

SEXUAL ORIENTATION, GENDER IDENTITY, HEALTH, AND STRESS

by

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ABSTRACT

This study examined health-related physical body measurements and experiences of heterosexist stress (consistent with Meyer's minority stress model) among sexual minority individuals and heterosexual individuals residing in the Texas Panhandle region of the United States. Height, weight, BMI, body fat percentage, body muscle percentage, visceral fat, body age, waist circumference, hip circumference, waist-to-hip ratio, blood pressure, and heart rate were assessed for 356 male and female participants. Results indicated that the lesbian participants presented with overall poorer health when compared to the bisexual female sample and the heterosexual female control group, as indicated by the *body health index* (i.e., a component extracted from principal component analysis that is compiled of the previously mentioned measurements associated with body health). Also, the majority of the lesbian sample was found to be obese, compared to the heterosexual female comparison group and the bisexual sample. These findings confirm that lesbian women are at a higher risk for overall poorer health, obesity, and obesity-related disorders when compared to their heterosexual and bisexual peers, but no mediating factors for these differences was determined.

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CHAPTER I

INTRODUCTION

A large body of research has demonstrated that sexual minority individuals (e.g., people that identify as lesbian, gay, bisexual, transgender, or non-heterosexual) show a heightened risk for a myriad of health issues when compared to heterosexual individuals (Frost, Lehavot, and Meyer, 2013; Lick Durso, and Johnson, 2013; Mink, Lindley, and Weinstein, 2014; Operario, Gamarel, Grin, Lee, Kahler, Marshall, van den Berg, and Zaller, 2015). Presently, there is a sufficient number of studies to preliminarily conclude that sexual minority individuals present with a wide array of mental and physical health disparities that range from poor overall health to higher rates of contraction of specific diseases (Carpenter, 2003; Denton, 2012; Lick, et al., 2013; Mink et al., 2014). The latter research includes the widely cited results of the 2001 to 2010 National Health and Nutrition Examination Survey (NHANES) (Operario et al., 2015). The NHANES garnered interest by the Institute of Medicine (IOM), and subsequently led the IOM to call for a greater prioritization of research on the health of sexual minorities in the United States (Operario et al., 2015). The majority of researchers that have attempted to tease apart the origin of these health differences have cited the higher exposure to social stress (e.g., antigay victimization, discrimination, internalized homophobia) that sexual

minority individuals face as a key factor, that may be the locus of these negative health differences (Frost et al., 2013; Institute of Medicine [IOM], 2011; Lick et al., 2013; Meyer, 1995; 2003a; 2003b; 2010; 2015; Meyer, Schwartz, and Frost, 2008). Holding a sexual minority status exposes the individual to experiencing unique excesses of stress that are not typically experienced by heterosexual individuals (Frost et al., 2013; Meyer, 1995; 2003a; Mink et al., 2014). For example, concealment of one's sexual identity (outness) and internalized homophobia are not forms of stress that other minority populations experience (Frost et al., 2013; Meyer, 2003a; Mink et al., 2014). Therefore, the current study uses the specialized term 'minority stress,' as it relates to the physical health of sexual minority individuals, in an effort to be inclusive of the group-specific, multiple social stressors that have been found to be distinctive to this community (Brooks, 1981; Frost et al., 2013; Lick et al., 2013; Meyer, 1995; 2003a; 2003b; 2010; 2015; Meyer et al., 2008). A multitude of previous research that has focused on minority stress, has described how the model relates to mental health as opposed to physical health, and has revealed some robust correlations between experiences of minority stress and increases in mental health issues among sexual minority individuals (Carpenter, 2003; Lick et al., 2013; Meyer, 1995; 2003a; 2003b; 2010; 2015; Meyer et al., 2008; Mink et al., 2014). High suicide rates and mental health disparities among sexual minority individuals have been consistently reported over the past few decades (refer to Frost et al., 2013; Lick et al., 2013; Meyer, 1995; 2003a; 2003b; 2010; 2015; Meyer et al., 2008), but the physical health disparities that sexual minority individuals experience have generated less interest (Lick et al., 2013). The latter statement is of particular concern considering that the

physical health disparities of sexual minority individuals are actually more common than are their attempts or incidences of suicide, and these physical illnesses generate more serious costs to personal well-being and worldwide public health overall (Lick et al., 2013; Mink et al., 2014). Despite the paucity of population-based sexual minority research, combined with the fact that the physical health disparities of the sexual minority community are quite taxing on the population as a whole, it would seem imperative to address these concerns (IOM, 2011). However little to no attention has been paid to these issues by the public or academics alike, and very few studies have examined the impact of minority stressors on the physical health outcomes of sexual minority individuals (Frost et al., 2013; Lick et al., 2013). The existing research that has delved into the effects of minority stress on the physical health of sexual minority individuals is often described as being quite limited in its generalizability and validity (Frost et al., 2013; Meyer, 1995; Mink et al., 2014). The latter concerns are related to the fact that most of the current studies rely on cross-sectional data, subjective self-reports, convenience samples, and/or interviews with the participants rather than objective measures of health (Frost et al., 2013; Operario et al., 2015). Additionally, no studies to date have objectively measured sexual minority individuals residing in rural areas, which would seem to be of great importance due to previous research equating rural, versus urban locale, with greater experiences of heterosexist stress and increased risk for overall poor health (Barefoot, Warren, and Smalley, 2015; Swank, Frost, and Fahs, 2012). Therefore, the causes of the health disparities that have been found within the sexual minority community remain relatively unclear (Frost et al., 2013; Lick et al., 2013; Mink et al., 2014).

Aims and hypotheses

The current study examined the effect of minority stress on the physical health of sexual minority individuals residing in the rural area of the Texas Panhandle, using Balsam, Beadnell, and Molina's (2013) Daily Heterosexist Experiences Questionnaire. The current study proposed four main hypotheses. The first hypothesis is that increased experiences of heterosexist stress (which were expected to be higher in a rural area) (Barefoot et al., 2015; IOM, 2011; Swank et al., 2012), as it relates to minority stress, would have an adverse impact on the health outcomes of sexual minority participants relative to heterosexual participants currently residing in the Texas Panhandle. Previous research has shown that lesbian, bisexual (male and female), and *gay* individuals demonstrate differences in weight, BMI, body image, eating habits, and self-reporting of BMI compared to heterosexuals (Alvy, 2013; Bailey, Markey, Markey, August, and Nave, 2013; Barefoot et al., 2015; Boehmer and Bowen, 2009; Bowen and Balsam, 2008; Carpenter, 2003; Cooper, Robinson, and Gillis, 2014; Deputy and Boehmer, 2014; Markey and Markey, 2013; Mason and Lewis, 2015). In light of this information, the current study aims to objectively measure, both heterosexual and non-heterosexual individuals' height, weight, BMI, body fat percentage, body muscle percentage, visceral fat, and further measurements including waist and hip circumference that are more indicative of overall health (Bailey et al., 2015; CDC, 2012; Markey and Markey, 2013). The second proposed hypothesis of the current study is that sexual minority women (SMW) will exhibit higher weight, BMI, and waist-to-hip ratios when compared to their

heterosexual counterparts. The third proposed hypothesis of the current study is that sexual minority men (SMM) may exhibit lower weight, BMI, waist-to-hip ratios, and an increased risk for poorer cardiovascular health when compared to their heterosexual counterparts. Additionally, previous research has stated that all sexual minority individuals demonstrate a higher risk for cardiovascular disease and/or hypertension (Everett and Mollborn, 2013; Lick et al., 2013, Mink et al., 2014); therefore the blood pressure and heart rate of all participants will be physically measured in an effort to supplement previous research on this area of study. Also, the blood pressure of sexual minority males will be of particular concern as it relates to the current study's third hypothesis. The fourth proposed hypothesis of the current study is that sexual minority individual's self-reports of weight may be underestimated or overestimated. Group differences are expected, and will depend on the group being examined, with previous research citing gay males as having the highest rates of underestimation of their weight compared to all other sexual minority individuals (Richmond, Walls, and Austin, 2012). The current study aims to objectively measure the aforementioned cluster of physical health measures in an effort to create a more comprehensive picture of the overall health of sexual minority individuals. The latter data will be cross-compared with that of the sexual minority individual's heterosexual counterparts, in an effort to better understand the complicated relationship between sexual orientation, biological sex, stress, and health.

CHAPTER II

LITERATURE REVIEW

Sexual Orientation versus Gender Identity

Sexual orientation and gender identity are distinct constructs that many people often muddle together or misunderstand completely (Smalley, Warren, and Barefoot, 2015). The Gender Equity Resource Center (2013) defines sexual orientation as:

The deep-seated direction of one's sexual (erotic) attraction. It is on a continuum and not a set of absolute categories. Sometimes referred to as affection, orientation or sexuality. Sexual orientation evolves through a multistage developmental process, and may change over time. Asexuality is also a sexual orientation. (p.1)

Some well-known examples of sexual orientations that will be the primary focus of the current study include: lesbian (a woman that is attracted to other women), gay (a man that is attracted to other men, but this can also be used as an umbrella term to refer to all lesbian, gay, bisexual, transgender, queer/questioning [LGBTQ] people), bisexuality/bisexual/bi (a person who is attracted to two sexes or two genders, and this attraction does not have to occur simultaneously), heterosexuality/heterosexual/straight (the sexual, emotional, and/or romantic attraction to a sex that is “opposite” of one’s own). However, there are many other orientations that have been identified, but will not be discussed in this review (Gender Equity Resource Center, 2013; GLAAD, 2015;

Institute of Medicine [IOM], 2011; Mayer, Bradford, Makadon, Stall and Goldhammer, 2008). As sexual orientation becomes less of a taboo topic (Balsam, Beadnell, and Molina, 2013; IOM, 2011), other terms to define sexual orientation have emerged such as: asexual (an individual who is not sexually attracted to others, regardless of their sex or gender), queer (another, seemingly more intricate, umbrella term used to refer to all LGBTQ individuals, but one with a controversial history in the LGBTQ community), and pansexual (an individual who is fluid in sexual orientation and/or gender identity). Collectively, the literature suggests that many of the new terms lack precise definitions, and are not commonly used outside of the sexual minority community (Smalley et al., 2015). Additionally, due to the fact that language is continuously evolving, most experts recommend regularly refreshing one's education as to what terminology is currently proper and/or culturally acceptable (Gender Equity Resource Center, 2013). It can be assumed that due to, not only the evolution of language, but also due to the fact that words such as queer, gay, and homosexual (sexual, emotional, and/or romantic attraction to the same sex), etc. are used interchangeably, complications arise in regards to effectively conducting research and succinctly disseminating information on, and to, the public (Cochran, 2001; Mayer et al., 2008). In addition, some of the terms that are used by both researchers, and the LGBTQ community, such as queer and homosexual remain controversial, and can carry a derogatory connotation depending on the culture, context, and region in which they are being used (Gender Equity Resource Center, 2013; Institute of Medicine [IOM], 2011). Another crucial aspect of the previously addressed confusion, concerning the terminology used inside and outside of the sexual minority community,

can further be illustrated by the fact that many of the terms for sexual orientation are bundled together with other terms that are not sexual orientations such as gender identities. Gender identities and biological/genetic sex chromosomal mutations such as transgender and intersex also fall under the most commonly used umbrella term which is the previous briefly discussed abbreviation: LGBTQIA+ (i.e., *lesbian, gay, bisexual, transgender, queer/questioning, intersex, asexual*, and with the [+] representing any other individual that holds an identity that deviates from those of conventional sexuality/gender identity). Sexual orientations, gender identities, individuals that have been born with biological/genetic sex chromosomal mutations and people questioning their sexuality are all referred to under this single abbreviation (Mayer et al., 2008). This usage occurs despite the fact that each of these letters represents a very different construct, and each construct is met with varying experiences of differing forms of minority stress (Mink, Lindley, and Weinstein, 2014), which will be discussed later in this review. Although, the abbreviation LGBTQIA+ is used to collectively refer to a myriad of distinctive sexual orientations and gender identity groups, each of these groups encompasses subpopulations that have their own unique experiences and health requirements (IOM, 2011; Mink, Lindley and Weinstein, 2014). Furthermore, individuals that choose not to label their sexual orientation are also typically found to identify with the LGBTQIA+ community, and may simply identify as *other* (Mink et al, 2014). For the sake of parsimony, this review will primarily focus on the LGBT portion of the abbreviation, unless otherwise specifically specified. The main reason for this lack of discussion is due to the scarcity of research on these populations (Gough, Weyman, Alderson, Butler, and

Stoner, 2006). As was previously mentioned, the various populations represented by the letters, “L,” “G,” “B,” “T”, are distinct groups, each with their own special health concerns and necessities (IOM, 2011). The latter statement is important to reiterate due to the fact that, although these groups may have many common experiences (such as stigmatization), and are usually treated as a homogenous group, by not only the scientific community but also within the community itself, each subpopulation seems to present with group-specific concerns which will be discussed in further detail (IOM, 2011; Mayer et al., 2008). It is important to state that the exact amount of individuals that comprise each of the previously mentioned sub-groups of the LGBT spectrum has been speculated, but most experts concur that the actual prevalence of each sexual minority group is most likely higher than what is currently reported, due to a variety of reasons (Coffman, Coffman, and Marzilli-Ericson, 2013; Zucker, 2009). Therefore, in an attempt to curb confusion, the current review will use or omit certain portions of the abbreviation in sections where they do, or do not apply, and the concept of gender identity will be explained in greater depth.

Gender Identity

Gender identity is quite distinct from sexual orientation. GLAAD (2015) defines gender identity as:

One's internal, deeply held sense of one's gender. For transgender people, their own internal gender identity does not match the sex they were assigned at birth. Most people have a gender identity of man or woman (or boy or girl). For some

people, their gender identity does not fit neatly into one of those two choices.
(p. 1)

One of the most commonly known forms of gender identity is the identity known as transgender. Transgender or intersex are not sexual orientations, but rather transgender is a construct of gender identity, whereas intersex is a congenital anomaly associated with changes in the genetic sex chromosomes or in-utero hormone exposure rates of the individual (Gender Equity Resource Center, 2013). The Organisation of Intersex International Australia (OII) (2013), states that the term intersex should be differentiated from gender identity terminology. The OII (2013) defines intersex as: “having physical, hormonal or genetic features that are: a.) Neither wholly female nor wholly male; or b.) A combination of female and male; or c.) Neither female nor male.” Due to the current lack of information and understanding of the intersex community, the current review will not attempt to discuss the experiences of these individuals at length as the research is still in its infancy for this specific population (Gough et al., 2006). However, gender identities are of important concern, as they highly relate to both the mental health of the individual and a higher correlation of this individual holding an atypical sexual orientation (APA, 2013a; 2013b). Therefore, more elaboration into what it means to be transgender is necessary as this particular gender identity has recently received a lot of public attention, and reports show that more individuals are presenting with this specific type of gender incongruence (Zucker, 2009).

What it means to be ‘Transgender’

The term transgender refers to people whose gender identity and/or gender expression differs from, what is typically associated with the sex they were assigned at birth, the term has historically been used synonymously with the terms cross dresser, drag queen, transvestite, or transsexual, but many LGBT advocates have suggested moving away from these older terms, perhaps due to the possibility of negative connotations (GLAAD, 2015; Mink, et al., 2014). Most of the negative connotations or misinterpretations of these terms have been briefly mentioned previously, but will be discussed in further detail. Contrary to popular belief, transgender individuals may identify with various sexual orientations regardless of their gender identity, and although many transgender individuals may be on hormone therapy, they may not choose to undergo sexual reassignment surgery (SRS). Another common misconception is that all transgender individuals desire SRS, when in fact not all transgender people can or will proceed with an SRS procedure, and holding a transgender identity is not dependent upon medical procedures (GLAAD, 2015). As such, one's gender identity may not align with their expressed phenotype or the sex they were assigned at birth, but does not mean that they identify as non-heterosexual individuals (Smalley et al., 2015). On the contrary, many transgender individuals identify as heterosexual, and prefer to date individuals that also identify as heterosexual (Smalley et al., 2015). As was previously mentioned, historically derogatory terms have been misused to refer to transgender individuals such as cross dresser, drag queen, transvestite or transsexual. Cross dressers and drag queens are typically gay men who dress as women for the purpose of entertainment, a form of employment, and/or self-expression, and it is important to note that these individuals do

not typically demonstrate distress related to their natal sex (GLAAD, 2015). Transsexual is a term that was historically used to refer to being transgender, and although this term holds some negative connotations, some transgender people still prefer to use it (GLAAD, 2015). However it should be noted, if there is any need for clarification of someone's sexual orientation and/or gender identity, the consensus is to ask the individual what identity/pronouns they ascribe to themselves (if any), rather than making any assumptions (GLAAD, 2015). The latter explanation of how subtle changes in language, reliance on umbrella/interchangeable terms, variations in terminology based on geographic location or usage of controversial terms can create confusion in research, literature, and explanation is worth noting (Mink et al, 2014). While transgender may be the most widely known form of gender identity, it is important to note that it is not the only gender identity category that people identify with (Gender Equity Resource Center, 2013). In addition to identifying as transgender, there are individuals who identify with other gender identities such as: genderqueer, gender non-conforming and nonbinary (one who does not identify with either, the male or female gender, on the spectrum of gender fluidity). GLAAD (2015) provides a comprehensive glossary of current gender terms in which genderqueer is defined as: A term used by some people who experience their gender identity and/or gender expression as falling outside the categories of man and woman. They may define their gender as falling somewhere in between man and woman, or they may define it as wholly different from these terms... (p. 1) and gender non-conforming is defined as: "A term used to describe some people whose gender expression is different from conventional expectations of masculinity and femininity." GLAAD

(2015) further explains that holding a genderqueer or gender non-conforming identity does not equate to being transgender and vice versa. Most of the aforementioned gender identities tend to personify a nonbinary individual (Smalley et al., 2015). Not unlike the definitions used to describe sexual orientations, the latter terms used to describe gender identity also lack precise definitions, and can also generate confusion in the literature (Smalley et al., 2015). When individuals experience the aforementioned feelings of incongruence related to their gender, feelings of psychological distress can arise and these feelings of distress may qualify the individual for a diagnosis of a mental illness found in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) (American Psychiatric Association [APA], 2013a). The DSM-5 (2013a) is the most recent version of a clinical tool that is used to assist mental health professionals in diagnosing, defining, and treating mental illnesses. The sexual minority community has experienced a somewhat jaded history, respective to their relationship with the mental health community, and some of these issues remain controversial to this day (American Psychiatric Association [APA], 2013a; Meyer, 2003a; Zucker and Spitzer, 2005). For example, the DSM-5 (2013a) currently classifies people whose gender at birth is contrary to the one they identify with, as meeting the criteria for a condition known as gender dysphoria, which occurs when an individual experiences long periods of distress related to the development of secondary sex characteristics of their natal sex (APA, 2013b). However, many gender variant individuals do not meet the criteria for a diagnosis of gender dysphoria, as gender nonconformity in itself is not a mental illness (APA, 2013b). Gender dysphoria is also diagnosed in children that desire to be of the other gender than

that of which they were assigned at birth (i.e., biological sex), and experience clinically significant distress or impairment in social, occupational, or other important areas of functioning (APA, 2013a; 2013b). However, children with a diagnosis of gender dysphoria (APA, 2013a) will not be discussed in this review. For the current review, it is important to state that being a sexual minority individual or a gender variant individual does not equate to being pathological, but many of the individuals that identify as members of the LGBT community do report a higher prevalence of psychiatric disorders relative to their heterosexual or cisgender (opposite of transgender; those whose current gender identity is the same label as their assigned sex at birth) counterparts (Tate, Bettergarcia and Brent, 2015), and this heavily studied phenomenon has been linked to difficult social experiences, as they relate to Meyer's minority stress model (Lick, Durso and Johnson, 2013; Meyer, 1995, 2003a; 2003b; 2010; 2015; Meyer, Schwartz, and Frost, 2008), which will be discussed later in this review. The current review discusses gender identity, gender dysphoria, and transgender individuals due to the fact that transgender individuals tend to identify with the LGBT community, hence the inclusion of the letter "T," into the abbreviation (Mink et al., 2014). It is important to discuss that identification as being transgender does not equate with one holding an atypical sexual orientation, and neither does self-identifying as genderqueer or gender non-conforming (APA 2013a; 2013b). However, many individuals that are transgender seek out a diagnosis of gender dysphoria in an effort to obtain the treatments they feel will result in alleviation of their distress, as do other individuals with atypical gender identities (APA, 2013a; 2013b). However, many researchers have deemed the requirement of receiving a mental health

diagnosis (which further exacerbates stigma), in order to receive treatment such as hormone replacement therapy, a double mastectomy, etc. as a way for the mental health field to continue to view atypical sexual orientations and gender identities as pathological, potentially curable or conditions that can be changed (Mayer et al., 2008; Zucker and Spitzer, 2005). Furthermore, most individuals that meet the criteria for gender dysphoria will identify as a sexual minority individual even if their distress abates, but the stress that they are exposed to regarding their identity typically does not abate (APA, 2013a; 2013b). The American Psychiatric Association considered homosexuality as a mental disorder only 30 short years ago, and historically some atrocious practices were used to “treat” sexual minority individuals (APA 2013a; 2013b; Flentje, Heck, and Cochran, 2013). The jaded history between sexual minority individuals and the healthcare system continues to this day, and could be the very reason that many sexual minority individuals in more conservative areas of the country are reluctant to seek out healthcare (Austin and Irwin, 2010). In recent years, the American Psychiatric Association (APA) has made multiple efforts to mend their seemingly tainted relationship with the sexual minority community, but the controversy over gender dysphoria and reorientation therapies remains to this day (APA, 2013b; Cochran, 2001; Davy, 2015; Flentje et al., 2013). When one examines the nature of other cultures, and the influence that culture has on the psyche of those that deviate from cultural norms, it would seem that the current culture of healthcare could be contributing to the issues related to minority stress rather than alleviating them by further labeling an already marginalized population of society (Flentje et al., 2013; Mayer et al., 2008).

The Complicated History of Sexual Minority Individuals and Healthcare

While the origin of atypical sexual orientations and/or gender identities is still predominantly ambiguous (Whiteway and Alexander, 2015), historically in the mental health community there has been an ongoing debate as to whether homosexuality is, or is not, a mental disorder (Davy, 2015; Meyer, 2003a; Zucker and Spitzer, 2005). The DSM-5 (2013a) defines a mental disorder as:

A syndrome characterized by clinically significant disturbance in an individual's, cognition, emotion, regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning. Mental disorders are usually associated with significant distress or disability in social, occupational, or other important activities. An expectable or culturally approved response to a common stressor or loss, such as the death of a loved one, is not a mental disorder. Socially deviant behavior (e.g., political, religious, or sexual) and conflicts that are primarily between the individual and society are not mental disorders unless the deviance or conflict results from a dysfunction in the individual as described above. (p. 20)

As is explained by the DSM-5's definition of a, "mental disorder," deviant behavior and conflicts between the individual and society are not mental disorders, unless the deviance or conflicts arise as a symptom of a dysfunction in the individual (Vasey and Bartlett, 2007). Homosexuality was fully removed from the DSM in 1986 (American Psychiatric Association, 1987; 2000), but many contend that the continued inclusion of gender dysphoria in the DSM-5 (2013a) perpetuates the idea that same-sex attraction and/or gender variance are pathological in nature (APA, 2013b; Zucker and Spitzer, 2005; Zucker, 2009). The latter statement of controversy is important to note due to the fact that most of the individuals that meet the diagnostic criteria for gender dysphoria, eventually

take on a non-heterosexual orientation, even if they no longer meet the criterion for diagnosis of gender dysphoria (APA, 2013a; 2013b). The American Psychiatric Association (APA) (2013b) also revised the DSM-5 (2013a) by replacing the name of the disorder, previously referred to as Gender Identity Disorder (GID), with a more acceptable name of gender dysphoria. In addition, the criterion for diagnosis was also changed, and gender dysphoria received its own chapter in the DSM-5 (2013a). Previously, gender identity disorder could be found grouped together in the DSM with sexual dysfunctions and paraphilic disorders (APA, 2013b). The latter grouping was said to have created additional stigma and misunderstanding for those suffering from psychological distress related to their gender variance, and was said to suggest that gender atypical individuals are pathological in nature (APA, 2013b). The reasoning behind the change in nomenclature, symptomology, and location, was due to the fact that while diagnostic terms can facilitate clinical care, these terms can also create a stigmatizing effect that can in turn lead to negative mental and/or physical health outcomes (APA, 2013b). Therefore, “identity disorder” was changed to the term “dysphoria,” in an effort to curtail stigma and ensure proper clinical care for individuals who see and feel themselves to be of a different gender, other than the gender they were assigned at birth (APA, 2013b). The critical aspect necessary for a diagnosis of gender dysphoria calls for clinically significant distress associated with the incongruence between the individual’s expressed/experienced gender, and the gender others would assign to the individual, and this distress must be present for six months or longer (APA, 2013a).

Sex refers to an individual's biological status as male or female at birth, whereas gender tends to refer to the social norms/roles that are expected of males and females within a given culture (Vasey and Bartlett, 2007). Although changes have been made to the DSM regarding gender dysphoria, transvestic disorder remains in the DSM-5 (2013a), under the section of paraphilic disorders, alongside such disorders as Fetishistic Disorder and Pedophilic Disorder (APA, 2013a). Transvestic individuals tend to have recurrent, intense sexual arousal from wearing clothing of the opposite sex. The latter urges create a sense of distress in the individual across several areas of their lives such as their social and occupational areas of functioning (APA, 2013a). Transvestic disorder is rare, and most individuals that qualify for a diagnosis are male, and while their symptoms may abate upon entering a relationship with a female, their psychological distress tends to eventually return, and can create issues in their relationships (APA, 2013a). Although, gender dysphoria was removed from the paraphilic section of the DSM-5 (2013a), transvestic disorder remains in the section, and when combined with the specifier of autogynephilia (being sexually aroused by thoughts or images of one's self as the opposite sex) the disorder remains to be highly correlated with gender dysphoria, and in these cases the diagnoses will both be applied to the individual experiencing them (APA, 2013a). It could be concluded that although some strides have been made in the mental health community, regarding the ethical treatment of sexual minority individuals, there is quite a bit of work left to do to decrease stigma and increase understanding of these unique individuals without labeling or further distressing them (Mayer et al., 2008). Furthermore, it can be said that by continuing to apply pathologies to sexual minority

individuals for insurance purposes, the mental health community is creating more confusion amongst researchers who lack knowledge in these areas. Therefore, a better understanding of gender dysphoria is necessary to truly understand why the disorder has not been removed from the DSM-5 (APA, 2013a; Zucker, 1990; Zucker and Spitzer, 2005; Zucker, 2009). As such, the following section will focus on the etiology and prevalence of gender dysphoria in particular. The history of sexual minority individuals and their experiences with the healthcare system, and the mental healthcare system in particular, are important to discuss due to the fact that many sexual minority individuals do not engage in medical services or interventions as frequently as their heterosexual counterparts (Austin and Irwin, 2010). Additionally, this latter lack of engagement has been implicated as a possible explanation for some of the increased health disparities that are present among the sexual minority community (Austin and Irwin, 2010).

Furthermore, many states have not banned the practice of reorientation therapy (therapy intended to change one's sexual orientation) by mental health professionals despite the American Psychiatric Association condemning the practice, and even suggesting that these types of therapies tend to cross ethical boundaries and create more harm than good for the patient (Flentje et al., 2013). As such, gender dysphoria remains to be classified as a mental disorder for individuals experiencing distress due to their biological sex, and conversion therapy remains to be an avenue of treatment for individuals with atypical sexual orientations, and both of these practices remain highly controversial among sexual minority individuals (Flentje et al., 2013; Zucker and Spitzer, 2005). Many individuals that present with gender dysphoria will eventually take on an atypical sexual orientation,

and could eventually end up as a candidate for reorientation therapy as a result of their sexual orientation if the individual resides in an area where these practices are still allowed and more commonplace (APA, 2013a; 2013b; Flentje et al., 2013). Due to the latter concerns and controversy the current review intends to address the possible implications for sexual minority individuals that come with seeking out healthcare, and how they may contribute to the fact that many of these individuals choose to not engage with healthcare professionals (Austin and Irwin, 2010).

Etiology of Gender Dysphoria

The American Psychiatric Association (APA) (2013a), states that the onset of gender dysphoria usually occurs between 2 and 4 years of age. The disorder tends to persist throughout the lifespan, and rates of persistence of gender dysphoria across the lifespan vary between natal males and natal females (APA, 2013a). The World Professional Association for Transgender Health or WPATH (2012) states that although some patients can be successfully treated for gender dysphoria with psychotherapy alone, most patients require hormone replacement therapy (HRT) and/or sexual reassignment surgery (SRS) in order to achieve full alleviation of their symptoms. The APA (2013a; 2013b) concurs that in patients with recurrent symptoms of gender dysphoria, clinical consultation is typically sought with the ultimate goal of obtaining HRT and/or SRS, and most insurance companies require a diagnosis of gender dysphoria in order to provide these treatments. As controversial as it may be, having a diagnosis of gender dysphoria becomes crucial for individuals seeking hormone replacement therapy (HRT) or medical procedures such as a double mastectomy (APA, 2013a; 2013b). Also, persistent and documented gender

dysphoria is a requirement for sexual reassignment surgery (SRS). In addition, the individual seeking SRS must live as their desired gender for 12 months prior to surgery. The World Professional Association for Transgender Health (WPATH) is a medical subspecialty organization dedicated to the understanding and treatment of gender dysphoria. WPATH typically sets the standard of care for transgender patients undergoing any type of transition. They have created the *Standards of Care for the Health of Transsexual, Transgender, and Gender Non-Conforming People* (WPATH, 2012). Despite the strides that have been made, regarding coverage and access to medical treatments for gender dysphoric individuals, the requirement of having a psychiatric diagnosis/label in order to obtain health insurance for these medically necessary treatments for transgender people remains a sensitive subject for many individuals (APA, 2013b; Zucker, 2009). Also, being diagnosed with a mental illness, which is stigmatizing in itself, only further compounds the experiences of minority stress that all sexual minority individuals face (Mayer et al., 2008). However, the current study is unable to separately measure these experiences due to limited access to the population of inquiry, and limited resources.

Prevalence of Gender Dysphoria

The APA (2013a) reports that the prevalence of gender dysphoria in Western populations is about 0.005-0.014% for natal males, with 2.2-30% presenting with the disorder throughout their lifespan and 63-100% self-identify as gay or homosexual if the distress does not persist. The disorder shows a much lower prevalence rate in natal females of

0.002-0.003%, with 12-50% presenting with the disorder throughout the lifespan, and 32-50% of these individuals self-identify as lesbian or homosexual if the distress subsides (APA, 2013a). Almost all of the individuals presenting with gender dysphoria are attracted to individuals of their natal sex (APA, 2013a). Furthermore, if someone who once met diagnostic criteria is relieved of their symptomology, and the diagnosis is subsequently removed, the individual will typically take on an atypical sexual orientation for the remainder of their lifespan (APA, 2013a). The latter phenomenon occurs despite the individual no longer meeting the criterion for diagnosis of gender dysphoria (APA, 2013a). As was previously mentioned, many states and mental health organizations continue to use reorientation therapy for individuals that hold a sexual minority identity that is incongruent with the individual's beliefs or culture (Flentj et al., 2013). Therefore, it could be said that if an individual is alleviated of their distress related to their gender dysphoria, they will most likely take on a sexual orientation that can still generate distress (APA, 2013a; 2013b). However, the solution to eliminating distress related to one's sexual orientation cannot seem to be effectively redirected, but rather lies in issues generated by popular culture and the society in which the sexual minority individual resides in (Flentj et al., 2013).

Gender dysphoria does not appear to be isolated to Western culture, as it has been reported across many countries and cultures. In addition, the equivalent of gender dysphoria has been reported in industrialized countries with gender categories that are not binary (male and female only). However, it is unknown if the diagnostic criteria for gender dysphoria would be met in these instances, but this will be discussed in further

detail when examining cross-cultural differences. As was previously mentioned there are subtle differences in the prevalence, and acceptance of gender dysphoria based on the affected individual's country of origin. For instance, in Iran and Korea, acceptance of individuals that deviate from gender norms is lower than that of the United States and European countries (APA, 2013a; 2013b). Other cross-cultural differences regarding gender dysphoria can be seen in the differences of prevalence. Japan and Poland, for instance, exhibit higher rates of gender dysphoria in natal females in comparison to Western society, where the sex ratio favors natal males (APA, 2013a). Interestingly, a study conducted by Zucker (2009), regarding the prevalence of gender dysphoric individuals in Toronto, revealed that there was a four to five time increase in child and adolescent referrals for gender dysphoria over the last 30 years. Although the current study does not aim to attempt to measure gender dysphoria, it is important to discuss this particular disorder because many individuals believe that the inclusion of gender dysphoria in the DSM-5 is merely an attempt to continue to deem atypical sexual orientations or gender identities as pathologies (Zucker and Spitzer, 2005). In light of these concerns many researchers have moved toward different terminology to refer to sexual minority individuals. Perhaps in an effort to better curtail confusing terms, VanderLaan, Petterson, Mallard, and Vasey (2015) have added new terminology to the research by investigating what they refer to as: androphilia. Androphilia is described as the sexual attraction, and arousal, to adult males and the researchers explain that male androphilia varies cross-culturally, as do gender norms and perceptions of sexual minority individuals (VanderLaan et al., 2015).

Cross-Cultural Differences in Sexual Orientation and Gender Identity

The definitions of different sexual orientations and gender identities in the previous sections have focused exclusively on the increasingly visible sexual minority populations that compromise current Western culture, but it is interesting to note that it is not uncommon for individuals living in non-Western cultures to claim that “homosexuals” are unknown in their societies (VanderLaan et al., 2015). The issues of confusion in the terminology used to describe sexual orientation and gender identity are further confounded if a more globally panoramic perspective of these definitions is taken into consideration (VanderLaan et al., 2015). Cross-cultural research has revealed that many of the aforementioned Western definitions of sexual orientations and gender identities do not necessarily translate to other places and times (VanderLaan et al., 2015). To circumvent the issue of confusion, regarding cross-cultural terms, VanderLaan et al. (2015) employ the term androphilic biological males to refer to males that express a culturally specific set of traits that characterize them as same-sex attracted individuals. VanderLaan et al. (2015) focus their work on a single population of transgender androphilic males residing in Samoa are referred to as fa’afafine. The word fa’afafine translates to: “in the manner of a woman,” in English. In the Samoan culture fa’afafine are born biologically male, but they do not identify as such, nor does Samoan society recognize the fa’afafine as males (VanderLaan et al., 2015). Rather than referring to fa’afafine as gay men, they are deemed as a type of third gender, but these individuals could easily fall under the terms of transgender or genderqueer, if one were to apply the

Western perspective to Samoan culture. Vasey and Bartlett (2007) initially chose to study the fa'afafine due to the high degree of social tolerance that Samoan culture displays towards feminine males. The latter investigation would allow the researchers to examine whether gender-atypical behavior, gender-atypical identity, and sex-atypical identity, in and of themselves, are a source of distress in sex/gender variant individuals, in a culture where one would not expect there to be a high rate of minority stress, and its by-products, due to a higher level of societal acceptance (Vasey and Bartlett, 2007). Fa'afafine experience a level of acceptance that is typically not afforded to Western sexual minority individuals (Vasey and Bartlett, 2007). Vasey and Bartlett (2007) conducted their testing on 53 adult fa'afafine, comparing the group to a male (n = 27) and female (n = 24) control groups. Participants were asked to report their levels of gender-atypical behaviors during childhood, and their experienced levels of distress, or lack thereof, as it related to these expressed behaviors (Vasey and Bartlett, 2007). The study revealed that there was no evidence of distress reported among the fa'afafine relative to their cross-gender behaviors or identity. However, many fa'afafine did express experiencing distress about being a boy, and having male genitalia as a child, which the authors report would possibly make the fa'afafine meet the Western definition of criteria for a diagnosis of gender dysphoria (APA, 2013a; 2013b; Vasey and Bartlett, 2007). The latter conclusion illustrates the impact that the region and culture in which a sexual minority individual resides can drastically impact the health trajectory of the individual long term (Barefoot et al., 2015; IOM, 2011; Vasey and Bartlett, 2007; Swank et al., 2012). In addition, Vasey and Bartlett (2007) showed that although increased societal acceptance decreased

the distress the fa'afafine experienced related to their gender-atypical behaviors, it did not lessen their levels of distress related to their genitalia. The latter confound is particularly important because it suggests that, perhaps even the most gender-tolerant of cultures, would still produce sexual minority individuals that meet the current criteria for a diagnosis of gender dysphoria due to the distress they experience in relation to their secondary sex characteristics (Vasey and Bartlett, 2007). However, many other societies and cultures other than Western society, and the Samoans, have sub-populations of individuals that fall outside of traditional gender norms (Kalra and Shah, 2013).

The hijras of the Indian subcontinent are another group of individuals that are known in their culture as a third gender (Kalra and Shah, 2013). As with Western society, different terms are used to refer to the hijras depending on the region in which the individual resides. For example, in North India, hijras are referred to as kinnar, whereas in South India, hijras are known as Aravanis. The latter difference in terminology is important to discuss, as it is similar to the Western practice of using multiple words for identities that are essentially synonymous in nature. Furthermore, similar to Western society, there are slang terms that the hijra community uses to identify certain sub-groups within their own population (Karla and Shah, 2013). For instance, a hijra that is anal-receptive is termed a kothis (similar to the Western term of bottom), and there are many more terms used within the sexual minority community of India to refer to different sub-groups (Karla and Shah, 2013). The hijra community, as a whole, encompasses persons with a wide variety of gender identities and sexual orientations that do not conform to the conventional notions of male and female (Kalra and Shah, 2013). Although hijras have

inhabited Indian societies for ages, they have typically been marginalized and stigmatized similar to their Western counterparts (Kalra and Shah, 2013). Additionally, many hijras that reside in smaller, more rural areas tend to relocate to the urban city of Mumbai, which is one of the most populated cities in India, and has a well-developed hijra subculture (Kalra and Shah, 2013). The latter migration of sexual minority individuals from rural areas to more urban areas, where social support and acceptance are higher, can be compared to the high amount of American sexual minority individuals that relocate from rural areas to urban areas in an effort to better their lives (Barefoot et al., 2015; IOM, 2011). The previous accounts of the experiences of the fa'afafine and hijras illuminate two cultures that are very different from the current culture of Western society. Additionally, these studies show that distress related to sex/gender variance do not seem to be culturally dependent but may be universal in nature (Kalra and Shah, 2013; Vasey and Bartlett, 2007). Karla and Shah (2013) determined that 48% of their hijra participants suffered from psychiatric disorders, and that 80% qualified for a diagnosis of gender identity disorder (the study used the DSM-IV-TR not the DSM-5) (Kalra and Shah, 2013). The latter findings are important, as previous research has shown that LGBT individuals tend to experience higher rates of psychological distress overall, and are more likely to be diagnosed with mental disorders compared to their heterosexual counterparts (Lewis, Derlega, Berndt, Morris, and Rose, 2002; Meyer, Schwartz, and Frost, 2008; Rostosky, Riggie, Horne, and Miller, 2009). The latter findings have been replicated cross-culturally using variations of Meyer's minority stress model (1995, 2003a), in Australia (Denton, 2012; McNair, Szalacha, and Hughes, 2011), Canada (Denton, 2012;

Brennan, Ross, Dobinson, Veldhuizen, and Steele, 2010), the Netherlands (Denton, 2012; Sandfort, Bakker, Vanwesenbeeck, and Schellevis, 2006), and the United States (Cochran, Sullivan, and Mays, 2003; Denton, 2012). The following section will discuss Meyer's minority stress model.

Meyer's Minority Stress: Implications for Sexual Minority Individuals

The impacts of being a racial or ethnic minority have been studied extensively, and most research defines being a member of a group that is "less than" the majority of a society or a defined social group as holding a minority status (Mink et al., 2014; Meyer, 1995; 2003a; 2003b; 2010; 2015). A multitude of literature has uncovered the ways in which stress or stigma can be experienced by an individual as a result of being classified as a minority due to the individual's ethnic or racial background (Arbona and Jimenez, 2013; Li, Xu, and Liu, 2014; Smedley, Meyer, and Harrell, 1993). Stigmatization has demonstrated an association with experiences of adverse effects in regards to the individual's self-esteem, ability to secure or sustain employment, and social acceptance among the mentally ill (Meyer, 1995). Other studies have focused on the distinctive minority-status stresses that the LGBTQ community faces as a corollary of their sexual orientation, due to the fact that LGBTQ individuals experience stigma and stressors that are quite different from those of heterosexual minority individuals (Arbona and Jimenez, 2013; Li et al., 2014; Smedley et al., 1993; Meyer, 1995, 2003a; 2003b; 2010; 2015; Meyer et al., 2008; Mink et al., 2014).

Meyer (1995, 2003a; 2003b) created the popular minority stress model that is a conglomeration of several sociological and social psychological theories (e.g., Allport, 1954; Crocker, Major, and Steele, 1998; Goffman, 1963; Jones, Farina, Hestrof, Markus, Miller, and Scott, 1984; Link and Phelan, 2001), building upon previous research conducted regarding minority stress and lesbians (Brooks, 1981). Meyer (1995) defined minority stress using a psychosocial model, in which the heterosexist/cisgender views that Western society imposes on individuals can serve as a source of morbidity and distress for minority individuals. Brooks (1981) defined minority stress as:

a state intervening between the sequential antecedent stressors of culturally sanctioned, categorically ascribed inferior status, resultant prejudice and discrimination, the impact of these forces on the cognitive structure of the individual, and the consequent readjustment or adaptational failure. (p. 84)

For the purposes of the current review, terms related to minority stress will be confined to the social context of Western society, and confined to the definition of minority stress presented by Meyer (1995, 2003a; 2003b; 2010; 2015; Meyer et al., 2008), as it relates to the non-heterosexual population. However, this is not to say that sexual minority stress does not occur outside of Western populations, which was briefly discussed related to the fa'afafine of Samoa and the hijra of India (Kalra and Shah, 2013). Minority stress is a commonly used framework for attempting to understand the health disparities of sexual minority individuals (Meyer, 2010). The minority stress model suggests that sexual minority individuals constitute a disadvantaged social group that is subject to stigma and prejudice, and the experiences of said stigma and prejudice predispose sexual minority individuals to experience excess amounts of stress, which subsequently leads to adverse

health outcomes (Meyer, 2010). Stress discourse usually concerns external occurrences that are taxing to individuals, and that impact their ability to endure which can subsequently lead to mental or physical ailments (Meyer, 2003a). The general meaning of stress that is used for this review also includes the phenomenological meaning of stress. The latter refers to the physical, mental, or emotional pressure, strain, or tension that arises from experiences of stressors (Meyer, 2003a). Researchers have stated that stress is experienced both on an individual level as well as on a social level (Meyer, 2003a). Minority stress is an expansion of the social stress theory (Crocker et al., 1998; Link and Phelan, 2001) that posits that stressors constitute any factors or circumstances that require individuals to adapt to changes intrapersonally, interpersonally, or in their environments (Swank et al., 2012). Social stress theory is an extension of stress theory, and suggests that unique stressors in the social and personal environment of an individual (e.g., prejudice, discrimination, racism, sexism, or homophobia) can become chronic sources of stress that require continuous adaptation by the individual experiencing said stressors, and possibly lead to negative mental and physical health outcomes (Meyer, 1995; 2003a). Stress theory is a useful, and highly used, sociological model to better understand the relationship between being socially disadvantaged and negative health concerns (Meyer, et al., 2008). Meyer (2003a) describes the conceptualization of social stress as being difficult, due to the fact that stress has historically been viewed from the subjective (individual) point rather than from the objective (social) point (Meyer, 2003a). Meyer (1995, 2003a; 2003b) defines stress as “any condition having the potential to arouse the adaptive machinery of the individual,” and this includes the phenomenological meaning

of stress, that also refers to physical, mental, or emotional pressure, strain, or tension. Stress is usually experienced when someone perceives that stressors (contextual characteristics or demands of a situation) are greater than their ability to respond or cope, which then jeopardizes their mental, physical, emotional, or spiritual well being (Arbona and Jimenez, 2014; Meyer 2003a; Mink et al., 2014). The minority stress model uses sociological theory that links social structure to health outcomes to further build upon the premise of the social stress theories. These social stress theories view the society one lives in as providing meaning to the person's world, and organization to their experiences (Meyer, 1995). Also, a study conducted by Durkheim (1951) highlighted the importance of one's social environment, as it related to one's level of suicidality, and found that a sense of normlessness, lack of social control, and alienation from others increased one's risk of committing suicide, due to one's social needs not being met. Furthermore, Durkheim (1951) stated that human beings needed moral regulation from society to manage their needs and objectives. Moss (1973) also looked into how humans interact with society, and explained that these interactions with society provide a person with information as to the construction of the world they live in, and when the information the sexual minority individuals receive from others is incongruent with their own experience, their health tends to be compromised. Building upon all of these previous social stress theories, Meyer's (1995; 2003a; 2003b; 2010; 2015; Meyer et al., 2008) minority stress model suggests that the sexual minority population is socially disadvantaged due to experiencing psychosocial and environmental problems related to being a sexual and/or gender minority. Due to the fact that most sexual minority individual's view of the world

tends to be at odds with that of the dominant culture, social structure, and societal norms, this discourse predisposes the sexual minority individual to the risk of experiences of minority stress, and these chronic experiences may negatively impact both their mental and physical health (Smalley et al., 2015; Meyer, 1995; 2003a; 2003b; 2010; 2015; Meyer et al., 2008). It is important to note that I. H. Meyer has been tweaking his minority stress model across a 30-year time span, but the original concept was only applied to gay men.

Meyer (1995) first tested out his model in a longitudinal study. The minority stress model was originally applied to a sample of only gay males ($n=741$) in the highly urban metropolitan area of New York City, during the mid-late 1980's. During the 1980's the foundation for a model of minority stress could not be found in a single theory, nor was the term minority stress popularly used in research and literature as it is today (Meyer, 1995). The intent of the original study was to investigate the effect of minority stress on the mental health of gay men, and to specify/test explicit minority processes among these individuals (Meyer, 1995). Meyer (1995) found that increased experiences of minority stress were directly correlated with a two-threefold increase in high levels of psychological distress in gay males, and that internalized homophobia, stigma, and prejudice events (considered independently and as a group) all significantly predicted feelings of demoralization, guilt, suicide, AIDS-Related Traumatic Stress Response (AIDS-TSR), and sex problems among gay men (Meyer, 1995). In addition to the latter finding, Meyer (1995) refuted previous work on minority stress that linked adverse mental health outcomes among sexual minority individuals to the fact that they held a

low economic status, rather than attributing their disparities to living in an oppressive social environment. Minority stress was present regardless of the participant's socioeconomic status (SES) (Meyer, 1995). Although, Meyer's (1995) study illustrates minority stress as it relates to gay males, it could not be generalized to lesbians or other sexual minority individuals that hold multiple marginalized identities. The reasoning behind this lack of generalizability is due to the fact that lesbians and ethnic/racial minority individuals are subjected to social stress and oppression related to both their sexual orientation, gender related prejudices, and/or racial/ethnic related prejudices (Brooks, 1981; Meyer, 1995). Because lesbians tend to be female, they are said to experience dual stigmatizing identities similar to that of sexual minorities that also hold an ethnic minority status (Meyer, 1995). To elaborate on the latter concept, minority status does not necessarily equate to the number of the group, but rather to the group's social capital (Mink et al., 2014). Therefore, although women may constitute a numerical majority, women still struggle for equal rights and social power, thereby rendering females as a marginalized group (Mink et al., 2014). Meyer's (1995) original study focused exclusively on gay males, and how minority stress impacted these individuals, but this research admittedly was not generalizable to the entire LGB community. Therefore, Meyer (1995, 2003a) later used a meta-analysis approach to review and expand upon the previous literature that evidenced a high frequency of mental disorders amongst lesbian women, gay men, and bisexual individuals as it related to and/or was mediated by his minority stress model (Meyer, 2003a; 2003b). This was in an effort to better understand the potential underlying associations between individuals' sexual

orientation and their susceptibility to psychiatric disorders and a poorer quality of life. After much analysis and literature comparisons, Meyer (1995, 2003a) developed a revised version of the original minority stress model (the conceptualized impact of heterosexist stress on LGBTQ populations) that is a much more tailor-made model for the LGB community overall. Meyer (1995; 2003a) expanded his original theory to include new social problems that include: heteronormativity (defined as: “occurring when institutionalized heterosexuality constitutes the standard for legitimate, authentic, prescriptive, and ruling social, cultural, and sexual arrangements”) (Mink et al., 2014); individual heterosexism (the social and cultural oppression experienced by LGBTQ populations); homophobia (dislike of or prejudice against homosexual individuals); biphobia (an aversion toward bisexuality and bisexual people as a social group or as individuals)- and/or transphobia (the stigmatization of people who ascribe to atypical gender categories or have some degree of incongruence between their biological sex at birth and gender expression) which all tend to result in discrimination, victimization, and/or harassment (Balsam, Beadnell, and Molina; 2013; Meyer, 2003a; 2003b; Meyer, 2010; Smalley et al., 2015; McCarthy, Fisher, Irwin, Coleman, and Pelster, 2014). The underlying assumptions of minority stress are: 1.) That the stress is unique, or in addition to general stressors that are experienced by all people; 2.) That the stress is chronic and; 3.) That the stress is socially based. *Socially based* is used here with the meaning that the experienced stress stems from social processes, institutions, and structures beyond the individual, as opposed to individual events or conditions that are related to general stressors that are characteristic of the individual (Meyer, 1995; 2003a). In conjunction

with other sociological theories the minority stress model is tantamount, in that it predicts that disadvantaged social status increases the potential for development of mental disorders in particular (Meyer, 2010).

Meyer, Schwartz, and Frost (2008) replicated Meyer's previous work by recruiting (N = 524) individuals (both heterosexual and self-identified sexual minority individuals) also residing in the New York City area, to participate in a study that further investigated the differences of experiences of minority stress, but using a larger, more diverse sample. Their sample included 396 LGB individuals, and a heterosexual control group that consisted of (n = 128) males and (n = 65) females (Meyer et al., 2008). The researchers examined different sets of contrasts of selected social statuses in an effort to effectively demonstrate that holding a minority sexual orientation leads to unique stress exposure (Meyer et al., 2008). Furthermore, the researchers wanted to see if the sexual minority individual's gender and/or ethnicity would increase or decrease their experiences of minority stress (Meyer et al., 2008). The study revealed that there was no parsimony in social stress evidence, but that sexual minority individuals tend to be exposed to greater amounts of acute stressors including prejudice-related life events. Additionally, black and Latino LGB individuals were exposed to far more stress than their white counterparts (both heterosexual and LGB) (Meyer et al., 2008). However, it is important to note that the study did not confirm their initial hypothesis that being a woman was related to higher occurrences of perceived discrimination, chronic strains, or the number of general or prejudice-related stressful events. On the contrary, it was found that women tended to experience less prejudice events, but seemed to have higher

expectations of stigma (Meyer et al., 2008). In regard to chronic strains, significant variations were found amongst the sample, with women experiencing more chronic strains related to parenting, relationships, caretaking and residence that were not apparent among their male counterparts (Meyer et al., 2008). LGB individuals overall, despite their gender, experienced higher levels of chronic strain related to wanting children, education, caretaking, and relationships with their parents (Meyer et al., 2008).

Racial/ethnic minority LGB individuals experienced more chronic strain related to finances, parenting, relationships, residence, and overall general strains (Meyer, et al., 2008). These aforementioned experiences of chronic stress are associated with poor mental, physical, emotional, or spiritual well being (Seaward, 2006). The types of stressors that are experienced by sexual minority individuals will be discussed further.

Types of Stressors Experienced by the Sexual Minority Population

Meyer's (1995, 2003a) original theory proposes three processes as the main components of the minority stress model that are relevant to LGB individuals: 1.) *Enacted stigma*, or external objective stressful events and conditions such as experiences of harassment, rejection, aggression, violence or discrimination; 2.) *Expectations of rejection* or expectations of external stressful events, and the vigilance associated with preventing these types of events from occurring; 3.) *Internalized homophobia*, which occurs when an individual internalizes negative social attitudes toward homosexuality and; 4.) A final component Meyer later added to his operationalized definition, that is unique to LGB individuals, which is *identity concealment* or having to hide one's sexual

orientation from others out of fear of discrimination, rejection, etc. (Meyer, 2003a; 2003b; Carter II, Mollen, and Smith, 2014). Meyer (2003a) describes the aforementioned stressors on a continuous scale defined as distal-proximal stressors. Distal minority stressors are objective, in that they do not depend on the individual's perceptions, whereas proximal minority stressors are subjective, and related to one's self-identity as a sexual minority (Meyer, 2003a). It is important to note that individuals' identities may be related to their health, both directly and indirectly in conjunction with stressors, to cause distress. Meyer (2003a) further assesses the impact of the perception of one's identity by stating that minority stressors may impact an individual more negatively when their LGB identity is more prominent than when it is secondary to the person's self-definition. Another important finding in Meyer's (2003a) work, is that women who have romantic relationships with other women, but do not identify as being a lesbian may experience distal stressors, in the form of being perceived by others as being a lesbian. Therefore, Meyer (2003a; 2003b) suggests that the implications of societal perceptions can generate a prejudice towards individuals who do not even identify themselves as a minority. Although, a large amount of researchers, across many fields of inquiry, have used Meyer's minority stress model in their assessments of the LGBT community, many researchers report that the majority of research have flawed methodologies related to the scales that were used to quantify and describe minority stress (Balsam et al., 2013). Therefore, much of the current research would seem to be in a proverbial "arm's race" to effectively measure the impact of minority stress across all of the dimensions that the current review has previously mentioned.

Scales and Issues with Self-report/Subjective Data

Balsam et al. (2013) express concerns in regards to the current scales that measure minority stress, due to the fact that there are no existing measures that fully meet all of Meyer's (1995, 2003a; 2003b; Meyer et al., 2008; 2010; 2015) full range of possible negative experiences. One critique is that most of the current scales such as: The Gay-related Stressful Life Events Scale (Rosario, Hunter, and Gwadz, 1993; Rosario, Schrimshaw, Hunter, and Gwadz, 2002), the Heterosexist Harassment, Rejection, and Discrimination Scale (Szymanski, 2009), and the Gay Bashing Scale (Zamboni and Crawford, 2007), focus on one, or a subset of experienced stigma, such as discrimination and harassment, but not the other key components of the model (Balsam et al., 2013). However, other scales such as the Nungesser Homosexuality Attitudes Inventory and Martin and Dean's nine-item Internalized Homophobia Scale, focus their attention on quantifying the amount of internalized homophobia that the individual is experiencing (reviewed in Szymanski, Kashubeck-West, and Meyer, 2008). Given the limitations brought on by the aforementioned scales, Balsam et al., (2013) developed the Daily Heterosexist Experiences Questionnaire (DHEQ), which is a 50-item comprehensive measure of day-to-day minority stress experienced by a more diverse LGBT population. The DHEQ is a novel instrument used to assess the unique, daily minority stressors stemming from heterosexual oppression in the lives of the LGBT population (Balsam et al., 2013). Unlike the previously mentioned scales, the DHEQ was developed and validated with LGBT samples that were diverse in regards to ethnicity, race, gender, and

sexual identity. Therefore, the DHEQ should be more generalizable to the broader LGBT community, as well as when comparing different subpopulations within the LGBT community (Balsam, et al., 2013). An important strength of the DHEQ is that it contains key components of Meyer's (1995, 2003a) minority stress model that were not included in previous scales, such as vicarious trauma and isolation (Balsam et al., 2013). Additionally, the DHEQ quantifies minority stress across a number of different domains that have been suggested as being crucial by Meyer's (1995; 2003a; 2003b) minority stress model, previous empirical research, and the initial research conducted by Balsam et al. (2013) to develop the scale. The DHEQ can be used with all members of the LGBT community, regardless of their sexual orientation, gender identity, or race/ethnicity. The latter generalizability of the questionnaire was validated by the usage of samples that were diverse in race, ethnicity, gender, and sexual identity across three separate trials (Balsam et al., 2013). Furthermore, the test is able to distinguish between whether an experience occurred, the amount of subjective distress the event generated, and offers up a clearly specified time frame of 12 months for minority stressors (Balsam et al., 2013). Higher scores on subscales of the DHEQ are related to greater amounts of emotional distress and perceived overall LGBT discrimination, which shows a direct link between LGBT minority stress and mental health issues (Balsam, et al., 2013). However, the DHEQ is a self-report measure, and many of the studies conducted on sexual minority individuals relied solely on self-report data such as that of the DHEQ (IOM, 2011). However, one issue with self-report data sources is that they are subjective in nature, and questionable in regard to the accuracy of the individual giving the report, and it is known

that reporting bias is common (Richmond, Walls, and Austin, 2012). While little is known about how reporting patterns compared across sexual orientation groups, Richmond, Walls, and Austin (2012), determined that, while there was not a significant difference in the reporting behavior of body mass index (BMI) between gender-specific sexual minority individuals and same-gender heterosexuals, gay males showed greater reporting bias in comparison to heterosexual males (Richmond et al., 2012). One of the most crucial findings of the study was that there was a significant underreporting of BMI by all groups, and the absolute value of this underreporting increased as the individual's measured BMI increased (Richmond et al., 2012). It is important to note that Richmond et al. (2012) did not ask participants to report their BMI, they were asked to report their height and weight, and the BMI was subsequently calculated using this information along with specific questions about the individual's health. Given the prior discussion it can be said that the negative impact of minority stress on the sexual minority population can be somewhat visualized in the current statistics provided by databases such as the National Institute of Health (NIH) (2013), and these databases seem to be the primary source of information that previous research has relied upon. However, most of the current literature admits that these methodologies are limited, flawed, or reflect contradictory findings, in regards to the sexual minority population (Barefoot et al., 2015; Cochran, 2001). Given the aforementioned concerns with self-report data, the current study aims to both objectively measure all participants in addition to collecting subjective reports such as the DHEQ. Despite the latter concerns, the consensus among researchers is that there are marked differences, in both the mental and physical health trajectories of sexual

minority individuals when compared to heterosexuals, and that the latter differences are still found when confounding variables are controlled for (Meyer, 2003b).

Intersectionality and Minority Stress

More recently, Mink, Lindley, and Weinstein (2014) have incorporated Meyer's (1995, 2003a; 2003b; 2010; Meyer et al., 2008) previous work in conjunction with the social cognitive theory of Bandura (1986), and the Lazarus model of stress and coping (Lazarus and Folkman, 1984; Lazarus, 1981), to create: *The Intersectional Ecology Model of LGBTQ Health (IEM)*. A key component of the IEM model (2014) that is lacking in Meyer's (1995; 2003a; 2003b; 2010; Meyer et al., 2008) minority stress model is the addition of the concept of intersectionality (multiple cultural identities) (Mink et al., 2014). Mink et al., (2014) proposed their revised stress model in response to the U.S. Department of Health and Human Service's: *Healthy People 2020* initiative that called for an integrated framework for guiding future LGBTQ health research. For the purpose of parsimony, and due to the disproportionate amount of research that has incorporated the IEM in their research, the current study will rely on Meyer's (1995, 2003a; 2003b; 2010; 2015; Meyer et al., 2008) model. However, future research should perhaps attempt to integrate the two models or conduct further research to determine if one model is superior to the other, and if it may be the best to apply in researching the sexual minority population. One important aspect of the IEM model comparative to Meyer's (1995, 2003a; 2003b; 2010; Meyer et al., 2008) model is that the IEM model (2014) integrates transgender individuals and their health concerns into the model. The latter inclusion of

these gender variant individuals into the minority stress model is important, as most gender variant individuals tend to be categorized with, and associate themselves with the LGBTQ community (Mink et al., 2014). Regardless of the models that are used in attempts to uncover the mediators of poor health among the sexual minority community, decades of research have reliably confirmed risky health behaviors and a higher prevalence of mental health disorders, physical health disparities, and weight concerns within this community that will be further discussed in depth herein (Lick et al., 2013; Mink et al., 2014).

Health Differences Found Among Sexual Minorities

A recurrent theme expressed herein is the positive relationship between the experienced level of minority stress processes and increases in the instances of illness (physical and mental) and/or the increased engagement in negative health behaviors among sexual minority individuals (Carpenter, 2003; Cochran and Mays, 2007; Denton, 2012; Lick et al., 2013; Mink et al., 2014). When LGBT individuals experience stigma it leads to alienation, lack of integration with the community, and issues with self-acceptance (Meyer, 1995; 2003a). Also, greater exposure to life stressors such as victimization, discrimination, stigmatization, expecting rejection, and vigilance accompanies holding a sexual minority status (Fredriksen-Goldsen, Kim, Barkan, Balsam, & Mincer, 2010; Meyer, 1995; 2003a). Meyer (2003a) suggests that the latter experience of minority stress processes is related to a myriad of mental health issues such as depression, substance use, suicide ideation, and obesity (Meyer, 1995; 2003a; Fredriksen-Goldsen et al., 2010).

Most studies cite the heteronormative culture that dominates Western societies, as creating hostile environments for LGBTQ individuals, and the conflict of holding a sexual minority identity that is incongruent with the dominant culture, gives rise to stigma (when a society regards the members of a particular group or category negatively and designates them with an inferior status in their social interactions with the non-stigmatized), which in turn creates a pervasive and chronic strain on the marginalized population that negatively impacts their health (Meyer, 1995; 2003a; Mink et al., 2014). These negative by-products of stigma can have far-reaching consequences on the health and overall well being of sexual minority individuals (Meyer, 1995; 2003a; 2003b). For instance, a study by Kuyper and Vanwesenbeeck (2011) investigated the impact of minority stress on sexual health (a term that encompasses the adequate protection against sexually transmitted diseases [STDs], HIV, and the absence of sexual dysfunction, and sexual coercion). The study determined that LGB individuals experience higher rates of sexual coercion and that bisexual individuals (regardless of biological sex) report a higher demand for professional sexual health care within the last 12 months prior to the study (Kuyper et al., 2011). The latter findings are particularly alarming considering that other studies have found that members of the sexual minority population are less likely to seek out medical care or participate in proactive medical interventions (GLMA, 2001; [IOM] Committee on Lesbian, Gay, Bisexual, and Transgender Health Issues and Research Gaps and Opportunities, 2011; Mayer et al., 2008). One potentially negative coping mechanism LGB individuals have learned is to anticipate stigma and maintain vigilance in order to avoid any discrimination that they perceive they may face. The higher the amount of

stigma that the individual perceives they will experience, the higher the vigilance they will express in order to offset the experience of said stigma (Meyer, 1995; 2003a; 2003b). Meyer (1995; 2003a; 2003b) explains that LGB individuals have to expend larger amounts of energy to maintain their self-concept. A more proximal stressor that is particularly distressing for LGB individuals is the paradoxical issue of concealment and disclosure of one's sexual identity (i.e., outness). As with the maintenance of self-concept, there is an increased amount of energy required to maintain the concealment of one's sexual identity. The cognitive processes necessary to conceal one's identity are taxing and distressing. Concealment of one's sexual identity has been identified as a unique and important source of stress for LGB individuals (Meyer, 2003a). There are many strategies that LGB individuals use to conceal their identities that include lying and censoring any clues that they may express that could potentially reveal their minority status. The prior forms of concealment and repression have been associated with an inhibition in immune functions and overall negative health outcomes (Meyer, 2003a). The latter suppression of the immune system, in conjunction with expressed negative behaviors, and the absence of seeking proactive medical care that has been demonstrated by sexual minority individuals (GLMA, 2001; [IOM] Committee on Lesbian, Gay, Bisexual, and Transgender Health Issues and Research Gaps and Opportunities, 2011; Mayer et al., 2008; Meyer, 2003a) is hypothesized to account for the disproportionate rates of both poor mental and physical health that have been proposed by a plethora of studies comparing sexual minority individuals to their heterosexual counterparts (Lick et al., 2013; Meyer, 1995; 2003a; Meyer et al., 2008; Mink et al., 2014).

Risky Health Behaviors Found within the Sexual Minority Population

As has been demonstrated in this review, there are considerable amounts of literature to suggest that sexual orientation and/or gender identity is associated with a person's health-related behaviors (IOM, 2011; Lick et al., 2013; Mink et al., 2014). Indeed, the body of literature examining the unique stressors of the sexual minority community is growing at an exponential rate (Carpenter, 2003; IOM, 2011). Despite the large amounts of literature, there do not seem to be many programs or sexual minority population-specific intervention programs, and the creation of these programs seems to be a consistent theme that researchers encourage for future research (Carpenter, 2003). Sexual minority individuals demonstrate a myriad of negative, high-risk health behaviors, that include increased amounts of alcohol consumption (Burgard, Cochran, and Mays, 2005; Cooper, Robinson, and Gillis, 2014), higher rates of cigarette smoking (Burgard et al., 2005; Cooper et al., 2014), higher rates of illicit drug usage (Cooper et al., 2014; Lick et al., 2013), increased rates of sexual risk taking behaviors, such as higher rates of unprotected sexual activity, and similarly related sexually risky behaviors (Mayer et al., 2008), more self-harm related behaviors (Mink et al., 2014), and poor dietary and nutrition habits (Gay and Lesbian Medical Association [GLMA], 2001). Overall, the LGBT community tends to be less likely to seek out medical intervention or participate in proactive medical care (e.g., GLMA, 2001; [IOM] Committee on Lesbian, Gay, Bisexual, and Transgender Health Issues and Research Gaps and Opportunities, 2011; Mayer et al., 2008). The latter lack of engagement between sexual minority individuals and the medical system has been

deemed as the most profound health risk factor for the LGBT community (Johnson, Mimiaga, and Bradford, 2008). Interestingly, the previously mentioned risky behaviors differ depending on which subpopulation of the LGBTQ community is being investigated (Mink et al., 2014). For instance, the NHIS (2013) survey of adults, aged 18-64 revealed that 19% of self-identified heterosexual individuals were currently cigarette smokers, whereas 27.2% of self-identified gay or lesbian individuals and 29.5% of bisexual individuals were current smokers. In regards to alcohol consumption, 26.0% of heterosexual individuals reported having had five or more drinks in one day at least once in the past year, whereas gay or lesbian respondents reported a higher frequency of 35.1%, and bisexual individuals reported the highest amount of alcohol consumption at 41.5% (NHIS, 2013). Further differences that can be found between the subpopulations of the LGBTQ community have been uncovered in relation to eating behaviors (Bailey, Markey, Markey, August, and Nave, 2015; Boehmer and Bowen, 2009; Carpenter, 2003; Markey and Markey, 2013; Mason and Lewis, 2015). For instance, obesity rates have been shown to be higher among lesbian and bisexual (LB) women in comparison to heterosexual women, and LB women report higher rates of binge eating behavior (Carpenter, 2003; Cooper et al., 2014; Mason and Lewis, 2015). In contrast, research on sexual minority males (SMM) has revealed that gay men tend to have a significantly lower body mass index (BMI), lighter body weights, and smaller upper torso sizes when compared to their heterosexual male counterparts (Kaminski, Chapman, Haynes, and Own, 2005; Katz-Wise, Blood, Milliren, Calzo, Richmond, Gooding, and Austin, 2014). The complex relationships between minority stress, obesity, eating disorders, and eating

behaviors among lesbian, gay, and bisexual (LGB) individuals are of key importance to the current review, and will be discussed in greater detail at a later time (Cooper et al., 2014; Denton, 2012). In addition to negative, high-risk, health behaviors, the LGBTQ community also experience higher rates of, or risk for, mental illnesses and other chronic physical health conditions (Denton, 2012; Lick et al., 2013; Meyer, 1995; 2003a; Meyer et al., 2008; Mink et al., 2014).

Prevalence of Mental Illness in the Sexual Minority Population

LGBTQ individuals report higher rates of anxiety (Johnson et al., 2008; Lick et al., 2013; Mink et al., 2014), depression (Cooper et al., 2014; Johnson et al., 2008; Lick et al., 2013; Mink et al., 2014), suicidal ideation (Johnson et al., 2008; Mink et al., 2014), panic disorder (Mink et al., 2014), post-traumatic stress disorder (PTSD) (Mink et al., 2014), and substance-related disorders (Johnson et al., 2008; Lick et al., 2013; Mink et al., 2014). The two prominent theories, which account for the higher incidence rate found within the sexual minority population, are Meyer's (1995, 2003a; 2010; 2015; Meyer et al., 2008) minority stress model, and the psychological mediation framework by Hatzenbuehler (2009). Hatzenbuehler (2009) elaborated on Lehavot and Simoni's (2011) work, by investigating the ways in which the perceptions of sexual minority individuals may mediate the associations between minority stressors and mental health issues. Lehavot and Simoni (2011) highlight the importance of including culturally relevant individual difference variables, in regards to testing the impact of minority stressors on subsets of the LGBTQ population. In addition to presenting with higher rates of mental

illness, sexual minority individuals also show higher rates of physical illness compared to the heterosexual population (Denton, 2012; Lick et al., 2013; Mink et al., 2014). The intent of the current study is to investigate minority stress as it relates to the physical health of sexual minorities and to BMI/weight in particular. The relationship of the sexual minority community and the mental healthcare system have been illuminated in great depth, and a multitude of research has delved into the relationship between minority stress and its relationship to higher rates of mental illness, but little research has investigated this form of stress as a mediating factor for physical health (Denton, 2012).

Prevalence of Physical Illness in the Sexual Minority Population

Along with increases in risky behaviors, and instances of mental illness, LGBTQ individuals are susceptible to more physical health concerns that include an increased risk of cancer (Cochran and Mays, 2007; Cooper et al., 2014; Lick et al., 2013;), higher rates of cardiovascular disease (Cochran and Mays, 2007; Lick et al., 2013), more diagnoses of asthma (Cochran and Mays, 2007; Lick et al., 2013), higher rates of chronic diseases and allergies (Lick et al., 2013), higher prevalence of diabetes (Cochran and Mays, 2007), osteoarthritis, and serious gastro-intestinal problems (Lick et al., 2013; Mink et al., 2014; Sandfort, Bakker, Schellevis, and Vanwesenbeeck, 2006). As was previously mentioned with risky behaviors differing based on the subpopulation in question, the same is true for physical health problems differing depending on which subpopulation of the LGB community is being examined (Cochran and Mays, 2007; Lick et al., 2013; Mink et al., 2014). For instance, lesbian and bisexual women generally report poorer overall physical

health when compared to heterosexual women, and are at a higher risk for diabetes (Cochran and Mays, 2007; Mink et al., 2014). Additionally, bisexual women in particular, report higher rates of asthma, urinary tract infections (UTIs), and have higher Hepatitis B and C infection rates (Lick et al., 2013). To contrast, males that engage in sex with other males are at a higher risk of contracting HIV and other sexually transmitted diseases (Cochran and Mays, 2007). In light of the dearth of research, suggesting a relationship between an individual's sexual orientation and/or gender identity, and their health. The Centers for Disease Control (CDC) and Prevention's National Center for Health Statistics revised the 2013 National Health Interview Survey (NHIS) to include questions regarding sexual orientation, in an attempt to be more inclusive of LGBTQ health, and to address the concerns that research has brought to the forefront. The latter change marked the first time that nationally representative data on sexual orientation would be available to researchers and the public (Ward, Dahlhamer, Galinsky, and Joestl, 2014). The United States Department of Health and Human Services (2014) began the *Healthy People 2020* initiative, with one of the four primary goals being to achieve health equity, eliminate health disparities, and improve the overall health the population, including the LGBTQ community. Mink et al. (2014) and seemingly all other researchers that have, or are currently researching sexual minority populations all conclude that although LGBTQ health research has increased exponentially, it is still very much in its infancy, and much more research is needed to create a better picture of the true experiences of sexual minority individuals, and how they relate to these individual's health (Denton, 2012). One factor that many researchers

have posited as impacting the long-term health of sexual minority individuals is their geographic location (Barefoot et al., 2015).

Location: Rural Sexual Minority Populations versus Urban Sexual Minority Populations

The Institute of Medicine (2011) reported that geographic location has been shown to significantly affect mental and physical health outcomes for LGBT individuals, with those in rural areas expressing more negative feelings regarding disclosing their sexual orientation to others. Sexual minority individuals residing in rural areas reported that their regions had less LGBT organizations, less amounts of fellow LGBT community members for them to interact with, and less support from families and friends (Austin and Irwin, 2010; IOM, 2011). Many sexual minority individuals that grow up in rural areas of the United States, eventually relocate to more urban areas for increased access to LGBT friendly organizations and communities (Austin and Irwin, 2010; Barefoot et al., 2015; IOM, 2011). The relocation seen among sexual minority individuals in the West is similar to the migration of the hijras, from rural to urban India that was previously discussed, and the motives for relocation of both sets of individuals is in an effort to acquire more social support (Austin and Irwin, 2010; IOM, 2011; Kalra and Shah, 2013). Additionally, sexual minority individuals in rural areas may have less access to health care providers that are knowledgeable and/or comfortable with treating them (Austin and Irwin, 2010; IOM, 2011). More recent studies of sexual minority individuals have focused on separately examining differences between the subpopulations of the LGBT

community regarding their locations within the United States (Austin and Irwin, 2010; Barefoot et al., 2015; Swank et al., 2012). Barefoot et al. (2015) examined health risks of gender and sexual minorities (GSM) as a part of a larger parent study that included 3,279 GSM individuals. For the purposes of their study, Barefoot et al. (2015) only included individuals that self-identified as lesbian cis-gendered females ($n = 895$), that self-reported their weight and height. The researchers found that the current locale of the lesbians, and whether that location was rural or urban, was the only significant factor that seemed to have an impact on their BMIs (Barefoot et al., 2015). There was no interaction between previous locale and current locale. However, after controlling for certain demographic factors (e.g., age, race, and education), lesbians that currently resided in rural areas were found to have overall higher BMIs when compared to their urban-residing counterparts (i.e., 30.6 vs. 28.5) (Barefoot et al., 2015). Also, the mean BMI for lesbians residing in rural areas falls in the category of being obese whereas the mean BMI for those that reside in urban areas fell in the overweight range (Barefoot, et al., 2015). Barefoot et al.'s (2015) study further demonstrates a relationship between one self-identifying as lesbian, and not only a risk for obesity, but also a risk for being overweight (i.e., 25.0-29.9) period, as the mean BMI for the entire sample was 29.2 (very close to obese which is a BMI > 30). Researchers have posited that growing up in a rural environment as a sexual minority woman (SMW) creates a higher risk for obesity, but Barefoot et al.'s (2015) study refuted these claims and suggests rather that a higher risk for obesity is not reflective of the environment in which the individual grew up, but rather the environment they are currently living in. For example, a woman that grew up in a

rural area would be at a higher risk for obesity while she was living in this environment, as rural living has been associated with an increased risk for obesity in SWM, but if this woman were to relocate to a more urban environment, it is hypothesized that her risk for obesity would decrease (Barefoot, et al., 2015). The researchers hypothesize that the latter change in risk is due to the fact that sexual minority individuals that reside in rural areas experience increased levels of minority stress and enacted stigma when compared to individuals living in urban areas (Barefoot et al., 2015; Swank et al., 2012).

Furthermore, the results of the study revealed that diet and exercise patterns differed between rural and urban-residing lesbians (Barefoot et al., 2015). Rural lesbians reported that they never engage in exercise, and that they consume foods that are higher in protein relative to their urban counterparts, whereas urban residing lesbians reported that they frequently exercised (i.e., 3 or more times per week) (Barefoot, et al., 2015). However, there were no differences found in the amount of fruit/vegetable consumption between urban or rural residing lesbians, which has been reported in previous research (Barefoot et al., 2015). While there has been a plethora of research conducted on the relationship between sexual minority individuals and mental health risks, studies similar to that of Barefoot et al. (2015) investigating the physical health disparities within this community, location of the individual, and the underlying mechanisms of health differences among the sexual minority population are sparse.

Weight, Obesity, Eating Habits, and the Sexual Minority Population

In addition to mental and physical health issues, other aspects that are indicative of overall health, such as body weight, body image, and the increased risk of being obese show marked differences among sexual minority individuals and heterosexual individuals (Alvy, 2013; Boehmer and Bowen, 2009; Bowen and Balsam, 2008; Carpenter, 2003; Cooper et al., 2014; Deputy and Boehmer, 2014; Mason and Lewis, 2015). Although rising obesity rates are seemingly a widespread national concern, data has consistently demonstrated that sexual minority women (SMW) are at an increased risk for being overweight/obese and developing diabetes, in comparison to heterosexual women (Cochran and Mays, 2007; Barefoot et al., 2015; Mereish, 2014; Struble, Lindley, Montgomery, Hardin, and Burcin, 2010; Yancey, Cochran, Corliss, and Mays, 2003). Ironically, the opposite effect has been seen in gay men, who are much less likely to be obese than their heterosexual male counterparts (Carpenter, 2003; Cooper et al., 2014). Lesbian women seem to show the highest rates of obesity out of all the LGBT community members, and lesbian and bisexual women report higher rates of binge eating relative to heterosexual women (Carpenter, 2003; Mason and Lewis, 2015; Polimeni, Austin, and Kavanagh, 2009). A relatively recent study that was conducted in California concluded that the odds of being obese are three and a half times higher in lesbians than for heterosexual women (Richmond, et al., 2012). Being overweight or obese can have extremely detrimental effects on one's health that include an increased risk for serious health-related problems such as high cholesterol, cardiovascular diseases, diabetes, hypertension, stroke, respiratory issues, diseases of the gallbladder, and psychosocial disorders (Gay and Lesbian Medical Association, 2001). The majority of research that

has been conducted on sexual minority individuals regarding obesity has been conducted on lesbian and bisexual women (Bowen and Balsam, 2008). As was previously mentioned, different subgroups of the LGBTQ community experience stressors differently, and seem to show different outcomes, in regards to health (Cochran and Mays, 2007; Lick et al., 2013; Mink et al., 2014).

To better understand this phenomenon, Bowen and Balsam (2008) conducted a meta-analysis of 19 studies regarding obesity rates among sexual minority women (SMW), and concluded that although most of the studies agree that more lesbians are obese than heterosexual women, none of the studies were population based, and all were qualitative in nature. The latter reliance on cross-sectional data, low-quality methodologies, subjective data, and studies that lack a heterosexual control/comparison group, render much of this previous research problematic and difficult to generalize to the population as a whole (Bowen and Balsam, 2008; Bowen and Boehmer, 2007; Cochran, 2001). Another study conducted by Richmond, Walls, and Austin (2012), reported that gay and bisexual males presented with overall lower BMIs compared to heterosexual males, whereas lesbian and bisexual females presented with overall higher BMIs compared to heterosexual females. It is important to note that research has shown a different pattern of BMI among sexual minority men (SMM), in that gay males exhibit higher BMI in early adolescence when compared to heterosexual males of the same age (Katz-Wise et al., 2014). However, by late adolescence/adulthood gay males exhibit lower BMIs compared to their heterosexual peers, and current studies cannot account for these differences (Katz-Wise et al., 2014). The sexual minority participants in Richmond

et al.'s (2012) study had higher depression scores compared with the heterosexual participants. Regardless of the issues with previous research, the Institute of Medicine (IOM) (2011) has expressed that sexual minority women (SMW) are seemingly more vulnerable to obesity than other women, but the underlying mechanisms for these differences remains unknown (Boehmer and Bowen, 2009; Bowen et al., 2008). Other research, showing a correlation between one's sexual orientation and eating-related issues thereby renders a more comprehensive understanding of the weight concerns among sexual minority individuals as being critical in order to create comprehensive health programs to address and possibly prevent these health problems (Bailey et al., 2015; Bowen et al., 2008; Carpenter, 2003; Denton, 2012).

Conclusions and Future Research Suggestions

To summarize, there is a growing body of research that demonstrates a link between holding a sexual minority status and an increased experience of minority stressors (Denton, 2012; Frost et al., 2013; Lick et al., 2013; Meyer, 1995; 2003a; 2003b; 2010; 2015; Meyer et al., 2008). The aforementioned heightened experience of minority stressors has been consistently linked to increased amounts of both mental and physical health disparities among sexual minority individuals (Barefoot et al., 2015; Cochran, 2001; Denton, 2012; Frost et al., 2013; Lick et al., 2013; Meyer, 1995; 2003a; 2003b; 2010; 2015; Meyer et al., 2008). Unfortunately, theories to explain the causes and correlates of the poor health outcomes that have been demonstrated among sexual minority individuals are in their infancy and lack solid foundations of understanding

(Denton, 2012; Lick et al., 2013). The latter statement should be of paramount concern not only for the public, but for health care professionals, epidemiologists, psychologists, sociologists, and government agencies given the fact that the previously mentioned health disparities account for the deaths of millions of sexual minority individuals (Lick et al., 2013; Mink et al., 2014). The United States Department of Health and Human Services (2010) anticipates that the health concerns of sexual minority individuals will be better addressed and explained upon the release of the *Healthy People guidelines for 2030*, and that researchers and policymakers will be able to use this information to potentially mitigate these disparities (Lick et al., 2013). As it has been mentioned herein in great depth, there are many correlates and confounding issues that arise when researching the relationship between sexual orientation, gender identity, stress, and the health of sexual minority individuals (Barefoot et al., 2015; Cochran, 2001; Denton, 2012; Lick et al., 2013; Mink et al., 2014). Therefore, future researchers should consider collaborating more closely with all other allied fields of public health, using more objective measurements of health in their methodology (e.g., actual measurements of participants, true experimental studies), assessments of pathophysiological mechanisms to better explain stress's impact on health, and how geographical location may interact with one's health (Barefoot et al., 2015; Denton, 2012; Frost et al., 2013; Meyer, 2003a; 2003b). Meyer (2003a; 2003b) highlights the importance of viewing and quantifying stressful experiences of prejudice in an objective manner rather than a subjective manner, to better reduce biases related to appraisal and recall. Also, an objective view would potentially better account for the role of prejudice in differential health outcomes as a precursor to

disease (Meyer, 2003b). Additionally, future research and intervention/prevention programs should account for the full spectrum of minority stressors that Meyer (1995; 2003a; 2003b; 2010; 2015; Meyer et al., 2008) has added to his model and explicate the differential mechanisms that could potentially link these minority stressors to a myriad of both mental and physical health issues in sexual minority individuals (Denton, 2012; Frost et al., 2013).

The Current Study

In light of the literature discussed above on the differences between sexual minority groups in subjective health measures, and due to the need for new research to investigate whether these differences translate to objective measures, the current study will investigate sexual orientation differences in objective measures of physical health (e.g., measured height, weight, BMI), among sexual minority individuals residing in the rural area of the Texas Panhandle. Previous studies have concluded that one's BMI may not be as indicative of their overall health as other physical measurements (Centers for Disease Control and Prevention [CDC], 2004; 2011; Bailey et al., 2015; Katz-Wise et al., 2014; Markey & Markey, 2013), and therefore additional measurements will be taken such as: waist circumference; hip circumference; body fat percentage; body muscle percentage; visceral fat content; body age (as calculated by the Omron scale); blood pressure and; heart rate (due to differences found regarding cardiovascular health) (Everett and Mollborn, 2013; Lick et al., 2013; Mink et al., 2014). The current study will use the most up to date, reliable, and diverse scales that are currently available (e.g., DHEQ scale) in

an attempt to extrapolate the mediating factors/stressors that may possibly account for any differences in health that may be found among self-identified LGBT community members. Additionally, due to discrepancies in the previous literature regarding self-report bias among sexual minority individuals (Richmond et al., 2012), and questions regarding the perception of sexual minority individual's body image (Alvy, 2013; Brand, Rothblum, Solomon, 1991; Kaminski et al., 2005; Roberts, Stuart-Shor, Oppenheimer, 2009) the current study will ask individuals to self-report their height and weight prior to these measurements being taken. The premise of the aforementioned process will be conducted in an attempt to evaluate hypothesis four, which implies that sexual minority individuals may underestimate or overestimate their weight at higher rates than heterosexual individuals.

CHAPTER III

METHODS

Participants

Three hundred and sixty three participants were recruited for a study on sexual orientation, health and stress. After exclusion (see the results section), the sample included 356 individuals of that 209 were self-identified women ($M = 26.74$, $SD = 10.10$, with an age range of 18–75) and 127 were self-identified men ($M = 26.17$, $SD = 8.44$). In an effort to be racially inclusive, participants were given a fill-in-the-blank space for their race, and of the 356 participants: 59.4% self-identified as White; 22.5% participants identified as Hispanic; 8.3% identified as Black/African American; 3.8% reported their race as being “other” or a mixture of several races; 2.9% identified as Asian; 1.9% identified as Native American; 0.6% identified as Middle Eastern; 0.3% stated that they did not know their race and; 0.3% identified as Brazilian. Advertisements specified that any one was eligible to participate, regardless of their biological sex, sexual orientation or gender identity. The only requirement for participation was for the participant to be 18 years of age or older, and competent to consent to participate.

Participants were recruited from the West Texas A&M University campus and the surrounding areas by instructor referrals, advertisements that were placed on the school bulletin boards, and recruitment via social media outlets such as: Facebook and

Instagram. Additionally, onsite testing was conducted at local businesses and organizations such as: The 806 Coffee Lounge; The Amarillo Unitarian Universalist Fellowship; and a local Transgender support group. Onsite testing was also conducted at both the 2015 Amarillo, Texas and 2015 Lubbock, Texas gay pride events. Participants were asked to refer other individuals to take part in the study (snowball sampling). Testing was conducted either in the researchers' laboratory or in private areas of each aforementioned business, organization or event locale onsite. The first part of the testing required participants to fill in questionnaires that were programmed online and hosted by the WT servers. The questionnaires asked participants to provide information regarding demographics, health-related questions, and questions regarding their personal experiences of minority stress. The second part of testing, involved taking actual physical body measurements of participants in the lab or in a mobile lab on location at one of the previously mentioned venues. The entire protocol lasted approximately 30 minutes, with time at the end of the protocol reserved for participants' questions and some explanation of the study aims. The only compensation any participants' received were bonus points for students that were recruited through various classes that were unrelated to the study and any of its investigators. West Texas A&M University's Internal Review Board (IRB) approved the methodology. The majority of the research took place at the university. All of the participants indicated their voluntary involvement in this research via an online consent form.

Two questionnaires: Overall Health Habits Questionnaire and DHEQ Questionnaire

Overall Health Habits Questionnaire

The overall health habits questionnaire that was designed based on online health screening questionnaires and previous national health survey questions (e.g. Greenwood, J.L.J., Murtaugh, M.A., Omura, E.M., Adler, S.C., Stanford, J.B, 2008; National Health and Nutrition Examination Survey Data, 2014; U. S. Department of Health and Human Services, 1996; 2010). The overall health habits questionnaire includes personal questions about the individual as well as Likert scale questions and was designed in an effort to better assess demographics and the current overall health of the participants. The questionnaire attempted to measure the participant's current health by asking questions regarding: race; sexual orientation; alcohol use; illicit drug use; and nicotine consumption. Additionally, participants were asked to self-report their height and weight (prior to these measurements being taken) in an effort to possibly gauge the accuracy of self-reported body measurements. All questions had a "skip question" option, and participants were instructed that they had the option of typing in "skip question" or "I don't know," into the fill-in-the-blank boxes if they did not feel comfortable answering the questions. The questionnaire was programmed to be administered online using iPads or laptops on location or in the lab. The items on this questionnaire are available in the Appendix (attach Appendix to this document please and leave out things we didn't put in analyses with the exception of skewed unusable variables).

Daily Heterosexist Experiences Questionnaire (DHEQ)

Experiences of day-to-day minority stress were measured via The Daily Heterosexist Experiences Questionnaire (DHEQ). The DHEQ is a novel, clinically validated questionnaire created by Balsam, Beadnell, and Molina (2013), it has been validated with LGBT samples that are diverse in race, ethnicity, gender, and sexual identity, and contains 50-Likert items generated from three mixed-method studies that measure day-to-day minority stress. Participants responded to “How much has this problem distressed or bothered you during the past 12 months?” Frequency of occurrence was reported on a 6-point Likert scale (0 “Did not happen/not applicable to me” through 5 “It happened, and it bothered me EXTREMELY”), and a sixth option of “skip question,” was added to the options. Scores were recorded in a manner such that higher scores reflected higher experiences of heterosexist stress.

Body Measures

An Omron scale (Model HBF-514) was used to measure participants’ weight, BMI, body fat percentage, overall muscle percentage, visceral fat, and body age. This scale has been successfully used in previous research and is a relatively reliable and valid tool (see Kawalec-Kajstura, Malinowska-Lipień, and Brzostek, 2014). Participants were required to remove their shoes and socks, and their height was measured. After measuring the participant’s height, the researcher would enter the participant’s height into the Omron scale as a ‘GUEST’, along with the participant’s age and biological sex at birth. Height

was measured using measuring rods that were set up to be perpendicular to the ground on location or in the lab.

It is important to note that the Omron scale only offers the option of male or female as the possibilities for sex, and great care was taken to ensure that the biological sex assigned at birth was used during the measuring process. The Omron scale calculates the participants' weight, BMI, body fat percentage, overall muscle percentage, visceral fat, and body age. Once the machine had correctly displayed all of the values, the researcher would ask the participant to sit down for their blood pressure and heart rate to be measured. Participants were instructed to place both of their feet on the ground, and the Omron blood pressure cuff (Model BP 652) was placed on the left wrist of the participant. Similar blood pressure tools have successfully been used in previous research (see Hung, Lai, Cocks, Rainer, and Graham, 2015). Instructions were given to participants to align the cuff with their heart, and support their left arm with their right arm until the blood pressure cuff gave a full measurement. Next, the participant was asked to stand, and instructed as how to properly use the Myotape (specially designed body measuring tape) provided to measure both the circumference of their waist and hip size. Waist circumference was measured at the widest point between the rib cage and the iliac crest, and hip circumference was measured at the widest point between the waist and thigh or the largest area of the buttocks (as per Vukovic, Feinberg, DeBruine, Smith, and Jones, 2010). All of the aforementioned measurements were left blind to the participants unless they specifically asked to have them revealed to them. In the latter case, any requested measurements were hand-written on a sticky note, and this was provided to the

participant. In these cases, the researchers emphasized that they were not medical professionals and that the participants should seek advice from their medical doctors on how to interpret these measures. No measurements were read aloud to maintain the confidentiality of the participant.

CHAPTER IV

RESULTS

Participants

Participants were ($N = 356$) males and females. The original sample contained ($n = 207$) heterosexual participants ($n = 136$ female, $n = 70$ male, and $n = 1$ “skip q” on biological sex) $n = 45$ bisexual ($n = 35$ female, $n = 10$ male), $n = 33$ lesbians ($n = 32$ female, $n = 1$ male), $n = 43$ gay men (all male), $n = 7$ queer individuals ($n = 4$ female, $n = 3$ male) and $n = 2$ asexual individuals (both female). Three participants chose “skip question” on the sexual orientation prompt, while 16 chose “other”. Queer participants and asexual participants were excluded due to low subsample sizes. Further excluded was the one male lesbian participant and the 10 bisexual males also due to low sample size. Additionally, the heterosexual participant who did not provide data on biological sex was excluded.

Further Demographics after Exclusion

The final sample contained ($N = 316$) participants of whom ($n = 136$) were heterosexual women, ($n = 70$) were heterosexual men, ($n = 35$) were bisexual women, ($n = 32$) were lesbian women, and ($n = 43$) were gay men. The mean age for the sample was 26.74 ($SD = 10.10$). There were significant differences in ages between heterosexual women ($M = 26.21$, $SD = 11.59$, $n = 136$), and lesbian women ($M = 32.44$, $SD = 10.7$, $n =$

32) and also between bisexual women (24.77, SD = 5.43, n = 35), and lesbian women, but not between bisexual women and heterosexual women. This difference was taken into account in the main analysis that follows, by including age as a covariate. There was no significant difference in age between gay men (M = 26.70, SD = 8.87, n = 43) and heterosexual men (M = 26.17, SD = 8.44, n = 70). There was also no difference in age between the men and women in the whole sample ($F_{(1,315)} = .230, p = .61$). Participants ranged in age from 18 to 75 years of age. Fifty nine percent of the participants self-identified as White, while 22.5% self-identified as Hispanic, followed by 8.2% self-identifying as Black/African America, 3.8% self-identified as being racially mixed, while the rest self-identified as “other”.

Compression of Data Related to Health

Since the data file contained a large number of variables, before analyses, proper data compression was executed. The following three sections provide information about this compression of data.

Body Measurements

Objective Body Measurements Related to Health: Body Health Index

For each participant weight status was operationalized using body mass index (BMI) scores calculated using the formula $BMI = \text{weight lbs.} / (\text{height in inches squared}) \times 703$. The average BMI for the whole sample was 27.37 (SD = 6.47), which is considered overweight (BMI 25.5-29.9) according to the standards set forth by the CDC

(2011). Similarly, waist-to-hip ratio (WHR) was calculated by dividing waist circumference by hip circumference.

Next, a principal component analysis (PCA) was run on objective body measurement data (BMI, body muscle, body fat, visceral fat, weight, height, waist circumference, hip circumference, waist-to-hip ratio [WHR], and body age). The correlation matrix of this analysis showed a high correlation between BMI and weight. To avoid problems with multicollinearity in the data, BMI was excluded from this model. Furthermore, height was excluded as its loading on the factor was minimal. The new analysis produced two components, the first of which explained 58.7% of the variance in scores and had an eigenvalue of 4.70. This factor was labeled *body health index* hereafter. High scores on this factor indicated high waist circumference, high body age, high weight, high visceral fat, high hip circumference, high body fat, high WHR, and low body muscle. The determinant of the correlation matrix was .000, while the Kaiser-Olkin Measure of Sampling Adequacy was .676, indicating a proper sample size for this analysis. Additionally, Bartlett's Test of Sphericity was significant $p < .001$, indicating no major problem. Refer to Table 1 for the component matrix for the analysis.

Body health index

Waist Circumference	.944
Body Age	.929
Actual Weight	.891
Visceral Fat	.810
Hip Circumference	.755
Body Fat Percentage	.726
Waist to Hip Ratio	.447
Body Muscle Percentage	-.440

Table 1. Component matrix for principle component analysis of body measurements. The *body health index* explained 58.7% of the variance in scores and had an eigenvalue of 4.70.

Heart-related Health: Heart-Health Index

Three variables related to heart health (systolic blood pressure, diastolic blood pressure and heart rate) were compressed onto a single component, which explained 53.53% of the variance and had an eigenvalue 1.61. Bartlett's test of Sphericity was significant ($p < .001$) and Kaiser-Meyer-Olkin Measure of Sampling Adequacy met minimum requirements at .506. High scores on this measure reflected lower heart health

since they were associated with higher blood pressure and heart rate. Refer to Table 2 for the component matrix for the analysis.

Heart health index

Diastolic	.886
Systolic	.877
Heart Rate	.230

Table 2. Component matrix for principle *heart health index* which explained 53.5% of the variance in scores and had an eigenvalue of 1.61.

Behavioral Habits Related to Health: Substance Use Index

Self-reports of behaviors associated with drug, alcohol and nicotine use were collected. For average statistics for the whole sample, please see Table 3. Next, these three variables were compressed into a single factor using principle component analysis. The one component produced explained 54.7% of the variance in scores and had an eigenvalue of 1.643. This factor was named *substance use index* from here on. High scores on this factor indicate high drug, alcohol and nicotine use. The determinant of the correlation matrix was .752, while the Kaiser-Olkin Measure of Sampling Adequacy was .627, indicating a proper sample size for this analysis. Additionally, Bartlett's Test of Sphericity was significant $p < .001$, indicating no major problem. Refer to Table 3 for the component matrix for the analysis.

Substance Use Index

Alcohol	.771
Drugs	.751
Smoking	.697

Table 3. Component matrix for principle component *substance use index* which explained 54.7% of the variance in scores and had an eigenvalue of 1.641.

DHEQ Scores

For each participant average DHEQ scores were calculated by first summing the scores on the questions and then dividing by the number of questions answered. For those participants who did not answer more than 5 questions on the full DHEQ scale, no score was calculated and there was no data point to be used in the full analysis. Exploration of data revealed a non-parametric distribution of this variable. It was positively skewed suggesting that most participants experienced lower heterosexist stress relative to the extent of the range of this variable. To correct this, the variable was log transformed and this new transformation was used hereafter. A one way ANOVA with DHEQ scores as the dependent variable and sexual orientation as the main factor found that sexual minority groups were experiencing heterosexist stress significantly more than did heterosexual individuals. Although there were no significant differences between sexual minority groups in heterosexist experiences ($p > .112$), lesbian participants experienced the

most ($M = 1.47$, $SD = .70$) heterosexist stress, followed by gay men ($M = 1.39$, $SD = .63$), followed by bisexual women ($M = 1.30$, $SD = .77$). Heterosexual women experienced higher stress ($M = .43$, $SD = .27$) than did heterosexual men ($M = .32$, $SD = .26$). The sexual minority groups differed significantly to those of heterosexual groups (all $p < .001$).

Main Analyses of Group Differences

To investigate whether differences regarding sexual orientation and health were mediated by heterosexist stress, a MANCOVA was run (Dependent Variables: *body health index*, *substance use index*, *heart health index*; fixed factors: *sexual orientation*, *biological sex*; Covariates: *age*, *DHEQ scores*). Age was added as a covariate since health-related outcomes are associated with age (CDC, 2011; 2004) and there were age differences between the subsamples of heterosexual women and lesbian women and the bisexual women and lesbian women. Age and DHEQ scores were not correlated ($p > .699$). The analysis showed a significant Levene's test for *substance use index*. Multiple attempts at transformation of this variable resulted in extreme data loss. Indeed, this variable was extremely positively skewed and a larger sample size is required for this variable to be viable in the analysis. Therefore, this variable was excluded and the MANCOVA rerun without it. The other two dependent variables were normally distributed. This analysis revealed main effects of *age* on *body health index* ($F_{(1, 286)} = 49.33$, $p < .001$, $N = 293$) and on *heart health index* ($F_{(1, 286)} = 35.20$, $p < .001$), main effects of *biological sex* on both *body health index* ($F_{(1, 286)} = 30.78$, $p < .001$) and *heart health index* ($F_{(1, 286)} = 15.35$, $p < .001$) and lastly, a main effect of *sexual orientation* on *body health index* ($F_{(3, 286)} =$

8.45, $p < .001$) but not on *heart health index* ($p = .39$). There was no main effect of DHEQ scores on the two dependent variables (both $p > .387$) and there were no significant interactions between any variables. Therefore, heterosexist stress was not associated with health measures and was not mediating any group differences.

To interpret the main effects of age on *body health index* and *heart health index*, correlations were run separately for age and these two dependent variables. Both the correlations were significant: *age* and *body health index* ($r = .378$, $p < .001$); *age* and *heart health index* ($r = .323$, $p < .001$). As expected, older participants tended to score lower on indexes of heart and body health.

To interpret the sex differences in heart and body health, separate independent t-tests with *biological sex* as a grouping variable were run. There was a significant difference between men ($M = -.30$, $SD = .10$, $s.e.m = .10$, $n = 104$) and women ($M = -.20$, $SD = .92$, $s.e.m = .07$, $n = 189$) in body health ($t = -4.399$, $p < .001$) whereby women scored significantly lower than did men on the *body health index*. Similarly, women ($M = -.13$, $SD = .94$, $s.e.m = .07$, $n = 202$) scored significantly lower ($t = -3.21$, $p < .001$) on the *heart health index* than did men ($M = .24$, $SD = 1.1$, $s.e.m = .10$, $n = 112$). Levene's tests were insignificant for both these t-tests suggesting that the assumptions of equal variances were not violated.

The means on *the body health index* for the different sexual orientation groups was as follows: heterosexual men and women together ($M = -.16$, $SD = .92$, $n = 195$), bisexual women ($M = -.144$, $SD = .81$, $n = 31$), gay men ($M = .29$, $SD = 1.15$, $n = 40$) and lesbian women ($M = .67$, $SD = .90$, $n = 27$). For the sake of comparing women and

men separately, the data were split by sex and the main effect of sexual orientation on *body health index* was interpreted by running post-hoc analyses using a One-Way ANOVA with *body health index* as the dependent variable and *sexual orientation* as a factor. The analysis showed a significant difference ($F_{(2,188)} = 17.61, p < .001$, see Figure 1.) between heterosexual women ($M = -.39, SD = .84, s.e.m = .07, n = 131$) and lesbian women ($M = .67, SD = .90, s.e.m = .17, n = 27$) and a significant difference ($p = .001$) between bisexual women ($M = -.144, SD = .81, s.e.m = .15, n = 31$) and lesbian women, however there was no significant difference ($p = .430$) between heterosexual women and bisexual women on this measure. Levene's test was insignificant for this statistics suggesting no violation of homogeneity of variances. There was no significant difference ($F_{(1,103)} = .018, p = .89$, see Figure 2.) on *body health index* between heterosexual ($M = .32, SD = .90, s.e.m = .11, n = 64$) and gay men ($M = .29, SD = 1.15, s.e.m = .18, n = 40$). To be sure that age was not a driver between the group differences for women, another ANCOVA was run with age as a covariate. The same pattern of results emerged. Furthermore, controlling for DHEQ scores did not alter the pattern of results. Again, these data suggest that the group differences between lesbian participants and bisexual and heterosexual participants are not driven by age or heterosexist stress.

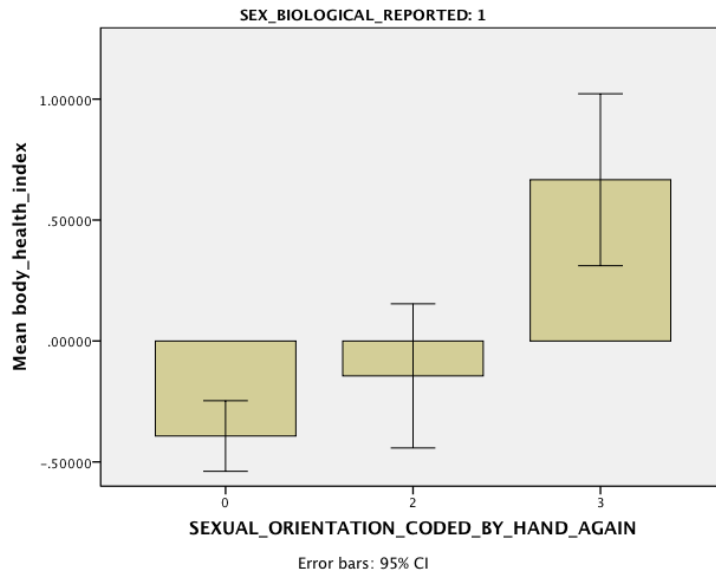


Figure 1. Sexual orientation differences in *body health index* in the sample of women. From left to right, 0=heterosexual, 2=bisexual, 3=lesbian.

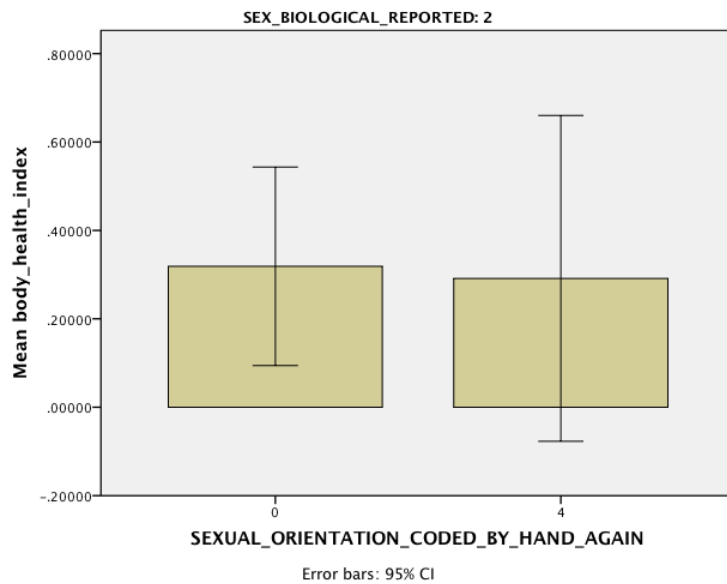


Figure 2. No differences in body health index between heterosexual (left) and gay men (right)

To further explore the sexual orientation differences in health-related scores, separate ANOVAS were run for factors that did not load onto the *body health index*.

Since the current study is one of the first to consider differences in objective health measures between sexual orientation groups, in particular differences in *actual weight* (see Boehmer and Bowen, 2009; Bowen and Balsam, 2008; Carpenter, 2003) information about weight was also provided. The following sections outline each of these new statistics.

Sexual Orientation Differences in BMI

A one-way ANOVA with BMI as the dependent variable and sexual orientation as the grouping variable showed that there was a significant difference between groups ($F_{(2, 198)} = 19.14, p < .001$, see Figure 3.). Post-hoc tests revealed that this significant difference was driven by significant differences ($p < .001$) between lesbian women ($M = 33.17, SD = 1.13$) and heterosexual women ($M = 26.19, SD = .53$), and by significant differences ($p = .004$) between lesbian women and bisexual women ($M = 28.89, SD = 1.1$), but not between bisexual and heterosexual women ($p = .11$). There was no significant difference ($p = .56$, see Figure 4.) in BMI between heterosexual men ($M = 26.53, SD = .68$) and gay men ($M = 27.1, SD = .86$). Furthermore, the average BMI for heterosexual women, heterosexual men, and bisexual women are comparable to the national average for men and women 20 years and older (which is 27.8 and 28.1) (CDC, 2011; 2004). However, the average for lesbian women is well over the national average, and is classified as obese (CDC, 2011; 2004).

To compare the female sexual minority sample to relevant previous studies, the percentage of normal weight, overweight and obese participants in each of the sexual minority groups is reported. Ten percent of lesbians' BMI fell within the normal range

(i.e., BMI = 18.5-24.9), 23% were overweight (i.e., BMI = 25-30), 68% were obese (i.e., BMI >30), while 35% of bisexual women's fell within the normal range, 26% were overweight, and 38% were obese. Seven percent of gay men were underweight (i.e., BMI < 18.5), while 44% fell within the normal range, 19% were overweight, and 30% were obese.

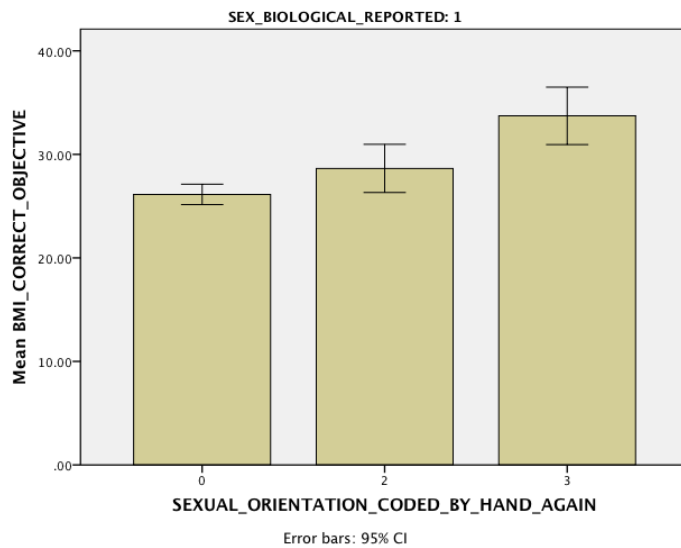


Figure 3. Sexual orientation differences in BMI in the sample of women. From left to right, 0=heterosexual, 2=bisexual, 3=lesbian.

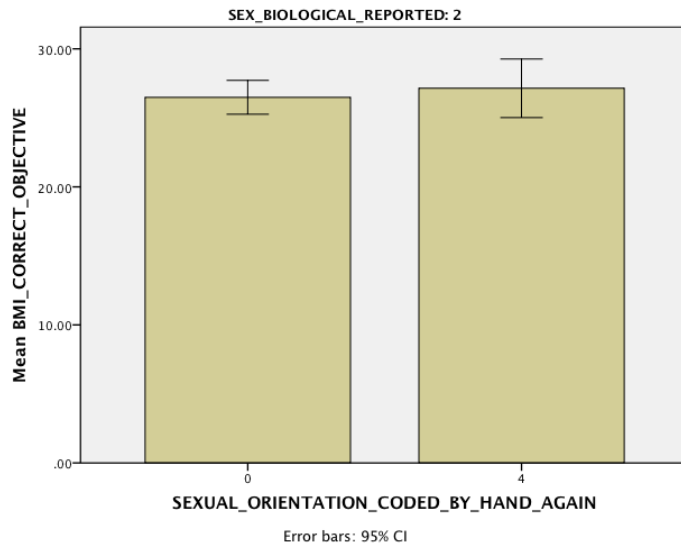


Figure 4. Sexual orientation differences in BMI in the sample of men. From left to right 0=heterosexual and 4=gay.

Sexual Orientation Differences in Objective (i.e. Actual) and Subjective (i.e., Self-report) Weight Measures

Similar to the pattern of results for sexual orientation and BMI above, a one way ANOVA with sexual orientation as a factor and objective weight (i.e., measured on the Omron scale) as a dependent variable found group differences ($F_{(2,198)} = 15.06, p < .001$, see Figure 5.) between lesbian women and heterosexual women (Post hoc $p < .001$), as well as between lesbian women and bisexual women ($p = .003$), but not between bisexual women and heterosexual women ($p = .51$). There were no differences in weight between heterosexual men and gay men ($F_{(1,109)} = .001, p = .979$, see Figure 6.).

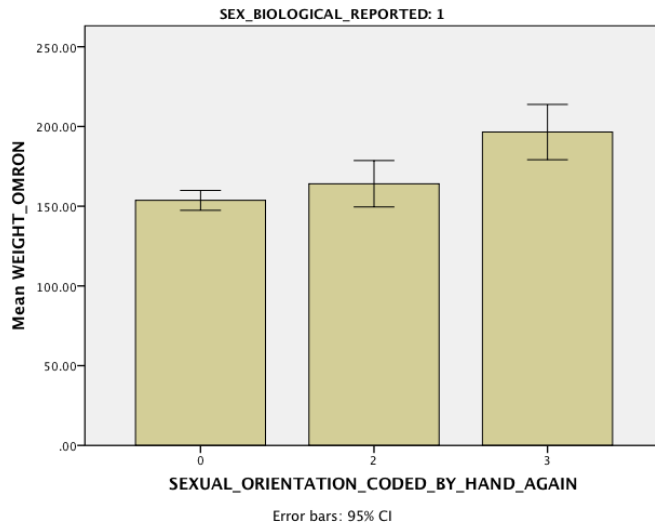


Figure 5. Sexual orientation differences in objective weight in the sample of women. From left to right, 0=heterosexual, 2=bisexual, 3=lesbian.

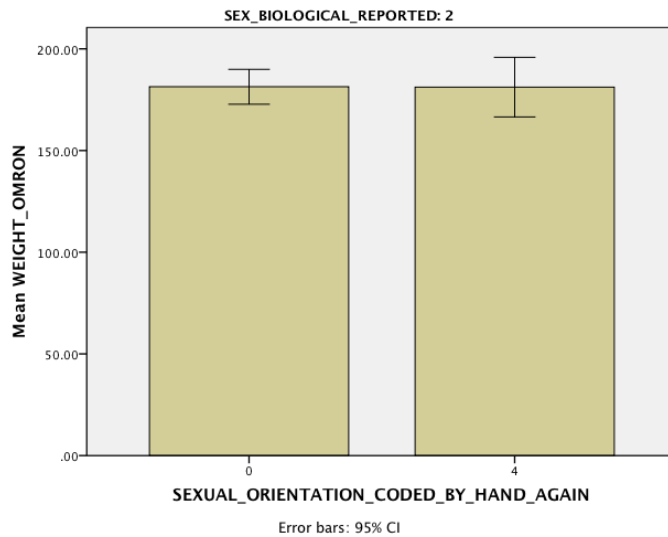


Figure 6. Sexual orientation differences in objective weight in the sample of men. From left to right, 0=heterosexual and 4=gay.

The same analyses were run with *self-reported weight* replacing objective weight as the dependent variable and a similar pattern of results emerged. Lesbian participants were different ($F_{(2, 182)} = 20.56, p < .001$, see Figure 7.) on this measure from heterosexual women ($p < .001$) and bisexual women ($p = .001$), but there were no other group

differences amongst women. There was no difference in self-reported weight between heterosexual men and gay men ($p = .988$, see Figure 8.).

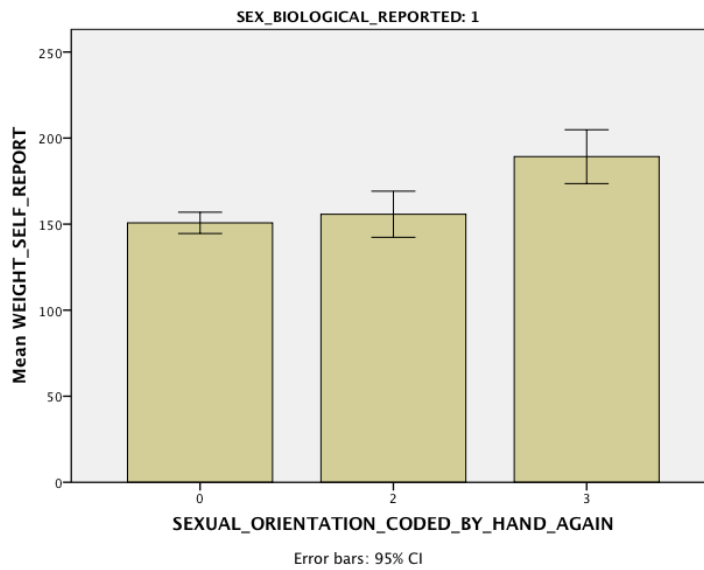


Figure 7. Sexual orientation differences in self-reported weight among the female sample. From left to right, 0=heterosexual, 2=bisexual, 3=lesbian.

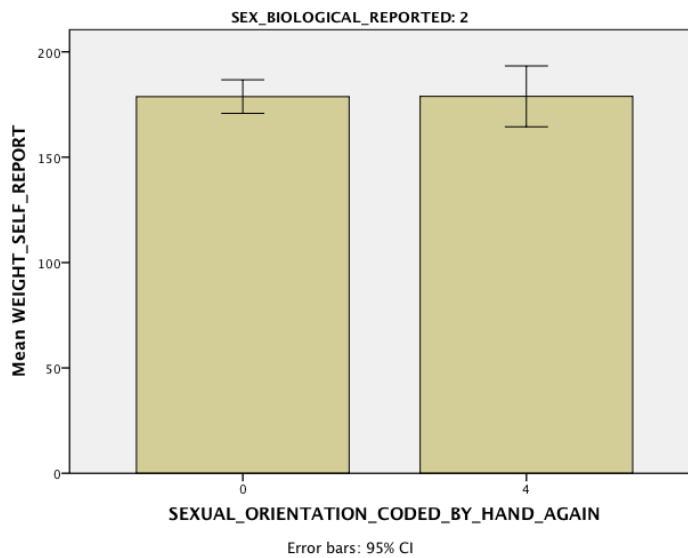


Figure 8. Sexual orientation differences in self-reported weight among the male sample. From left to right 0=heterosexual and 4=gay.

To investigate whether there were group differences between actual weight and self-reported weight, a new variable was first created by subtracting self-reported weight from actual weight. Since most participants tended to underestimate their weight this new variable was termed *weight underestimation*. The point of this analysis was to investigate whether certain groups were more likely to over- or underestimate their weight. A one-way ANOVA with this new variable as the dependent variable and *sexual orientation* as the grouping variable found no differences between any of the groups on this measure (both $F_s < 1.23$, $p > .27$). It is not the case that sexual orientation was associated with more or less underestimation of weight. A separate ANOVA revealed that there was also no sex difference (dependent variable) in the underestimation of weight. Women (actual weight $M = 162.04\text{lbs}$; self-reported weight = 157.79lbs) did not underestimate weight more than did men (*actual weight* $M = 181.29\text{lbs}$; *self-reported weight* = 178.81lbs), but men did actually weigh more than did women ($F_{(1,311)} = 15.53$, $n = 312$). Collapsed across all groups, in the whole sample, the participants tended to significantly underestimate their weight by 3.22lbs (paired samples $t = 7.74$, $p < .001$). The mean for the *actual weight* in the sample was $M = 168.64$, $SD = 41.59$, $n = 293$ while the mean for *self-reported weight* was $M = 165.42$, $SD = 39.87$.

Group Differences in Actual and Self-reported Weight and Height

The average height for the whole sample was 65.83in , ($SD = 3.57$, $n = 311$), while *self-reported height* was 64.56in , ($SD = 11.85$, $n = 311$). Men ($M = 69.03\text{in}$, $SD = 2.76$, $n = 112$) were actually taller ($F_{(1,312)} = 260.03$, $p < .001$) than women ($M = 64.03\text{in}$, $SD =$

2.45, $n = 202$). To investigate height overestimation, a new variable was created by subtracting actual height from self-reported height. There were no significant differences in actual or self-reported height between any of the sexual orientation groups. There was no sex or sexual orientation difference in height overestimation (all F 's < 1.83 , all p 's $> .18$). A paired samples t -test comparing means for self-reported height and actual height found that people were indeed overestimating their heights significantly ($t = 2.05$, $p = .041$).

CHAPTER V

DISCUSSION

Previous studies have repeatedly reported that sexual minority individuals show higher rates of mental and physical illness, compared to heterosexual individuals, but the origin of these differences in health remains unknown (Denton, 2012; Frost et al., 2013; Lick et al., 2013; Meyer, 1995; 2003a; Mink et al., 2014; Operario et al., 2015). One major implication for the increased amount of poor health among sexual minority individuals is experiencing minority stress (including heterosexist stress), which subsequently leads to an increased incidence of both physical and mental illnesses (Denton, 2012; Frost et al., 2013; Lick et al., 2013; Meyer, 1995; 2003a; 2015; Mink et al., 2014; Operario et al., 2015). Sexual minority women (SMW), have self-reported their physical health as being overall poor, higher rates of being overweight or obese, and show higher risk for developing diabetes in comparison to their heterosexual female peers (Boehmer and Balsam, 2009; Bowen et al., 2008; Carpenter, 2003; Denton, 2012; Katz-Wise et al., 2014; Mereish, 2014; Mink et al., 2014; Struble et al., 2010; Yancey, 2003). Furthermore, many previous samples have focused on individuals in urban versus rural settings despite the fact that the IOM (2011) and other researchers such as Barefoot et al. (2015) and Austin and Irwin (2010) have concluded that sexual minority individuals

residing in more rural areas present with not only a higher risk for health problems, but also engage less in acquiring healthcare. Adult gay males have self-reported the opposite effect of sexual minority females, reporting lower BMI or being underweight, and a higher rate of hypertension and cardiovascular disease when compared to heterosexual males (Everett and Mollborn, 2013; Kaminski et al., 2005; Katz-Wise et al., 2014). However, at this current time, the entirety of previous studies have been conducted using subjective measures and/or national database sets, as opposed to collecting objective measurements in conjunction with subjective measures (Boehmer and Balsam, 2009; Bowen et al., 2008; Carpenter, 2003; Deputy et al., 2014; Fredricksen-Goldsen et al., 2010; IOM; 2011; Mereish, 2014; Yancey et al., 2003). The issue with relying solely on self-report/subjective data lies in the fact that research has shown that individuals tend to underestimate their BMI/weight (Richmond et al., 2012).

Most of the literature discussed above has employed subjective measures. For example Bowen and Balsam (2008) conducted a meta-analysis of 19 studies to review the literature regarding sexual minority women, obesity, and related issues. Of the 19 studies reviewed, nine found sexual minority women to be overweight or obese when compared to heterosexual females, five found no differences between the groups, and four did not report having a heterosexual comparison group (Bowen and Balsam, 2008). The authors cite many issues with the methodology of previous studies, which includes: 1.) No population-based samples; 2.) Reliance on cross-sectional data rather than recruiting a heterosexual control group and; 3.) A lack of consistent measures of participants' sexuality (Bowen and Balsam, 2008). Currently, there are only a few published studies

that have investigated the previously reported weight disparities that have been found among sexual minority individuals using objective measures along with subjective measures. Furthermore, the few studies that have used objective measures have focused solely on partnered lesbian women and gay men, in the highly urban area of Philadelphia, PA (Bailey et al., 2015; Markey and Markey, 2013). Due to this gap in the literature, the current study set out to investigate sexual orientation differences in both objective and subjective health-related measures. It was hypothesized that increased experiences of heterosexist stress may influence health-related body measures. Therefore, heterosexist stress was measured using the Daily Heterosexist Experiences Questionnaire (DHEQ), which has been only recently standardized, and has yet to be employed on a wider scale in this type of research. Additionally, other behavioral measures associated with health were collected. These included self-reports of substance use behaviors. The following sections will discuss the current study's findings in more detail as they compare to other studies' findings.

Demographics of the Texas Panhandle

The Texas Panhandle is considered to be a rural setting, and this is of particular importance for the current study due to the fact that previous research has indicated a link between sexual minority individuals residing in rural areas and increased instances of minority stress and poor health (Austin and Irwin, 2010; Barefoot et al., 2015; IOM, 2011). Furthermore, previous studies have primarily focused on sexual minority individuals residing in urban areas (Balsam et al., 2013; Bailey et al., 2015; Markey and Markey, 2013). The current study recruited individuals from the rural area of the Texas

Panhandle in an effort to better understand the relationship between one's sexual orientation as it relates to a rural versus urban environment, and subsequently to one's health. In 2013 self-report survey data collected from The Community Health Assessment, revealed that Potter (n = 379) and Randall counties (n = 421) (counties that comprise both the cities of Amarillo and Canyon Texas) were below the state and national average of persons who are overweight or obese in 2010 (Texas Health Institute [THI], 2013). This proportion rose to 65% in 2013, which aligns with the national average (CDC, 2011). Currently, the CDC (2015) reports the obesity rate for Texas as 30-35%. However, the rate of obesity in Texas is expected to reach 57% by 2030, and almost 20% of Amarillo area residents reported poor or fair health (THI, 2013). It is important to note that The Community Health Assessment (2013) did not ask survey respondents to report their sexual orientation or gender identity. Therefore, this information is not available to compare to the current study. Furthermore, the survey was not broken down by biological sex or gender (THI, 2013). The Texas Department of State Health and Human Services conducted the 2010 Behavioral Risk Factor Surveillance System (BRFSS) survey that reported that the Texas Panhandle (Public Health Administrative Region 1) demonstrated a 65% risk for being overweight compared to the Texas statewide risk of 66.6%, and the nationwide risk of 64.3%. In regards to obesity the Texas Panhandle demonstrated a 31.8% risk for obesity compared to the Texas statewide risk of 31.8%, and the nationwide risk of 28.9% (BRFSS, 2011). It is important to note that the BRFSS sample for the Texas Panhandle (Amarillo, Canyon, Lubbock, TX) or Public Health Administrative Region 1 (n = 1,873) was disproportionately female (n =

1,169) when compared to male respondents (n = 704), and predominantly white (n = 1,468) with only 271 Hispanic respondents and 73 black respondents (BRFSS, 2011). The latter surveys generate data that are not representative, nor generalizable to the population as a whole, and studies that solely rely on this type of self-report data reveal the problems that can arise when comparing specific samples to government surveys or cross-sectional data. The current study consisted of a much more diverse sample than that of the BRFSS (2011), that included 59.4% individuals that self-identified as White, 22.5% participants that identified as Hispanic, 8.3% Black/African American individuals, 3.8% individuals reported their race as being “other” or a mixture of several races, 2.9% as Asian, 1.9% as Native American, 0.6% as Middle Eastern, 0.3% of the sample stated that they did not know their race, and 0.3% identified as Brazilian. The latter data contains a more diverse sample than the BRFSS (2011), and further includes the objective measurements of individuals residing in the Texas Panhandle relative to the subjective measurements that are reported in the aforementioned government reports. The latter differences in methodology between the current study and national data sets, are important to mention due to the fact that many researchers have criticized using these types of data banks due to their lack of true representation of the population as a whole (Bowen and Balsam, 2008).

Age and Health

It is not surprising that the current study found that age was positively correlated with body measurements associated with poorer health. Indeed, previous studies about age-related changes in health have found that as individual's age, they become more

susceptible to a myriad of physical illnesses (CDC, 2015). The current study found that as people age, they are more likely to be at higher risk of body and heart illnesses.

Self-reported Height and Weight

Previous research has suggested that people tend to underestimate their weight in general, but that gay males have a tendency to underestimate their weight at a higher rate than heterosexual men (Richmond et al., 2012). The current study aimed to investigate this phenomenon by asking participants to self-report their height and weight prior to these measurements being collected on an Omron scale. On average, all participants underestimated their weight, which is consistent with previous findings (Richmond et al., 2012). However, there were no sexual orientation differences in weight underestimation. The latter findings contradict Richmond et al.'s (2012) results whereby gay men were more likely to underestimate their weight. The discrepancy between Richmond et al.'s (2012) findings and those of the current study may be due because participants were more inclined to disclose their weight more correctly due to the knowledge that they would be measure following completion of their online questionnaires.

DHEQ scores

The current study aimed to employ the Daily Heterosexist Experiences Questionnaire (DHEQ) (Balsam et al., 2013), in an effort to measure the amount of heterosexist stress, that is experienced by both heterosexual and non-heterosexual individuals, in the rural area of the Texas Panhandle within the last 12 months. It is important to mention that this specific questionnaire has not been applied to heterosexual individuals prior to the current

study. The DHEQ was developed using a three-phase, mixed methods study design in order to better assess the unique aspects of Meyer's (1995; 2003a; 2003b; 2010; 2015) minority stress model for LGBT adults (Balsam et al., 2013). Prior to the current study, no previous study has used the DHEQ to assess experiences of heterosexist stress among heterosexual participants as a control. A recent study by Mereish (2014) concluded that lesbian women who experience heterosexist discrimination were at 2.55 higher odds of being overweight and 2.49 higher odds of being obese compared to lesbian women who did not experience this type of stress. Although the current study used a different measure of heterosexist stress than that employed by Mereish (2014), the current study did not find a relationship between DHEQ scores and health. Interestingly however, the current study did find that all the sexual minority groups (i.e., lesbian, bisexual and gay men) were significantly different on this measure than their heterosexual counterparts. LGB individuals residing in the Texas Panhandle demonstrated significantly higher DHEQ scores than heterosexual individuals regardless of their sexual orientation or biological sex. Moreover, there were no significant differences between sexual minority groups in their DHEQ scores. It could be the case that in the rural area of the Texas Panhandle, sexual minority individuals are under such great amounts of heterosexist stress that the DHEQ scale simply is not sensitive enough to pick up the variability in scores due to individual differences. This may account for why there was no correlation between DHEQ scores and health measures in the current study. Alternatively, it could be the case that heterosexist stress simply does not act as a mediating factor for any of the measured variables.

Substance Use Index

The substance abuse index is a component composed of behaviors associated with drug, alcohol and nicotine use, which were compressed into a single factor using principle component analysis. A high score on the substance use index indicates that the individual uses drugs, consumes alcohol, and consumes nicotine at a higher rate. Results from the substance use index were inconclusive due to data loss resulting from transformation of the data due to this particular variable being extremely positively skewed. In light of this finding, a larger sample size would be necessary to render this variable as viable for analysis.

Heart-Health Index

The heart health index was a component composed of three variables related to heart health (systolic blood pressure, diastolic blood pressure and heart rate), which were compressed onto a single component. Higher scores on the heart health index indicated overall poorer heart health since a higher score on the index is associated with a higher blood pressure ratio and a higher resting heart rate. Women scored significantly lower on the heart health index than did men. This is not surprising since men generally present with higher blood pressure ratios than age-matched, premenopausal women (Maranon and Reckelhoff, 2013). Previous research has also indicated that sexual minority individuals present with a higher risk for cardiovascular disease and hypertension, but these studies have also relied on subjective rather than objective measures of blood pressure and heart rate (Everett and Mollborn, 2013; Lick et al., 2013; Mink et al., 2014).

No differences were found in the current study between sexual minority individuals and heterosexual individuals in regards to their cardiovascular health. Additionally, the current study found that heterosexual stress did not co-vary with cardiovascular health. This finding is surprising considering that sexual minority individuals presented with such high DHEQ scores, and that stress is a known factor in influencing the progression heart disease (CDC, 2015; 2011; 2004; Everett and Mollborn, 2013; Seaward, 2006). It is important to note that many participants were recruited and participated in the study in a coffee shop, where the participants had recently consumed beverages that contained caffeine, and other participants were recruited and participated outdoors during gay pride events. When testing was conducted outdoors the temperatures were very high. Both of the latter environmental conditions may have impacted the blood pressure ratios and heart rates of participants.

Sexual Orientation Differences in BMI

The current study confirms the hypothesis that lesbian women have overall poorer health, higher BMI, and larger waist-to-hip circumferences than heterosexual females. The average BMI of lesbians in the Texas Panhandle was 33.17 (SD = 1.13) which is considered obese (>30) by the standards set forth from the Centers for Disease Control and Prevention (CDC) (2011; 2004). The average BMI of heterosexual females' was 26.19 (SD = .53), which is considered to be overweight (BMI range 25-29.9) but aligns with the national average for heterosexual women 20 years of age and older (CDC, 2011; 2004). Bisexual females' average BMI was 28.89 (SD = 1.1), which is overweight, but not significantly different from that of heterosexual females or the national average for

females 20 years of age or older (CDC, 2011; 2004). The group differences among women in the overall sample were not surprising considering that numerous studies had found that sexual minority women tended to weigh more than did heterosexual women (Boehmer and Bowen, 2009; Balsam et al., 2012; Carpenter, 2003; Deputy et al., 2014; Yancey et al., 2003). However, what was surprising is that bisexual women (i.e., a sexual minority group) did not differ in BMI from heterosexual women. This result will be interpreted in more depth in further sections of this discussion.

In regards to males, the current study did not find a significant difference between heterosexual males and sexual minority males (SMM) residing in the rural area of the Texas Panhandle regarding overall health or BMI. The average BMI for gay males was 27.1 (SD = .86) and the average BMI for heterosexual males was 26.53 (SD = .68); both averages are considered to be overweight, but do not differ from the national average for males 20 years of age or older (CDC, 2015). The latter finding disconfirms the hypothesis that gay males exhibit lower BMI than heterosexual males (Kaminski et al., 2005; Katz-Wise et al., 2014). A possible explanation for why there were no differences in BMI between gay men and heterosexual men may be due to the current sample being from a rural setting, while previous research has focused on more urban settings (Bailey et al., 2015; Markey and Markey, 2013) or very large national data sets that may not be representative of the Texas Panhandle. It is possible that lifestyles related to diet and exercise as well as barriers to routine healthcare are different in rural settings than in urban settings, and that these factors may be more important in overriding the driving

forces associated with group differences found in urban samples (Barefoot et al., 2015; IOM, 2011; Swank et al., 2012).

Waist Circumference

The same pattern of results emerged to that of BMI emerged for group differences in waist circumference. The CDC (2015) has indicated that waist circumference, hip circumference, waist-to-hip ratios, and measures of body fat percentage are better indicators of overall health than BMI. Furthermore, the CDC (2015) states that excessive abdominal fat places individuals at a higher risk for developing obesity-related conditions, such as Type 2 Diabetes, high blood pressure, and coronary artery disease. A man whose waist circumference is $>40''$, and a non-pregnant woman whose waist circumference is $>35''$, are considered to be at a higher risk of developing obesity-related conditions (CDC, 2011; 2004). Previous studies have indicated that the latter measurements would be more beneficial to researchers than measuring BMI alone (Bailey et al., 2015; Markey and Markey, 2013).

Main Analyses: PCA: Body Health Index

In the current study, the body health index was a principal component composed of body muscle percentage, body fat percentage, visceral fat, weight, and body age that were calculated by the Omron scale. Waist circumference, hip circumference, and (WHR) were also included in the PCA, and were measured with Myotape (specialized instrument to properly calculate waist and hip circumference). A high score on the body health index indicated high waist circumference, high hip circumference, high WHR, high body age,

high weight, high visceral fat, high body fat percentage, and low body muscle percentage. The latter factors are better indicators of overall body health compared to BMI or each measure alone (CDC, 2011; 2004). In regards to body health, females scored significantly lower than males. This finding was not surprising, since the CDC (2015) reports that females tend to have higher BMIs than males, but could be due to the fact that females tend to have higher amounts of body fat relative to males.

There were also significant differences between sexual orientation groups in overall body health. Lesbian participants had poorer overall body health than did heterosexual and bisexual women. However, there were no differences in body health between bisexual and heterosexual women. Additionally, gay males and heterosexual males showed no significant differences in overall body health. These findings parallel the findings for group differences in BMI and waist circumference. Importantly, these reported findings were not related to age, since controlling for age did not affect the results. Similarly, daily heterosexist experiences were not found to mediate the differences between lesbian participants and other female participants.

The current sample is representative of a highly rural population and this is important due to the fact that the IOM (2011) reported that the location that the sexual minority individual resides in is highly related to their mental and physical health outcomes. Furthermore, Barefoot et al. (2015) found that rural, compared to urban, locale significantly impacted lesbian women's BMI/weight and their diet/exercise patterns. Lesbian women residing in rural areas reported higher BMI/weights, less amounts of

physical activity, and consuming larger amounts of foods that are high in protein when compared to lesbians residing in more urban areas (Barefoot et al., 2015).

The major hypothesis that was supported by the data was that lesbian women demonstrated overall poorer health (as evidenced by higher scores on the body health index), higher BMI, higher weight, lower body muscle percentage, and larger waist-to-hip ratios when compared with heterosexual individuals. The data did not support the previously reviewed findings regarding bisexual females (Bowen and Balsam, 2008), and gay males did not demonstrate lower BMI when compared to heterosexual males as was hypothesized. Furthermore, there appeared to be no interaction between DHEQ scores and health as was predicted.

There are many possible explanations for these results. One prominent explanation for the findings is the rural environment of the Texas Panhandle, in which measurements were taken (Barefoot et al., 2015; IOM, 2011; Swank et al., 2012). Another possible explanation could be that lesbian individuals do not ascribe to the cultural pressures of body image, and are less likely to be dissatisfied with their body image when compared to heterosexual females (Alvy, 2013; Polimeni et al., 2009). However, further research would need to be conducted in order to investigate the underlying mechanisms of health differences that the current study has uncovered among lesbian women residing in the Texas Panhandle and other areas.

Markey and Markey (2013) collected three height and weight measurements from self-identified lesbians in the Philadelphia, PA metropolitan area ($N = 144$) with an average age of 33.4 ($SD = 10.20$), and calculated the participant's BMI from the average

of the three measures. The researchers determined that their sample's BMI distribution did not differ from their heterosexual counterparts that were measured in a previous study, but did not measure a heterosexual control group simultaneously (Markey and Markey, 2013). The average BMI for the sample was 29.38 (SD = 8.23), which is considered overweight, but does not deviate from the national average for heterosexual females over the age of 20 years old (Markey and Markey, 2013). It is important to note that Markey and Markey (2013) focused their study on examining weight concerns interpersonally, or in the context of one being involved in a romantic relationship and how this relationship relates to one's health. The researchers determined that heavy lesbian individuals have more weight concerns than lesbians that are thin, and that lesbian women with a high BMI have more weight concerns when their partner is thin (Markey and Markey, 2013). Interestingly, the current study revealed that lesbians residing in the rural area of the Texas Panhandle had an average BMI of 33.17 (SD = 1.13), which is considered to be obese, and is quite higher than the average reported by Markey and Markey (2015) of 29.38 (SD = 8.23) for urban residing lesbians in Philadelphia. The average BMI for Panhandle lesbians is not only higher than that of Markey and Markey's (2015) sample, but it is also higher than the state and nationwide BMI averages for women 20 years of age and older (CDC, 2011; 2004). Additionally, the current study collected a heterosexual comparison sample simultaneously in an effort to better demonstrate differences between sexual minority individuals.

A follow up study conducted by Bailey et al. (2015) recruited (N = 288) lesbian and gay males in the Philadelphia, PA metropolitan area. The sample consisted of 72

lesbian couples and 72 gay couples (mean age = 33.74 years SD = 11.27 years). Again, a heterosexual comparison group was not used, but cross-sectional data was used from a previous study (Bailey et al., 2015). The researchers collected the participant's height and weight three times, and calculated their BMI with the averages of these three measures (Bailey et al., 2015). The lesbian couples average BMI was 29.38 (SD = 8.23) and gay couples average BMI was 26.28 (SD = 5.58). Although the average BMI of both groups is considered to be overweight, they are similar to the national average BMI for males and females 20 years of age and older (Bailey et al., 2015). Also, romantic partners tend to have the same BMIs (Bailey et al., 2015). The researchers determined that: 1.) An individual's BMI is positively related to his or her tendency to engage in emotional or uncontrolled eating; 2.) Partners' BMIs exhibit a significant negative relationship with dietary restraint and; 3.) Individuals with higher BMIs engage in more dietary restraint, uncontrolled, and emotional eating relative to their thin partners (Bailey et al., 2015). The current study also assessed the BMI of gay men, and yielded similar results, with the average BMI for gay men being 27.1 (SD = .86).

The two aforementioned studies (see Bailey et al., 2015; Markey and Markey, 2013) are important to mention due to the fact that they demonstrate relationships between sexual minority individual's weight and their partner's weight. However, they do not align with the previously mentioned research that suggests that lesbian women exhibit higher rates of obesity in comparison to heterosexual individuals (Boehmer and Balsam, 2009; Bowen et al., 2008; Carpenter, 2003; Deputy et al., 2014; Fredricksen-Goldsen et al., 2010; IOM, 2011; Mereish, 2014; Yancey et al., 2003). On the contrary,

according to Bailey et al. (2015) and Markey and Markey (2013), it would seem that both of their sexual minority sample's BMIs align with their heterosexual counterparts'. Furthermore, a study by Kaminski et al. (2005) reported that gay men did not show higher rates of emotional eating nor did heterosexual males, but gay men tended to show higher rates of body dissatisfaction and distorted cognition related to their physique. Kaminski et al. (2005) did not take into account the relationship status of their participants, but did cross-reference a heterosexual comparison group. Inconsistencies between the previously mentioned research studies on sexual minority individuals, is common and these issues create a need for studies with more stringent methods to better understand the complex relationship between identification as a sexual minority individual and implications on one's health (Bowen and Balsam, 2008). Barefoot et al. (2015), The Institute of Medicine (2011), and Swank et al. (2012) have all suggested that the area in which the sexual minority individual resides highly contributes to the trajectory of both their physical and mental health, with sexual minority individuals that reside in highly urban areas reporting better overall health than sexual minority individuals that reside in more rural areas (Barefoot et al., 2015; IOM, 2011; Swank et al., 2012). The current study aimed to measure sexual minority individuals currently residing in rural areas and/or small towns within the rural area of the Texas Panhandle in an effort to build upon previous research regarding one's location, and how it relates to experiences of heterosexism, minority stress, and increased risk for poor physical health (Barefoot et al., 2015; IOM, 2011; Swank et al., 2012).

Many organizations are calling for increased research into the health of sexual minority individuals (IOM, 2011; U.S. Department of Health and Human Services, 1996; 2010). As such, the current study aimed to build upon previous studies using objective measures, in which participants will be physically measured rather than rely on subjective measures of weight or previously obtained data from national surveys. Also, recruitment of a control heterosexual comparison group was important to address previous concerns found in the reviewed literature (Bowen and Balsam, 2008). The current study aimed to investigate any differences in health across multiple sub-groups of the LGBTIA+ population (i.e., bisexual males and females, transgender individuals, queer, asexual), and extend previous measurements beyond that of height, weight, and BMI.

Limitations

The current study allowed participants to self-identify as more than lesbian, gay, or bisexual. Several participants self-identified as queer ($n = 7$) or other ($n = 16$) as their sexual orientations, and others identified as asexual ($n = 2$) with ($n = 3$) choosing to skip the question regarding sexual orientation. One participant reported being a transgender lesbian. Due to the lack of literature regarding the implications of identifying as one of the aforementioned sexual orientations and/or gender identities the latter participants were excluded from data analysis. Future studies should widen the focus of their research on SMW to include females that identify as queer, other or additional categories of sexual orientations. Identification with one of the latter terms would imply identification of oneself as a sexual minority individual, but it would be misleading to report these results within the same context as lesbian, gay, or bisexual individuals. A larger sample of the

previously mentioned sexual minority individuals would be necessary in order to gain a better picture of their overall health. A better understanding of all sexual minority women may offer more insight into the larger picture of health of all sexual minority individuals as has been concluded that sexuality tends to fall on a continuum across the lifespan.

REFERENCES

- Allport, G. W. (1954). *The nature of prejudice*. Reading, MA: Addison-Wesley.
- Alvy, L.M. (2013). Do lesbian women have a better body image? Comparisons with heterosexual women and model of lesbian-specific factors. *Body Image, 10* (4), 524-534.
- American Psychiatric Association (APA). (1987). *Diagnostic and statistical manual of mental disorders* (3rd edition, revised). Washington, DC: Author.
- American Psychiatric Association (APA). (2000). *Diagnostic and statistical manual of mental disorders* (4th edition, text revised). Washington, DC: Author.
- American Psychiatric Association (APA). (2013a). *Diagnostic and statistical manual of mental disorders* (5th edition). Washington, DC: Author.
- American Psychiatric Association (APA). (2013b). *Gender Dysphoria*. Retrieved from <http://www.dsm5.org/documents/gender%20dysphoria%20fact%20sheet.pdf>
- Arbona, C., Jimenez, C. (2014). Minority stress, ethnic identity, and depression among Latino/a college students. *Journal of Counseling Psychology, 61* (1), 162-168.

- Austin, E. L., Irwin, J. A. (2010). Health behaviors and health care utilization of southern lesbians. *Women's Health Issues, 20* (3), 178-184.
- Baams, L., Grossman, A. H., Russell, S. T. (2015). Minority stress and mechanisms of risk for depression and suicidal ideation among lesbian, gay, and bisexual youth. *Developmental Psychology, 51* (5), 688-696.
- Bailey, L., Markey, C. N., Markey, P. M., August, K. J., Nave, C. S. (2015). Understanding same-sex male and female partners' restrained eating in the context of their relationships. *Journal of Health Psychology, 20* (6), 816-827.
- Balsam, K. F., Beadnell, B., Molina, Y. (2013). The daily heterosexist experiences questionnaire: Measuring minority stress among lesbian, gay, bisexual, and transgender adults. *Measurement & Evaluation in Counseling & Development, 46* (1), 3-25.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Barefoot, K. N., Warren, J., Smalley, K. B. (2015). An examination of past and current influences of rurality on lesbians' overweight/obesity risks. *LGBT Health, 2* (2), 154-161.
- Boehmer, U., Bowen, D. J. (2009). Examining factors linked to overweight and obesity in women of different sexual orientations. *Preventative Medicine, 48* (4), 357-361.

- Bowen, D.J., Balsam, K.F., Ender, S.R. (2008). A review of obesity issues in sexual minority women. *Obesity, 16* (2), 221-228.
- Brand, P. A., Rothblum, E. D., Solomon, L. J. (1991). A comparison of lesbians, gay men, and heterosexuals on weight and restrained eating. *International Journal of Eating Disorders, 11* (3), 253-259.
- Brennan, D. J., Ross, L. E., Dobinson, C., Veldhuizen, S., Steele, L. S. (2010). Men's sexual orientation and health in Canada. *Canadian Journal of Public Health, 101* (3), 255-258.
- Brooks, V. (1981). *Minority stress and lesbian women*. Lexington, MA: Lexington Books.
- Burgard, S. A., Cochran, S. D., Mays, V. M. (2005). Alcohol and tobacco use patterns amongheterosexually and homosexually experienced California women. *Drug and Alcohol Dependence, 77* (1), 61-70.
- Carpenter, C. (2003). Sexual orientation and body weight: Evidence from multiple surveys. *Gender Issues, 21* (3), 60-74.
- Carter II, L. W., Mollen, D., Smith, N. G. (2014). Locus of control, minority stress, and psychological distress among lesbian, gay, and bisexual individuals. *Journal of Counseling Psychology, 61* (1), 160-175.
- Centers for Disease Control and Prevention (CDC). (2015). *Adult obesity* [Data file]. Retrieved from <http://www.cdc.gov/obesity/data/adult.html>

- Centers for Disease Control and Prevention (CDC). (2011). *BRFSS annual survey data: Survey data and documentation* [Data file]. Retrieved from http://www.cdc.gov/BRFSS2010data507brfss/technical%5Finfodata/surveydata/2010/overview_10.rtf.
- Center for Disease Control and Prevention (CDC). (2004). *Mean body weight, height, and body mass index, United States 1960-2002 (National Health and Nutrition Examination Survey)* [Data file]. Retrieved from <http://www.cdc.gov/nchs/data/ad/ad347.pdf>.
- Center for Health Statistics (CHS). (2010). *Texas behavioral risk factor surveillance system survey data*. Austin, TX: Texas Department of State Health Services.
- Cochran, S. D. (2001). Emerging issues in research on lesbians' and gay men's health: Does sexual orientation really matter? *American Psychologist*, 56 (11), 931-947.
- Cochran, S. D., & Mays, V. M. (2007). Physical health complaints among lesbians, gay men, and bisexual and homosexually experienced heterosexual individuals: Results from the California Quality of Life Survey. *American Journal of Public Health*, 97 (11), 2048–2055.
- Cochran, S. D., Sullivan, J. G., & Mays, V. M. (2003). Prevalence of mental disorders, psychological distress, and mental health services use among lesbian, gay, and bisexual adults in the United States. *Journal of Consulting and Clinical Psychology*, 71 (1), 53-61.

- Coffman, K. B., Coffman, L. C., Marzilli-Ericson, K. M. (2013). *The size of the LGBT population and the magnitude of anti-gay sentiment are substantially underestimated* (NBER working paper No. 19508). Cambridge, MA: National Bureau of Economic Research (NBER).
- Cooper, C., Robinson, M., Gillis, L. (2014). A critical understanding of weight in LGBT communities. *Rainbow Health Ontario*. Retrieved from http://www.rainbowhealthontario.ca/admin/contentEngine/contentDocuments/Understanding_Weight_in_LGBT_Communities.pdf
- Crocker, J., Major, B. (1989). Social stigma and self-esteem: The self-protective properties of stigma. *Psychological Bulletin*, 96 (4), 608-30.
- Davy, Z. (2015). The DSM-5 and the politics of diagnosing transpeople. *Archives of Sexual Behavior*, 44 (5), 1165-1176.
- Dean, L., Meyer, I. H., Robinson, K., Sell, R. L., Sember, R., Silenzio, V. M. B., Bowen, D. J., Bradford, J., Rothblum, E., Scout, White, J., Dunn, P., Lawrence, A., Wolfe, D., Xavier, J. (2000). Lesbian, gay, bisexual, and transgender health: Findings and concerns. *Journal of the Gay and Lesbian Medical Association*, 4 (3), 101-150.
- Denton, F. N. (2012). Minority stress and physical health in lesbians, gays, and bisexuals: The mediating role of coping self-efficacy. *Theses and Dissertations-Educational, School, and Counseling Psychology*. Retrieved from http://uknowledge.uky.edu/edp_etds/2

- Deputy, N. P., Boehmer, U. (2014). Weight status and sexual orientation: Differences by age and within racial and ethnic subgroups. *American Journal of Public Health, 104* (1), 103-109.
- Durkheim, E. (1951). *Suicide: A study in sociology*. New York, NY: Free Press.
- Everett, B., Mollborn, S. (2013). Differences in hypertension by sexual orientation among U.S. young adults. *Journal of Community Health, 38* (3), 588-596.
- Flentje, A., Heck, N. C., Cochran, B. N. (2013). Sexual reorientation therapy interventions: perspectives of ex-ex-gay individuals. *Journal of Gay & Lesbian Mental Health, 17* (3), 256-277.
- Fredriksen-Goldsen, K. I., Kim, H., Barkan, S. E., Balsam, K. F., Mincer, S. L. (2010). Disparities in health-related quality of life: A comparison of lesbians and bisexual women. *American Journal of Public Health, 100* (11), 2255-2261.
- Frost, D. M., Lehavot, K., Meyer, I. H. (2013). Minority stress and physical health among sexual minority individuals. *Journal of Behavioral Medicine, 38* (1), 1-8.
- Gender Equity Resource Center. (2013). Definition of terms. Retrieved from http://geneq.berkeley.edu/lgbt_resources_definiton_of_terms
- GLAAD. (2015). Transgender FAQ. *GLAAD*. Retrieved from <http://www.glaad.org/transgender/transfaq>
- Gay and Lesbian Medical Association, and LGBT health experts. (2001). *Healthy People 2010 companion document for lesbian, gay, bisexual and transgender (LGBT)*

health [Online]. Retrieved from

http://www.glma.org/_data/n_0001/resources/live/HealthyCompanionDoc3.pdf.

Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity*. Englewood Cliffs, NJ: Prentice-Hall.

Gough, B., Weyman, N., Alderson, J., Butler, G., Stoner, M. (2006). 'They did not have a word': The parental quest to locate a 'true sex' for their intersex children. *Psychology and Health*, 23 (4), 493-507.

Greenwood, J.L.J., Murtaugh, M.A., Omura, E.M., Adler, S.C., Stanford, J.B. (2008). Creating a clinical screening questionnaire for eating behaviors associated with overweight and obesity. *Journal of the American Board of Family Medicine*, 21 (6), 539-548.

Hatzenbuehler, M. L. (2009). How does sexual minority stigma "get under the skin"? A psychological mediation framework. *Psychological Bulletin*, 135 (5), 707-730.

Hung, K. K. C., Lai, W. Y., Cocks, R. A., Rainer, T. H., Graham, C. A. (2015). Validation of the Omron HEM-650 wrist blood pressure device using the British Hypertension Society protocol in emergency patients in Hong Kong. *Emergencias*, 27 (5), 313-315.

Institute of Medicine (IOM). (2011). *The health of lesbian, gay, bisexual, and transgender people: Building a foundation for better understanding*. Washington, DC: National Academies Press.

- Johnson, C. V., Mimiaga, M. J., Bradford, J. (2008). Health care issues among lesbian, gay, bisexual, transgender and intersex (LGBTQI) populations in the United States: Introduction. *Journal of Homosexuality*, 54 (3), 213-224.
- Jones, E. E., Farina, A., Hestrof, A. H., Markus, H., Miller, D. T., Scott, R. A. (1984). *Social stigma: The psychology of marked relationships*. New York, NY: W. H. Freeman & Company.
- Kalra, G., Shah, N. (2013). The cultural, psychiatric, and sexuality aspects of hijras in India. *International Journal of Transgenderism*, 14 (4), 171-181.
- Kaminski, P. L., Chapman, B. P., Haynes, S. D., Own, L. (2005). Body image, eating behaviors, and attitudes toward exercise among gay and straight men. *Eating Behaviors*, 6 (3), 179-187.
- Katz-Wise, S. L., Blood, E. A., Milliren, C. E., Calzo, J. P., Richmond, T. K., Gooding, H. C., Austin, S. B. (2014). Sexual orientation disparities in BMI among US adolescents and young adults in three race/ethnicity groups. *Journal of Obesity*, 2014 (1), 5374242.
- Kawalec-Kajstura, E., Malinowska-Lipień, I., Brzostek, T. (2014). The diagnosis of excessive body mass and body fat in 18-year-old youth – assessment of comparability of results obtained on the basis of BMI and BIA methods. *Polish Journal of Public Health*, 124 (3), 120-124.

- Kuyper, L., Vanwesenbeeck, I. (2011). Examining sexual health differences between lesbian, gay, bisexual, and heterosexual adults: The role of sociodemographics, sexual behavior characteristics, and minority stress. *Journal of Sex Research*, 48 (2-3), 263-274.
- Lazarus, R. (1981). The stress and coping paradigm. In C. Eisdorfer, D. Cohen, & P. Maxim (Editions), *Models for clinical psychopathology* (pp. 177–214). New York, NY: Spectrum.
- Lazarus, R., Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer Publishing Company.
- Lea, T., de Wit, J., Reynolds, R. (2013). Minority stress in lesbian, gay, and bisexual young adults in Australia: Associations with psychological distress, suicidality, and substance use. *Archives of Sexual Behavior*, 43 (8), 1571-1578.
- Lehavot, K., Simoni, J. M. (2011). The impact of minority stress on mental health and substance use among sexual minority women. *Journal of Consulting and Clinical Psychology*, 79 (2), 159-170.
- Lewis, R. J., Derlega, V. J., Berndt, A., Morris, L. M., Rose, S. (2002). An empirical analysis of stressors for gay men and lesbians. *Journal of Homosexuality*, 42 (1), 63-88.

- Li, Y., Xu, Z., Liu, S. (2014). Physical activity, self-esteem, and mental health in students from ethnic minorities attending colleges in China. *Social Behavior and Personality*, 42 (4), 529-538.
- Lick, D. J., Durso, L. E., Johnson, K. L. (2013). Minority stress and physical health among sexual minorities. *Perspectives on Psychological Science*, 8 (5), 521-548.
- Lim, F. A., Brown, D. V. Jr., Kim, S. M. J. (2014). Addressing health care disparities in the lesbian, gay, bisexual, and transgender population: A review of best practices. *American Journal of Nursing*, 114 (6), 24-34.
- Link, B. G., Phelan, J. C. (2001). Conceptualizing stigma. *Annual Review of Sociology*, 27, 363–385.
- Markey, C. N., Markey, P. M. (2013). Weight disparities between female same-sex romantic partners and weight concerns: Examining partner comparison. *Psychology of Women Quarterly*, 37 (4), 469-477.
- Mayer, K. H., Bradford, J. B., Makadon, H. J., Stall, R., Goldhammer, H. (2008). Sexual and gender minority health: What we know and what needs to be done. *American Journal of Public Health*, 98 (6), 989-995.
- Mason, T. B., Lewis, R. J. (2015). Minority stress and binge eating among lesbian and bisexual women. *Journal of Homosexuality*, 62 (7), 972-992.
- McCarthy, M. A., Fisher, C. M., Irwin, J. A., Coleman, J. D., Pelster, A. D. K. (2014). Using the minority stress model to understand depression in lesbian, gay,

- bisexual, and transgender individuals in Nebraska. *Journal of Gay & Lesbian Mental Health*, 18 (4), 346-360.
- McNair, R., Szalacha, L. A., & Hughes, T. L. (2011). Health status, health service use, and satisfaction according to sexual identity of young Australian women. *Women's Health Issues*, 21 (1), 40-47.
- Mereish, E. H. (2014). The weight of discrimination: The relationship between heterosexual discrimination and obesity among lesbian women. *Psychology of Sexual Orientation and Gender Diversity*, 1 (4), 356-360.
- Meyer, I. H. (2015). Resilience in the study of minority stress and health of sexual and gender minorities. *Psychology of Sexual Orientation and Gender Diversity*, 2 (3), 209-213.
- Meyer, I. H. (2010). The right comparisons in testing the minority stress hypothesis: Comment on Savin-Williams, Cohen, Joyner, and Rieger (2010). *Archives of Sexual Behavior*, 39 (6), 1217-1219.
- Meyer, I. H. (2003a). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychology of Sexual Orientation and Gender Diversity*, 1 (S), 3-26.
- Meyer, I. H. (2003b). Prejudice as stress: Conceptual and measurement problems. *American Journal of Public Health*, 93 (2), 262-265.

- Meyer, I. H. (1995). Minority stress and mental health in gay men. *Journal of Health and Social Behavior*, 36 (1), 38-56.
- Meyer, I. H., Schwartz, S., Frost, D. M. (2008). Social patterning of stress and coping: Does disadvantaged social statuses confer more stress and fewer coping resources? *Social Science & Medicine*, 67 (3), 368-379.
- Mink, M. D., Lindley, L. L., Weinstein, A. A. (2014). Stress, stigma, and sexual minority status: The intersectional ecology model of LGBTQ health. *Journal of Gay & Lesbian Social Services*, 26 (4), 502-521.
- Maranon, R., Reckelhoff, J. F. (2013). Sex and gender differences in control of blood pressure. *Clinical Science*, 125 (7), 311-318.
- Moss, G. E. (1973). *Illness, immunity, and social interaction*. New York, NY: Wiley.
- National Health and Nutrition Examination Survey Data (NHANES) (2014). *Prevention CDC*. Hyattsville, MD: US Department of Health and Human Services.
- Operario, D., Gamarel, K. E., Grin, B. M., Lee, J. H., Kahler, C. W., Marshall, B. D. L., van den Berg, J. J., Zaller, N. D. (2015). Sexual minority health disparities in adult men and women in the United States: National health and nutrition examination survey. *American Journal of Public Health*, 105 (10), e27-e34.
- Organisation of Intersex International Australia. (2013). What is intersex? Defining intersex. *OII Australia*. Retrieved from <https://oii.org.au/18106/what-is-intersex/>

- Polimeni, A., Austin, S. B., Kavanagh, A. M. (2009). Sexual orientation and weight, body image, and weight control practices among young Australian women. *Journal of Women's Health, 18* (3), 355-362.
- Richmond, T. K., Walls, C. E., Austin, S. B. (2012). Sexual orientation and bias in self-reported BMI. *Obesity, 20* (8), 1703-1709.
- Roberts, S. J., Stuart-Shor, E. M., Oppenheimer, R. A. (2009). Lesbians' attitudes and beliefs regarding overweight and weight reduction. *Journal of Clinical Nursing, 19* (13-14), 1986-1994.
- Rosario, M., Schrimshaw, E. W., Hunter, J., Gwadz, M. (2002). Gay-related stress and emotional distress among gay, lesbian, and bisexual youths: A longitudinal examination. *Journal of Consulting and Clinical Psychology, 70* (2), 967-975.
- Rosario, M., Hunter, J., Gwadz, M. (1993) Gay-related Stressful Life Events Measure. Unpublished instrument.
- Rostosky, S. S., Riggle, E. D. B., Horne, S. G., Miller, A. D. (2009). Marriage amendments and psychological distress in lesbian, gay, and bisexual (LGB) adults. *Journal of Counseling Psychology, 56* (1), 56-66.
- Sandfort, T. G. M., Bakker, F., Vanwesenbeeck, I., Schellevis, F. G. (2006). Sexual orientation and mental and physical health status: Findings from a Dutch population survey. *American Journal of Public Health, 96* (6), 1119-1125.

- Schnitker, L., Martin-Khan, M., Beattie, E., Gray, L. (2011). Negative health outcomes and adverse events in older people attending emergency departments: A systematic review. *Australasian Emergency Nursing Journal*, 14 (3), 141-162.
- Schwartz, S., Meyer, I. H. (2010). Mental health disparities research: The impact of within and between group analyses on tests of social stress hypotheses. *Social Science and Medicine*, 70 (8), 1111-1118.
- Seaward, B. (2006). *Managing stress: Principles and strategies for health and wellbeing*. Burlington, MA: Jones & Bartlett Learning.
- Smalley, K. B., Warren, J. C., Barefoot, K. N. (2015). Differences in health risk behaviors across understudied LGBT subgroups. *Health Psychology*, (1), 1-12.
- Smedley, B. D., Myers, H. F., Harrell, S. P. (1993). Minority-status stresses and the college adjustment of ethnic minority freshmen. *The Journal of Higher Education*, 64 (4), 434-452.
- Struble, C. B., Lindley, L. L., Montgomery, K., Hardin, J., Burcin, M. (2010). Overweight and obesity in lesbian and bisexual college women. *Journal of American College Health*, 59 (1), 51-56.
- Swank, E., Frost, D. M., Fahs, B. (2012). Rural locations and exposure to minority stress amongsexual minorities in the United States. *Psychology & Sexuality*, 3 (3), 226-243.

- Szymanski, D. M. (2009). Examining potential moderators of the link between heterosexual events and gay and bisexual men's psychological distress. *Journal of Counseling Psychology, 56* (1), 142–151.
- Szymanski, D. M., Kashubeck-West, S., Meyer, J. (2008). Internalized heterosexism: Measurement, psychosocial correlates, and research directions. *The Counseling Psychologist, 36* (4), 525–574.
- Tate, C. C., Bettergarcia, J. N., Brent, L. M. (2015). Re-assessing the role of gender-related cognitions for self-esteem: The importance of gender typicality for cisgender adults. *Sex roles, 72* (5-6), 221-236.
- Texas Health Institute. (2013). *2013 Amarillo community health improvement plan (CHIP)* [Data file]. Retrieved from http://publichealth.amarillo.gov/pdf/CHIP_2013.pdf
- The World Professional Association for Transgender Health (WPATH). (2012). Standards of care for the health of transsexual, transgender, and gender-nonconforming people (7th version). *The International Journal of Transgenderism, 13* (4), 165-232.
- U. S. Department of Health and Human Services. (1996). *Physical activity and health: A report of the surgeon general*. Atlanta, GA: U. S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

- U. S. Department of Health and Human Services. (2010). *Healthy people 2020* [Data file]. Retrieved from <http://www.healthypeople.gov/2020/default.aspx>
- Vasey, P.L., Bartlett, N. H. (2007). What can the Samoan “fa’afafine” teach us about the western concept of gender identity disorder in childhood? *Perspectives in Biology and Medicine*, 50 (4), 481-490.
- VanderLaan, D.P., Petterson, L.J., Mallard, R.W., Vasey, P.L. (2015). (Trans)Gender role expectations and child care in Samoa. *The Journal of Sex Research*, 52 (6), 710-720.
- Vukovic, J., Feinberg, D. R., DeBruine, L., Smith, F. G., Jones, B. C. (2010). Women’s voice pitch is negatively correlated with health risk factors. *Journal of Evolutionary Psychology*, 8 (3), 217-225.
- Ward, B. W., Dahlhamer, J. M., Galinsky, A. M., Joestl, S. S. (2014). *Sexual orientation and health among U. S. adults: National health interview survey, 2013* (77th version). *National health statistics report*. Hyattsville, MD.
- Whiteway, E., Alexander, D. R. (2015). Understanding the cause of same-sex attraction. *Science & Christian Belief*, 27 (1), 17-40.
- Yancey, A.K., Cochran, S.D., Corliss, H.L., Mays, V.M. (2003). Correlates of overweight and obesity among lesbian and bisexual women. *Preventative Medicine*, 36(6), 676-683.

- Zamboni, B. D., Crawford, I. (2007). Minority stress and sexual problems among African American gay and bisexual men. *Archives of Sexual Behavior*, 36 (4), 569–578.
- Zucker, K. J. (1990). Psychosocial and erotic development in cross-gender-identified children. *The Canadian Journal of Psychiatry*, 35 (6), 487-495.
- Zucker, K. J., Spitzer, R. L. (2005). Was the gender identity disorder of childhood diagnosis introduced into the DSM-III as a backdoor maneuver to replace homosexuality? A historical note. *Journal of Sex & Marital Therapy*, 31 (1), 31-42.
- Zucker, K. J., Lawrence, A. A. (2009). Epidemiology of gender identity disorder: Recommendations for the *Standards of Care* of the World Professional Association for Transgender Health. *International Journal of Transgenderism*, 11 (1), 8-18.

APPENDIX

Overall Health Habits Questionnaire

1. What is your biological sex? (Male, female, skip question)
2. What is your age? (fill in box)
3. What is your sexual orientation? (Lesbian, Gay, Bisexual, Straight, Don't know, skip question)
4. What is your current relationship status? (Single, Committed, In an open relationship, Married, Skip question).
5. Do you consider yourself a parent to children living in your home? (Yes, No, skip question)
6. What is your current weight in pounds? (Fill in box or don't know)
7. What is your current height in feet and inches? (Fill in box or don't know)
8. What is your race? (Such as White, Black, Asian or Pacific Islander, American Indian, Native American) (Fill in box or don't know)

9. Do you have any of the following health issues: thyroid problems or side effects of a medication(s)? (Yes, no, skip question)
10. How would you rate your level of physical activity? (little to none, moderate, above average, very active, skip question)
11. Have you tried to lose weight before? (Yes, no, skip question)
12. Over the course of your lifetime have you experienced weight loss or gain of 10 or more pounds, more than once? (Yes, no, don't know, skip question)
13. Have you ever been diagnosed with an eating disorder? (Yes, no, skip question)
14. Have you ever binged? (ate large quantities of food at one time) (Yes, no, skip question)
15. Have you ever purged? (induced vomiting to void the stomach of food) (Yes, no, skip question)
16. Have you ever been diagnosed with anxiety and/or depression? (Yes, no, skip question)
17. Have you ever sought comfort in foods such as fast food, pizza, or other "junk foods?" If so how frequently? (once a day, once a week, once a month, less than once a month, never, skip question)

18. On average, how many servings of beverages, with high sugar content, would you say that you consume on a daily basis? (An example of a typical serving is a 12 ounce soft drink) (none, 1 serving, 2-3 servings, 5 or more servings)
19. Do you consume alcoholic beverages, and if so how frequently (never, sometimes, often, very frequently)
20. How often do you eat fruits? (never, sometimes, often, very frequently)
21. How often do you eat vegetables? (never, sometimes, often, very frequently)
22. How do you rate your level of agreement with the accuracy of the media's portrayal of the ideal body? (strongly disagree, disagree, agree, strongly agree)
23. What is your level of comfort with your personal knowledge of healthy eating habits? (not comfortable at all, neutral, somewhat comfortable, very comfortable)
24. Have you ever experienced feelings of negativity, possible prejudice, discrimination or harassment from others regarding your weight? (never, sometimes, often, very frequently)
25. Do you feel as if you have people in your life who negatively affect your efforts to live a healthy lifestyle? (yes or no)

26. What is your current level of comfort with your weight? (not comfortable at all, neutral, somewhat comfortable, very comfortable)
27. How would you categorize your current weight? (underweight, athletic, average, overweight, obese, morbidly obese)
28. Have you consumed any illicit drugs in the last 12 months (including marijuana)? If so how frequently? (never, sometimes, often, very frequently, skip question/non-Applicable)
29. Do you smoke cigarettes? If so how frequently? (never, sometimes, often, very frequently, skip question/non-applicable)
30. Over the past 12 months, how stressed or bothered have you felt due to external social factors (such as people not treating you fairly, prejudice, discrimination, harassment, victimization, trauma and so on). (not at all, a little bit, moderately, quite a bit, extremely, skip question/non-Applicable)

Daily Heterosexist Experiences Questionnaire (DHEQ)

The following is a list of experiences that LGBT people sometimes have. Please read each one carefully, and then respond to the following question:

*How much has this problem distressed or bothered you **during the past 12 months?***

- . 0= Did not happen/not applicable to me
- . 1= It happened, and it bothered me NOT AT ALL
- . 2= It happened, and it bothered me A LITTLE BIT
- . 3= It happened, and it bothered me MODERATELY
- . 4= It happened, and it bothered me QUITE A BIT
- . 5= It happened, and it bothered me EXTREMELY
- . Skip Question
 - . 1. Difficulty finding a partner because you are LGBT
 - . 2. Difficulty finding LGBT friends
 - . 3. Having very few people you can talk to about being LGBT
 - . 4. Watching what you say and do around heterosexual people
 - . 5. Hearing about LGBT people you know being treated unfairly
 - . 6. Hearing about LGBT people you don't know being treated unfairly
 - . 7. Hearing about hate crimes (e.g., vandalism, physical or sexual assault) that happened to LGBT people you don't know
 - . 8. Being called names such as "fag" or "dyke"

- . 9. Hearing other people being called names such as "fag" or "dyke"
- . 10. Hearing someone make jokes about LGBT people
- . 11. Family members not accepting your partner as a part of the family
- . 12. Your family avoiding talking about your LGBT identity
- . 13. Your children being rejected by other children because you are LGBT
- . 14. Your children being verbally harassed because you are LGBT
- . 15. Feeling like you don't fit in with other LGBT people
- . 16. Pretending that you have an opposite-sex partner
- . 17. Pretending that you are heterosexual
- . 18. Hiding your relationship from other people
- . 19. People staring at you when you are out in public because you are LGBT
- . 20. Worry about getting HIV/AIDS
- . 21. Constantly having to think about "safe sex"
- . 22. Feeling invisible in the LGBT community because of your gender expression
- . 23. Being harassed in public because of your gender expression
- . 24. Being harassed in bathrooms because of your gender expression
- . 25. Being rejected by your mother for being LGBT
- . 26. Being rejected by your father for being LGBT
- . 27. Being rejected by a sibling or siblings because you are LGBT
- . 28. Being rejected by other relatives because you are LGBT
- . 29. Being verbally harassed by strangers because you are LGBT
- . 30. Being verbally harassed by people you know because you are LGBT

- . 31. Being treated unfairly in stores or restaurants because you are LGBT
- 32. People laughing at you or making jokes at your expense because you are LGBT
- 33. Hearing politicians say negative things about LGBT people
- . 34. Avoiding talking about your current or past relationships when you are at work
- . 35. Hiding part of your life from other people
- . 36. Feeling like you don't fit into the LGBT community because of your gender expression
- . 37. Difficulty finding clothes that you are comfortable wearing because of your gender expression
- . 38. Being misunderstood by people because of your gender expression
- . 39. Being treated unfairly by teachers or administrators at your children's school because you are LGBT
- . 40. People assuming you are heterosexual because you have children
- . 41. Being treated unfairly by parents of other children because you are LGBT
- . 42. Difficulty finding other LGBT families for you and your children to socialize with
- . 43. Being punched, hit, kicked, or beaten because you are LGBT
- . 44. Being assaulted with a weapon because you are LGBT
- . 45. Being raped or sexually assaulted because you are LGBT
- . 46. Having objects thrown at you because you are LGBT
- . 47. Worrying about infecting others with HIV
- . 48. Other people assuming that you are HIV positive because you are LGBT

- . 49. Discussing HIV status with potential partners
- . 50. Worrying about your friends who have HIV