Self-Selected music accounted for the greatest reductions in state anxiety among primary care patients, followed by reductions accounted for by investigator-selected music, commercial audio, or no music, which is predicted to account for the lowest reductions in state anxiety. The results revealed that there was no significant mean difference between or among the group conditions. This result is inconsistent with the plethora of research that has concluded that self-selected music demonstrated reductions in state anxiety among patients in various medical settings, such as before, during or after minor and invasive operative and surgical procedures (Bringman et al., 2009; Buffum et al., 2006; Cooke, Chaboyer, Schluter, & Hiratos, 2005; El-Hassen, Mckeown, & Mullen, 2009; Hayes et al., 2003; Li, Zhou, Yan, Wang, & Zhang, 2012; O'Callaghan et al., 2012; Pothoulaki et al., 2008; Twiss, Seaver, & McCaffrey, 2006; Vachiramon, Sobanko, Rattanaupawan, & Miller, 2013). In

addition, this study did not support the previous research findings that investigator-selected music (Classical Music), typically soothing and sedative music, effectively reduced state anxiety (Chi & Young, 2011; DeMarco, Alexander, Nehrenz, & Gallagher, 2012; Haun, Mainous, & Looney, 2001; Lai et al., 2008; Ni, Tsai, Lee, Kao, & Chen, 2012; Weeks & Nilsson, 2011). Although the benefits of self-selected music and investigator-selected (classical music) music have been established in various medical settings, the current research study did not support the effectiveness of music among a primary care population.

However, although this research study did not support the current research regarding state anxiety or the effectiveness of self-selected music in reducing state anxiety among various medical populations, it examined a primarily underserved primary care patient population. The study included patients who identified as African American or multi-racial ( $n = 69.5\%$ ), providing information regarding cultural diverse patients psychological well-being, primary care appointment characteristics, musical preferences, and general satisfaction with their primary care setting.

### **Limitations**

There are several limitations in the current study. First, the study was composed of primary care patients from PCOM Family Medicine center affiliated with the Philadelphia College of Osteopathic Medicine (PCOM) located within the northeastern section of the city of Philadelphia. Although the patient demographics represented an underserved and culturally diverse population, primarily African American, it may not represent or generalize to the majority of primary care centers in the United States.

Next, the current study included a total sample size of 46 primary care patients, which was fewer than anticipated. Among the 46 patients who were included in the study, data were not included if it was missing the post-state anxiety measure, further reducing the overall sample size ( $N = 38$ ). The small sample size may have influenced the statistical analyses and the ability to examine the differential treatment effects within the independent variable groups. In addition, the low statistical power resulting from the small sample size in the current study ( $N = 38$ ) may have limited the significance of the statistical analyses. A post hoc power analysis revealed a low level of observed power at .17. The current study was able to recruit a total of only 38 patients; however, 23 patients were ineligible to participate and 57 refused participation (female = 30; male = 27).

Moreover, the study utilized self-report measures, some of which were developed by the investigator and did not consist of any psychometric properties because the creation was intended for the current research study only. Although the study utilized self-report measures, patients may not have answered the questions in an accurate manner, thus leading to distorted responses. Primary care patients may have responded to items inaccurately for a few reasons; some of these include not wanting to disclose specific information about drug or alcohol usage, the belief that they lacked introspection into the questions on the measures, or their desire to appear more favorably.

Also, the patients' levels of pre-state anxiety and trait anxiety in the current study were generally low. Patients, who participated in the study, reported minimum levels of state anxiety ( $M = 10.36$ ) and trait anxiety ( $M = 37.8$ ). The minimum levels of state and trait anxiety experienced by patients may have influenced the analyses, indicating that no

significant effect was observed. For instance, if patients reported minimum levels of pre-state anxiety, large reductions in post-levels of state anxiety would be unlikely.

Next, the study examined a sample of patients who attended examinations during a convenient time period. All patients in the study were attending appointments scheduled from 1:15p.m to 4:00p.m daily; this may represent an incomplete observation of a primary care population and fail to generalize to all primary care patients. In addition, patient wait times in the waiting area were not examined; this may have resulted from the primary care centers use of medical students, who have initial contact with patients, limiting wait times.

Furthermore, the current study used Pandora's top musical genres. The study included each of the top musical genres; however, these musical selections may not have included every patient's self-selected relaxing musical preference. Because of this, patients may have selected a less preferred musical genre and failed to experience a significant reduction in state anxiety. In addition, the study did not include the option of selecting "no music", because some patients may prefer not to listen to music or do not find it to be a relaxing experience.

In addition, the patients' exposure to a maximum of 15 minutes of music, commercial audio, or no music, was not achieved because of the fast-paced nature of the primary care setting. Due to the unpredictable exam room wait times in the fast-paced primary care setting, patients' listening times varied.

### **Suggestions for Future Work**

The patient demographics represented an underserved and culturally diverse population; however, they may not have represented the majority of primary care centers

in the United States. Future studies would benefit from examining several different primary care settings with continued emphasis on understanding the psychological issues faced by culturally diverse, primary care populations. In addition, primary care populations including pediatric and senior populations may provide information regarding the benefits of music and allow for greater generalization of results. Future research should extend the data collection period, in order to allow for greater levels of significance. Similarly, future studies should attempt to recruit a larger sample size in order to examine between group effect on the levels of post state anxiety. In order to obtain a larger sample size, it may be beneficial to extend the length of the data collection process, as well as to recruit primary care patients from several different primary care centers. Future studies should attempt to examine primary care patients attending morning appointments, as well as afternoon examinations, in order to obtain a generalizable sample of primary care patients.

Self-report measures were the means by which data were collected in the current study; however, future studies may benefit from collecting qualitative data, in order to examine patients' thoughts and feelings. More especially, it would be beneficial to understand the patients' thoughts prior to attending their appointments, which may have been related to health anxiety or general anxiety thoughts. Due to the limited numbers of patients reporting state anxiety, future studies would benefit from examining the significant effects of group conditions among those who report moderate to severe levels of state anxiety, as measured by the 6-item State-Trait Anxiety Inventory State Anxiety scale.

Also, future studies may benefit from allowing patients to select either an individual song choice or band of their choice, as well as having the opportunity to select “no music”. Future studies could examine aspects of the practicality of playing music in the primary care setting, for instance, using computerized technology, such as an I-Pad. Due to the unpredictability of exam room wait times, patient exposure to condition times varied. Furthermore, due to the primary care centers use of medical students, waiting room times may also have been limited. Future studies would benefit from a preliminary analysis of the primary care center and an evaluation of the average patient wait times in the waiting room and exam room. Future research may also benefit from examining state anxiety and music’s anxiolytic effects among other medical populations; this may include situations such as times before patients undergo phlebotomy procedures or during hospitalized intensive care admissions. In addition, future research could examine the level of state anxiety among medical physicians and the anxiolytic effects of self-selected music, before they examine patients.

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## Appendix A

### Personal Information Questionnaire

*Please answer the following questions by filling in the blank or circling the appropriate answer.*

**(1) Please indicate your gender:** Male or Female

**(2) Age** \_\_\_\_\_

**(3) What is the highest level of education you have completed?**

Grammar School      High School or equivalency      Community College or 2 year program  
College (4 years)      Post-College (graduate school or equivalent)      Other \_\_\_\_\_

**(4) Which ethnic group(s) best describes you?**

African-American (non-Hispanic)      Asian/Pacific Islanders      Caucasian (non-Hispanic)  
Caribbean      Latino/Hispanic      Native American      Middle Eastern  
Other \_\_\_\_\_

**(5) Which race do you most identify with?**

Arab      Asian/Pacific Islander      African American/Black      Caucasian/White      Hispanic  
Latino      Multiracial      Other \_\_\_\_\_

**(6) Of the following medications that have been prescribed by your medical professional are you currently taking any prescribed:**

**Anti-anxiety medications?** Yes or No

**Depression medications?** Yes or No

**Sleep medications?** Yes or No

**(7) Are you currently taking any non-prescribed or “over the counter medications”?** Yes or No

**(8) Are you currently under the influence of any illicit drug or alcohol?** Yes or No

**(9). In the past month have you used alcohol or taken non-prescribed medications to calm your nerves?** Yes or No

**(10) Please indicate if you have difficulty hearing?** Yes or No

**(11) Are you currently experiencing a headache? Yes or No**

**(12) Would you describe this appointment that you are attending today:**

Not Serious at all    Moderately Serious    Serious    Very Serious

**(13) How would you describe the reason for your scheduled appointment?**

Routine    Problem    Follow-up Treatment    Illness    Emergency    Other:\_\_\_\_\_

**(14) When was your last appointment with your primary care physician?**

Less than 6 months ago    6-12 months ago    1-2 years ago    More than 2 years ago

**(15) Are you a new patient to the PCOM Family Medicine practice    Yes or No**

**If not, how long have you been a patient at Family Medicine? \_\_\_\_\_.**

**Appendix B**

**Musical Preference Form**

**Please circle the ONE type of music you think is the most relaxing to you and that you like to listen to in order to relax:**

Alternative

Blues

Classical

Christian & gospel

Country

Dance

Easy Listening

Hip hop

Indi

Jazz

Latin

Love Songs

Mexican

New Age

Oldies

Pop

R & B

Reggae

Rock

**Please rate on a scale of 1 to 5 the music you think is the most relaxing to you and that you like to listen to in order to relax:**

	<b>Not at all relaxing</b>	<b>Somewhat Relaxing</b>		<b>Very Relaxing</b>	
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Alternative	1	2	3	4	5
Blues	1	2	3	4	5
Classical	1	2	3	4	5
Christian & gospel	1	2	3	4	5
Country	1	2	3	4	5
Dance	1	2	3	4	5
Easy listening	1	2	3	4	5
Hip hop	1	2	3	4	5
Indi	1	2	3	4	5
Jazz	1	2	3	4	5
Latin	1	2	3	4	5
Love songs	1	2	3	4	5
Mexican	1	2	3	4	5
New age	1	2	3	4	5
Oldies	1	2	3	4	5
Pop	1	2	3	4	5
R&B	1	2	3	4	5
Reggae	1	2	3	4	5
Rock	1	2	3	4	5