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An Integrated Behavioral Model of Healthcare Utilization among Transgender and Gender-Nonconforming Adults

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AN INTEGRATED BEHAVIORAL MODEL OF HEALTHCARE UTLIZATION AMONG TRANSGENDER AND GENDER-NONCONFORMING ADULTS

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

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Abstract

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By Megan Elizabeth Sutter, M.S.

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Transgender and gender-nonconforming (TGNC) individuals in the United States experience significant marginalization due to stigma enacted at the structural, interpersonal, and individual levels. As a result, this population has reported increased behavioral and physical health needs, as well as unique barriers to healthcare. Moreover, TGNC individuals have reported greater experiences of childhood abuse compared to cisgender individuals. The cumulative experiences of stigma-related stressors and adverse childhood experiences put this population at risk for the development of mental and physical health problems, increasing need for health services. However, TGNC individuals have reported being denied medical care and postponing seeking care due to fear of discrimination, which may increase complications and severity of illness, and result in increased hospitalizations and healthcare costs.

Utilizing the Andersen Behavioral Model of Health Services Use and Theory of Planned Behavior, the current study examined robust associations among stigma-related stressors,

adverse childhood experiences, personal and physician-related enabling factors, mental, behavioral, and physical health needs, and healthcare utilization, intention, and delay among an online convenience sample of 109 TGNC adults in the United States. A series of multivariate and mediational analyses were conducted to determine the connections among predisposing factors, enabling resources, needs, health beliefs, and healthcare intention, delay, and behavior.

Although predisposing factors were not directly associated with healthcare behavior, they were directly associated with healthcare delay. Moreover, mediation analyses indicated an indirect effect of victimization and adverse childhood events to decreased healthcare utilization and increased delay through mental health needs, internalized stigma, negative personal beliefs, perceived TGNC-inclusivity of healthcare providers, and finally, behavioral intention. Thus, the present study illuminated a possible cascade of detrimental effects that are initiated by stigma-related stress and adverse childhood experiences through enabling resources, needs, and beliefs, that ultimately are associated with healthcare utilization intent, behavior, and delay. These findings highlight the need to address both TGNC individuals' *timely* use of care, and the *quality* of care they receive. It is imperative that future research takes a multi-level approach by creating and testing evidence-based interventions to improve both healthcare providers' competency, as well as for TGNC individuals' ability to coping with stressors.

Introduction

Transgender is an overarching term that represents the gender identity or gender expression of individuals that diverges from the societal norm. More specifically, transgender individuals are people whose gender identity (i.e., felt gender) does not match their assigned sex-at-birth. The terms transgender *gender-nonconforming* or *genderqueer* are typically subsumed under the umbrella of, or trans, and represents individuals whose behaviors or appearances do not conform to social norms (Coleman et al., 2012). The exact size of the trans and gender-nonconforming (TGNC) population is unknown, in part because of the hidden nature of the population as well as lack of gender identity information on national benchmark surveys; although current estimates are <1% of the United States (U.S.) population (American Psychiatric Association, 2013).

Due to multiple levels of stigma, TGNC individuals face physical violence, harassment, and discrimination in the workplace and schools (Lombardi, Wilchins, Priesing, & Malouf, 2001; Sperber et al., 2005), as well as discrimination from the biomedical field as well as the U.S. healthcare system (Bockting et al., 2004). Stigma related to gender variance is associated with serious mental health problems, such as depression, suicidality (Clements-Nolle et al., 2001), internalized stigma, and increased substance use (Benotsch et al., 2013). For individuals with gender dysphoria, transition-related medical care such as hormone therapy, breast augmentation, and genital surgery, have been shown to be protective factors for mental health problems, substance use, and HIV (Blosnich et al., 2013; Grossman & D'Augelli, 2006), highlighting the importance for access to needed services.

In addition to mental health problems, historically negative experiences with the medical field resultant from medicalization/pathologizing of their identity through diagnoses (e.g., gender identity disorder), barriers receiving transition-related care (Drescher, Cohen-Kettenis, & Winter, 2012), and lack of healthcare provider training (Poteat et al., 2013) have placed TGNC individuals with a unique set of needs to address their access to proper TGNC. Due to this pervasive marginalization, stigma, and discrimination, TGNC individuals have difficulties accessing TGNC services (Cruz, 2014).

The rates of TGNC discrimination in the TGNC system are alarmingly high with 19-25% of TGNC people reporting being denied health services solely due to their gender identity, and 28% having postponed care when they were sick or injured due to fear of discrimination (Grant et al., 2011; Kenagy, 2005). Lack of access to TGNC-sensitive health services has been associated with lower healthcare utilization (Sanchez et al., 2009). When TGNC individuals receive care they need, mental health problems, substance abuse, and HIV rates decline (Blosnich et al., 2013; Grosman & D'Augelli, 2006), which may reduce healthcare costs in the long term. Despite these findings, generalizability of current studies have been limited by the conflation of gender identity and sexual orientation, and the use of small samples limited mostly to White, transgender women, sex workers, and homeless individuals receiving care from HIV/AIDS and social service organizations (e.g., Kenagy, 2005; Nemoto, et al., 2015; Reisner et al., 2014).

Qualitative studies have identified barriers of TGNC utilization for TGNC individuals, including stigma, hostility, and verbal abuse by TGNC providers; lack of TGNC-inclusive TGNC services; lack of relevant and accessible information; lack of access to transition-related care; and mental health problems (Bauer et al., 2009; Kosenko et al., 2013; Radix et al., 2014;

Round et al., 2013). Provision of culturally competent and knowledgeable care was the greatest overarching need for transgender health services across studies. The TGNC provider- and patient-related mechanisms through which discrimination affects TGNC individuals' healthcare utilization and satisfaction with care are not known. Using the Andersen Behavioral Model of Health Services Use and the Theory of Planned Behavior, this study aims to identify the mechanisms through which discrimination leads to reduced TGNC utilization, including enabling factors, needs, and beliefs about TGNC utilization, and satisfaction with care. A quantitative understanding of the mechanisms by which TGNC individuals delay healthcare utilization would inform intervention efforts and provide researchers and clinicians with a more comprehensive understanding of the sociobehavioral influences underlying its manifestation.

First, a statement of the problem will be presented. Next follows a literature review that defines the population of interest, namely transgender and gender-nonconforming adults. Second, it will discuss the health disparities that TGNC individuals in the U.S. experience. Third, it will examine the multi-level experiences of stigma, among TGNC individuals. Fourth, TGNC issues in TGNC will be discussed including common reported barriers to care. Fifth, theoretical models will be proposed along with an integrated conceptual model based on the Behavioral Model of Health Services Use (Andersen, 1995) and the Theory of Planned Behavior (Ajzen, 1991). Finally, the Literature Review will end with the proposed hypotheses of the current study.

Statement of the Problem

TGNC adults experience a unique set of barriers to accessing quality healthcare. Predisposing characteristics put TGNC individuals in a position to avoid medical care, such as socioeconomic vulnerabilities due to difficulties obtaining and maintaining employment, past victimization, lack of insurance, past negative experiences with healthcare resulting in negative

expectations or fear of discrimination, negative health beliefs or low perceived behavioral control of healthcare use.

When present, enabling factors may mediate the association between predisposing factors and healthcare utilization. Although it does not solve all access problems, having insurance is associated with increased utilization of care. A particularly understudied aspect of the Behavioral Model of Health Services Use, healthcare provider factors influence patient healthcare utilization. In the general population, patient-centered care and trust have been associated with patient satisfaction, adherence to medical regimens, and healthcare utilization (Anderson, 2002; Honda, 2004). Specific to the population of interest, lack of TGNC-friendly and TGNC-knowledgeable providers is a significant barrier to care above cost (Sanchez et al., 2009).

Due to pervasive stigma, TGNC individuals report many health needs that increase the need for transition-related services. TGNC individuals have reported increased rates of depression, suicidal ideation, suicide attempts (Clements-Nolle et al., 2001), and substance abuse (Benotsch et al., 2013; Reisner et al., 2014). Some TGNC individuals experience gender dysphoria and require transition-related care, such as hormone replacement therapy or gender confirmation surgery (Coleman et al., 2012). For vulnerable sub-populations, HIV/AIDS is a particularly frequent health need (Nemoto et al., 2015). As individuals report more chronic health conditions and poorer perceived health status, the more need they have, which leads to more healthcare utilization (Dunlop et al., 2002).

Given the significant social stressors and associated health problems recognized in the growing literature of TGNC populations, the unknown links between predisposing characteristics, enabling factors, and needs, including patient-level and provider-level characteristics, provide an avenue for many rich research questions to be posed concerning the

robust associations among discrimination, healthcare utilization, satisfaction with care, and the mechanisms therein. The objective of the current proposed study is to utilize the Behavioral Model of Health Services Use (Andersen, 1995) and the theory of planned behavior (Ajzen, 1991) to create, test, and evaluate a robust model of healthcare utilization among an online convenience sample of TGNC adults.

Literature Review

Defining the Transgender and Gender-Nonconforming Population

Transgender and *gender-nonconforming* (TGNC) individuals are people whose gender identity or expression diverges from their sex assigned-at-birth, and often transcend culturally-defined categories (Bockting, 1999; GLAAD, 2016). Conversely, individuals whose gender identity resonates with their sex assigned-at-birth (i.e., on their original birth certificate) are known as *cisgender* (Bauer et al., 2008). Importantly, not all TGNC individuals identify with a strict gender binary (i.e., man or woman). Individuals may identify as a transman or trans women, but others may identify with some other term, such as genderqueer, agender, non-binary, or two-sprit, among others (National Center for Transgender Equality, 2014). While TGNC identities manifest in a wide range of terminologies, expressions, and behaviors, ultimately, they share the experience of multi-level gender identity/expression-based stigma (Grant et al., 2011; Lombardi, Wilchins, Priesing, & Malouf, 2001).

In recent years, there has been a call from the World Professional Association for Transgender Health (WPATH) against the psychopathologization of gender diversity (WPATH Board of Directors, 2010), noting that "the expression of gender characteristics, including identities, that are not stereotypically associated with one's assigned sex at birth is a common and culturally diverse human phenomenon [that] should not be judged as inherently pathological or negative." Once classified as a mental disorder (i.e., gender identity disorder [GID]; American Psychiatric Association, 2000), TGNC identities diverge from the culturally-imposed gender binary, which reinforces the belief that gender is inextricably linked to one's genitalia or sex chromosomes (West & Zimmerman, 1987). GID was re-classified as *gender dysphoria* in the DSM-V with the goal to de-pathologize gender variance and focus attention on the clinical

significance of distress caused by perceived incongruence between one's primary- and secondary-sex characteristics and gender identity (American Psychiatric Association, 2013). TGNC identities are not disordered identities, but rather the experience of gender dysphoria[1] – if present – is diagnosable and treatable (Coleman et al., 2012). This perspective assumes TGNC individuals also align with the gender/sex binary of man-woman, and criticism has posited that inclusion of any aspect of the TGNC identities, including distress, is stigmatizing (Drescher, 2014; Lev, 2013). Nevertheless, the classification of *gender dysphoria* can be useful for insurance billing and legal purposes, if needed (Drescher, 2014).

There are currently no formal epidemiological estimates on the incidence and prevalence of the TGNC population. Current rates tend to be limited due to sampling bias from clinics treating TGNC individuals with gender dysphoria, of which not all TGNC individuals experience. Zucker & Lawrence (2009) put forth an effort to obtain rough estimates of the population size of individuals with then-diagnosed GID from 25 clinics globally. They identified a pattern, such that more individuals identified as trans men than trans women, suggesting that the true prevalence of gender dysphoria may be higher among trans women. Of the studies that have been conducted, the majority have been in European countries such as the United Kingdom (Hoenig & Kenna, 1974; O'Gorman, 1982; Wilson, Sharp, & Carr, 1999), the Netherlands (Bakker, Van Kesteren, Gooren, & Bezemer, 1993; Eklund, Gooren, & Bezemer, 1988; van Kesteren, Gooren, & Megens, 1996), Sweden (Wålinder, 1971), Denmark (Sorensen & Hertoft, 1982), Germany (Gareels et al., 2000; Weitze & Osburg, 1996), and Belgium (De Cuypere et al., 2007). One review found prevalence rates ranging from 1:11,900-1:45,000 for trans women, and 1:30,400-1:200,000 for trans men (< .00001-.0001%). According to the Diagnostic and

[1] The psychological distress caused by incongruence between one's gender identity and assigned sex at birth, gender roles, and/or sex characteristics (Knudson, De Cuypere, & Bockting, 2010).

Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), approximately 0.005-0.014% of adult natal males and 0.002-0.003% adult natal females experience gender dysphoria (American Psychiatric Association, 2013). The William's Institute created a report, which combined population-based survey data in the U.S. that estimated approximately 700,000 TGNC individuals in the U.S., or 0.3% (Gates, 2011). Methodologically rigorous population-based studies are needed to estimate the population of TGNC individuals, and until then current estimates of the number of individuals on the TGNC spectrum are to be considered a minimum (Coleman et al., 2012).

Health Disparities

TGNC individuals face stark health disparities in the U.S., including depression, suicidal ideation and attempts, substance abuse, and HIV (Clements-Nolle et al., 2001; Nemoto et al., 2015; Resiner et al., 2014). In a large community-based sample of transgender men and women, rates of HIV were higher among trans women (35%) than trans men (2%), as well as rates of depression (62% vs. 55%; Clements-Nolle et al., 2001). In this study, trans men and trans women had comparable rates of suicide attempts (32%). Reisner and colleagues (2014) identified 58% of transgender individuals in their community health center-based sample reported experiencing suicidal ideation, 29% attempted suicide, 32% had a history of substance abuse, 55% smoked cigarettes, and 13% were HIV positive. When considering the intersectionality of race and social status, the disparity gaps widen. For example, nearly 47% of an African-American sample of transgender women from San Francisco and Oakland were HIV-positive (Nemoto et al., 2015), compared to 12% White and 23% Hispanic/Latina trans women in another sample from San Francisco (Clements-Nolle et al., 2001).

Due to sampling from community-based clinics, the assessments currently available on TGNC health needs report extremely high rates of mental and physical health problems, which may have led to overestimation of rates of health concerns. Reisner and colleagues (2014) conducted a study to overcome some of these sampling biases and lack of comparison groups. They compared nested matched-pair subsamples[2] of transgender and cisgender individuals to control for external confounding variables, and found significant differences between the gender groups for suicidal ideation and attempts; but they did not find differences in substance abuse, smoking, or HIV-positive status (Reisner et al., 2014). However, it is not clear if the cisgender individuals included LGBQ individuals, which would affect comparison rates. A meta-analytic review (Herbst et al., 2007) found high rates of trans women who tested positive for HIV (27.7%; four studies), and 11.8% self-reported being HIV-positive (18 studies), indicating that compared to the general population, trans individuals, trans women in particular experience elevated rates of HIV. Correlates of HIV risk included mental health issues, social isolation, economic marginalization, and unmet TGNC-specific healthcare needs (Herbst et al., 2007).

TGNC people experience barriers in access to healthcare, which the Institute of Medicine (IOM) defines as, "timely use of personal health services to achieve the best possible outcomes (IOM, 1993, p. 4)." One aspect of access to care is access to insurance. Mixed findings on differing rates between TGNC and cisgender individuals have been reported. One study of transgender people of color in Washington, DC reported lower insurance rates than the general population (68% vs. 83%; Xavier, Bobbin, Singer, & Budd, 2005); whereas a national survey of 6,450 TGNC individuals found TGNC people only marginally likely to have health insurance

[2] A hybrid version of nested case-control study and matched-pair design, in which cases of being transgender was considered the "case" and the matched pairs were 2 cis female and 2 cis male controls, matched on age, race/ethnicity, educational attainment, and income.

(81%) compared to the general population (83%). Grant and colleagues (2011) also found TGNC individuals to be less likely to be insured by their employer (51%) compared to the general population (58%). One sample of 182 transgender individuals from Philadelphia found one-third of their sample to have no primary care physician, and did not have access to general medical care (25%), gender-related surgery (40%), prescription medication (22%), or dental care (31%) due to cost (Kenagy, 2005).

TGNC individuals also have reportedly relatively low rates of utilization of healthcare services, as well as healthcare delay. Approximately a quarter of one sample of transgender individuals from Virginia reported needing health services (e.g., hormonal therapy, gynecological care), but were not able to obtain it in the past year (Bradford, Reisner, Honnold, & Xavier, 2013). In a retrospective study of medical chart reviews, Peitzmeier, Khullar, Reisner, and Potter (2014) found that trans men compared to cisgender women were less likely to be up-to-date on Pap tests (64% vs. 73%), even after controlling for individual-level factors (e.g., age, race, sexual behavior, insurance, income, percent of missed appointments), and provider-level factors (e.g., provider gender, years of practice). In a study of transgender people recruited from community health centers, 81% had seen a doctor in the past year (Sanchez, Sanchez, & Danoff, 2009). The National Transgender Discrimination Survey reported high rates of postponing medical care due to discrimination (28%) and cost (48%; Grant et al., 2011).

Stigma, Discrimination, and Minority Stress

While lack of access to care indeed contributes to widening health disparities gaps, the connection between improved access to care and improved health in and of itself is insufficient. It is now the consensus that health disparities are largely attributed to social stressors (Krieger,

1999), including stigma and discrimination associated with nonconformity to gender norms for TGNC individuals (Meyer, 2003; Hendricks & Testa, 2012).

Stigma is defined as the concurrence of labeling, stereotyping, separation, status loss, and discrimination within a social, economic, or political context that implicitly or explicitly allows for the exchange of power (Link & Phelan, 2001). Stigma can be operationalized on multiple levels, including individual, interpersonal, and structural (White Hughto, Reisner, & Pachankis, 2015), and is considered a fundamental cause of health inequities across many stigmatized populations (Hatzenbuehler, Phelan, & Link, 2013). For TGNC individuals, stigma is a major impetus in the etiology of mental health problems through multi-level, direct and indirect pathways (Hendricks & Testa, 2012; White Hughto, Reisner & Pachankis, 2015).

TGNC individuals face significant marginalization in the U.S. This population faces consequences of real and perceived stigma, such as physical violence, harassment, and discrimination in the workplace and schools (Lombardi et al., 2001; Sperber et al., 2005), as well as discrimination from the biomedical field and the U.S. healthcare system (Bockting et al., 2004). Unfortunately, there are few basic human rights protections for TGNC individuals which are rarely enforced when they do exist (Currah & Minter, 2000). As a result, TGNC individuals experience devastating rates of discrimination and victimization. In the 2010 National Transgender Discrimination Survey, a quarter of respondents experienced cumulative acts of discrimination, including at least three major discriminatory events (e.g., physical assault, homelessness, and denial of medical service; Grant et al., 2011).

According to the minority stress psychological process model (Figure 1), lesbian, gay, and bisexual (LGB) experience social stressors associated with their sexual orientation, namely

experiences of real, perceived, and internalized heterosexism[3]. The model provides pathways through which distal, stigma-related stressors, and proximal group-specific and general psychological factors result in poor mental health outcomes among this population. Stigma-related stressors, or distal factors, are external experiences with prejudicial events such as discrimination, rejection, and/or violence attributed to one's demographic characteristics or identity. Repeated exposure to experiences of environmental and external stressors leads to cumulative stress over time. An example of this is work-based discrimination that threatens one's economic security and physical safety.

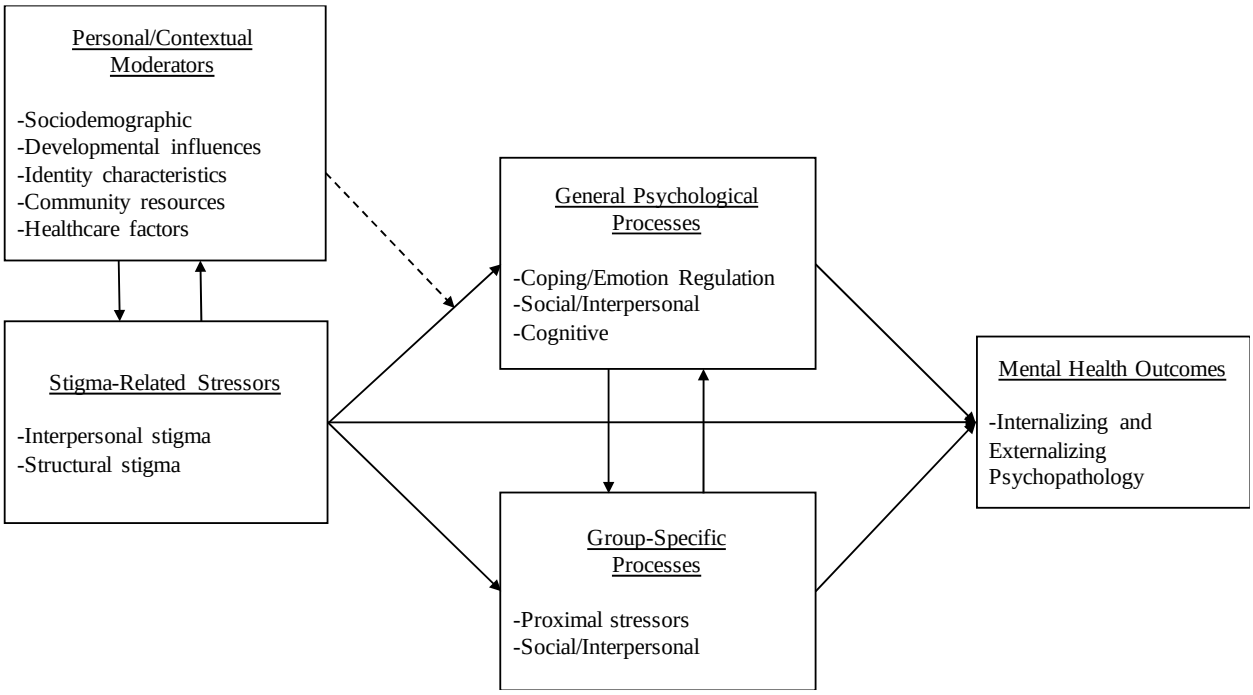

Figure 1. Minority stress psychological process model for transgender and gender-nonconforming individuals

[3] Internalization by lesbian, gay, and bisexual individuals of negative societal attitudes and assumptions about homosexuality (Sophie, 1987).

The second process of the minority stress psychological model are group-specific proximal stressors which includes expectations of rejection and concealment, as well as the internalization of stressors. Stigma-related stressors result in the anticipation and expectation of prejudicial events associated with one's identity, as well as the vigilance to maintain this expectation. Due to this anticipatory stress, LGB individuals may learn to expect harassment, rejection, or even violence due to their identities, and may seek to conceal their identity as LGB individuals to avoid the consequences, both physical and psychological. Negative implications of anticipatory stress include experiences of distress, which may be exacerbated by the effort to conceal one's identity. Internalized stigma is the mechanism through which heterosexist attitudes and prejudices are internalized. For LGB individuals, this is known as internalized heterosexism or homophobia, and for TGNC individuals it is known as internalized cissexism or transphobia. Self-stigmatization results in the devaluation of the self and affects one's coping abilities.

The psychological mediation model (Hatzenbeuler, 2009) posits that the causal link between stigma-related stressors (i.e., distal stressors) and behavioral health outcomes is mediated by general psychological processes shared by heterosexuals (e.g., emotional dysregulation, social problems, maladaptive coping), as well as mediated by group-specific process (i.e., proximal stressors). These stigma-related stressors, along with everyday stressors, contributes to increased mental health problems, such as depression, anxiety, suicidality, and substance use disorders. These processes, however, can be mitigated by the presence of coping resources and social support at the community, interpersonal, and individual levels.

Minority Stress Model among TGNC Individuals

Stigma-related stressors. Within the minority stress model, stigma-related stressors were termed distal processes, and defined as enacted prejudice events, such as violence,

victimization, and discrimination (Meyer, 2003). In a critical review of TGNC stigma, White Hughto, Reisner, & Pachankis (2015) broke down stigma into three major levels: individuals, interpersonal, and structural. Within the psychological mediation framework set forth in this paper, stigma-related stressors for TGNC individuals include interpersonal and structural stigma, which in turn influences group-specific and general psychological processes, and ultimately explain mental and behavioral health problems among TGNC people.

***Structural stigma*.** An important aspect of the distal aspects of the minority stress model that is not often discussed is structural or institutional discrimination. As previously stated, stigma of TGNC individuals stems from their divergence from the societal norm of the culturally-imposed gender binary (i.e., male/female). These norms are reinforced through cultural beliefs surrounding gender roles and conformity, as well as through laws and public policies that create, perpetuate, and/or ignore inequities that TGNC individuals face, as well as exclude TGNC people from benefits and protections afforded to others (Grant et al., 2011; Hatzenbuehler et al., 2009). Through diagnoses, labelling as "other," and laws/policies structural stigma operates widely across communities and institutions for the sake of maintaining power of cisgender norms (Valentine, 2007; White Hughto, Reisner, & Packhankis, 2015).

Most states in the US (30) have no explicit protections based on gender identity for non-discrimination of employment, housing, public spaces, and goods and services, and doctors' offices (ACLU, 2016). There are numerous recent examples of laws enacted that restrict freedoms of TGNC individuals as well as perpetuate inequalities LGBTQ individuals. The 2016 North Carolina House Bill 2 restricts access to bathrooms based on "biological sex," preventing TGNC individuals to use the bathroom of their felt gender (Public Facilities Privacy & Security Act; HB2, 2016). Another example comes in the form of a "religious liberty" law in the state of

Mississippi (Protecting Freedom of Conscience from Government Discrimination Act; HB1523, 2016) which effectively legalized discrimination based on one's religious beliefs, including denial of "treatments, counseling, or surgeries related to sex reassignment or gender identity transitioning" and "psychological, counseling, or fertility services" to those whose identities infringe upon their religious beliefs. Qualitative and quantitative findings suggest that not having access to gender-affirming restrooms are associated with emotional distress, perceived danger (Herman, 2013), and reduced lifetime suicide attempts (Seelman, 2016). Moreover, structural stigma (e.g., lack of non-discrimination policies) has been associated with more lifetime suicide attempts (Perez-Brumer, Hatzenbuehler, Oldenburg, & Bockting, 2015) and risk for past 30-day adverse emotional symptoms (Reisner et al., 2015). Moreover, living in a state with non-discrimination policies for employment has been linked to 26% decreased likelihood of having a mood disorder and 43% decreased likelihood of self-harm among TGNC veterans in the U.S. (Blosnich et al., 2016).

Interpersonal stigma. Interpersonal stigma, or distal stressors as Meyer (2003) described them, includes experiences of discrimination, violence, and sexual, verbal, or physical assault enacted within healthcare settings, the workplace, within families, and by strangers (White Hughto, Reisner, & Pachankis, 2015). These events are described as interpersonal because they are direct actions performed by individuals toward a TGNC because of their gender identity or expression. For enacted interpersonal stigma to transpire, one's TGNC identity must be evident; therefore, individuals who are visually identifiable as TGNC are more likely to experience discrimination (Grant et al., 2011).

Interpersonal stigma is highly prevalent among TGNC populations (Clements-Nolle et al., 2001, 2006; Grant et al., 2011; Lombardi et al., 2001; Nemoto et al., 2011). In review of

violence toward TGNC individuals due to gender identity or expression, Stotzer (2009) found 20-86% reported ever being physically assaulted, 48-69% reported harassment, and 13-86% reported sexual assault, including rape. An alarming 28% have reported being harassed in medical settings and 19% reported being refused care (Grant et al., 2011). These rates are limited by frequent sampling from communities that disproportionally represent the most vulnerable segments of the TGNC population. However, this demonstrates the socioeconomic disparities that are entwined with TGNC individuals' experiences of enacted stigma.

Violence, discrimination, and rejection of TGNC people is also frequently enacted by individuals close to the victim, such as friends or family (Stotzer, 2009). Factor and Rothblum (2007) compared TGNC individuals with their cisgender sibling counterparts and identified that the TGNC siblings reported more experiences of harassment and discrimination and perceived lower social support from family than their cisgender siblings. Also, Reisner and colleagues (2014a) found that TGNC individuals experienced significantly more childhood abuse compared to cisgender people. Family rejection is associated with increased risk of suicide attempts and substance misuse among TGNC adults (Klien & Golub, 2016). Rejection from family people of gender identity or expression can result in homelessness (Grant et al., 2011) and delay of transition (Fabbre, 2014).

Interpersonal stigma has been associated with greater likelihood of depression (Bazargan & Galvan, 2012), PTSD symptoms (controlling for prior trauma experiences; Reisner et al., 2016a), and robustly associated with increased risk for suicidality (Clements-Nolle et al., 2006; Goldblum et al., 2012; House, Van Horn, Coppeans, & Stepleman, 2011; Kohlbrenner, Deuba, Kumar Karki, & Marrone, 2016; Maguen & Shipherd, 2010; Nuttbrock et al., 2010; Rood, Puckett, Pantalone, & Bradford, 2015; Testa et al., 2012).

Psychological mediational processes. Within the minority stress model, distal and proximal stressors were treated separately as consequences of minority status and antecedents to mental health outcomes (Meyer, 2003). In the psychological mediation framework, group-specific processes (e.g., concealment, fear of rejection, and internalized stigma) and general processes (e.g., coping, cognitive) are theoretically caused by structural and interpersonal stigma.

Proximal stressors. Individual-level stigma-related stressors, or proximal stressors are the person-level processes are comprised of thoughts, feelings, and/or beliefs individuals having about themselves (e.g., internalized transphobia) or that they perceive others have towards them (e.g., fear of rejection), which is associated with mental and behavioral health outcomes (White Hughto, Reisner, & Pachankis, 2015). Internalized transphobia has been associated with increased risk for lifetime suicide attempts (Perez-Brumer et al., 2015), perceived stress, depression, and anxiety (Testa, Habarth, Peta, Balsam, & Bockting, 2014).

Interpersonal and structural stigma shapes how individuals view themselves and behave through internalizing negative beliefs about gender nonconformity into their self-concept. TGNC people may choose to conceal their identity, which can be due to internalized stigma or fear of discrimination or rejection (Hendricks & Testa, 2012; Meyer, 2003). For individuals who conform to gender norms, they may not disclose their gender identity or history, which can cause distress for fear of being "found out" (Smart & Wegner, 1999). Conversely, individuals who do not visually conform to gender norms may choose to conceal their identity by expressing their gender as their sex-assigned-at-birth. Concealment of gender identity through these modes can limit ability to call on needed medical or community resources that may buffer the effects of stigma on their mental health (White Hughto, Reisner, & Pachankis, 2015).

***Interpersonal/social processes*.** Being connected to the TGNC community and having pride in the TGNC identity is associated with positive outcomes. TGNC community connectedness and pride have been associated with reduced perceived stress, greater perceived social support, reduced depression Pflum, Testa, Balsam, Goldblum, & Bongar, 2015), and reduced anxiety (Pflum et al., 2015; Testa et al., 2015), particularly for trans women (Pflum et al., 2015). Receiving peer support from other TGNC individuals has also moderated the association between social stigma and psychological distress (Bockting et al., 2013). Awareness and engagement with other TGNC people was associated with less fearfulness, suicidality, and more comfort (Testa, Jimenez, & Rankin, 2014).

Mental and behavioral health outcomes. Stigma associated with marginalized identities can result in serious mental health problems, internalized stigma, increased substance use, and feelings of powerlessness. Xavier and colleagues (2005) identified high rates of substance abuse (48%), suicidal ideation (38%), and suicide attempt rate (16%) in their sample of TGNC people of color in Washington, DC. Clements-Nolle, Marx, & Katz (2006) also found high rates of depression (58%) and suicide attempts (32%) among TGNC individuals, which were linked to ever having alcohol or drug treatment, experiencing sexual assault, and gender-based discrimination. Factors associated with suicide attempts include depression, ever having alcohol or drug treatment, sexual assault, and gender-based discrimination (Clements-Nolle et al., 2006). Social stigma reported by a large sample of TGNC individuals from the U.S. was associated with psychological distress, which was moderated by social support from other TGNC peers (Bockting et al., 2013). Moreover, TGNC individuals who have reported experiences of violence had four times the odds of attempted suicide in one study (Testa et al., 2012), and those who had reported gender-based victimization were two times as likely to report past-year suicidal ideation

and seven times more likely to have ever attempted suicide (Scanlon, Travers, Coleman, Bauer, & Boyce, 2010).

Healthcare Experiences among TGNC Populations

Stigma also affects TGNC individuals through limited access to quality healthcare. This form of structural stigma is multi-faceted and results from socioeconomic barriers as well as institutional barriers such as medical education and policies. First, there is a lack of training for medical and other healthcare providers with regards to TGNC health needs, as well as psychosocial factors that influence behavior unique to these populations, including transition-related care (Obedin-Maliver et al., 2011; Sequeira et al., 2012; Solursh et al., 2003). This lack of training for healthcare providers results in their inability to provide knowledgeable, competent, patient-centered care to TGNC patients (Lurie, 2005; Poteat et al., 2013; Snelgrove et al., 2012). In addition to lack of knowledge, healthcare providers tend to hold negative attitudes about TGNC patients (Dorsen, 2012). One study of LGBTQ physicians found that 65% had heard negative comments about LGBTQ individuals, and 34% reported witnessing discriminatory care of these groups (Eliason et al., 2011). These numbers may be underestimated, as attitudes toward TGNC people are even less favorable than toward LGB individuals (Norton & Herek 2012). Having a TGNC-inclusive healthcare provider has been associated with reduced experiences of depression and past-year suicidality (Kattari, Walls, Speer, & Kattari, 2016a).

Access to health insurance and limitations within health insurance policies for TGNC individuals limits their ability to access healthcare services. TGNC individuals experience employment discrimination and as a result are less likely to insured by their employer than cisgender individuals (Grant et al., 2011). TGNC individuals also are less likely to have a usual source of care and access to general medical care, transition-related care, and dental care due to

cost (Kenagy, 2005). For those with insurance, there are barriers to covering the costs of transition-related care because these procedures and treatments are often seen medically unnecessary (Khan, 2013), and may result in use of "street hormones" or other unsafe procedures (Sanchez et al., 2009). Of course, not all TGNC individuals desire transition-related services, but when seeking usual care, healthcare providers may overly-focus on their identity (if disclosed) and ignore other aspects of patients' health or will not make proper referrals (e.g., cervical screenings for trans men).

Unfortunately, large proportions of TGNC individuals have been denied health services (19-25%; Grant et al., 2011; Kenagy, 2005), and 28% postponed care for fear of discrimination (Grant et al., 2011) solely due to their TGNC or gender-nonconforming identity. Moreover, 28% of one sample also reported experiences of harassment in medical settings, and 50% reported having to teach their medical provider about TGNC-related care (Grant et al., 2011). Disclosure of identity may put TGNC patients at risk for discrimination or harassment; however, concealment results in lack of access to needed services and subsequent distress.

Barriers to care. Qualitative work has identified several barriers to the provision of quality care, including knowledge of TGNC issues (Bauer et al., 2009), communication and interpersonal skills (Rounds et al., 2013), discrimination from healthcare providers (Kosenko et al., 2013), and fear of discrimination from healthcare providers based on friends' experiences (Radix et al., 2014).

One study assessed how erasure of TGNC identities affects healthcare among this population in Canada (Bauer et al., 2009). Focus groups were conducted and the researchers identified several themes associated with healthcare: (1) income instability, (2) barriers to accessing TGNC-inclusive healthcare services, (3) the lack of relevant and accessible

information, (4) systemic social service barriers, (5) self-esteem and mental health issues, (6) challenges to finding help, and (7) relationship and sexual health concerns (Bauer et al., 2009). Pervasive experiences with transphobia touched on all these themes through informational and institutional erasure of the trans identity. Informational erasure, such as in university or clinical training (e.g., in textbooks), as well as a lack of research on trans issues. Institutional erasure involves a lack of policies to include trans people, such as not having one's gender identity as an option on medical forms, to an absence of safe and inclusive spaces in hospitals or offices (Bauer et al., 2009).

Another qualitative study on young trans women of color (ages 16-25) studied the effects of HIV on their lives (Garofalo, Deleon, Osmer, Doll, & Harper, 2006). The study found that less than a quarter of the 51 participants were living with HIV, over one-third had a history of incarceration, and over half had exchanged sex for resources and/or were forced into sexual activity. Forty-one percent had difficulty accessing TGNC. Over 20% of the sample reported experiences of discrimination from medical and social services organizations. Qualitative comments noted that HIV is a big problem; however, a bigger issue was getting TGNC-sensitive services that participants need to live healthy and safe lives (Garofalo et al., 2006).

Kosenko, Rintamaki, Raney, and Maness (2013) examined more in-depth experiences of stigma in healthcare contexts among 152 TGNC patients. Although, this sample included self-identified TGNC individuals, including intersex individuals who identified as trans. Six themes emerged in their thematic analysis: (1) sex insensitivity, (2) displays of discomfort, (3) denial of services, (4) substandard care, (5) verbal abuse, and (6) forced care. As with other qualitative studies, denying one's TGNC identity was reported. Generally, people reported experiences of physicians being physically uncomfortable around the patient, and some were outright denied

service because of their gender identity. Some even reported being forced into mental or medical healthcare. This highlights subtle and blatant enacted stigma against gender variant individuals seeking care (Kosenko et al., 2013).

Quantitative analyses have been conducted on the utilization of care among TGNC individuals in the U.S. Cruz (2014) assessed issues related to access to care for trans individuals with a large online sample (*n*=6456). Among the 82.5% of the sample who indicated postponed care due to discrimination or affordability, increased odds of reporting discrimination as a reason for delaying curative care was associated with having hormone replacement therapy (HRT), wanting/having top surgery[4], wanting bottom surgery[5], outness when seeking care, primarily seeking care from an emergency department or clinic (vs. doctor's office), and not having health insurance (Cruz, 2014). Rachlin, Green, and Lombardi (2008) also studied 122 trans men reports of experiences with medical care in the U.S. Participants were recruited from a conference and peer support groups. The majority was taking testosterone (n = 106), and some had gender-confirming surgery (n = 68). Overall, there was a high report of employment, insurance, knowledge of standards of care, and access to providers, which is in stark contrast to previous studies of trans women. Individuals unable to seek support or who were not willing to seek support at conferences or peer support groups may have worse experiences with TGNC not captured in this study (Rachlin, Green, & Lombardi, 2008).

In a community-based participatory mixed-methods study, Radix, Lelutiu-Weinberger, and Gamarel (2014) identified several significant barriers to accessing quality healthcare and healthcare utilization among transgender individuals in NYC. While the majority of people had

[4] For trans men, top surgery involves bilateral mastectomy (i.e., breast removal) and contouring of the chest for masculinization. For trans women, top surgery involves breast augmentation.
[5] Bottom surgery involves reshaping the present genitalia into the form of one's felt gender.

insurance, received routine care in the past year, and received HIV testing in their lifetime, only half reported that their respective provider was very knowledgeable of transgender health. Areas with persistent barriers in the qualitative analyses were utilization in preventative services, access to transition-related care, access to legal assistance, and inclusion of transgender people in public health education and campaigns. Specific barriers to seeking care included humiliation, prior negative experiences, and learning about friends' negative experiences, which led to fear of discrimination for some. Reporting a need for transition-related care in conjunction with barriers to medical care led to use of unsafe procedures for some individuals (e.g., silicone injections, unsupervised hormone use; Radix, Lelutiu-Weinberger, & Gamarel, 2014).

Fear of discrimination may be conceptualized as anticipatory stress, which involves the subjective experience of stress prior to encountering the stressor. Thus, anticipating a discriminatory event in a healthcare encounter results in uncertainty, which strongly influences stress and anxiety (Utsey et al., 2013), and may reduce healthcare utilization. Together, these experiences reduce access to equitable, quality care for this population.

Several studies have noted problematic interactions with providers as a barrier to healthcare (Garofalo et al., 2008; Bockting et al., 1998). Garafalo et al. (2008) noted 20% of the sample to have been mistreated by medical and social service providers. Focus groups have shed light on discrimination in HIV/AIDS clinics (Bockting et al., 1998) as well as substance use treatment centers (Lombardi, 2007). Kosenko and others (2013) identified several themes that point to specific provider behaviors that have been deemed problematic by TGNC patients. Such behaviors are denying TGNC identities as valid, observing physical displays of discomfort from providers, being denied services by providers due to their gender identity, receiving substandard care because of their gender identity, verbal abuse, and being forced into care (Kosenko et al.,

2013). Another qualitative study (Radix, Lelutiu-Weinberger, & Gamarel 2014) found that only half of their sample had received care from a "very knowledgeable" provider of transgender health issues. These findings highlight both the subtle and blatant enacted stigma and sometimes violence against gender variant individuals seeking care. Moreover, experiencing stigma or fearing discrimination can lead to use of unsafe medical procedures such as silicone injections and unsupervised hormone use (Radix et al., 2014).

Even when individuals have insurance, barriers persist. Sanchez, Sanchez, and Dannoff (2009) found that lacking access to a provider knowledgeable about transgender health issues, lack of access to a transgender-friendly provider, high cost, lack of access to a specialist, inconvenient location, and language barriers were associated with lower healthcare utilization. Access to a transgender-knowledgeable provider did not differ by insurance groups in their sample (Sanchez et al., 2009). Individuals without a regular provider have been more likely to obtain hormones from nontraditional sources, to obtain syringes (for hormone use) from friends, and to be dissatisfied with the results of their hormone regimen (Sanchez et al., 2009).

In countries with universal TGNC, such as Argentina and Canada, studies have found low healthcare utilization among TGNC individuals (Bauer et al., 2014; Socias et al., 2014). This highlights the fact that pure access and cost is not an adequate explanation of why TGNC individuals do not utilization or have access to healthcare. About a quarter of a Canadian sample of transgender people reported avoiding emergency department care because of stigma associated with their gender identity (Bauer et al., 2014). Moreover, over half of the same sample experienced negative emergency department visits because of their gender identity when presenting as their "felt gender" (Bauer et al., 2014). Socias and others (2014) found that trans

women from Argentina who witnessed police violence, experienced internalized stigma, and experienced discrimination from healthcare providers and patients tended to avoid healthcare.

Provider-level barriers to quality care. As mentioned previously, many healthcare providers lack knowledge of and hold negative attitudes about TGNC individuals. Due to inadvertent or deliberate institutional policies and practices, TGNC health issues are rarely included in medical school curricula (Sequeira et al., 2012; Stoddard et al., 2011), leaving physicians insufficiently prepared to provide competent care for TGNC patients. Physicians have self-reported a lack of knowledge of TGNC-specific healthcare needs, problems in knowing where to access relevant information, and difficulties making referrals to TGNC-competent healthcare providers (Poteat et al., 2013; Snelgrove et al., 2012).

Lack of access to regular, TGNC-sensitive healthcare is associated with poor outcomes. One-third of TGNC people have reported having no primary care physician and one-fourth had no access to general medical care (Kenagy, 2005). Poor outcomes include decreased healthcare utilization, increased use of transition-related hormones from nontraditional sources (street market), obtaining syringes for hormone use from friends, and silicone injections (Sanchez et al., 2009). In the general population, perceptions of low access to care are related to more hospitalizations (Bindman et al., 1995), and physician mistrust is associated with unmet health needs and decreased healthcare utilization (Mollborn et al., 2005). Conversely, when TGNC individuals receive the care they need, mental health problems, substance abuse, and HIV rates decline (Blosnich et al., 2013; Grossman & D'Augelli, 2006).

Theoretical Framework

The current proposal utilizes two major theories of health behavior and healthcare utilization. The first is the Andersen Behavioral Model of Health Services Use (Andersen, 1995),

which is a leading model in explaining contextual factors associated with healthcare utilization. Given the importance of stigma-related stressors and physician-level characteristics that previous literature has identified in healthcare utilization and avoidance among TGNC populations, this model was comprehensive in its inclusion of personal context, vulnerability, enabling factors, and need. The second is theory is the Theory of Planned Behavior (Ajzen, 1991), which was chosen to complement the Andersen Model, for the addition of perceived behavioral control, social norms, and behavioral intention. Both theories will be discussed next, in turn.

Behavioral Model of Health Services Use. Andersen's (1995) model posits that patterns of healthcare utilization can be explained by the collective influence of environmental and personal factors, needs (objective and perceived), and enabling resources (Figure 2).

Predisposing characteristics. Traditionally, predisposing characteristics include individuals' demographic factors such as gender and age that contribute to either biological underpinnings of needs for healthcare services. There are also aspects of social structure that contribute to health services need due to the status their group membership or identity in the surrounding community, as well as available resources in the physical environment that lead an individual to be able to make healthy life choices. Aspects of social structure include education, occupation, race/ethnicity, and culture. Finally, health beliefs are attitudes, values, and knowledge one has about health and health services which impacts need perceptions of healthcare services (Andersen, 1995).

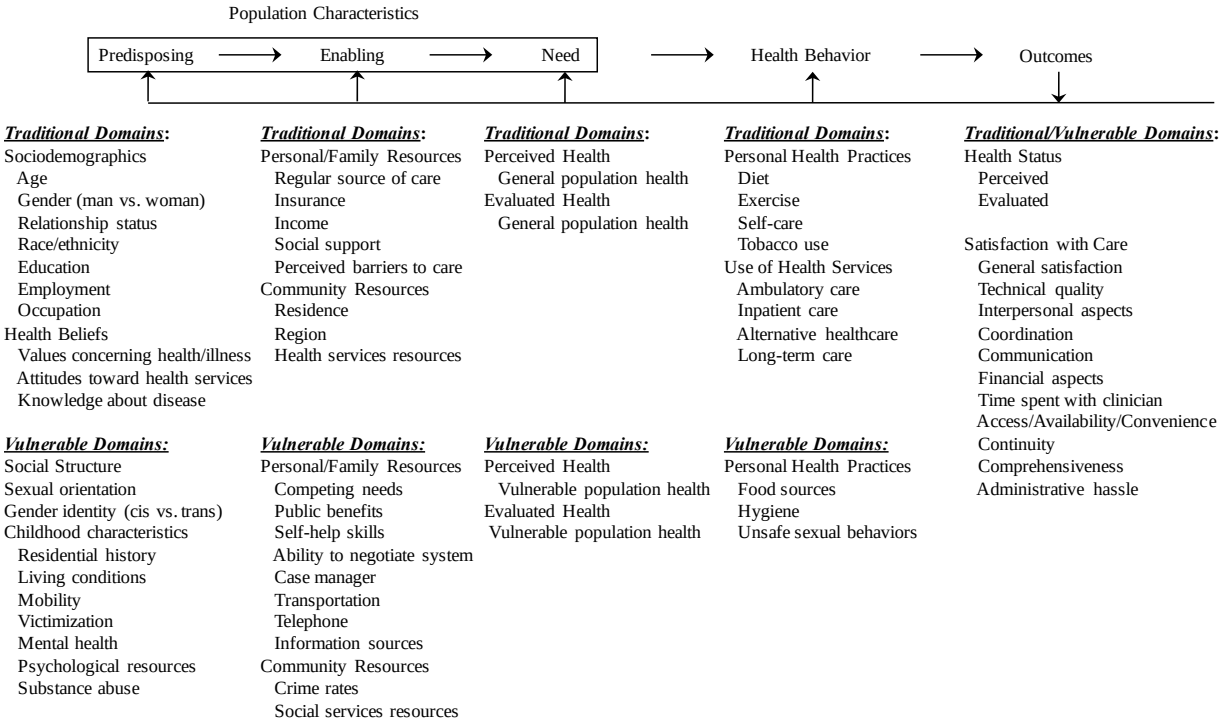

Figure 2. The Behavioral Model of Healthcare Services for Vulnerable Populations

This model was expanded by Gelberg, Andersen, and Leake (2000) for vulnerable populations, and predisposing characteristics were added to the model, including childhood characteristics (e.g., history of abuse and neglect, foster care, parental illness), living conditions, residential history, criminal behavior and prison history, victimization, mental illness, psychological resources (e.g., coping, mastery, self-esteem, cognitive ability, and developmental characteristics), and substance use/abuse.

Enabling resources. Enabling resources include personal, familial, and community factors that must exist in order for individuals to use healthcare services. Such enabling factors include availability of healthcare facilities, individual income, health insurance, having a regular source of care, region, and transportation issues (Andersen, 1995). The expanded enabling vulnerable domain also includes the availability and use of public benefits and social services,

competing needs (i.e., comorbid health conditions), use/availability of information sources, and community crime rates (Gelberg, Andersen, & Leake, 2000).

Need. Traditionally, the need domain includes both perceived need (i.e., self-perceptions) and objective appraisals (i.e., evaluated needs). Perceived need has been helpful in explaining care-seeking behaviors and medical regimen adherence, whereas objective appraisals are more important with regards to the amount and type of treatment patients' needs after seeing a healthcare provider (Andersen, 1995). The vulnerable need domain added perceptions and objective needs of that disparately affect vulnerable populations, such as those with HIV/AIDS, tuberculosis, and/or low-birth weight infants. The authors specified that when predicting use of mental health services or related outcomes to need in this domain (e.g., substance use treatment seeking), mental illness and substance use, for example, would be included in the 'need' domain as opposed to the 'predisposing' domain (Gelberg, Andersen, & Leake, 2000).

Personal health practices. This domain includes health behaviors such as diet, exercise, self-care and adherence to medical regimens. This is the domain that includes use of health services (Andersen, 1995). Expanded for vulnerable populations, the model includes food sources, hygiene, and risky sexual behavior (Gelberg, Andersen, & Leake, 2000).

Outcomes. Outcomes of the behavioral model of health services use surpass the traditional vs. vulnerable dichotomy and include both perceived and objective health status, as well as satisfaction with care (Andersen, 1995).

Theory of Planned Behavior.

Although the Behavioral Model of Health Services Use includes health beliefs, it does not include other factors known to be important in predicting behavior**,** such as perceived behavioral control (Figure 3). The Theory of Planned Behavior (Ajzen, 1991), an extension of the theory of reasoned action posits that beliefs about a given behavior predict the intent and ultimately the actual behavior. There are three major beliefs that predict behavioral intention: attitudes, subjective norms, and perceived behavioral control.

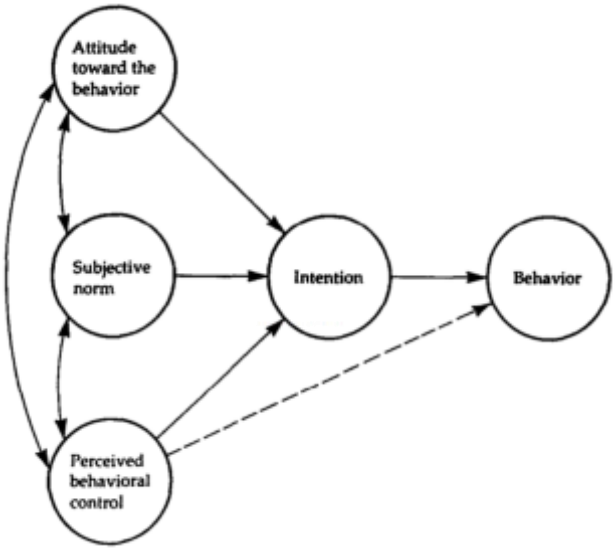

Figure 3. Theory of Planned Behavior

Attitudes. Attitudes refer to individuals' perceived positive or negative consequences of performing a given behavior. This aspect of the theory is the degree to which a behavior is perceived to be good, bad, or somewhere in between (Ajzen, 1991).

Subjective norms. Subjective norms are the perceptions of whether important others (e.g., peers, parents, significant other) think one should engage in a behavior (Ajzen, 1991).

Perceived behavioral control. As opposed to actual behavioral control, perceived behavioral control is the degree of difficulty one perceives of performing a given behavior. This concept is notably different from other control-related constructs (Ajzen, 1991). Locus of control, or individuals' belief that their behaviors are in their control vs. external control, is a more stable trait, whereas perceived behavioral control is unique to the behavior of interest in a given circumstance (Rotter, 1966). Perceived behavioral control is indeed congruent, if not synonymous, with the construct of perceived self-efficacy, or the self-judgment of one's ability

to execute courses of action to overcome future situations (Bandura, 1982). Thus, perceived behavioral control is individuals' confidence in their ability to implement some behavior (Ajzen, 1991).

Behavioral intention. Peoples' intention for a given behavior are thought to capture motivational factors that influence behavior. If a behavior is under one's volitional control (i.e., a person can choose to perform the behavior or not), the strength of intention to perform the respective behavior will predict the performance of the actual behavior (Ajzen, 1991).

Behavior. This is most likely the most obvious aspect of the theory of planned behavior, although important to acknowledge and define. Attitudes, subjective norms, perceived behavioral control, and intentions must be congruent with the actual behavior of interest. The context of assessment must be consistent across these constructs, as well as the interval. When behavior is at the complete discretion of the individual, intention is sufficient for predicting the behavior. However, as volitional control over the behavior decreases, perceived behavioral control becomes more important in behavior prediction (Ajzen, 1991).

A Conceptual Model of TGNC Adult Healthcare Utilization

In light of the theories described above, it is proposed that the decision to utilize healthcare among TGNC adults is affected by an accumulation of past negative experiences or expectations during healthcare encounters, perceived and objective need, and enabling factors, including health beliefs and intentions (Figure 4). As preventative and curative healthcare use is reduced, it is supposed that this process feeds back to the beginning of the model and leads to: greater need, increased negative expectations, anticipatory discrimination, reduced attitudes, increased perceived barriers, and maladaptive coping, which may lead to use of overutilization of emergency departments for the primary source of care and increased burden on the healthcare

system. With the integration of the Behavioral Model of Healthcare Services Use and the Theory of Planned Behavior, the factors that promote or hinder TGNC adults' use of preventative and curative healthcare may be elucidated. The evidence for each underlying factor is presented next.

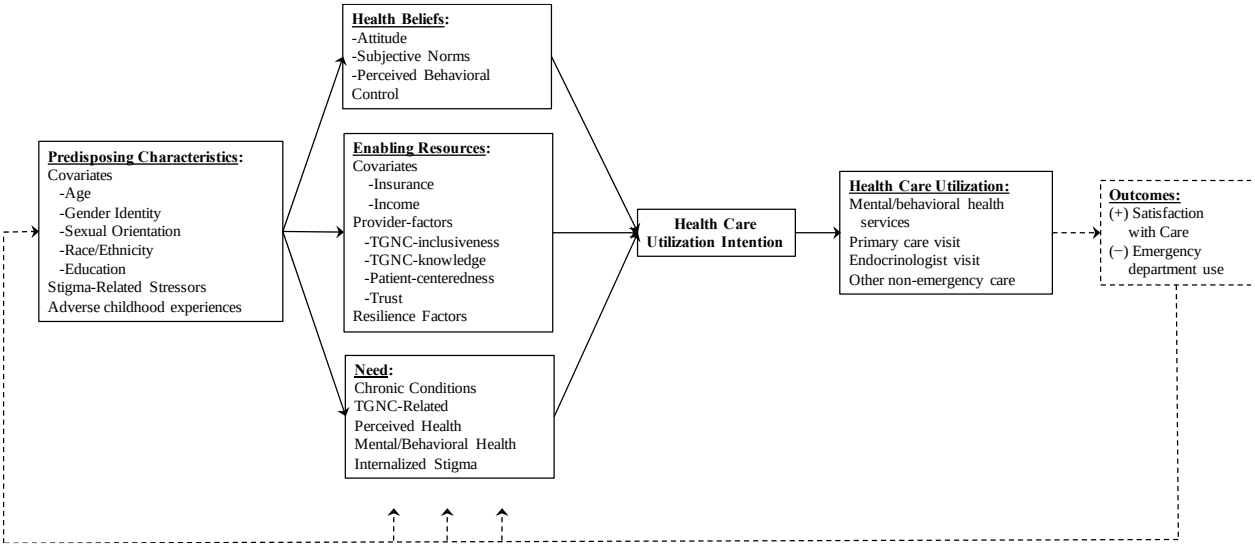

Figure 4. Integrated Conceptual Model of Healthcare Utilization among TGNC Adults.

Note. Dashed lines indicates future outcomes not tested in the current proposal.

Predisposing characteristics. Demographics, social contextual factors, and health beliefs have been shown to be associated with healthcare utilization. Older age has been associated with increased healthcare utilization, specifically for primary care use, specialty care, hospitalizations, and diagnostic services (Callahan et al., 2000). There are also significant gender differences such that cisgender women utilize healthcare more than cisgender men (Callahan et al., 2000), and trans men have disparate rates of pap tests versus cisgender women (Peitzmeier et al., 2014). Additionally, race can play a factor in healthcare utilization as evidenced by lower rates of diagnostic evaluations after an abnormal sigmoidoscopy among Black individuals versus Whites (Laiyemo et al., 2010). Socioeconomic factors such as education and income, while conceptualized as enabling factors, interact with demographic factors such as race, gender, and

sexual orientation, and are associated with reduced healthcare use and quality, regardless of insurance (Ficella, Franks, & Clancy, 1998).

Health beliefs, namely attitudes, subjective norms, and perceived behavioral control of healthcare utilization are included in predisposing factors. As discussed previously, positive attitudes, subjective norms, and perceived behavioral control of healthcare utilization will increase the likelihood of an individual performing that behavior. The theory of planned behavior has been tested extensively in a diverse range of behavioral settings, including behaviors most relevant to the current proposal such as attendance at a health screening (Sheeran, Conner, & Norman, 2001), having a health check (Conner & Norman, 1994), having a cancer screening (De Vellis, Blalock, & Sandler, 1990), seeking prompt medical care (Godin et al., 1993), going to a routine mammogram (Baumann, Brown, Fontana, & Cameron, 1993), and HIV-related health seeking behaviors among trans women (Prabawanti, Dijkstra, Riono, & Hartana, 2014). In a review of the application of the theory of planned behavior to health-related behaviors, the averaged correlations between the major theoretical constructs, intention, and behavior were above average for clinical and screening behaviors (Godin & Kok, 1996). The correlation between attitudes (.51), subjective norms (.33), and perceived behavioral control (.46) and intention of clinical and screening behaviors were moderate to high (Godin & Kok, 1996). In addition, the correlation between actual clinical/screening behavior and intentions (.35) and perceived behavioral control (.29) were moderately strong (Godin & Kok, 1996).

Only one study has utilized the Theory of Planned Behavior among transgender women from Jakarta, Indonesia in the context of HIV-related health seeking behavior (Prabawanti et al., 2014). This study found that perceived behavioral control was the best predictor of HIV-related health seeking behavior, including sexually transmitted infection service seeking, medical care

adherence, HIV testing, and pick up of HIV test results. In addition, they found that the association between attitudes and behavior was mediated by subjective norms for some behaviors and perceived behavioral control for all behaviors (Prabawanti et al., 2014).

In the adapted behavioral model, predisposing factors also included histories of victimization. As such, previous gender identity-based victimization and discrimination, as well as adverse childhood experiences were assessed. Moreover, TGNC individuals have reported fear of discrimination from healthcare providers, and thus anticipatory discrimination may develop as a generalization from their experiences with discrimination in other social domains or from friends' experiences. As TGNC individuals experience discrimination throughout their lifetime, negative expectations of treatment within the healthcare system may be reinforced. As such, it is expected that the health beliefs will be more predictive of behavioral intention and behavior for individuals with worse predisposing characteristics.

Enabling resources. Access to adequate financial resources and medical insurance are clearly important enabling resources with regards to utilizing healthcare. Individuals with a higher socioeconomic position have reported higher rates of a number of cancer screenings (Potosky, Breen, Graubard, & Parsons, 1998), flu immunizations (Gornick et al., 1996), and higher quality ambulatory (Brook et al., 1990) and hospital care (Kahn et al., 1994).

Healthcare provider-related factors consist of variables that evaluate the context of which patient healthcare utilization occurs as well as patient factors that allow patients to obtain care (e.g., presence of a regular source of care; Phillips, Morrison, Andersen, & Aday, 1998). Physician characteristics such as training (internal and family practice vs. obstetrics-gynecology) have been associated with patient utilization of preventative health services (Lurie et al., 1993). Patient-provider interactions are linked to patient perceptions of trust and quality of care.

Patients' trust evaluations of physicians are linked to various verbal and nonverbal behaviors, such as eye contact and active listening (Cook et al., 2004). Further, the degree to which patients are provided the opportunity to participate in clinical encounters is associated with trust of physicians (Keating et al., 2002). Patient-centered interactions are characterized by mutual decision-making, empathetic, responsive, and compassionate (IOM, 2001), and are key to quality patient-provider interactions, and increased trust (Fiscella et al., 2004; Hammond, 2010). Patient-centeredness has also been linked to patient satisfaction (Anderson, 2002; Bertakis, 1977; Cecil et al., 1997; Roter et al., 1987), positive health outcomes (Greenfield et al., 1988), and healthcare utilization (Honda, 2004). A related construct, cultural competency is marked by understanding the meaning and importance of culture (Saha, 2008), and has been associated with increased patient satisfaction and health information seeking (Paez et al., 2009). Therefore, patient ratings of the TGNC-related knowledge, inclusiveness, patient-centeredness, and trust in physician are included in the conceptual model.

Need. In the general population, individuals who report worse physical health, such as more chronic health conditions and reduced perceived health status have greater needs for healthcare services use, and thus have been more likely to utilization health services (Andersen, 1995; Dunlop, Manheim, Song, & Chang, 2002). Perceived needs may be conceptualized as one's perceived health status, as well as perceived need for care as opposed to evaluated health needs by a clinician (Andersen, 1995).

For mental health services, in one clinical sample, perceived need has been associated with use of specialty mental healthcare (McAlpine & Mechanic, 2000). Because of minority stress and gender dysphoria, when present, TGNC people may need mental health services. Several studies have conducted needs assessments of TGNC adults in various U.S. cities and

commonly reported needs include HIV-related care and testing, suicidality, substance abuse, exposure to violence, access to TGNC-related care (Kenagy, 2005; Xavier et al., 2005).

Healthcare utilization intention and behavior. Although the previous sections have linked predisposing characteristics, enabling resources, and need to healthcare utilization, the choice of healthcare utilization behavior domains will be justified next. Mental and behavioral health problems are particularly salient for TGNC individuals to treat current mental or behavioral health issues, including gender dysphoria, when present. Moreover, a mental health screening is required for referral to hormonal and surgical treatments related to gender dysphoria, although psychotherapy is not required (Coleman et al., 2012). TGNC youth compared to cisgender matched controls have reported greater use of inpatient and outpatient mental health treatment (Reisner et al., 2016).

The other two major types of health services use to be assessed are primary care visits and specialist visits. These visits capture individuals' use of regular care including general preventive healthcare, and that does not include emergency department visits or hospitalizations not associated with transition-related care. The need to separate transition-related surgery and other forms of hospitalization will capture the appropriate use of healthcare services. In particular, the link between mental health and physical health needs and healthcare utilization behaviors differ depending on the behavioral outcome and method of assessing symptoms. Somatization, or the tendency to react to distress with physical symptoms (Lipowski, 1988), has been associated with increased primary care utilization (Kirmayer & Robbins, 1991). Individuals who have reported comorbid psychiatric disorders (e.g., major depressive disorder, panic disorder) and somatization have shown significantly greater utilization of hospital admissions, emergency department visits, and inpatient and outpatient costs compared to those with

psychiatric disorders only (i.e., no somatization); however, individuals who display *somatization only* have reported greater emergency department and primary care visits than those with comorbid psychiatric disorder and somatization (Barsky, Orav, & Bates, 2005). Thus, internalizing mental health and externalizing symptoms are expected to differ based on the healthcare service sought.

Trans women who have access to either a regular general health practitioner or mental health provider have reported reduced risk behavior, such as smoking, and have been more likely to obtain hormone therapy from a licensed physician (Sanchez et al., 2009). Delaying medical care when needed may result in increased complications, severity of illness, and hospitalization (Baker, Shapiro, & Schur, 2000; Diamant et al., 2004).

The Current Study

Due to pervasive stigma-related stress, and subsequent internalization of stigma, TGNC individuals report many health needs that increase the need for healthcare services. TGNC individuals have reported increased rates of depression, suicidal ideation, suicide attempts (Clements-Nolle et al., 2001), and substance abuse (Benotsch et al., 2013; Reisner et al., 2014). Some TGNC individuals experience gender dysphoria and require transition-related care, such as hormone replacement therapy or gender confirmation surgery (Coleman et al., 2012). For vulnerable sub-populations, HIV/AIDS is a particularly frequent health need (Nemoto et al., 2015). As individuals report more chronic health conditions and poorer perceived health status, the more need they have, which leads to more healthcare utilization (Dunlop et al., 2002).

Given the significant social stressors and associated health problems recognized in the growing literature of TGNC populations, the unknown links between predisposing characteristics, enabling factors, and needs, including patient-level and provider-level

characteristics, provide an avenue for many rich research questions to be posed concerning the robust associations among stigma-related stressors, healthcare utilization, satisfaction with care, and the mechanisms therein. The objective of the current proposed study is to utilize the Behavioral Model of Health Services Use (Andersen, 1995) and the Theory of Planned Behavior (Ajzen, 1991) to create, test, and evaluate a robust model of healthcare utilization among an online convenience sample of TGNC adults.

Previous studies of TGNC individuals have been limited in sampling methodology and lack of theory. Most research of TGNC individuals have used community-based health clinical-based samples, which may have elevated the perceived needs of the population. This common sampling method also has resulted in a potential over-representation of individuals with gender dysphoria, and have lacked a focus on gender-nonconforming and genderqueer subpopulations. Moreover, the theories utilized in the present study have largely not been utilized among TGNC populations, with the exception of one study (i.e., Prabawanti et al., 2014).

By contrast, the present student examined predisposing characteristics, enabling factors, needs, health beliefs, and healthcare utilization, intention, and delay among a national online convenience sample based in the U.S. The aims of the study were to (1) examine the interrelations of the model's constructs, and (2) to determine the mediational pathways through which predisposing characteristics are associated with healthcare utilization, intention, and delay.

Hypothesis 1. Predisposing characteristics will be associated with healthcare utilization. It is expected that worse predisposing characteristics such as discrimination will be associated with reduced healthcare utilization (Socia et al., 2014).

Hypothesis 2. It is hypothesized that enabling resources will be associated with healthcare utilization. Provider trust, patient-centered care, and culturally competent care have

been associated with greater likelihood of healthcare utilization and patients' health information seeking (Honda, 2004; Paez et al., 2009).

Hypothesis 3. Need will be associated with healthcare utilization differentially by type of need. Greater somatic symptoms, number of chronic conditions, and psychiatric conditions have been associated with an increased likelihood of health services utilization (Barsky, Orav, & Bates, 2005; Dunlop et al., 2002). More specifically, perceived need for counseling services will be associated with increased mental health service utilization (McAlpine & Mechanic, 2000). However, proximal stressors, such as internalized transphobia or fear of rejection/discrimination have been associated with perceived barriers to healthcare utilization and healthcare avoidance (Bauer et al., 2014; Radix, Lelutiu-Weinberger, & Gamarel, 2014; Socias et al., 2014); therefore, it is hypothesized that greater proximal stressors would be associated with reduced healthcare utilization.

Hypothesis 4. It is expected that more positive health beliefs will be associated with more healthcare utilization (Prabawanti et al., 2014).

Hypothesis 5. The effects of predisposing characteristics on healthcare utilization behavioral intention will be mediated through enabling resources, need, and health beliefs. Health beliefs toward HIV-related health behaviors among transgender women have been associated with behavioral intention, and in turn health seeking behavior (Prabawanti et al., 2014). The mediation of the association between enabling resources and needs and healthcare use by intention has not been examined previously; although, due to the positive association between intention and behavior, similar relationships are expected between enabling resources, need, and healthcare use intentions.

Hypothesis 6. The association between predisposing characteristics and healthcare utilization behavior will be mediated by a cascade of indirect effects: (a) enabling resources, (b), need, (c) health beliefs, and (d) healthcare utilization intent. According to the Minority Stress Model (Meyer, 2003) and Psychological Mediation Framework (Hatzenbuehler, 2009), experiences of distal stressors, such as discrimination and victimization are associated with disengagement in promotive resources, greater internalizing of stigma, more mental health problems, and disordered cognitions. It is hypothesized that perceived behavioral control (Prabawanti et al., 2014), in particular, will be affected by internalizing of stigma, reduced behavioral intention, and ultimately, reduced healthcare utilization.

Hypothesis 7. It was hypothesized that the association between predisposing characteristics and healthcare delay would be mediated by enabling resources, need, and health beliefs. Exposure to violence, discrimination, and internalized stigma, among trans women has been associated with healthcare avoidance (Socias et al., 2014). Qualitative studies have identified lack of TGNC-knowledgeable and TGNC-friendly providers as a barrier to care (Bauer et al., 2009; Radix et al., 2014); however, quantitatively, these factors have not been directly associated with being under a physician's care (either primary care or mental health; Sanchez et al., 2009). Therefore, it is expected that TGNC-inclusiveness or knowledge indirectly affects healthcare utilization delay through decreased perceived control rather than directly.

Method

Participants

The current analytic sample of 109 TGNC individuals were recruited through a combination of convenience and snowball sampling from January to April 2017. This sample size was evaluated for obtained power to detect a medium-sized effect with $\alpha = .05$ and 10 predictors (the largest number of predictors in any subsequent multivariate models) using a *post hoc* power analysis conducted with G*Power (Faul et al., 2009), which indicated that *n* of 109 for OLS regression and f^2 of .17 achieved power (1-β) of .82. Therefore, the current sample is approximately adequate to detect medium and large-sized effects, and smaller effects in the more parsimonious tested multivariate models. To be included in the survey, participants must have: (a) been at least 18 years of age, (b) currently reside in the U.S., (c) not identified as cisgender, and (d) had access to a computer or mobile device with Internet or a telephone.

Measures

Predisposing characteristics included gender identity-based stigma-related stressors, such as discrimination and victimization, as well as adverse childhood experiences. Health beliefs included attitudes, social norms, and perceived behavioral control of healthcare utilization. Enabling resources included perceived physician-related factors, as well as TGNC-community resilience. Needs included mental health, substance use, number of chronic conditions, perceived physical health status, transition-related needs, and internalized stigma. Finally, healthcare utilization past-year behavior and delay, as well as future intention were assessed.

Sociodemographic information. Sociodemographic information was assessed, including race/ethnicity, age, gender identity, assigned sex-at-birth, sexual orientation, educational attainment, employment status, committed relationship status (no, yes with 1 person, yes with

more than 1 person) income, past year income stability (1=very unstable to 6=very stable), weeks worked in the past year, state of residence, and type of city of residence.

Participants were asked whether they had insurance (yes/no) and from what source they received their insurance, which was coded as none, private, and public. Participants also indicated whether they had a regular healthcare provider (e.g., doctor, nurse, or midwife) they usually see when they are sick or need care (yes/no).

Predisposing characteristics.

Gender identity-based stigma-related stressors. The Gender Minority Stress and Resilience Measure (GMSRM; Testa et al., 2014) was used to assess past experiences of gender identity-related discrimination (5 items), rejection (6 items), and victimization (6 items). For discrimination, rejection, and victimization, participants indicated if they had experienced an event: Never; Yes, before age 18; Yes, after age 18; and/or Yes, in the past year. If a response was indicated as "Yes" for any option, the item was scored as "1." Total subscale scores were computed by summing the respective dichotomous items together. The subscales have shown good convergent and divergent validity in a transgender sample (Testa et al., 2014). In the current sample, discrimination showed slightly less than adequate reliability (α = .69), while rejection (α = .71), and victimization (α = .83) showed adequate or good reliability. The total score α of discrimination, rejection, and victimization was .78, and scores ranged from 0 to 15.

Adverse childhood experiences. The Adverse Childhood Experiences (ACEs) Questionnaire was utilized to assess the occurrence of 10 domains of childhood abuse, neglect, and household dysfunction that had occurred before the age of 18, resulting in a range of scores from 0 to 10. Higher scores indicate more endorsement of adverse experiences. This scale showed good reliability in the present sample (α = .80).

Health beliefs. Attitudes, subjective norms, and perceived behavioral control were measured by constructing a theory of planned behavior questionnaire (Ajzen, 2006). All measures are assessed on a 7-point scale, and have demonstrated good internal consistency (Sheeran et al., 2001). Attitude was measured by responding to the stem "Attending a healthcare visit would be..." on Likert scales (e.g., 1 = Extremely bad to 7 = Extremely good). The subjective norm measure comprised two items to assess if important others would advise them to attend a healthcare appointment (e.g., 1 = definitely should not to 7 = definitely should). Perceived behavioral control was measured with three items on the likelihood of how difficult it would be to attend a healthcare appointment (e.g., 1 = Extremely difficult to 7 = Extremely Easy). In the present sample, the healthcare utilization healthcare utilization (HCU[6]) attitudes, subjective norms, and perceived behavioral control had less than adequate to excellent internal consistency (αs = .80, .67, and .97, respectively).

Enabling resources.

Perceived TGNC inclusiveness. A measure of TGNC-inclusiveness was adapted from the Bias and Cultural Competence Survey (Johnson et al., 2004). Respondents were asked to think about their gender identity and expression before responding to the six questions on a 5-point Likert scale and one question on a scale of 0 to 10. The first three items tapped physician bias and interpersonal cultural competence (e.g., I feel that my doctor understands my gender identity and/or expression) with responses ranging from *Not at all* to *Very much*. The second set of three items tapped health system bias (e.g., Do you think there was ever a time when you would have gotten better medical care if you were not trans or gender-nonconforming?), with responses ranging from *None of the time* to *All of the time*. Finally, respondents were asked to

[6] The acronym HCU will be used to indicate healthcare utilization variables within the present study

respond from 0 (least transgender-inclusive care) to 10 (most transgender-inclusive care), which was recoded to a 5-point scale to reflect approximately even groups by quantiles from 0 (0-3), 1 (4-5), 2 (6-7), 3 (8-9), to 4 (10). This scale demonstrated good internal consistency in the present sample (α = .87).

Perceived TGNC knowledge. A researcher-created questionnaire was generated to assess perceptions of knowledgeability among physicians and medical staff at previous healthcare visits. The scale consisted of four items assessed on 5-point scale (e.g., In the past, have you had to teach any of your healthcare providers about your gender identity or expression?), and one global item assessing transgender knowledgeable from 0 (least knowledgeable about transgender health) to 10 (most knowledgeable about transgender health), which was re-coded to a 5-point scale to reflect approximately even groups by quantiles from 0 (0-2), 1 (3-4), 2 (5-6), 3 (7-8), to 4 (9-10). This scale demonstrated adequate internal consistency in the present sample (α = .77).

Patient-centeredness. The Patient Satisfaction Questionnaire (Marshall & Hays, 1994) was used to tap into how participants perceive their quality of medical care. Specifically, the interpersonal (two items), communication (two items), and time (two items) constructs were utilized to assess the degree to which respondents perceived their healthcare providers to express respect, empathy, and responsiveness to needs. Items are scored on a 5-point scale from strongly agree to strongly disagree. Higher scores indicate higher perceived quality, patient-centered care. In the current sample, these items showed adequate internal consistency (α = .78).

Trust. The 11-item Trust in Physician Scale (Anderson et al., 1990) measured provider trust. Participants respond to items on a 5-point scale (1 = Strongly Agree to 5 = Strongly Disagree). The scale has shown good internal consistency (α = .90) and construct validity in its development. In the present sample, it showed excellent reliability (α = .92).

Community resilience. The GMSRM subscales of TGNC pride (eight items) and community connectedness (5 items) were used to assess TGNC community resilience. Reponses options were on a 5-point scale from strongly disagree to strongly agree. Pride and community connectedness showed good internal consistency in the present sample (α = .84 and α = .85, respectively).

Needs.

Chronic conditions. Chronic conditions were assessed with the sum of the number of conditions respondents endorsed (asthma, diabetes, HIV infection, kidney disease, cancer, coronary artery disease, liver problems, heart disease, stroke, and other). Items were scored as 1 (yes) or 0 (no). This measure has been utilized in a diverse sample of lesbian and bisexual women to assess needs within the Andersen Behavioral Model of Health Services Utilization (Li et al., 2015).

Transition-related needs. Participants were asked in the past 12 months whether they had needed any of the following services but had been unable to obtain them: hormonal therapy, transgender surgery of any kind, counseling or psychotherapy, or gynecological care. This measure has been utilized in a sample of transgender individuals (Bradford et al., 2013). Items were scored as such: not needed, needed and obtained, and needed but not obtained. For the purposes of the present study, each need was examined separately (needed vs. not needed).

Perceived health status. Perceived health status was assessed with the NIH PROMIS global health measure (Cella et al., 2010), which has shown good construct validity and internal consistency (α = .81; Hays et al., 2009). The global physical subscale was used in the present study, which showed adequate reliability in this sample (α = .71). Global physical health taps into physical functioning, fatigue, and pain. Scoring involves recoding items, summing the two

subscales into raw total scores, and converting the raw scores into *t*-scores based on PROMIS procedures (Hays et al., 2009). Higher scores indicate better health in the respective domain.

Mental health. The NIH PROMIS global mental health (Hays et al., 2009) subscale was used to assess general quality of life, mood, social functioning, and emotional problems. This showed good internal consistency in the current sample (α = .82). In addition, the NIH PROMIS (Cella et al., 2010) Emotional Distress−Depression and −Anxiety participant short forms were used. The short forms have shown good construct validity and internal consistency (α=.76-.83; Pilkonis et al., 2011), as well as excellent reliability in the current sample (αs = .90).

Proximal group-specific processes. The GMSRM was used to assess internalized transphobia, nondisclosure, and negative expectations for the future. Response options were assessed on a 5-point scale from strongly disagree to strongly agree. These GMSRM subscales have shown good internal consistency (αs = .80-.91) in a transgender sample (Testa et al., 2014), as well is in the current sample (αs = .87-91).

Substance use. The NIDA screening questionnaire for substance use was utilized to determine the frequency of respondents' use of 7 types of substances over the past year: alcohol, cigarettes, e-cigarettes/vape, other tobacco product, prescription drugs for non-medical reasons, marijuana, and other illicit drugs. Response options ranged from 0 (never) to 4 (daily or almost daily).

Healthcare utilization intention. Intention for HCU was assessed with three items indicating how likely respondents would be to attend a health visit, with responses ranging from 0 (extremely unlikely) to 7 (extremely likely). This scale has shown good validity and internal consistency (α = .93; Sheeran et al., 2001), as well as in the present sample (α = .97).

Healthcare delay. Participants were asked the yes or no questions of whether, "During the last 12 months, was there any time when you had a medical problem but put off, postponed or did not seek medical care when you needed to?"

Healthcare utilization. Past year HCU was assessed via the number of visits to a doctor's office or clinic, mental health professional, endocrinologist, or other healthcare professional (excluding other hospital, emergency room visits, and transition-related surgery). This single-item form of healthcare utilization measurement has shown good test-retest reliability (r = .76; Ritter et al., 2001). Due to high variability, each behavior was shortened to reflect approximately even groups by quantiles differentially for each of the types of HCU behaviors. The general rule was to attempt to sort approximately 20% of raw responses into each recoded response category after leaving raw 0 responses as a 0 in the recoding (see Table 1 for exact percent in each recoded category). For primary care use, responses options were coded as 0 (0 visits), 1 (1 visit), 2 (2-3 visits), 3 (4-5 visits), 4 (6-8 visits), and 5 (>8 visits). For mental health services, responses were coded as 0 (0 visits), 1 (1 visit), 2 (2-3 visits), 3 (4-10 visits), 4 (11-20 visits), and 5 (>20 visits). For endocrinology visits, responses were coded as 0 (0 visits), 1 (1 visit), 2 (2 visits), 3 (3 visits), 4 (4 visits), and 5 (>4 visits). Finally, for other services, responses were coded as 0 (0 visits), 1 (1 visit), 2 (2-3 visits), 3 (4-5 visits), 4 (6-10 visits), and 7 (>10 visits).

Table 1
Percent of Recoded HCU Behavior Variables by Original HCU Variable

	Original[a]			
Recoded Value	HCU-primary	HCU-mental health	HCU-endo	HCU-other
0	12.0	34.9	69.7	40.6
1	15.7	10.1	4.6	10.4
2	22.2	6.4	11	17
3	14.8	21.1	3.7	14.2
4	17.6	11.9	5.5	10.4
5	17.6	15.6	5.5	7.5

Note. [a]After winzorsing procedure

Procedure

A combination of convenience and snowball sampling was utilized in the present study. Originally with the goal of utilizing respondent driven sampling, ten TGNC individuals, known as 'seeds,' were identified to initiate the recruitment process through the author's personal social network and online TGNC-serving organizations. Once identified, the purpose of the study and recruitment procedures were explained to the seeds, who each received a referral coupon (i.e., recruitment flyer with brief instructions, a unique alphanumeric code, study hyperlink, the Internal Review Board (IRB) number, and the PI's contact information) to distribute to up to five friends who were potentially good candidates for the study. However, due to low referral rates, more seeds were attempted to be identified with little success. Thus, efforts were re-focused on convenience sampling through TGNC-focused listservs and online groups (see Figure 5 for a flow chart of recruitment). The survey took place online via Qualtrics on participants' personal computers or mobile phones and took approximately 45 minutes to complete. The option was given to complete the survey by phone in the case of lack of computer/internet access or visual disability to maximize access to the survey; however, no participants requested that option.

Potential participants were screened for inclusion criteria via an online Qualtrics survey (Appendix A). If participants qualified for the survey, they were automatically presented a hyperlink to a separate Qualtrics survey for informed consent and the full survey. If they did not qualify (determined through branching logic), a message was presented thanking them for their time, and based on their responses, they did not qualify for the present study. Once participants reached the end of the full survey, a hyperlink appeared that led to a separate survey unlinked to their survey responses, where they were prompted to enter their contact information for compensation purposes (Appendix B). At this point, a debriefing form was presented including

information about the study and psychosocial resources for mental health or discrimination issues that may have been elicited by responding to the survey (Appendix C).

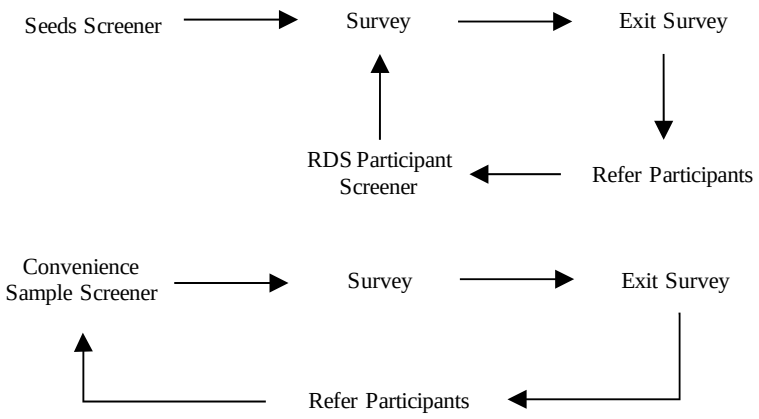

Figure 5. Flowchart of Recruitment.

A $5 Amazon.com gift card was sent to their e-mail within approximately one week of completion, along with a referral coupon to be used up to five times. Secondary compensation was offered in the form of one raffle entry per referral (up to five entries) for eight chances to win a $25 gift card to the online vendor of their choice. Secondary compensation was determined by linking the referral coupon codes of completed surveys to their seeds' referral codes to ensure confidentiality. Procedures were approved through the IRB of Virginia Commonwealth University (IRB #HM20007094).

Data Analytic Plan

Analytic sample selection. There were 240 individuals who attempted to complete or completed the full survey. Of these 240, 5 were duplicates, 15 were nearly incomplete, and 101 were identified as providing error-heavy responses due to inconsistent response patterns with eligibility criteria in the screener and full survey (e.g., country not matching the U.S., or gender

identity indicating cisgender), extremely short completion time (<10 minutes), and improbable response patterns (e.g., all 0's). The latter group of participants likely was false responses by computer programs (bots) with users fraudulently attempting to receive the study's offered compensation. After these cases were deleted, 119 participants with complete or partially complete data remained. Of these, 110 participants reached the end of the survey with either complete or intermittently missing data. Nine participants did not reach the end of the survey, but completed demographic and some healthcare utilization information (healthcare utilization health beliefs and behavior). The decision was made to delete these nine individuals, because they did not complete any of the inferential constructs in the present study. Additionally, one respondent indicated their gender identity as intersex and not transgender or gender-nonconforming, and subsequently was removed. Therefore, the final analytical sample consisted of 109 participants.

Preliminary analyses. To determine patterns of missing data, a Little's MCAR test was run prior to testing data normality. Criteria of data missing at a rate of <2% is considered negligible. The continuous predictor variables assessed for normality prior to the primary analyses. For each scale, *z*-scores were calculated, and variables with a standard score greater than the absolute value of 3.29 were winsorized (Tabachnick & Fidell, 2001).

Prior to conducting the inferential statistical analyses, descriptive information (i.e., means, standard deviations, and percentages) were run regarding the sample characteristics of demographics, levels of predisposing characteristics, enabling resources, needs, healthcare intention, and healthcare utilization. A correlation matrix was constructed to evaluate bivariate associations among predisposing characteristics, enabling resources, needs, healthcare intention,

and healthcare utilization variables. Bivariate associations were also calculated by participant demographic characteristics and the major components of the conceptual model.

To determine if healthcare utilization, intent, or delay differed as a function of demographic variables, several tests were conducted. A MANOVA and correlations were used for HCU behaviors and intent, and ANOVAs and chi-square tests were used for healthcare delay. Categorical variables were race/ethnicity, insurance source, sexual orientation, gender identity, relationship status, and type of city of residence. Continuous variables included age, income, income stability, hours per week worked, subjective social status, and educational attainment. For the analyses in which there were significant differences or associations by demographics and healthcare utilization, the significant demographic variables were added as covariates in the subsequent analyses.

Hypothesis testing. First, a series of multivariate associations among predisposing factors, needs, and enabling factors to healthcare utilization behavior, intent, and delay were assessed using multivariate multiple regression (HCU behavior and intent) and MANOVAs (delay and transition-related need). Associations among variables were assessed in the following steps to control for family-wise error: (1) examine the total multivariate omnibus effect; (2) if step 1 was significant, examine the omnibus effect for each independent variable; (3) if at least one effect from step 2 was significant, examine the overall models for each dependent variable; and (4) within the significant models for each dependent variable from step 3, examine the significance of individual associations between independent and dependent variables.

Next, to examine the hypotheses of indirect effects such that predisposing characteristics, enabling factors, needs, and beliefs were associated with HCU behaviors through intention were tested using simple mediation models and serial mediation models. Tests of mediation using

bootstrapping methods (Preacher & Hayes, 2004) were performed separately for the sample using the PROCESS macro for SPSS (Hayes, 2013). Bootstrap resampling is an ideal method for conducting mediation models, because it can test both direct and indirect effects, including bootstrapping and Monte Carlo confidence intervals for indirect effects, and automatically conducts a test of homogeneity of regression. Bootstrapping increases power and can be used with smaller sample sizes compared to the Sobel's test (Preacher & Hayes, 2004). The mediation used 5000 bootstrap samples to estimate the mediation for each resampled data set. Sociodemographic variables identified as significant in the preliminary analyses were included as covariates in all the models. Holm-Bonferonni (Holm, 1979) correction was used to control for family-wise error within each mediation model. This approach was taken only with the direct effects, because *p*-values are not provided with bias-corrected bootstrapped indirect effects. For each statistically significant association within a model, the largest *p*-value that is less than .05 will be evaluated first ($a < .05$), then the next-to-smallest is evaluated second ($a < .025$; .05/2), and so on.

Results

Data Preparation

Missing data analysis. A Little's MCAR test was conducted for most variables. Demographic variables and cancer screenings behaviors were not included in this analysis. Screening behaviors were excluded because these tests are dependent on risk, sex at birth, and age. The MCAR test indicated that data were missing completely at random, $\chi^2(2699) = 1479.99$, $p = 1.000$. Due to the low percent of missing data, imputation was not performed.

Normality. All continuous variables were first examined for univariate outliers. Healthcare utilization (HCU) for doctor's offices/clinics had one outlier with a $z = 10.29$, HCU for mental health professionals had three outliers (zs = 3.55, 4.46, 6.84), HCU for endocrinologists had two outliers (zs = 4.23 and 5.17), and HCU-other had one outlier ($z = 10.19$). In all cases, the outliers were windsorized to the next highest value. This resulted in skewness (<2.41) and kurtosis (<5.93) values within less-than-ideal ranges for all variables other than HCU-other (REPORT). The windsorized HCU-other variable was reexamined for univariate outliers, for which there were four (zs = 4.35). These outliers were windsorized, which resulted in skewness of 2.23 and kurtosis of 4.45. For chronic conditions, there were two outliers (zs = 4.34 and 5.08), which were windorized, resulting in skewness and kurtosis values within the normal range (1.27 and 1.68, respectively). Upon re-coding the HCU behaviors, skewness and kurtosis were re-checked, and all four behaviors had values within normal ranges (Table 2).

Table 2
Skewness and Kurtosis for Recoded HCU Behaviors

	HCU-primary	HCU-mental health	HCU-endo	HCU-other
Skewness (*SE*)	-.03 (.23)	.18 (.23)	1.62 (1.34)	.55 (.24)
Kurtosis (*SE*)	-1.18 (.46)	-1.48 (.46)	1.34 (.46)	-1.01 (.47)

For HCU social norms and intention, there were four outliers; however, they were marginal (*z*s <3.61). Upon examination of skewness (<|1.77|) and kurtosis (<2.67) values, these variables were unchanged.

Preliminary Analyses

Overall sample. For a summary of participant demographics, see Table 3.

Tests for covariates. Correlations were run between continuous demographics (age, income, income stability, educational attainment, and hours worked per week) and healthcare utilization behaviors and intention. Age was significantly associated with HCU-mental health (r = -.27, p = .004) and HCU intent (r = .30, p = .002). Hours worked per week was negatively associated with HCU-primary (r = -.28, p = .005), and positively associated with HCU-mental health (r = .22, p = .021). Income stability was positively associated with HCU intent (r = .23, p = .019). Educational attainment was negatively associated with HCU-endocrinologist (r = -.21, p = .032). All other correlations were not significant (ps > .10).

The same method above was applied to (1) HCU beliefs (attitudes, social norms, and perceived behavioral control), (2) predisposing factors, and (3) enabling factors. Age was positively associated with all HCU beliefs (rs = .23-.31, ps < .018), gender identity-based discrimination (r = -.19, p = .044), trust in physicians (r = .21, p = .032), and perception of TGNC-inclusive care (r = .39, p < .001). Income (r = .20, p = .042) and income stability (r = .24, p = .011) were associated with attitudes, as well as discrimination (r = -.25, p = .011 and r = -.19, p = .047, respectively). Income stability was associated with perceived behavioral control (r = .26, p = .007), trust (r = .20, p = .041), and TGNC-inclusiveness (r = .23, p = .019). Educational attainment was positively associated with social norms (r = .27, p = .004), perceived behavioral

Table 3

Sociodemographics of Sample

Characteristic	*n*	%	Characteristic	*n*	%
Gender identity			Relationship Status		
Man or trans man	43	39.4	No	42	38.5
Woman or trans woman	30	27.5	Yes, with one person	57	52.3
GNC, nonbinary, or agender	36	33.0	Yes, with more than one person	10	9.2
Sexual orientation[a]			Type of city of residence		
Straight	27	24.8	Rural	20	18.3
Bisexual	38	34.9	Suburban	48	44.0
Gay or lesbian	22	20.2	Urban	40	36.7
Queer	43	39.4	Missing	1	0.9
Different option [write in]	19	17.4	Annual Family Income		
Race/ethnicity			$5,000 through $11,999	8	7.3
White, non-Hispanic	94	86.2	$12,000 through $15,999	11	10.1
Black or African American	3	2.8	$16,000 through $24,999	10	9.2
Hispanic/Latinx	2	1.8	$25,000 through $34,999	10	9.2
Asian American	4	3.7	$35,000 through $49,999	17	15.6
Other	6	5.5	$50,000 through $74,999	22	20.2
Education			$75,000 through $99,999	12	11.0
High school graduate	6	5.5	$100,000 through $149,999	11	10.1
GED or equivalent	1	0.9	$150,000 and greater	7	6.4
Some college / no degree	26	23.9	Missing	1	0.9
Associate degree	10	9.2	Insurance Status		
Bachelor's degree	33	30.3	Yes	93	85.3
Master's degree	21	19.3	No	16	14.7
Professional/Phd/MD	12	11.0	Source of healthcare coverage		
Employment Status			Purchased through employer/union	37	33.9
Employed for wages	60	55.0	Purchased by self or family	21	19.3
Self-employed	13	11.9	Medicare	11	10.1
Out of work for 1+ year	4	3.7	Medicaid or other state program	18	16.5
Out of work for < 1 year	5	4.6	TRICARE	4	3.7
A homemaker	1	0.9	Some other source	2	1.8
A student	8	7.3			
Retired	13	11.9	Characteristic	*M*	*SD*
Unable to work	5	4.6	Age	40.08	16.20
U.S. States represented[b]	28		Income Stability	4.46	1.55

Notes. [a]For analyses, sexual orientation was coded as heterosexual vs. not.
[b]AL, AK, AZ, AR, **CA**, CO, FL, HI, **IL**, KS, KY, ME, **MA**, MI, MN, MS, MO, NH, **NY**, NC, OH, OR, PA, SD, TX, **VA**, WA, WV, and WI, with most of the sample being derived from the bolded states.

control (r = .25, p = .008), and rejection (r = .21, p = .027). Finally, hours-per-week worked was associated with reported TGNC-knowledgeable care (r = .22, p = .027).

A one-way ANOVA was run between continuous demographics listed above and HCU delay. Age was significantly different based on HCU delay, $F(1, 106) = 7.01$, p = .009. Individuals who reported delaying medical care were on average younger (M = 36.60, SD = 17.85) than those who did not delay (M = 44.74, SD = 14.02). Other mean differences were not significant (ps > .065).

A MANOVA was run to determine the omnibus and between subject effects of categorical demographics (relationship status, type of city of residence, insurance source, gender identity, sexual orientation, race, and having a regular doctor) and HCU behaviors and intent. Omnibus tests indicated that insurance source [λ=.73, $F(10, 178) = 3.07$, p = .001] and regular doctor [λ=.82, $F(5, 88) = 4.00$, p = .003] were associated with HCU. Specifically, HCU-primary and HCU-mental health differed by insurance source, [$F(1, 92) = 7.85$, p = .001; $F(1, 92) = 3.17$, p = .047], such that individuals who had did not have insurance had a lower HCU-primary average (M = 1.47, SD = 1.77) than those who had a private insurance source (M = 2.39, SD = 1.43) and public insurance source (M = 3.62, SD = 1.47), which also significantly differed in a Bonferroni-corrected multiple comparison test. Contrarily, for HCU-mental health, those who had public insurance (M = 1.45, SD = 1.78) had significantly lower HCU than those with private insurance (M = 2.48, SD = 1.88), but there was no difference between either public or private vs. those who had no insurance (M = 1.63, SD = 1.78). In addition, HCU intent significantly differed by individuals who reported having a regular doctor (M = 5.31, SD = 1.66) versus those who did not (M = 4.08, SD = 1.26).

The same method above was applied to a MANOVA with (1) HCU beliefs (attitudes, social norms, and perceived behavioral control), (2) predisposing factors, and (3) enabling factors as the outcome variables. Gender identity and sexual orientation had a significant omnibus effect, λ=.88, $F(6, 196) = 2.21$, $p = .044$; and λ=.92, $F(3, 98) = 2.96$, $p = .036$, respectively. In the between-subjects effects, attitudes were significantly different by gender identity [$F(2, 100) = 4.75$, $p = .011$], such that trans women had more positive attitudes (M = 4.59, SD = 1.12), compared to trans men (M = 3.81, SD = 1.51), and, in turn, GNC individuals (M = 3.71, SD = 1.31). Perceived behavioral control was significantly different by sexual orientation [$F(1, 100) = 5.72$, $p = .019$], such that individuals who identified as heterosexual had stronger perceived behavioral control (M = 5.41, SD = .98) versus those who did not (M = 4.55, SD = 1.54). The multivariate omnibus test was not significant for predisposing characteristics (ps > .133).

With enabling factors as independent variables, gender identity had a significant omnibus effect [λ=.77, $F(12, 190) = 2.19$, $p = .014$] as well as having a regular doctor [λ=.75, $F(6, 94) = 5.33$, $p < .001$]. For gender identity, trust, patient-centered care, and TGNC-inclusiveness were all significantly different (ps < .012). Follow up Bonferroni-corrected multiple comparisons indicate that trans women had more trust (M = 29.84, SD = 7.43 vs. M = 23.63, SD = 9.49), greater perceived patient-centered (M = 3.56, SD = .59 vs. M = 2.97, SD = .86) and TGNC-inclusive care (M = 20.77, SD = 5.91 vs. M = 17.00, SD = 6.00), versus individuals who identified as GNC. Individuals who reported having a regular doctor vs. not differed significantly by trust, patient-centered care, TGNC-knowledgeable and inclusive care (ps < .021), such that those who reported having a regular doctor had on average more trust (M = 29.25, SD = 9.01 vs. M = 20.53, SD = 7.56), more perceived patient-centeredness (M = 3.38, SD = .74 vs. M = 2.98,

SD = .74, and TGNC-knowledgeable (*M* = 12.73, *SD* = 4.39 vs. *M* = 9.33, *SD* = 4.38) and inclusive care (*M* = 21.01, *SD* = 5.47 vs. *M* = 14.57, *SD* = 6.15) versus those who did not have a regular doctor.

A series of chi-square tests examined differences in proportions between HCU delay and categorical demographic variables. Gender identity significantly different by HCU delay [$\chi^2(2, N = 106) = 10.04$, $p = .007$]. Trans women had a lower proportion of HCU delay (42.9%) compared to trans men (63.3%) and GNC or non-binary individuals (77.8%). All other chi-square tests were not significant (*p*s > .083).

Based on these bivariate results, age, income stability, insurance source, and having a regular doctor were the most consistent covariates to control for in mediational analyses that examine associations with HCU behavior, intent, and delay. For mediational models that examined the associations among health beliefs and enabling factors, covariates of age, income stability, gender identity, sexual orientation, and having a regular doctor may be particularly influential. For HCU delay, gender identity and age may be the most important demographic factors to include in subsequent models.

Bivariate associations. A correlation matrix was created run to examine the bivariate associations among the primary variables in the present study. Table 4 shows the associations of the four types of healthcare utilization, intent, and delay among health beliefs, predisposing characteristics, enabling factors, and needs along with the means and standard deviations of all continuous variables and frequency of dichotomous variables.

Utilization of primary care was significantly associated with social norms, perceived behavioral control, patient-centered care, TGNC-inclusive care, alcohol use (negative), number of chronic conditions, and need for hormone therapy. Utilization of other healthcare was

associated with perceived behavioral control, alcohol use (negative), cigarette use (negative), and number of chronic conditions. Utilization of mental health services was associated with global mental health (negative) and anxiety. Utilization of endocrinology services was associated with global mental health and need for hormonal therapy.

Intention to use healthcare services was associated with attitudes (negative), perceived behavioral control (negative), discrimination, victimization, negative expectations for the future, adverse childhood experiences, trust, patient-centered care, TGNC-inclusive and knowledgeable care, marijuana use (negative), global physical health, depression (negative), anxiety (negative), and number of chronic conditions (negative). Delaying medical care when needed was positively associated with discrimination, victimization, negative expectations, adverse childhood experiences, depression and anxiety, as well as was negatively associated with attitudes, perceived behavioral control, trust, pride, community consciousness, patient-centered care, TGNC-inclusive and knowledgeable care, and global physical and mental health.

Health beliefs were positively associated with each other, and were inconsistently associated with predisposing characteristics, enabling factors, and needs (Table 5). Norms were the least-robust correlate, only positively correlating with patient-centered care and TGNC-inclusive care, and negatively with adverse childhood experiences. Attitudes and perceived behavioral control were each negatively associated with discrimination, victimization, negative expectancies, ACES, depression, and anxiety, as well as positively associated with trust, community consciousness, patient-centered care, TGNC-inclusive and knowledgeable care, and global mental and physical health. More positive attitudes toward HCU was negatively associated with marijuana use, and perceived behavioral control over HCU was negatively associated with internalized transphobia and nondisclosure.

Table 4

Descriptive Statistics and Bivariate Correlations among HCU Behaviors, Intent, and Delay and Health Beliefs, Predisposing Characteristics, Enabling Factors, and Needs

	Primary	Mental Health	Other	Endo	Intent	Delay[a]	*M*	*SD*
Health Beliefs								
Attitudes	.12	.05	.04	-.09	.64**	-.29**	4.09	1.35
Social Norms	.25**	.05	-.04	-.15	.37**	.03	5.03	1.39
PBC	.22*	.03	.22*	.10	.42**	-.35**	4.72	1.48
Predisposing								
Discrimination	.18	.15	-.07	.06	-.09	.29**	2.50	1.60
Rejection	.17	.05	-.06	-.04	-.04	.18	2.84	1.62
Victimization	.17	-.15	-.03	.05	-.15	.22*	1.85	1.75
ACES	.02	.06	.02	.11	-.25*	.30**	3.67	2.69
Enabling								
Trust	.19	.16	.08	.07	.42**	-.34**	26.85	9.45
Patient-centeredness	.20*	.04	.05	.16	.39**	-.41**	3.27	0.76
TGNC-knowledge	-.02	.12	.01	.06	.28**	-.24*	9.73	3.63
TGNC-inclusiveness	.20*	.12	.07	.02	.51**	-.36**	17.01	5.26
Pride	.11	.02	.00	.18	.03	-.26*	17.81	6.68
Comm Conscious	.01	.03	.02	.05	.17	-.20*	11.82	4.15
Needs								
Alcohol use	-.28**	.02	-.23*	-.09	.03	.03	1.82	1.38
Cigarette use[a]	-.13	.02	-.21*	.13	-.27**	-.05[b]	Yes	27.5%
NMUPD[a]	-.10	.03	.11	.16	-.30**	.09[b]	Yes	12.8%
Other Illicit[a]	-.22*	.00	.01	.34**	-.35**	.00[b]	Yes	9.2%
Marijuana use	-.07	.06	-.12	.14	-.27**	.13	.97	1.35
Global physical health	-.10	-.02	-.07	-.06	.22*	-.41**	46.95	8.14
Global mental health	-.05	-.20*	.10	.20*	.10	-.46**	42.68	9.56
Depression	-.12	.10	.00	-.08	-.24*	.47**	57.99	9.29
Anxiety	.01	.22*	-.02	-.06	-.20*	.45**	60.64	10.32
Chronic conditions	.30**	-.15	.22*	.14	-.27**	.13	1.09	1.16
Int transphobia	-.16	.16	.01	.03	-.09	.14	13.49	7.97
Neg expectations	-.04	.04	-.11	-.07	-.14	.24*	21.34	7.13
Nondisclosure	-.16	.01	-.01	-.01	-.07	.14	11.20	5.40
M (*SD*)	2.62 (1.64)	2.12 (1.90)	1.66 (1.70)	.87 (1.53)	4.97 (1.48)	65% Yes	–	–

Notes. HCU = healthcare utilization; endo = endocrinologist; PBC = perceived behavioral control; ACES = adverse childhood experiences.

[a]Point-biserial correlation coefficient

[b]Spearman rank-order correlation coefficient

*$p < .05$. **$p < .01$.

Table 5
Bivariate Correlations among Health Beliefs and Predisposing Characteristics, Enabling Factors, and Needs

	Attitudes	Social Norms	PBC
Attitudes	–	.25**	.45**
Social Norms	–	–	.24*
Predisposing			
Discrimination	-.22*	-.13	-.30**
Rejection	-.13	.01	-.18
Victimization	-.24*	-.11	-.21*
ACES	-.26**	-.23**	-.29**
Enabling			
Trust	.59**	.14	.31**
Patient-centeredness	.53**	.20*	.35**
TGNC-knowledge	.23**	.05	.29**
TGNC-inclusiveness	.64**	.22*	.48**
Pride	.08	.04	.09
Comm Conscious	.19*	.06	.22*
Needs			
Alcohol use	.01	.01	.01
Cigarette use[a]	-.28**	-.22*	-.19
NMUPD[a]	-.22*	-.19	-.23*
Other Illicit[a]	-.17	-.35**	-.15
Marijuana use	-.19*	-.07	-.08
Global physical health	.40**	.01	.32**
Global mental health	.28**	-.04	.32**
Depression	-.34**	-.06	-.40**
Anxiety	-.41**	-.07	-.38**
Chronic conditions	-.18	.00	-.12
Int transphobia	-.13	-.11	-.25**
Neg expectations	-.32**	-.15	-.34**
Nondisclosure	-.01	-.17	-.27**

Notes. PBC = perceived behavioral control; ACES = adverse childhood experiences. NMUPD = non-medical use of prescription drugs.
[a]Point-biserial correlation coefficient
*$p < .05$. **$p < .01$.

Predisposing characteristics were generally positively associated with each other, as well as mental health problems, negative expectations, chronic conditions, and negatively associated with global physical and mental health, community consciousness, TGNC-knowledge and inclusive care (Table 6).

Table 6

Bivariate Correlations among Predisposing Characteristics, Enabling Factors, and Needs

	Discrimination	Rejection	Victimization	ACES
Discrimination	–	.61**	.62**	.41**
Rejection	–	–	.58**	.28*
Victimization	–	–	–	.45**
Enabling				
Trust	-.06	-.05	-.10	-.07
Patient-centeredness	-.16	-.18	-.13	-.17
TGNC-knowledge	-.27**	-.25**	-.26**	-.15
TGNC-inclusiveness	-.26**	-.14	-.21*	-.22*
Pride	.00	-.04	.00	-.12
Comm Conscious	-.09	-.28**	-.29**	-.24*
Needs				
Alcohol use	.03	.06	.06	-.13
Cigarette use[a]	.30**	.18	.24*	.24*
NMUPD[a]	.12	.02	.15	.15
Other Illicit[a]	.04	-.06	.05	.28**
Marijuana use	.20*	.13	.14	.22*
Global physical health	-.28**	-.15	-.26**	-.26**
Global mental health	-.31**	-.29**	-.24*	-.15
Depression	.26**	.20*	.25**	.21*
Anxiety	.32**	.15	.17	.11
Chronic conditions	.08	.07	.30**	.32**
Int transphobia	.03	.15	-.02	.10
Neg expectations	.25**	.23*	.25**	.25**
Nondisclosure	.08	.10	.05	.16

Notes. ACEs = adverse childhood experiences. NMUPD = non-medical use of prescription drugs.
[a]Point-biserial correlation coefficient
*$p < .05$. **$p < .01$.

Enabling factors were generally positively associated with each other, as well as global physical and mental health, and negatively associated with mental health problems, including internalized transphobia and negative expectations (Table 7).

Health needs can be classified as internalizing mental health problems and externalizing behavioral and physical health issues. Internalizing health issues, such as depression, anxiety, and internalized transphobia, were generally positively associated with each other (Table 8).

Externalizing behaviors, such as cigarette or illicit drug use also positively related to each other, except alcohol use did not correlate with any other need. These externalizing behaviors were, in turn, associated with reduced global physical health and increased number of chronic conditions.

Table 7

Bivariate Correlations among Enabling Factors and Needs

	Trust	Patient-centeredness	TGNC-knowledge	TGNC-inclusiveness	Pride	CC
Trust	–	.68**	.60**	.68**	.14	.10
Patient-centeredness	–	–	.49**	.59**	.19	.11
TGNC-knowledge	–	–	–	.66**	.06	.08
TGNC-inclusiveness	–	–	–	–	.05	.11
Pride	–	–	–	–	–	.27**
Needs						
Alcohol use	.03	.03	.23*	.14	.03	.09
Cigarette use[a]	-.14	-.11	.04	-.25**	-.08	-.14
NMUPD[a]	-.11	.06	-.07	-.28**	-.18	-.26**
Other Illicit[a]	-.15	-.04	-.05	0.23*	.05	-.09
Marijuana use	-.29**	-.14	-.07	-.18	.14	-.02
Global physical health	.33**	.26**	.31**	.34**	.17	.21*
Global mental health	.32**	.32**	.25**	.31**	.30**	.24*
Depression	-.38**	-.35**	-.25**	-.41**	-.28**	-.20*
Anxiety	-.37**	-.31**	-.29**	-.47**	-.12	-.10
Chronic conditions	-.08	-.07	-.16	-.11	-.05	-.17
Internalized transphobia	-.14	-.18	-.03	-.24*	-.52**	-.21*
Negative expectations	-.20*	-.28**	-.26**	-.34**	-.46**	-.24*
Nondisclosure	.06	-.04	.02	-.03	-.46**	-.22*

Notes. NMUPD = non-medical use of prescription drugs. CC = community consciousness
[a]Point-biserial correlation coefficient
*$p < .05$. **$p < .01$.

Table 8

Bivariate Correlations among Needs

	1	2	3	4	5	6
1. Alcohol use	–					
2. Cigarette use[a]	.08	–				
3. NMUPD[a]	.01	.38**	–			
4. Other Illicit[a]	.02	.45**	.35**	–		
5. Marijuana use	.11	.23*	.05	.29**	–	
6. Global physical health	.11	-.23*	-.30**	-.24*	-.23*	–
7. Global mental health	.09	-.07	-.13	.06	-.20*	.64**
8. Depression	.01	.12	.24*	.14	.30**	-.63**
9. Anxiety	-.07	.13	.24*	.06	.25*	-.52**
10. Chronic conditions	-.13	.04	.30**	.22*	-.04	-.37**
11. Internalized transphobia	-.02	.04	.16	.11	.13	-.22*
12. Negative expectations	.09	.08	.16	.03	.02	-.24*
13. Nondisclosure	.11	.06	.31**	-.01	.01	-.04
	7	8	9	10	11	12
7. Global mental health	–					
8. Depression	-.81**	–				
9. Anxiety	-.73**	.81**	–			
10. Chronic conditions	-.06	.04	-.02	–		
11. Internalized transphobia	-.42**	.48**	.35**	-.09	–	
12. Negative expectations	-.37**	.33**	.25**	.10	.48**	–
13. Nondisclosure	-.16	.16	.09	.10	.44**	.51**

Notes. NMUPD = non-medical use of prescription drugs.
[a]Point-biserial correlation
*$p < .05$. **$p < .01$.

Multivariate Analyses

To examine Hypotheses 1-4, a series of multivariate analyses were conducted. Due to the numerous variables represented in each respective construct (predisposing characteristics, enabling factors, needs, and health beliefs), this set of analyses determined the most consistent individual variables associated with HCU behavior, intent, and delay, as well as among predisposing characteristics, enabling factors, needs, and health beliefs to include for subsequent tests of indirect effects analyses.

Multivariate associations of HCU behavior. A series of multivariate analyses were conducted to determine the relationships among HCU behaviors and each set of constructs.

Multivariate multiple regression (MMR) analyses (for continuous and binary independent variables entered together) and MANOVAs (for binary independent variables) were conducted with each HCU behavior (primary, mental health, endocrinology, and other) as the dependent variables. The independent variables were examined separately by construct: predisposing characteristics, internalizing behavioral health needs, externalizing behavioral and physical health needs, transition-related needs, enabling resources, and HCU beliefs and intent. Associations among variables were assessed in the following steps to control for family-wise error: (1) examine the total multivariate omnibus effect; (2) if step 1 was significant, examine the omnibus effect for each independent variable; (3) if at least one effect from step 2 was significant, examine the overall models for each dependent variable; and (4) within the significant models for each dependent variable from step 3, examine the significance of individual associations between independent and dependent variables. Table 9 displays significant omnibus statistics for total model effects from step 1. Table 10 displays significant omnibus statistics for each independent variable from step 2. Table 11 presents model results for significant dependent variables from step 3.

Table 9
Summary of Significant Omnibus Statistics Results for Total Model of HCU behavior

	Wilk's γ	*df*	*F*	*p*
Internalizing needs	.79	12, 359.6	2.04	.021
Externalizing needs	.54	24, 332.6	2.64	< .001
Transition-specific needs	.48	16, 269.5	4.54	< .001
Health beliefs	.80	12, 259.6	1.90	.034
HCU Intent[a]	–		–	–

Note. [a]Because there was only one independent variable, there is no omnibus result for the total model. See Table 10 for the omnibus effect of HCU intent

Predisposing characteristics. The first MMR conducted for predisposing characteristics was not significant (p = .105).

Need. For internalizing needs, the omnibus models for global mental health and internalized transphobia were significant. However, none of the omnibus models for HCU behavior were significant (ps > .108).

Next, with externalizing behavioral and physical, the overall models for chronic conditions and illicit drug use were significant (ps < .003). Among HCU behavior, HCU-primary, mental health, and endocrinology, omnibus tests were significant (ps < .017). Individually, chronic conditions (b = .49, p = .001) and illicit drug use (b = -1.67, p =.005) were associated with HCU-primary. Also, illicit drug use was associated with HCU-endocrinologist (b = 1.87, p = .001).

Third, in the MANOVA with transition-related needs as independent variables, the overall models for hormonal therapy and counseling needs were significant (ps < .006). Within HCU behaviors, mental health use was significant (p < .001), which was individually associated with counseling needs (b = 2.69, p < .001).

Table 10
Summary of Significant Omnibus Statistics Results for Independent Variables of HCU behavior

	Wilk's γ	*df*	*F*	*p*
Internalizing needs				
Global mental health	.88	4, 98	3.31	.014
Internalized transphobia	.88		3.19	.017
Externalizing needs				
Chronic conditions	.84	4, 95	4.41	.003
Illicit drug use	.79		6.35	< .001
Transition-specific needs				
Hormonal therapy	.85	4, 88	4.00	.005
Counseling	.58		15.71	< .001
Health beliefs				
Social norms	.90	4, 98	2.75	.032
HCU Intent	.87	4, 100	3.75	.007

Enabling factors. The fourth MMR for enabling factors was not significant (p = .885).

Health beliefs. With HCU beliefs as outcomes, social norms was significant overall (p = .032), which was also individually associated with HCU-primary (b = .24, p = .041).

HCU Intention. With HCU intent as the outcome, HCU-primary was significant overall (p = .002), and individually with intent (b = .33, p = .002).

Table 11
Summary of Significant Model Statistics Results for Dependent Variables of HCU behavior

	df	*F*	*p*	R^2
Externalizing needs				
Primary	6, 98	4.90	< .001	.23
Endocrinologist	6, 98	2.76	.016	.14
Other	6, 98	3.00	.010	.16
Transition-related needs				
Mental Health	4, 91	14.86	< .001	.40
Health beliefs				
Primary	3, 101	3.21	.026	.09
HCU Intent				
Primary	1, 104	10.07	.002	.09

Multivariate associations of HCU intention. A second series of MMRs was run to examine the associations among the model constructs above and HCU intention. For a summary of significant associations among these variables, see Table 12.

Predisposing characteristics. The overall model was not significant (p = .053).

Need. The overall model for internalizing needs was not significant (p = .493). However, the overall model for externalizing and physical health needs was significant, γ = .79, F(6, 102.0) = 4.63, p < .001. For needs, global physical health [F(1, 107) = 5.54, p = .020, R^2 = .05], chronic conditions [F(1, 107) = 8.56, p = .004, R^2 = .07], marijuana use [F(1, 107) = 8.06, p = .005, R^2 = .07], cigarette use [F(1, 107) = 8.25, p = .005, R^2 = .07], and other illicit drug use [F(1,

107) = 14.61, $p < .001$, $R^2 = .12$] were significant. Because there was only one dependent variable, individual associations are identical to the multivariate model statistics.

Enabling resources. The overall model was significant, $\gamma = .70$, $F(6, 102.0) = 7.21$, $p < .001$. The overall models for patient-centered care [$F(1, 107) = 19.20$, $p < .001$, $R^2 = .15$], TGNC-inclusive care [$F(1, 107) = 37.38$, $p < .001$, $R^2 = .26$], TGNC-knowledgeable care [$F(1, 107) = 9.33$, $p = .003$, $R^2 = .08$], and trust [$F(1, 107) = 22.67$, $p < .001$, $R^2 = .17$] were significant.

Health beliefs. The overall model was significant, $\gamma = .53$, $F(3, 105) = 31.11$, $p < .001$. The overall model for attitudes [$F(1, 107) = 74.20$, $p < .001$, $R^2 = .41$], social norms [$F(1, 107) = 17.24$, $p < .001$, $R^2 = .14$], and perceived behavioral control [$F(1, 107) = 23.22$, $p < .001$, $R^2 = .18$] were all significant multivariately, as well as individually with intent.

Table 12

Summary of Statistically Significant Multivariate Associations among HCU Behavior/Intent and Predisposing Characteristics, Needs, Enabling Resources, and Beliefs

	Beliefs	Needs	Enabling
HCU-primary	Social norms$^+$ HCU Intent$^+$	Chronic conditions$^+$ Alcohol use$^-$ Illicit drug use$^-$	–
HCU Intent	Social norms$^+$ PBC$^+$	Global physical health$^+$ Chronic conditions$^-$ Marijuana use$^-$ Cigarette use$^-$ Other illicit drug use$^-$	Patient-centeredness$^+$ Trust$^+$ TGNC-inclusiveness$^+$ TGNC-knowledgeable$^+$

Notes. DV = dependent variable. PBC = perceived behavioral control.
$^+$positive correlation. $^-$negative correlation.

Multivariate differences by HCU delay. A series of MANOVAs was conducted to examine the differences between individuals who delayed medical care and those who did not by the constructs above. For a summary of statistics by HCU delay for significant variables in the models, see Table 13.

Predisposing characteristics. The overall model was significant, $\gamma = .88$, $F(4, 103) = 3.63$, $p = .008$. Unique independent variables were victimization [$F(1, 107) = 7.37$, $p = .008$, $R^2 = .07$], discrimination [$F(1, 107) = 9.50$, $p = .003$, $R^2 = .08$], and adverse childhood experiences [$F(1, 107) = 10.26$, $p = .002$, $R^2 = .09$].

Needs. The overall model for internalizing behavioral health was significant, $\gamma = .77$, $F(3, 104) = 10.36$, $p < .001$. The overall models for global mental health [$F(1, 106) = 29.08$, $p < .001$, $R^2 = .22$] and negative expectations [$F(1, 106) = 6.97$, $p = .013$, $R^2 = .06$], which were both individually associated with delay ($b = -9.06$, $p < .001$ and $b = 3.47$, $p = .013$.

The overall model for externalizing behavioral and physical health was significant, $\gamma = .79$, $F(6, 101.0) = 4.37$, $p < .001$. The only unique overall model for need was global physical health, $F(1, 106) = 21.87$, $p < .001$, $R^2 = .17$.

A logistic regression was run with delay as the outcome and transition-related needs as independent variables. The model was significant, $\chi^2(N = 99, 4) = 11.58$, $p = .021$. Counseling needs was individually associated with delay [OR = 3.56, $p = .007$].

Enabling resources. The overall model was significant, $\gamma = .76$, $F(6, 101.0) = 5.20$, $p < .001$. All enabling factors were significantly different by delay: patient-centeredness [$F(1, 106) = 20.76$, $p < .001$, $R^2 = .16$], TGNC-knowledgeable care[$F(1, 106) = 6.45$, $p = .013$, $R^2 = .06$], TGNC-inclusive care [$F(1, 106) = 15.41$, $p < .001$, $R^2 = .13$], physician trust [$F(1, 106) = 13.54$, $p < .001$, $R^2 = .11$], pride [$F(1, 106) = 7.84$, $p = .006$, $R^2 = .07$], and community consciousness [$F(1, 106) = 4.33$, $p = .040$, $R^2 = .04$].

HCU beliefs and intent. The overall model was significant, $\gamma = .84$, $F(4, 103) = 5.08$, $p = .001$. Unique independent variables were attitudes and perceived behavioral control, $F(1, 106) = 9.82$, $p = .002$, $R^2 = .08$ and $F(1, 106) = 14.43$, $p < .001$, $R^2 = .12$, respectively.

HCU behaviors. The overall model with HCU behaviors was not significant (p = .408).

Table 13

Statistically Significant Multivariate Differences among HCU Delay and Predisposing Characteristics, Needs, Enabling Resources, and Beliefs

	No Delay		Delay	
	M	*SD*	*M*	*SD*
Predisposing characteristics				
Victimization	1.44	1.82	2.46	1.97
Discrimination	1.93	1.65	2.86	1.46
ACES	2.67	2.49	4.31	2.66
Needs				
Global physical health	51.14	8.64	44.28	6.57
Global mental health	48.15	8.54	39.08	8.55
Negative expectations	19.21	6.63	22.68	7.19
Counseling needs, % yes	48.8%		76.9%	
Enabling Resources				
Trust	30.70	8.03	24.22	9.52
TGNC-knowledge	13.14	4.14	10.88	4.77
TGNC-inclusive	22.02	5.44	17.42	6.29
Patient-centeredness	3.64	0.70	3.02	0.70
Pride	19.91	5.82	16.34	6.89
CC	12.88	2.26	11.23	4.87
HCU Beliefs				
Attitudes	4.57	1.27	3.76	1.32
PBC	5.35	1.11	4.30	1.57

Notes. CC = community consciousness. PBC = perceived behavioral control.

Multivariate associations among predisposing characteristics, needs, enabling factors, and beliefs. A series of MMRs were conducted to examine the associations among the major constructs within the model. Table 14 provides a list of the significant variables of the subsequent omnibus tests. Tables of statistical summaries of total model omnibus effects (Table 15), omnibus effects of independent variables (Table 16), and model statistics for dependent variables (Table 17) are presented after the text.

Table 14

Summary of Significant Multivariate Dependent and Independent Variables among Predisposing Characteristics, Enabling Resources, Needs, and Beliefs

Construct	Scales
Predisposing	Discrimination, rejection, victimization, ACEs
Needs	Negative expectations, internalized transphobia, global mental health, global physical health, illicit drug use, hormonal therapy needs, surgery needs
Enabling	Patient-centeredness, trust, TGNC-knowledge, TGNC-inclusiveness, pride, community consciousness
Beliefs	Attitudes, social norms, perceived behavioral control

Predisposing characteristics and need. A MMR was conducted with predisposing characteristics as the dependent variables and internalizing needs (global mental health, internalized transphobia, and negative expectations) as the independent variables. The omnibus tests for global mental health and negative expectations were significant. For predisposing characteristics, the overall models for victimization, rejection, and discrimination were significant. Individually, global mental health was associated with victimization (b = -.05, p = .012), rejection (b = -.05, p = .015), and discrimination (b = -.05, p = .003). Negative expectations significantly related to victimization (b = .08, p = .004) and discrimination (b = .05, p = .023), but not rejection (p = .110).

For the externalizing model of need, the overall model for chronic conditions was significant. Among predisposing characteristics, victimization, discrimination, and ACES were significant. Individually, chronic conditions were associated with victimization (b = .54, p = .002) and ACES (b = .63 p = .007).

A MANOVA was conducted with transition-related needs as independent variables and predisposing characteristics outcomes. Among predisposing characteristics, victimization,

discrimination, and ACES were significant overall models, and were each positively individually associated with surgery needs (*p*s < .043).

***Predisposing characteristics and enabling resources*.** The overall models for rejection, community consciousness, and TGNC-inclusive care were significant. Individually, rejection (*b* = -.68, *p* = .012) was associated with community consciousness, but not TGNC-inclusiveness (*p* = .179).

Predisposing characteristics and beliefs. An MMR was run with beliefs, which was not significant (*p* = .052).

Enabling factors and needs. For internalizing needs, the overall models indicated that internalized transphobia and negative expectations were significant, but not global mental health. Within enabling resources, all variables were significant overall. Individually, internalized transphobia and negative expectations were associated with pride (*b* = -.32, *p* < .001 and *b* = -.24, *p* = .007, respectively), but not community connectedness, patient-centeredness, or trust (*p*s > .077). Negative expectations was also individually associated with TGNC-inclusiveness and knowledge (*b* = -.22, *p* = .022 and *b* = -.18, *p* = .010, respectively).

Within the MMR of externalizing needs, although the overall model was significant (*p* = .017), the omnibus tests for the independent variables were all nonsignificant (*p*s > .089).

A MANOVA was conducted with enabling factors as the outcome variables and transition-related needs as the independent variables. The omnibus tests for hormonal needs, as well as for community consciousness, TGNC-knowledge, and TGNC-inclusiveness was significant. Individually, hormonal needs were individually associated with TGNC-knowledge (*b* = 2.86, *p* = .012) and inclusiveness (*b* = 5.44, *p* = .001), but not community consciousness.

Enabling factors and beliefs. With beliefs as the outcome and enabling factors as the independent variables, the overall model of attitudes was significant. The overall models for patient-centeredness, TGNC-knowledge, TGNC-inclusiveness, and trust were all significant. All individual associations with attitudes among enabling factors were positive and significant (*p*s < .001).

Needs and beliefs. The overall models for global mental health and negative expectations were significant, as well as for attitudes and perceived behavioral control among beliefs. Individually, attitudes were associated with global mental health (b = .03, p = .038) and negative expectations (b = -.05, p = .007). Perceived behavioral control was also associated with global mental health (b = .03, p = .045) and negative expectations (b = -.05, p = .021).

The overall model for global physical health and illicit drug use were significant, as well as for all health beliefs. Individually, attitudes and perceived behavioral control were associated with global physical health (b = .05, p = .002 and b = .05, p = .008, respectively). Illicit drug use was associated with social norms (b = -1.69, p = .002).

The overall model for transition-related needs was not significant (p = .316).

Table 15

Summary of Significant Omnibus Statistics Results for Total Models of Multivariate Models of Predisposing Characteristics, Needs, Enabling Factors, and Beliefs.

Independent Variable	Wilk's γ	*df*	*F*	*p*
DV = Predisposing				
Internalizing needs	.76	12, 270.2	2.50	.004
Externalizing needs	.59	24, 346.6	2.31	< .001
Transition-related needs	.89	4, 92	2.94	.025
Enabling resources	.65	24, 346.6	1.86	.009
DV = Enabling Resources				
Internalizing needs	.48	18, 283.3	4.63	< .001
Transition-related needs	.66	24, 315.2	1.69	.024
Health beliefs	.44	24, 346.6	3.82	< .001
DV = Health beliefs				
Internalizing needs	.73	12, 270.2	2.86	.001
Externalizing needs	.67	18, 283.3	2.51	< .001

Note. DV = dependent variable

Table 16

Summary of Significant Omnibus Statistics Results for Independent Variables within Multivariate Models of Predisposing Characteristics, Needs, Enabling Factors, and Beliefs.

Independent Variable	Wilk's γ	*df*	*F*	*p*
DV = Predisposing				
Global mental health	.90	4, 102	2.68	.036
Negative expectations	91		2.54	.044
Chronic conditions	.85	4, 99	4.49	.002
Surgery needs	.89	4, 92	2.94	.025
DV = Enabling resources				
Rejection	.92	6, 99	2.65	.020
Internalized transphobia	.83	6, 100	3.50	.004
Negative expectations	.83		3.48	.004
Hormonal therapy needs	.82	6, 90	3.38	.005
Attitudes	.73	6, 99	5.96	< .001
DV = Health beliefs				
Global mental health	.97	4, 102	2.86	.027
Negative expectations	.90		2.91	.025
Global physical health	.86	3, 100	5.22	.002
Illicit drug use	.90		3.87	.011

Note. DV = dependent variable

Table 17
Summary of Significant Model Statistics for Dependent Variables within Multivariate Models of Predisposing Characteristics, Needs, Enabling Factors, and Beliefs.

Dependent Variable	*df*	*F*	*p*	R^2
IV = Internalizing needs				
Victimization	3, 105	6.39	< .001	.15
Rejection		4.66	.004	.12
Discrimination		610	< .001	.15
Pride	3, 105	17.13	< .001	.33
Community consciousness		3.44	.020	.09
Patient-centeredness		3.38	.002	.13
TGNC-knowledge		3.59	.003	.12
TGNC-inclusiveness		7.49	< .001	.35
Trust		4.10	.007	.11
Attitudes	3, 105	5.70	.001	.14
Perceived behavioral control		6.58	< .001	.16
IV = Externalizing needs				
Victimization	6, 102	4.20	< .001	.20
Discrimination		3.50	.003	.17
ACES		4.66	< .001	.22
Attitudes	6, 102	4.37	< .001	.20
Social norms		2.78	.015	.14
Perceived behavioral control		2.23	.046	.12
IV = Transition-related needs				
Victimization	4, 95	3.67	.008	.13
Discrimination		4.11	.004	.15
ACES		3.15	.018	.12
Community consciousness	4, 95	2.71	.035	.10
TGNC-knowledge		2.87	.027	.10
TGNC-inclusiveness		4.04	.005	.15
IV = Predisposing				
Community consciousness	4, 104	5.81	< .001	.18
TGNC-inclusiveness		2.49	.048	.09

Note. IV = independent variable

Mediational analyses. A series of mediation models was run to evaluate Hypotheses 5-7 that the associations between predisposing characteristics, enabling resources, and need and healthcare utilization would be mediated by behavioral intentions. Because intent was associated with HCU-primary, that was the focus of HCU behavior.

Hypothesis 5. It was hypothesized that the association between predisposing characteristics and HCU intent would be mediated by enabling resources, need, and health beliefs. Based on the multivariate findings above, victimization was the most robust predisposing characteristic, followed by discrimination and ACEs. First a simple mediation model was run with victimization as the independent variable, intent as the outcome, and needs as the mediators (assessed via global mental health, negative expectations, chronic conditions, TGNC-inclusiveness and knowledge, trust, patient-centeredness, and perceived behavioral control). For a summary of direct effect paths a and b, see Table 18. The direct effect (c') of victimization on intent was not significant, while the total effect (c) was significant, indicating a complete mediation effect. The total indirect effect, as well as the indirect effects for chronic conditions, TGNC-inclusiveness, and perceived behavioral control were significant (Table 18). To determine if these effects remained after controlling for covariates, non-significant mediators were removed, and income stability, age, insurance, and having a regular doctor were added as covariates. The total and direct effects remained the same, as well as the indirect effects for the overall model, chronic conditions, and TGNC-inclusiveness, but not perceived behavioral control.

In the same manner, discrimination was treated as the independent variable; however, the direct effect, total effect, and indirect effects were not significant (*p*s > .05).

The same process as above was conducted with ACES as the independent variable. For needs, global mental health and physical health, negative expectations, chronic conditions, TGNC-inclusiveness and knowledge, and community consciousness were assessed as mediators. For a summary of direct effect paths a and b, see Table 18. The direct effect was not significant and the total effect was significant, indicating a full mediation. The total indirect effect was significant, as well as the indirect effect for chronic conditions and TGNC-inclusiveness (Table 18). With the covariates included and nonsignificant variables removed, TGNC-inclusiveness no longer had a significant indirect effect on intent.

Table 18
Summary of Direct Effects for the Mediation between Predisposing Characteristics and HCU Intent

	Direct Effect		Indirect Effect
IV = Victimization	*Path a*	*Path b*	Estimate
Global mental health	-1.31**	-.26	.03
Negative expectations	1.03**	-.02	.01
Chronic conditions	.18**	-.26*	-.05*
TGNC-inclusiveness	-.76*	.09**	-.06
TGNC-knowledge	-.48*	-.05	.02
Trust	-.62	.02	-.01
Patient-centeredness	-.05	.21	-.01
Perceived behavioral control	-.18*	.25**	-.05*
	Total Effect (c)	*Direct Effect (c')*	Total Indirect Effect
R^2 = .39	-.14*	.21	-.12*
IV = ACES	Estimate	Estimate	
Global mental health	-.52	-.02	.01
Global physical health	-.78**	.00	.00
Negative expectations	.67**	.02	.01
Chronic conditions	.14**	-.24*	-.03*
TGNC-inclusiveness	-.45*	.11***	-.05*
TGNC-knowledge	-.18	-.03	.01
Community consciousness	-.37*	.24*	-.01
Perceived behavioral control	-.16**	-.03	-.04
	Total Effect (c)	*Direct Effect (c')*	Total Indirect Effect
R^2 = .37	-.13*	-.57	-.11*

*p < .05. **p < .01. ***p < .001.

Hypothesis 6. It was hypothesized that the association between predisposing characteristics and HCU behavior would be mediated by a cascade of indirect effects: (a) enabling resources, (b), need, (c) health beliefs, and (d) HCU intent. Within the Hayes Process macro, a serial mediation model can be run with up to 4 mediators. To determine the best representative for enabling factors and need for HCU behavior, a test of indirect effects was run with victimization as the independent variable, perceived behavioral control as the outcome, and the enabling factors and needs examined in the model above (i.e., global mental health, negative expectations, chronic conditions, TGNC-inclusiveness and knowledge, trust, and patient-centeredness). The overall indirect effect for this model was significant (b = -.13, p < .05) with individual indirect effects being negative expectations and TGNC-inclusiveness (ps < .05). The same process was conducted with ACES as the independent variable with the mediators of global mental health and physical health, negative expectations, chronic conditions, TGNC-inclusiveness and knowledge, and community consciousness. The indirect effect of the total model (b = -.08, p < .05) and for TGNC-inclusiveness were significant (p < .05).

The model for victimization was conducted with HCU-primary as the outcome and the meditators in the following sequential order: TGNC-inclusiveness (enabling), negative expectations (need), perceived behavioral control (belief), and HCU intent. The total indirect was significant and several indirect paths within the sequence, although not the full sequence (Table 19). For ACES and HCU-primary, the mediators were run in the following sequential order: TGNC-inclusiveness (enabling), chronic conditions (need), perceived behavioral control (belief), and HCU intent. The total indirect model was not significant. Negative expectations replaced chronic conditions, which resulted in a significant total indirect path as well as several significant serial paths (Table 19).

Table 19.
Summary of Indirect Effects for the Serial Mediation between Predisposing Characteristics and HCU

	Indirect Effect		Indirect Effect
IV = Victimization	Estimate	IV = ACES	Estimate
Total	-.09*	Total	-.06*
Vic → TIC → Int → HCU	-.02*	A → TIC → Int → HCU	-.01*
Vic → TIC → NE → Int → HCU	.01*	A → TIC → NE → HCU	.01*
Vic → TIC → PBC → Int → HCU	-.01*	A → NE → Int → HCU	.01*
Vic → NE → Int → HCU	.01*		

Notes. Vic = victimization; Int = intent; TIC = TGNC-inclusiveness; NE = negative expectations; A = ACES = adverse childhood experiences.

Hypothesis 7. It was hypothesized that the association between predisposing characteristics and HCU delay would be mediated by enabling resources, need, and health beliefs. First, the model for victimization and HCU delay was examined. Because delay was dichotomous, no total effect (*c*) was estimated. The overall indirect effect was significant, as well as for global mental health; although, no other mediator was significant. The model was re-tested with gender identity and age as covariates, and the indirect effects were sustained. The same process was repeated and replicated for discrimination. For ACES, no significant indirect effect was identified (Table 20).

To further understand the link between victimization and HCU delay through global mental health, as with HCU behavior in Hypothesis 6, a serial mediation analysis was conducted in the following order: TGNC-inclusiveness, negative expectations, global mental health, and perceived behavioral control. Several significant serial mediation effects were identified, including the full serial model (Table 21).

Table 20

Summary of Direct and Indirect Effects for the Mediation between Predisposing Characteristics and HCU Delay

	Direct Effect		Indirect Effect
	Path a	*Path b*	
IV = Victimization	Estimate	Estimate	Estimate
Global mental health	-1.33**	-.09*	.13*
Negative expectations	1.02**	-.02	-.02
Chronic conditions	.19***	.07	.01
TGNC-inclusiveness	-.77*	-.02	.02
Trust	-.68	-.01	.00
Patient-centeredness	-.05	-.88	.05
Perceived behavioral control	-.19**	-.27	.05
	R^2	*Direct Effect (c')*	*Total Indirect Effect*
	.43	.17	.24*
IV = Discrimination	Estimate	Estimate	Estimate
Global mental health	-1.83**	-.09**	.17*
Negative expectations	1.10*	-.02	-.02
Chronic conditions	.06	.15	.01
TGNC-inclusiveness	-.87*	-.02	.02
Trust	-.37	-.02	.01
Patient-centeredness	-.08	-.80	.06
Perceived behavioral control	-.28**	-.25	.07
	R^2	*Direct Effect (c')*	*Total Indirect Effect*
	.44	.26	.31*

Notes. R^2 reflects Nagelkerke pseudo R^2 for dichotomous outcomes.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 21

Summary of Indirect Effects for the Serial Mediation between Predisposing Characteristics and HCU Delay

	Indirect Effect
IV = Victimization	Estimate
Total	.24*
Vic → TIC → GMH → Delay	.02*
Vic → TIC → NE → GMH → Delay	.01*
Vic → TIC → NE → GMH → PBC → Delay	.01*
Vic → NE → GMH → Delay	.03*
IV = Discrimination	
Total	.32*
D → TIC → GMH → Delay	.02*
D → TIC → NE → GMH → Delay	.01*
D → TIC → NE → GMH → PBC → Delay	.01*
D → NE → GMH → Delay	.03*
D → GMH → Delay	.12*

Notes. D = discrimination; Int = intent; TIC = TGNC-inclusiveness; NE = negative expectations; GMH = global mental health
*$p < .05$.

Discussion

The purpose of this study was to create and evaluate a robust model of healthcare utilization among TGNC adults in the U.S. based on the Behavioral Model of Health Services Use (Andersen, 1995) and Theory of Planned Behavior (Ajzen, 1991). Due to the significant stigma-related stress associated with internalizing and externalizing behavioral health problems among the TGNC population, and the unknown mechanistic links among predisposing characteristics, such as discrimination and adverse childhood experiences, enabling factors, and needs, including patient-level and provider-level characteristics, the present study provides a starting point to examine the cascade of effects hypothesized to lead to healthcare utilization intent, behavior, and delay. As series of bivariate correlations and multivariate analyses parsed out the individual associations among predisposing characteristics, enabling resources, needs, beliefs, and healthcare utilization behavior, intent, and delay. The most robust variables within these models were tested in simple mediation and serial mediation analyses to determine the indirect effects that theoretically drive the association between predisposing characteristics and healthcare utilization, intent, and delay.

Sample Demographics

Overall, the sample was relatively diverse with regards to gender identity (39.4% trans men, 27.5% trans women, and 33.0% gender-nonconforming/nonbinary/agender), sexual orientation (24.8% straight), as well as representation of being partnered vs. not partnered (38.5% vs. 61.5%) as well as different states in the U.S. (n = 28) and type of city of residence (18.3% rural, 44.0% suburban, and 36.7% urban). The sample was mostly employed with an average of 28 hours worked per week (ranged from 0 to 60; 50% worked < 35 hours per week), was well-educated, and had insurance of some kind (93%; 26.5% public source). Different ages

were well-represented (range from 18 to 79, normally distributed distribution), with 50% of the sample being between 18-33 years of age. Half of the sample had an annual family income of < $50,000 per year, and approximately 28% of the sample reported their past-year income stability as very unstable to slightly unstable, with the majority having at least slightly stable income. There was, however a lack of racial/ethnic diversity (86.2% White, non-Hispanic). Interpretation of the present findings and subsequent generalizations should consider the overall sample characteristics.

Healthcare Utilization and Overall Health

HCU rates were relatively high in the present sample, with 84.3% of the sample reporting utilizing care at a doctor's office or clinic, 65.1% utilizing mental healthcare, 30.3% utilizing endocrinologist healthcare, and 59.4% utilizing some other non-emergency source of care in the past year. Despite high rates of HCU, 65% of the sample reported delaying seeking healthcare when they needed it. These rates contrast Cruz (2014) who reported that 82.5% of the sample postponed care due to discrimination or affordability, highlighting that the current sample may be less vulnerable to delay in seeking care. Overall attitudes and perceived social norms toward HCU were average, with over half of respondents reporting positive feelings and perceived social norms toward HCU, as well as having feelings of control over engaging in HCU behavior. In multivariate models, HCU intention was positively associated with HCU-primary (i.e., doctor's/clinic visits); however, HCU delay was not associated with intention or behavior.

Predisposing characteristics included gender identity-based stigma-related stressors and adverse childhood experiences (ACES). The sample reported on average about 3 ACES (ranged from 0 to 10), with some of the most common being verbal (58%), physical (41%), sexual abuse (34%), feelings of being unimportant (60%), and history of family mental health problems

(60%). The seminal U.S.-based study on ACES found 11% of the sample had childhood verbal/psychological abuse, 11% physical abuse, 22% sexual abuse, and 20% mental health problems (Felitti et al., 1998), showing elevated rates of ACES compared to U.S.-based adults. Among stigma-related stressors, the majority reported at least one lifetime discriminatory event (88%), feelings of rejection (92%) and victimization experience (73%). Within the discrimination subscale, having difficulty getting medical or mental health treatment because of one's gender identity was reported by 52.3% of the sample. Within the negative expectations subscale, 49% reported that they either "agree" or "strongly agree" that if they expressed their gender identity/history they would be denied good medical care. This is comparable to the National Transgender Discrimination Survey report, which found that about one-third of their sample who saw a healthcare provider in the past year reported having a negative experience related to their gender identity (James et al., 2015).

Among health variables, the present sample was on average below the general population for mental health and global physical health. On the NIH PROMIS measures for depression, anxiety, and global mental health the average within this sample was about 1 standard deviation (SD = 10) from the general population mean (M = 50), which according to the scale development indicates mildly elevated depressive and anxiety symptoms, as well as decreased global mental health (Hays, 2009). For global physical health, the present sample was about .5 below the average population, which is still indicative of mild physical functioning deficits. The sample had on average 1 chronic condition (ranged from 0 to 11 for the raw score), with 37% having no chronic conditions and 54% having 1 or 2 conditions.

For enabling factors, the sample was normally distributed for reports of TGNC-inclusive and knowledgeable care, as well as patient-centered care and physician trust, with most respondents having average perceptions of these factors.

Hypothesis 1

It was hypothesized that reports of more predisposing characteristics and poor health beliefs would be associated with reduced healthcare utilization and increased likelihood of delay, as past discrimination experiences have been associated with more healthcare avoidance (Socia et al., 2014). None of the predisposing characteristics were associated with HCU behaviors, although discrimination, victimization, and ACES were positively associated with delay.

Contrary to the hypothesis, in the multivariate models, predisposing characteristics were not associated with behavior or intention. This may be due to the fact that a cascade of effects lie in between exposure to predisposing characteristics on reduced healthcare utilization, as demonstrated in the mediation models. Distal factors are least likely to be directly correlated with behavior, but rather act *through* proximal variables that are direct antecedents to behavior, such as intention and perceived control (Ajzen, 1993). However, victimization, discrimination, and ACES were significantly associated with HCU delay, which is in line with Socia and colleagues (2014) who found that discrimination based on gender identity and exposure to violence was associated with healthcare avoidance.

Hypothesis 2

It was hypothesized that enabling resources would be associated with healthcare utilization, as well as HCU intention. Provider trust, patient-centered care, and culturally competent care have been associated with healthcare utilization and patients' health information seeking (Honda, 2004; Paez et al., 2009). Bivariately, patient-centered care and TGNC-

inclusiveness were positively associated with HCU-primary. Patient-centeredness, TGNC-knowledgeable and inclusive care, and trust in physicians were positively associated HCU intent, and negatively associated with delay. This is the first study to show that receiving patient-centered, TGNC-inclusive care may influence HCU directly. Contrary to Sanchez and colleagues (2009) who did not find a direct association between TGNC-friendly care and HCU, these findings suggest that when TGNC individuals perceive their healthcare provider to be inclusive of their gender identity and expression, they may be more likely to utilize care from their doctor's office or clinic, where they may be more likely to receive timely health services. Further, community connectedness and pride were only negatively associated with HCU delay. This may be due to the potential buffering effect these constructs have on the association between stress and mental health problems (Bockting et al., 2013; Pflum et al., 2015; Testa et al., 2015), reducing the need for care, thus may be better represented as a mediator between predisposing characteristics and HCU, as demonstrated in hypotheses 4-6.

In the multivariate models, enabling factors were not significant predictors of behavior; although, they were significant for intention and delay, with common individual factors being patient-centeredness, trust, and TGNC-knowledge and inclusivity. Due to the multivariate nature of the analyses, the effects of HCU behavior may have been muted by utilization of endocrinology and "other" healthcare services, which were not associated with a lot of the variables in the study; whereas, the models for intention and delay did not have other variables in the model, being better-powered to detect effects. Alternatively, perception of lack of TGNC-inclusive and patient-centered care may reduce one's attitudes toward receiving care, and thus reduce intention and increase delay; however, individuals' need for health services may out-weigh desire to avoid care or lack of desirable qualities of a provider, and resulting in HCU.

Additionally, the current model does not assess the different sources of care within each HCU behavior, and thus one of the healthcare providers a patient accesses may be particularly TGNC-inclusive, while another is not, potentially washing out any real effects. Lacking a TGNC-competent provider has been reported as a barrier to care (Bauer et al., 2013; Sanchez, Sanchez, & Dannoff, 2009), as well as patient-centered qualities such as communication and interpersonal skills (Rounds et al., 2013) have been reported promotors to HCU.

Hypothesis 3

It was hypothesized that increased need would be associated with HCU, as greater health needs have been associated with increased likelihood of health services utilization (Dunlop et al., 2002). Some needs were bivariately associated with HCU behavior, although no consistent pattern emerged across behaviors. Generally, more behavioral health problems were inversely associated with HCU intent, and positively associated with delay.

Multivariately, needs were examined in three sets: internalizing, externalizing, and transition-specific needs, which were all associated with HCU behavior, intention, and delay. Common individual variables among HCU behavior, intent, and delay were global mental and physical health, proximal stigma-related stressors (negative expectations and internalized transphobia), and chronic conditions. The negative association between chronic conditions and HCU intent is contrary to the general population, which indicates that individuals with more chronic conditions and lower perceived health have shown greater use of services (Dunlop et al., 2002). One potential explanation is that increased chronic conditions among this population are associated with a history of trauma and victimization, which increase mental health problems, particularly depression and internalized stigma, which may be associated with reduced trust or lower perceived TGNC-inclusiveness of care through negative expectations of the future.

Another possible explanation is that emergency department visits were not assessed in the study, and it may be that individuals with greater predisposing factors and more physical health needs, such as chronic conditions utilize care through the emergency department at a greater degree.

Hypothesis 4

It was hypothesized that more positive health beliefs would be associated with increased healthcare utilization and increased likelihood of delay, as negative attitudes, social norms, and reduced perceived behavioral control have been associated with reduced sexual health behaviors (Prabawanti et al., 2014). Bivariately, social norms and perceived behavioral control were associated with healthcare utilization of primary care, while attitudes and perceived behavioral control were inversely associated with healthcare delay. This is generally supportive of the Theory of Planned Behavior, such that less-positive attitudes towards HCU and lower perceived control over HCU behavior are less likely to engage in this behavior, as well as contributes to delaying the behavior (Ajzen, 1993). Health beliefs were significant in the multivariate models of behavior (social norms), intention (social norms and perceived behavioral control), and delay (attitudes and perceived behavioral control), in support of the hypothesis and in line with the Theory of Planned Behavior.

Hypothesis 5

It was hypothesized that the direct effect of predisposing characteristics on HCU intention would be mediated by enabling resources, needs, and health beliefs. To examine the theoretical underpinnings of the present study, a series of mediation analyses were conducted. Based on the minority stress model and transactional model of stress, exposure to stigma-related stressors such as discrimination and trauma are associated with greater internalizing and externalizing health problems (Meyer, 2003). Negative health beliefs toward HIV-related health

behaviors among transgender women have been associated with behavioral intention, and in turn health seeking behavior (Prabawanti et al., 2014).

To determine the key individual variables among the constructs, a series of exploratory multivariate analyses assessed the associations among each construct set. General patterns were identified such that perceived behavioral control was associated with HCU intent and delay, better global mental and physical health, and negative expectations for the future. Better global mental health, negative expectations, and chronic conditions were associated with more stigma-based victimization and childhood trauma/neglect, which were, in turn, associated with HCU delay.

Three simple mediation models tested the indirect effect of enabling resources, health beliefs, and needs on the direct association between predisposing characteristics (victimization, discrimination, and ACES) and HCU intent. The significant indirect effects on HCU intention were significant for victimization through chronic conditions and perceived behavioral control, as well as ACES through chronic conditions and TGNC-inclusiveness. This suggests that increased stigma-related victimization (e.g., being physically or verbally attacked due to gender identity/expression) and childhood neglect and dysfunction increased likelihood of chronic conditions, which was, in turn, associated with reduced HCU intention. Exposure to violence, discrimination, and a history of neglect can shape individuals' coping strategies, cognitions, and beliefs about themselves and expectations for rejection from others (Hatzenbeuler, 2009; Meyer, 2003). Through this cluster of negative effects from trauma history that resulted in reduced intention to receive healthcare services is affected by negative expectations from others based on past experiences (Grant et al., 2011), as well as cognitive distortions, such as catastrophizing, resulting from mental health problems (Muran & Motta, 1993). Lacking TGNC-inclusive care

exacerbated the negative effect of ACES on HCU intention, such that having a history of adverse childhood events as associated with reduced HCU intention through decreased TGNC-inclusiveness. Finally, increased victimization was related to reduced HCU intent through a decreased sense of perceived behavioral control. Repeated exposure to various forms of victimization, discrimination, and rejection can result in maladaptive cognitive, emotional, and social processes through which negative health beliefs may form.

Additionally, individuals who experienced victimization have greater risk for chronic conditions, and in turn, reduced HCU intentions. Contrary to Dunlop and colleagues' (2002) findings, increased chronic conditions were negatively associated with intention to use healthcare services in the current study. This finding is particularly troubling in light of the minority stress model, which posits that stress associated with stigmatized identities, such as victimization, is associated with increased mental health problems and reduced quality of life (Meyer, 2003). Although a causal link cannot be made between the predisposing factors here and chronic conditions, it has been shown that exposure to adverse childhood experiences have been shown to prospectively predict metabolic risk markers (e.g., elevated BMI), disease risk, and increased inflammation (Danese et al., 2009) making individuals more vulnerable to various chronic conditions, such as heart disease.

Hypothesis 6

It was hypothesized that the direct effect of predisposing characteristics on HCU behavior would be mediated by a cascade of indirect effects in the following order: (a) enabling resources, (b) need, (c) health beliefs, and (d) HCU intent. A serial mediation analyses found that victimization was associated with reduced HCU behavior through the following cascades: (1) TGNC-inclusiveness, negative expectations, intention; and (2) TGNC-inclusiveness, perceived

behavioral control, intention. This suggests that greater experiences of victimization reduce HCU through first decreased experiences of TGNC-inclusiveness, which, in turn, is associated with reduced perceived behavioral control and separately, increased negative expectations, which are both negatively associated with HCU intention, decreasing likelihood of utilizing health services. For ACES, a similar pattern was identified, such that ACES were associated with decreased TGNC-inclusiveness, which was negatively associated with negative expectations, and directly associated with reduced HCU (not through intention); and that TGNC-inclusiveness and negative expectations were indirectly associated with HCU behavioral through intent, separately. What this pattern of findings suggests is that experiences of trauma and victimization, whether stigma-related or not, are associated with having fewer protective factors, greater psychological internalizing, which decreases likelihood of getting medical care.

A related construct to perceived behavioral control, self-efficacy, may be a particularly important cognitive process that affects TGNC individuals' ability to cope with general and stigma-related stressors alike, as well as interactions with mental and behavioral health needs. Self-confidence is likely to impact TGNC individuals' perception of barriers when overcoming structural, interpersonal, and individual stigmas. Greater self-efficacy may allow TGNC people to engage in emotional regulation, positive coping, and enlist social support resources for help when exposed to stressors (Lazarus & Folkman, 1984). Exposure to stigma-related stressors such as victimization may limit TGNC individuals' self-efficacy for overcoming future events. The internalization of stigma may exacerbate this process through diminished self-efficacy (Link, Struening, Neese–Todd, Asmussen, & Phelan, 2001). Interventions to increase self-efficacy have shown decreases in emergency department visits among individuals with chronic conditions,

indicating that promoting self-management skills may be a low-cost way to improve health outcome for individuals with greater needs (Lorig et al., 2001).

Greater experiences of adverse childhood experiences may be linked to reduced HCU through the emotional consequences of trauma/neglect and social isolation. Social isolation models have posited that isolation catalyzes hypervigilance for social threats (Cacioppo et al., 2006). As a result, individuals who are socially isolated are more biased to recalling negative social information, and social distancing (Newall et al., 2009), which results in additional feelings of stress, pessimism, anxiety, and low self-esteem (Cacioppo et al., 2006). It is possible that through the development of cognitive biases and pessimism due to experiences of social isolation earlier in life, negative evaluations may be projected onto healthcare providers' perceived TGNC-inclusiveness, and as a result, resulting in actual reduced HCU behavior due to negative perceptions.

Hypothesis 7

It was hypothesized that the direct effect of predisposing characteristics on HCU delay would be mediated by enabling resources, need, and health beliefs. In a similar pattern as above, victimization and discrimination were indirectly associated with increased HCU delay through reduced global mental health. Because mental health was the only significant indirect effect on delay, an exploratory serial mediation examined the series of mediation effects like Hypothesis 6. Based on the psychological process model of stigma-related stress among lesbian, gay, and bisexual adults (Hatzenbueler, 2009), increased stigma-related stressors such as discrimination and victimization are associated with increased mental health problems through decreased ability to engage in protective/buffering activities (e.g., reduced social support), and increased proximal minority stressors, such as negative expectations, as well as reduced cognitive resources (e.g.,

self-efficacy). The significant patterns identified in this analysis were that increased stigma-related stressors were inversely associated with TGNC-inclusiveness, which was, in turn, associated with a cascade of detrimental beliefs and cognitions; namely, increased negative expectations for the future, reduced mental health, reduced perceived behavioral control, and HCU delay.

These findings suggest that the link between discrimination and victimization based on gender identity/expression and delay in healthcare services begins with TGNC-inclusiveness. Because the study is cross-sectional, causality cannot be inferred; however, the correlation between discrimination, victimization, and TGNC-inclusiveness of care reflects what is known about structural stigma of the TGNC population, such that there is a lack of training for healthcare providers on the needs of the LGBTQ community at large, and in particular, TGNC individuals (Sequeira et al., 2012; Solursh et al., 2003), which affects their ability to provide adequate care to this population (Lurie, 2005; Poteat et al, 2013). Structural stigma creates a lack of TGNC-inclusive care providers, in conjunction with the direct interpersonal victimization and discrimination experienced by TGNC individuals, sometimes from healthcare providers directly (Grant et al., 2011). Lacking a TGNC-inclusive provider exacerbates the effects of victimization and discrimination on internalized stigma, such as negative expectations about the future or fear of rejection. This cascade of exposure to stigma-related stressors, including by healthcare providers and within the healthcare system, results in the internalization of negative beliefs and cognitions, which has been associated with greater mental health problems among TGNC individuals (Testa et al., 2014). Whereas, having a TGNC-friendly healthcare provider may serve as a buffer between exposure to victimization and reduced HCU.

As previously discussed, internalization of stigma and subsequent mental health problems may diminish perceived behavioral control. Among a sample of adults living with HIV, concealment of HIV status has been associated with lower condom-use self-efficacy and affective distress (e.g., anxiety, hostility; Kalichman & Nachimson, 1999) highlighting the role that stigma plays in negative self-evaluation, and perhaps suggesting that distress can cause diminished self-efficacy (Pachankis, 2007). This process may be exacerbated by the cycle of social avoidance and isolation previously mentioned (Cacioppo et al., 2006), resulting in avoidance of healthcare when needed.

Intervention Implications

The present findings highlight a cascade of adverse behavioral and physical health effects that can largely be attributed to exposure to stigma-related stress and trauma/neglect history in TGNC individuals. Multi-level intervention efforts are imperative to address the structural stigma that results in experiences of stigma-related stressors, such as discrimination and victimization.

Structural stigma also affects TGNC individuals through limited access to quality healthcare. This form of structural stigma is multi-faceted and results from socioeconomic barriers as well as institutional barriers such as medical education and policies. First, there needs to be improved access to training for medical and other healthcare providers with regards to psychosocial factors that influence behavior unique to these populations, including transition-related care (Obedin-Maliver et al., 2011; Sequeira et al., 2012; Solursh et al., 2003). Having a TGNC-inclusive healthcare provider has been associated with reduced experiences of depression and past-year suicidality (Kattari et al., 2016a), and depression was associated with decreased HCU intent and treatment delay in the present study, which may be particularly imperative for

individuals with depression or suicidal ideation. Healthcare provider education interventions have provided some evidence in the improvement of provider knowledge and willingness to provide TGNC-specific care (Thomas & Safer, 2015).

At the individual-level, evidence-based treatments are needed to help TGNC individuals cope with the negative effects of stigma. Although no evidenced-based treatments are currently available that are specific to TGNC populations, the unique pathways set forth in the integrated behavioral model of healthcare utilization in this study point to mutable areas that may be tailored and targeted through currently available interventions.

Mental health interventions, such as adapted TGNC-affirmative cognitive behavioral therapy (CBT; Austin & Craig, 2015), could be an effective treatment to address the cognitive, affective, and behavioral antecedents to mental health outcomes for TGNC individuals. Through identifying maladaptive coping behaviors or cognitions, such as negative expectations for the future, and providing adaptive coping skills in the context of the minority stress model can improve clients' self-efficacy for addressing stigma-related stressors in the future and enhance uptake of positive coping in the future. Through improving internalized stigma and reduced mental health, individuals may have an improved sense of behavioral control and as a result, may not delay healthcare services in the future when needed.

Specific modes of treatment that may be particularly beneficial for TGNC individuals may be online or telehealth platforms given the limitations in accessing qualified, TGNC-friendly healthcare providers (Colemen et al., 2012). Although this mode of treatment may not be beneficial for all TGNC individuals, this may be particularly useful for individuals most at risk, such as those living in rural areas, experiencing social isolation, or lacking transportation, for example.

From a primary prevention perspective, supporting TGNC children may prevent the myriad deleterious mental health effects previously discussed. For example, when transgender children (aged 3-12 years) have been allowed to transitional socially, they have reported no differences in depression, and only marginally different levels of anxiety compared to gender- and age-matched community controls, as well as their siblings (Olson, Durwood, DeMeules, & McLaughlin, 2015), as opposed to previous studies where children are not allowed to socially transition (Cohen-Kettenis, Owen, Kaijser, Bradley, & Zucker, 2003). Less is known about gender presentation and mental health of children with non-binary identities, however. Bockting (2014) notes that there are significant differences in TGNC individuals who recognize their gender-nonconformity from early childhood versus adolescence or adulthood. Recognizing oneself as TGNC at an early age forces the "coming out" process much earlier, and coping may begin at an earlier stage if their identity is accepted. Future studies should parse out the link between social transitioning in childhood, family support, and gender-conformity on mental health of TGNC children and adults.

Undoubtedly, focusing on individual change is not enough to end the cycle of health effects of stigma-related stress among TGNC people. Structural changes are also needed to have a positive effect on the mental health of TGNC individuals. For example, presence of non-discrimination policies has been associated with fewer lifetime suicide attempts (Perez-Brumer, Hatzenbuehler, Oldenburg, & Bockting, 2015) and lower risk for past 30-day adverse emotional symptoms (Reisner et al., 2015). Moreover, living in a state with non-discrimination policies for employment has been linked to 26% decreased likelihood of having a mood disorder and 43% decreased likelihood of self-harm among transgender veterans in the U.S. (Blosnich et al., 2016). Implementation of nondiscrimination policies at the federal, state, and local levels can have

direct positive effects on TGNC individuals' mental health, and as a result, on timely healthcare utilization. Specific avenues that are most relevant based on this framework are nondiscrimination in housing, employment, healthcare settings, health policies, and education, access to affordable healthcare (e.g., Patient Protection and Affordable Care Act, 2010), training for healthcare providers, and public health awareness campaigns (e.g., "TRANSform Washington," Transgender Law Center, 2016).

Limitations and Future Directions

Despite its strengths, the current study has several limitations that should be discussed in the context of generalization of findings and future research. One limitation is the sampling method utilized, namely, convenience and incentivized snowball sampling through online sources. As noted in the previous literature as well as the present study, the TGNC-population experiences discrimination and victimization from healthcare providers and therefore attitudes toward participating in research may be poorer among this population, reducing the ability to sample many individuals within the present study's timeframe. Moreover, online sampling only accessed individuals who could use the internet. While approximately 20% of the present sample were referral-based, the majority were convenience sampled through online TGNC-focused listservs, which may attract individuals who are more prone to volunteerism and more engaged in the community. Two possible alternatives to this perspective is that most TGNC research (specifically trans vs. GNC) has been conducted in extremely underserved, community-based clinics, which has highlighted the extreme needs of the most vulnerable TGNC individuals; however, those studies may not reflect all TGNC individuals. As such, the present study's findings cannot be generalized to individuals at the lower end of the socioeconomic spectrum;

although, approximately 18% of the current sample had an annual family income of < $16,000, the majority were well-educated with at least a high school diploma.

Additionally, the study largely reached non-Hispanic White individuals and does not address the intersectionality of racism and gender identity-based stigma, which will likely affect all associations in the present study. TGNC people of color are at even greater risk for socioeconomic disadvantages and lack of access to care, which may affect healthcare utilization. TGNC people of color have been more likely to report not getting a job, being denied promotion, or being fired due to their gender (Grant et al., 2011), greater risk for discrimination in healthcare settings (Grant et al., 2011; Kattari & Hasche, 2016b), and gender-based discrimination (Bradford et al., 2013). For young TGNC Latinas, gaining asylum in the US (i.e., legal documentation status) after experiencing discrimination and violence in their country of origin is linked to lower HIV risk, such as improved access to services (Palazzolo et al., 2016).

Second, the sample size may be under-powered to examine the complex associations in the present study. According to the post hoc power analyses, small-sized effects may not have been adequately captured with the sample size. As a result, there were practical limitations on the number of covariates entered into the mediation models, which may have over-emphasized direct and indirect effects.

Third, lack of pre-validated measures for constructs assessed in the present study resulted in the need to create several scales based on other constructs (e.g., TGNC-inclusivity). The scales created for the current study largely had adequate to very good internal consistency, increasing confidence that this is not a major limitation. However, future studies should focus solely on measurement developing for TGNC-inclusion and knowledge as these were robust predictors in the present study. Moreover, the intentions assessed in the present study were general to "going

to the doctor or other healthcare provider" and as a result was not associated with mental health utilization or endocrinology. Future studies should be very specific about the behavior of interest for each intention.

Fourth, other variables that may be associated with healthcare utilization behavior, intent, or delay, as well as with the present study constructs were not included in the present study. Other barriers to care other than perceived TGNC-competency may have been influential, such as systemic barriers (e.g., changes in access to health insurance, cost), social support, or coping. For example, disclosure of gender identity to healthcare provider may influence perceived threat of discrimination, which may either promote or hinder desire to utilize or postpone care (Whitehead, Shaver & Stephenson, 2016).

Finally, the present study examined a series of associations and indirect effects, of which each construct cannot be determined to have temporal precedence over another. Recall time period was deeply considered when determining the present measurements, and was one principal reason HCU intention was included as an outcome as opposed to only modeling past behaviors. As such, past year HCU behavior may have been influenced by temporal effects of that time period, and the study constructs may more adequately have captured the proposed direct and indirect effects if at least two time points of data were collected. Therefore, it is imperative that future studies collect data from more than one time point to determine temporal precedence using longitudinal model such as cross-lagged panel designs, latent growth modeling, or hierarchical linear modeling for nested effects of time to parse out the causal directionality of the effects in the present study. Better yet, ecological momentary assessment methods would be ideal to detect day-to-day experiences of stigma-related stressors, internalizing and externalizing health needs to determine their connection with future healthcare avoidance or utilization. With

this method, it would be able to be model the time between a stressful event, subsequent coping behaviors such as substance use, resultant mental health needs, and either healthcare delay or utilization.

Conclusions

The current study examined robust associations among stigma-related stressors, adverse childhood experiences, personal and physician-related enabling factors, mental, behavioral, and physical health needs and healthcare utilization, intention, and delay among TGNC adults in the US. Due to the burden of stigma-related stress, TGNC individuals experience increased behavioral and physical health needs compared to cisgender individuals. Before the current study, enabling factors, needs, and beliefs, that may drive the link between predisposing characteristics and decreased healthcare utilization and increased likelihood of health services delay had yet to be examined quantitatively. Although predisposing factors were not directly associated with healthcare behavior, they were directly associated with healthcare delay. Moreover, mediation analyses indicated an indirect effect of victimization and adverse childhood events to decreased healthcare utilization and increased delay through mental health needs, internalized stigma, negative personal beliefs, perceived TGNC-inclusivity of healthcare providers, and finally behavioral intention. Thus, the present study illuminated a possible cascade of detrimental effects that are initiated by stigma-related stress through enabling resources, needs, and beliefs, that ultimately are associated with healthcare utilization intent, behavior, and delay.

These findings, in consideration with previous literature, highlight a two-pronged approach to address not only TGNC individuals use of health services, but their *timely* use of care and the *quality* of care they receive. First, the present findings extend qualitative reports

regarding the need of access to TGNC-inclusive and knowledgeable healthcare providers. Lack of a TGNC-competent provider may influence individuals to delay needed care, which can exacerbate need further and increase risk, depending on the services needed. Second, these findings point to the interrelations among stigma-related stress, behavioral health needs, health beliefs, and enabling resources. Thus, it is imperative that future research takes a multi-level approach by creating and testing evidence-based interventions to improve both healthcare providers' competency for providing quality care for TGNC individuals, as well as TGNC individuals' ability and self-efficacy for coping with the cascade of negative health effects of stigma-related stress, including internalized and anticipatory stigma.

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Appendix A

Questions	Response Options
What is your age?	____Years
Do you consider yourself cisgender? Cisgender means your personal gender identity matches the sex you were assigned at birth	Yes No
What is your current gender identity? (Check all that apply)	_ Male/Man _ Female/Woman _ Trans male/Trans man _ Trans female/Trans woman _ Genderqueer/Gender-nonconforming _ Different identity (please state): _____
What sex were you assigned at birth, meaning on your original birth certificate?	_ Male _ Female
In which country do you reside?	_____ [drop down list of all countries]
Please enter the unique code provided to you by the person who referred to you the study:	

Appendix B

Question	Response
What is your first and last name?	
What is your email address?	
Please enter the unique code provided to you by the person who referred to you the study:	

Appendix C

DEBRIEF

What was tested?
This study is interested in the relationships between discrimination experiences, health, and healthcare provider experiences, and healthcare utilization. Previous studies have found that discrimination, health problems, and poor patient-provider interactions are associated with decreased healthcare utilization. In this survey, you were asked to answer questions about all of these constructs.

Hypotheses and main questions:
We expect to find that discrimination experiences are associated with increased health needs and poor patient-provider interactions, and this association may be stronger for some individuals than others based on minority status.

Why is this important to study?
Identifying the connections between discrimination, mental health, attitudes, and behaviors will inform intervention efforts to reduce these problems among transgender adults. Also, we are interested in translating this knowledge to an education training session for healthcare providers.

What if I want to know more?
If you are interested in learning more about the health of transgender adults and the association with healthcare factors, you can contact the principal investigator Megan Sutter. if you would like more information on the resources used for this study at (727) 348-4749 or sutterme@vcu.edu.

If you would like to receive a report of this research when it is completed (or a summary of the findings), please contact Megan Sutter at the contact above.

If you have any questions, concerns or complaints about the research, you may contact the VCU IRB Office of Research at (804) 827-2157 or 800 East Leigh St, Biotech One, Suite 3000, Richmond, VA 23298. Additional information about participation in research studies can be found at http://www.research.vcu.edu/irb/volunteers.htm.

If you become uncomfortable after thinking about your discrimination experiences or health-related behaviors or other aspects of this research, please contact a local counselor or healthcare provider. If you have trouble finding a healthcare provider, please contact the PI, and they will make every effort to refer you to a resource.

Resource List:

- The Trevor Project Helplines
- Trans Lifeline
- LGBT Helpline & Peer Listening Line

    - 25 and older: 617-267-9001 or Toll-Free 888-340-4528 | Monday – Saturday, 6:00 pm – 11:00 pm
    - Under 25: 617-267-2535 or Toll-Free 800-399-PEER | Monday – Saturday, 5:30 pm – 10:00 pm
- National Suicide Prevention Lifeline - *1-800-273-TALK (8255)*
- Center of Excellence for Transgender Health University of California, San Francisco
- Transgender Law Center's Legal Information Helpline
- Lambda Legal Help Desk

Appendix D

The Gender Minority Stress and Resilience Measure

Instructions:

Gender-related discrimination, rejection, and victimization items (first 17 items). Please check all that apply (for example, you may check both after age 18 and in the past year columns if both are true). In this survey gender expression means how masculine/feminine/androgynous one appears to the world based on many factors such as mannerisms, dress, personality, etc.
All other items. Please indicate how much you agree with the following statements.

Gender-related discrimination
Response options: Never; Yes, before age 18; Yes, after age 18; Yes, in the past year
1. I have had difficulty getting medical or mental health treatment (transition-related or other) because of my gender identity or expression.
2. Because of my gender identity or expression, I have had difficulty finding a bathroom to use when I am out in public.
3. I have experienced difficulty getting identity documents that match my gender identity.
4. I have had difficulty finding housing or staying in housing because of my gender identity or expression.
5. I have had difficulty finding employment or keeping employment, or have been denied promotion because of my gender identity or expression.

Gender-related rejection
Response options: Never; Yes, before age 18; Yes, after age 18; Yes, in the past year
1. I have had difficulty finding a partner or have had a relationship end because of my gender identity or expression.
2. I have been rejected or made to feel unwelcome by a religious community because of my gender identity or expression.
3. I have been rejected by or made to feel unwelcome in my ethnic/racial community because of my gender identity or expression.
4. I have been rejected or distanced from friends because of my gender identity or expression.
5. I have been rejected at school or work because of my gender identity or expression.
6. I have been rejected or distanced from family because of my gender identity or expression.

Gender-related victimization
Response options: Never; Yes, before age 18; Yes, after age 18; Yes, in the past year
1. I have been verbally harassed or teased because of my gender identity or expression. (For example, being called “it”)
2. I have been threatened with being outed or blackmailed because of my gender identity or expression.
3. I have had my personal property damaged because of my gender identity or expression.
4. I have been threatened with physical harm because of my gender identity or expression.
5. I have been pushed, shoved, hit, or had something thrown at me because of my gender identity or expression.

6. I have had sexual contact with someone against my will because of my gender identity or expression.

Internalized transphobia
Response options: 5-point scale from strongly disagree to strongly agree
1. I resent my gender identity or expression.
2. My gender identity or expression makes me feel like a freak.
3. When I think of my gender identity or expression, I feel depressed.
4. When I think about my gender identity or expression, I feel unhappy.
5. Because my gender identity or expression, I feel like an outcast.
6. I often ask myself: Why can't my gender identity or expression just be normal?
7. I feel that my gender identity or expression is embarrassing.
8. I envy people who do not have a gender identity or expression like mine.

Question to determine appropriate wording for items regarding negative expectations for the future and nondisclosure: Do you currently live in your affirmed gender* all or almost all of the time?
(*Your affirmed gender is the one you see as accurate for yourself.)
Response options: Yes, I live in my affirmed gender most or all of the time; No, I don't live in my affirmed gender most or all of the time
If *yes*: use "history" in items below. If no: use "identity" in items below.

Negative expectations for the future
Response options: 5-point scale from strongly disagree to strongly agree
1. If I express my gender IDENTITY/HISTORY, others wouldn't accept me.
2. If I express my gender IDENTITY/HISTORY, employers would not hire me.
3. If I express my gender IDENTITY/HISTORY, people would think I am mentally ill or "crazy."
4. If I express my gender IDENTITY/HISTORY, people would think I am disgusting or sinful.
5. If I express my gender IDENTITY/HISTORY, most people would think less of me.
6. If I express my gender IDENTITY/HISTORY, most people would look down on me.
7. If I express my gender IDENTITY/HISTORY, I could be a victim of crime or violence.
8. If I express my gender IDENTITY/HISTORY, I could be arrested or harassed by police.
9. If I express my gender IDENTITY/HISTORY, I could be denied good medical care.

Appendix E

Health Beliefs

A. ATTITUDES

Directions: On the measure below, please tick the box indicating how good/bad it would be to go to the doctor or other health provider for your own healthcare. Tick one box for each item. Number 4 means "undecided." The closer a number is to the description you think fits best, the stronger you feel about it.

Going to the doctor or other health providers for my own healthcare would be...

1. 1 = extremely good to 7 = extremely bad
2. 1 = extremely pleasant to 7 = extremely unpleasant
3. 1 = extremely beneficial to 7 = extremely harmful

B. SUBJECTIVE NORMS

Directions: On the measure below, please tick the box indicating how people that are important to you would feel about going to the doctor or other health providers for your own healthcare. Tick one box for each item. Number 4 means "undecided." The closer a number is to the description you think fits best, the stronger you feel about it.

	1	2	3	4	5	6	7
People who are important to me would [likely-unlikely] advise me to go to the doctor or other health providers for my own healthcare.	Extremely unlikely						Extremely likely
Most people who are important to me think I [should/should not] go to the doctor's or other health providers for my own healthcare.	Should NOT						Should

C. PERCEIVED BEHAVIORAL CONTROL

Directions: On the measure below, please tick the box indicating how difficult it would be to go to the doctor or other health providers for your own healthcare. Tick one box for each item. Number 4 means "undecided." The closer a number is to the description you think fits best, the stronger you feel about it.

	1	2	3	4	5	6	7
I could easily go to the doctor or other health providers for my own healthcare if I wanted to. (R)	Extremely unlikely						Extremely likely

How much control do you have over whether you go to the doctor or other healthcare providers for your own healthcare?	Very little control	Complete control
Going to the doctor or other healthcare provider for my own healthcare would be…	Difficult	Easy

Appendix F

A. TRANSGENDER-INCLUSIVENESS

Using any number from 0 to 10, where 0 is the least transgender-inclusive care possible and 10 is the most transgender-inclusive care possible, what number would you use to rate your healthcare provider? _____

Bias and Cultural Competence Survey Questions (Johnson et al., 2004)

Think about your gender identity and expression when responding to the following questions:

Physician Bias and Interpersonal Cultural Competence Measures

1) Did the doctor treat you with a great deal of respect and dignity, a fair amount, not too much, or none at all?
2) I feel that my doctor understands my gender identity and/or expression.
3) I often feel as if my doctor looks down on me because of my gender identity and/or expression.

Responses: 1 to 5 Not at all to Very much

Health System Bias and Cultural Competence Measures

1) Do you think there was ever a time when you would have gotten better medical care if you were not trans or gender-nonconforming?
2) Thinking about all of the experiences you have had with healthcare visits in the last 2 years, have you ever felt that the doctor or medical staff you saw judged you unfairly or treated you with disrespect because of your gender identity/expression?
3) Thinking about all of the experiences you have had with healthcare visits in the last 2 years, have you ever felt that the doctor or medical staff you saw judged you unfairly or treated you with disrespect because of how you express or feel your gender?

Responses: 1 = all of the time to 5 = none of the time

Appendix G

B. TRANSGENDER KNOWLEDGE

1. Using any number from 0 to 10, where 0 is the least knowledgeable about transgender health possible and 10 is the most knowledgeable about transgender health possible, what number would you use to rate your healthcare provider? _____

2. Thinking about all of the experiences you have had with healthcare visits in the last 2 years, have you ever felt that the doctor or medical staff you saw was knowledgeable about your healthcare needs? [*responses*: 1 = very knowledgeable to 6 = not at all knowledgeable]

3. In the past 2 years, my healthcare providers were knowledgeable about my gender-related healthcare needs? [*responses*: 1 = strongly disagree to 6 = strongly agree]

4. In the past, have you had to teach any of your healthcare providers about your gender identity or expression? [*responses*: 1 = all of the time to 6 = none of the time]

5. In the past, have you had to teach any of your healthcare providers about your gender-related healthcare needs, such as hormone-replacement therapy? [*responses*: 1 = all of the time to 6 = none of the time]

Appendix H

Patient-Centeredness

Patient satisfaction questionnaire

On the following pages are some things people say about medical care. Please read each one carefully, keeping in mind the medical care you are receiving now. (If you have not received care recently, think about what you would expect if you needed care today.) We are interested in your feelings, good and bad, about the medical you have received.

How strongly do you AGREE or DISAGREE with each of the following statements?

[1 = strongly agree, 5 = strongly disagree]

1. Doctors are good about explaining the reason for medical tests
2. Doctors act too business like and impersonal toward me
3. My doctors treat me in a very friendly and courteous manner
4. Those who provide my medical care sometimes hurry too much when they treat me
5. Doctors sometimes ignore what I tell them
6. Doctors usually spend plenty of time with me

Appendix I

Trust in Physicians

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I doubt that my doctor really cares about me as a person	0	1	2	3	4
2. My doctor is usually considerate of my needs and puts them first.	0	1	2	3	4
3. I trust my doctor so much I always try to follow his/her advice.	0	1	2	3	4
4. If my doctor tells me something is so, then it must be true.	0	1	2	3	4
5. I sometimes distrust my doctor's opinion and would like a second one.	0	1	2	3	4
6. I trust my doctor's judgments about my medical care.	0	1	2	3	4
7. I feel my doctor does not do everything he/she should for my medical care.	0	1	2	3	4
8. I trust my doctor to put my medical needs above all other considerations when treating my medical problems.	0	1	2	3	4
9. My doctor is a real expert in taking care of medical problems Iike mine.	0	1	2	3	4
10. I trust my doctor to tell me if a mistake was made about my treatment.	0	1	2	3	4
11. I sometimes worry that my doctor may not keep the information we discuss totally private.	0	1	2	3	4

Appendix J

Chronic Conditions

Indicate whether or not you have any of the following health conditions (Yes/No):

Asthma
Diabetes
HIV infection
Kidney disease
Cancer
Coronary artery disease
Liver problems
Heart disease
Stroke
Other (Please Specify)

Appendix K

Transition-related needs

Please indicate if you needed and/or were unable to obtain any of the following services in the past 12 months:

	Needed:	Obtained:
Hormonal therapy	0 = Yes 1 = No	0 = Yes 1 = No
Transgender surgery of any kind	0 = Yes 1 = No	0 = Yes 1 = No
Counseling or psychotherapy	0 = Yes 1 = No	0 = Yes 1 = No
Gynecological care	0 = Yes 1 = No	0 = Yes 1 = No

Appendix L

Perceived Health Status

Please respond to each item by marking one box per row.

	Excellent	Very good	Good	Fair	Poor
In general, would you say your health is:	5	4	3	2	1
In general, would you say your quality of life is:	5	4	3	2	1
In general, how would you rate your physical health?	5	4	3	2	1
In general, how would you rate your mental health, including your mood and your ability to think?	5	4	3	2	1
In general, how would you rate your satisfaction with your social activities and relationships?	5	4	3	2	1
In general, please rate how well you carry out your usual social activities and roles. (This includes activities at home, at work and in your community, and responsibilities as a parent, child, spouse, employee, friend, etc.)	5	4	3	2	1
	Completely	Mostly	Moderately	A little	Not at all
To what extent are you able to carry out your everyday physical activities such as walking, climbing stairs, carrying groceries, or moving a chair?	5	4	3	2	1

Appendix M

Emotional Distress-Depression – Short Form 4a

Please respond to each question or statement by marking one box per row.

In the past 7 days…

	Never	Rarely	Sometimes	Often	Always
I felt worthless	0	1	2	3	4
I felt helpless	0	1	2	3	4
I felt depressed	0	1	2	3	4
I felt hopeless	0	1	2	3	4

Appendix N

Emotional Distress-Anxiety – Short Form 4a

Please respond to each question or statement by marking one box per row.

In the past 7 days…

	Never	Rarely	Sometimes	Often	Always
I felt fearful	0	1	2	3	4
I felt found it was hard to focus on anything other than my anxiety	0	1	2	3	4
My worries overwhelmed me	0	1	2	3	4
I felt uneasy	0	1	2	3	4

Appendix O

Healthcare utilization intention

Directions: On the measure below, please tick the box indicating how likely it would be for you to go to the doctor or other healthcare providers for your own healthcare if you had the chance. Tick one box for each item. Number 4 means "undecided." The closer a number is to the description you think fits best, the stronger you feel about it.

	1	2	3	4	5	6	7
1. I intend to go to the doctor or other healthcare providers for my own healthcare if offered the opportunity	Extremely unlikely						Extremely likely
2. If you had the opportunity, how likely is it that you would go to the doctor or other healthcare providers for my own healthcare?	Extremely unlikely						Extremely likely
3. If I were offered a chance to visit the doctor or other healthcare providers for my own healthcare, I would try to go.	Extremely unlikely						Extremely likely

Appendix P

Healthcare utilization

Past year healthcare utilization

1. In the past 12 months, how many times did you go to a primary care physician for your own healthcare?
Do NOT include visits while in the hospital or an emergency room, mental health professionals, or specialist visits.
_____visits

2. In the past 12 months, how many times did you go to a mental or behavioral health professional? *Do NOT include visits while in the hospital or an emergency room*.
_____visits

3. In the past 12 months, how many times did you go to an endocrinologist? *Do NOT include visits while in the hospital or an emergency room*.
_____visits

4. In the past 12 months, how many times did you go to some other healthcare professional for transitional-related care (e.g., surgeon for gender affirmation surgery) *that was not listed above*? *Do NOT include non-transition-related visits while in the hospital or an emergency room*.
_____visits

Appendix Q

Adverse Childhood Experience (ACE) Questionnaire

While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household often …
Swear at you, insult you, put you down, or humiliate you?
or
Act in a way that made you afraid that you might be physically hurt?
Yes No If yes enter 1 _____

2. Did a parent or other adult in the household often …
Push, grab, slap, or throw something at you?
or
Ever hit you so hard that you had marks or were injured?
Yes No If yes enter 1 _____

3. Did an adult or person at least 5 years older than you ever…
Touch or fondle you or have you touch their body in a sexual way?
or
Try to or actually have oral, anal, or vaginal sex with you?
Yes No If yes enter 1 _____

4. Did you often feel that …
No one in your family loved you or thought you were important or special?
or
Your family didn't look out for each other, feel close to each other, or support each other?
Yes No If yes enter 1 _____

5. Did you often feel that …
You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?
or
Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
Yes No If yes enter 1 _____

6. Were your parents ever separated or divorced?
Yes No If yes enter 1 _____

7. Was your mother or stepmother:
Often pushed, grabbed, slapped, or had something thrown at her?
or
Sometimes or often kicked, bitten, hit with a fist, or hit with something hard?
or

Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?
Yes No If yes enter 1 _____

8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?
Yes No If yes enter 1 _____

9. Was a household member depressed or mentally ill or did a household member attempt suicide?
Yes No If yes enter 1 _____

10. Did a household member go to prison?
Yes No If yes enter 1 _____

Now add up your "Yes" answers: _____ This is your ACE Score

Appendix R

E. SUBSTANCE USE

In the past year, how often have you used the following?

0 = never; 1 = once or twice; 2 = monthly; 3 = weekly; 4 = daily or almost daily

Alcohol (men, 5 or more drinks a day; women, 4 or more drinks a day)

Cigarettes

E-cigarettes or vape

Other tobacco product

Prescription Drugs for Non-Medical Reasons

Marijuana

Other illegal drugs (e.g., cocaine, heroin, MDMA)

Vita

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