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Associations of Discrimination, Body Image, and Physical Activity among  
Transgender Women in Atlanta, GA

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Associations of Discrimination, Body Image, and Physical Activity among  
Transgender Women in Atlanta, GA

By

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Bachelor of Science

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2010

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An abstract of a thesis submitted to  
the Faculty of the Rollins School of Public Health of Emory University  
in partial fulfillment of the requirements for  
the degree of Master of Public Health in Behavioral Sciences and Health Education  
2018

## Abstract

### Associations of Discrimination, Body Image, and Physical Activity among Transgender Women in Atlanta, GA

By Angela Cheung

**Background:** Previous literature suggests that transgender individuals have worse physical and mental health outcomes, and while physical activity can provide direct health benefits, transgender persons are less likely to participate in physical activity than cisgender persons. Furthermore, studies have demonstrated that transgender individuals frequently experience gender-based discrimination at the interpersonal and institutional levels, and body image issues are especially prevalent among transgender persons. Barriers to physical activity may include gender-based discrimination or body image issues, but to date, no research has assessed these relationships among transgender women, who are a particularly vulnerable sub-group of the transgender population.

**Objective:** This study examines: (1) whether perceived interpersonal discrimination and physical activity are associated, (2) whether perceived institutional discrimination and physical activity are associated, (3) whether body image and physical activity are associated, (4) whether body image mediates the relationship between perceived interpersonal discrimination and physical activity, and (5) whether body image mediates the relationship between perceived institutional discrimination and physical activity.

**Methods:** Secondary data analysis was conducted using data collected as part of an observational study of N=92 transgender women in Atlanta, Georgia. All observations were included in the analysis, and data were analyzed using SPSS and SAS. Descriptive statistics were calculated, and bivariate analyses included running Pearson R tests, independent T-tests, and one-way ANOVA tests. Multivariable analyses were conducted using multiple linear regression. Mediation analyses produced 10,000 bootstrap samples and 95% confidence intervals. Multivariable and mediation analyses controlled for significant demographic covariates.

**Results:** Bivariate analyses showed that four demographic variables had p-values less than 0.20: race, ethnicity, education, and employment. When controlling for these demographic covariates, the association between perceived interpersonal discrimination and physical activity was not significant ( $p=0.908$ ). The associations between perceived institutional discrimination and physical activity ( $p=0.163$ ), as well as body image and physical activity ( $p=0.428$ ), were also not significant. Body image did not mediate the relationship between perceived interpersonal discrimination and physical activity (95% CI= -0.1510, 0.0643), nor the relationship between perceived institutional discrimination and physical activity (95% CI= -0.0451, 0.0639).

**Discussion:** Although the findings were not statistically significant, this study still adds to the existing body of literature. To the author's knowledge, this is the first study to assess the role of interpersonal discrimination, institutional discrimination, and body image on physical activity among transgender women. This study also examines a unique, understudied population of transgender women who are less likely to engage in physical activity and are at higher risk for obesity. Additional research is recommended to address the study's limitations, such as improving upon measures by considering the complexities of discrimination, body image, and physical activity.

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## Acknowledgments

I would like to thank my wonderful thesis committee members, Delia Lang and Laura Salazar, whose patient guidance and perceptive feedback helped me through every step of this thesis. Their support never wavered throughout the numerous drafts and inevitable hurdles, and Dr. Salazar was also gracious enough to allow me to access her dataset for my study. I am grateful for this learning opportunity and the chance to work with some of the best researchers in the field of behavioral science.

I would also like to Alex Mijares, who supported me from the beginning and was invaluable in facilitating introductions to get me started with the thesis process. She always provided kind words of encouragement, and I am thankful that she is not only my colleague, but also my friend.

Furthermore, I am appreciative of my friends and family, who have kept me motivated throughout the year. They have been my rocks, reassuring me during uncertainties and cheering me on from the beginning to the end. They inspire me to strive for my goals and ambitions, and I am so happy to have them by my side.

Lastly, I would like to thank Emory University and all of the professors, students, and staff at the Rollins School of Public Health, and especially, those in the Behavioral Science and Health Education department. I am amazed by the passion and dedication of the Rollins community, and I look forward to collaborating in the future to advance public health.

I owe my sincerest gratitude to all of these marvelous people who have helped me achieve a lofty goal and, more importantly, who have shaped my understanding of public health and health equity.

## Table of Contents

<b>INTRODUCTION .....</b>	<b>1</b>
Background.....	1
Theoretical Framework.....	8
Purpose of Study.....	9
<b>LITERATURE REVIEW .....</b>	<b>12</b>
Discrimination & Physical Activity.....	12
Body Image & Physical Activity .....	13
Research Gap .....	14
<b>METHODS .....</b>	<b>16</b>
Study Procedures .....	16
Measures .....	17
Data Analysis .....	20
<b>RESULTS .....</b>	<b>22</b>
Descriptive Analyses .....	22
Bivariate Analyses .....	24
Multivariable Analyses .....	25
Mediation Analyses .....	26
<b>DISCUSSION .....</b>	<b>28</b>
Main Findings by Hypothesis.....	28
Analysis of Main Findings.....	29
Limitations .....	34
Implications & Recommendations.....	35
Conclusion .....	37
<b>REFERENCES.....</b>	<b>38</b>

## INTRODUCTION

### **Background**

#### ***Transgender Identities***

In the United States, it is estimated that about 1 million people identify as transgender (Meerwijk & Sevelius, 2017). Transgender individuals are conceptualized as those whose gender identities do not necessarily align with their assigned sex at birth (Parents and Friends of Lesbians and Gays [PFLAG], n.d.). In contrast, cisgender individuals are those whose gender identities do reflect their assigned sex at birth. While assigned sex depends on anatomical, physiological, or genetic attributes, gender identity refers to a person's deeply held internal sense of gender as a man, woman, both, neither, or anywhere on the gender continuum (PFLAG, n.d.). More specifically, transgender men are those who are assigned female at birth but identify as male, and transgender women are persons who are assigned male at birth but identify as female (PFLAG, n.d.).

#### ***Body Image, Transitioning, & Gender Expression***

Because transgender individuals can experience dissonance between their assigned sex and their gender identity, they may hold a more negative body image (Vocks, Stahn, Loenser, & Legenbauer, 2009; Lindgren & Pauly, 1975). Body image refers to a person's attitudes, experiences, and perceptions as a result of his or her physical appearance, which are informed by observations of the self and the responses of others (Cash & Pruzinsky, 2002). In these ways, body image depends on both one's self-concept and on the social context (Cash & Pruzinsky, 2002).

Some transgender persons may choose to affirm their gender identity by transitioning through medical, legal, or social means (PFLAG, n.d.). Medical



transitioning can include taking hormones or undergoing surgeries to change their bodies to more closely resemble their gender identities, and legal and social transitioning encompasses changing names, pronouns, and identification documents to align with their gender identities (PFLAG, n.d.). However, not all transgender people decide to transition due to personal reasons or barriers beyond their control, such as access or cost (PFLAG, n.d.). Opting out of transitioning does not invalidate one's gender identity, but rather, self-identification in itself lies at the core of gender identity (PFLAG, n.d.).

It is also important to recognize that gender identity differs from gender expression. Transgender individuals may consciously or subconsciously communicate their gender to society through their outward clothing, appearance, behavior, or mannerisms (PFLAG, n.d.). These gender expressions can reflect societal norms of masculinity and femininity, or transgender persons may present as both male and female or neither (PFLAG, n.d.). However, this external gender expression may not necessarily reflect one's internal gender identity (PFLAG, n.d.). For example, a transgender person can identify as a woman but dress in a way that is traditionally masculine.

### ***Gender-Based Discrimination***

Society generally has a binary, biologically-determined understanding of gender as being male or female, with everyone expected to be one or the other. Because transgender people may not follow the traditional gender norms dictated by society, they are frequently the targets of discrimination due to their gender identity (Lombardi, Wilchins, Priesing, & Malouf, 2001; Al Ramiah, Hewstone, Dovidio, & Penner, 2010). Forms of discrimination can include verbal and non-verbal hostility, as well as denial of opportunities (Lombardi, Wilchins, Priesing, & Malouf, 2001; Al Ramiah, Hewstone,

Dovidio, & Penner, 2010). In fact, the National Transgender Discrimination Survey found that out of a sample of 6,450 transgender participants, 63% had experienced a serious act of discrimination that significantly impacted their quality of life (Grant et al., 2011). These acts included bullying, harassment, physical and sexual assault, diminished employment prospects, reduced housing opportunities, and denial of medical services (Grant et al., 2011).

In terms of verbal and non-verbal hostility, one study of 239 transgender persons showed that almost 59.5% of participants had been a victim of harassment or violence in their lifetime (Lombardi, Wilchins, Priesing, & Malouf, 2001). Experiences of street harassment or verbal abuse were the most common, affecting 55.5% of participants, followed by being stalked for 22.9% of participants (Lombardi, Wilchins, Priesing, & Malouf, 2001). Similarly, in the National Transgender Discrimination Survey, 53% of transgender people reported being verbally harassed or disrespected in public spaces (Grant et al., 2011). In addition to verbal aggression and public harassment, transgender individuals are often the subjects of physical and sexual violence. For example, 26.6% of transgender individuals in one sample reported experiencing a violent incident in their lifetime, with 19.4% assaulted without a weapon and 10.2% assaulted with a weapon (Lombardi, Wilchins, Priesing, & Malouf, 2001). Other common types of physical assault included having objects thrown at them, robbery, and unjustified arrests (Lombardi, Wilchins, Priesing, & Malouf, 2001). Sexual assault was also pervasive in this sample, for 13.7% of transgender participants reported instances of being raped or attempted rape (Lombardi, Wilchins, Priesing, & Malouf, 2001). These types of attacks are violent and can quickly escalate into homicide. The National Coalition of Anti-Violence Programs

(2016) found that at least 19 deaths of transgender people in 2016 were related to fatal violence, and the Human Rights Campaign (n.d.) tracked at least 28 homicides due to transgender status in 2017. These forms of verbal and non-verbal hostility occur at the interpersonal level, with members of society repeatedly targeting transgender individuals.

Not only does discrimination precipitate through interpersonal interactions, but discrimination is pervasive in institutional settings as well. With institutionalized discrimination, transgender persons face denial of opportunities and unequal access or treatment. In one report, 47% of transgender individuals surveyed indicated that they had experienced an adverse job outcome, such as loss of employment or denial of a job or promotion, due to their gender identity (Grant et al., 2011). Additionally, these individuals reported experiences with housing discrimination due to their gender identity, with 19% of participants refused housing and 11% evicted (Grant et al., 2011). Unequal treatment also occurred in healthcare, for 19% of participants had been refused medical care as a result of their transgender status (Grant et al., 2011). It should be noted that while discrimination can be systemic, friends, family members, coworkers, and other peers in these institutional settings can commit harassment and violence against transgender people as well. For example, 50% of transgender participants surveyed reported experiencing harassment in the workplace (Grant et al., 2011).

Discrimination against transgender people is widespread and occurs in many forms, and experiences can also vary between subgroups of transgender people. The National Transgender Discrimination Survey identified a higher risk of discrimination among transgender women than transgender men (Grant et al., 2011). Compared to transgender men, about 15% more transgender women reported experiencing

discrimination in hiring, and about 4% more transgender women were refused care due to their gender identity (Grant et al., 2011). Furthermore, 5% more transgender women faced physical violence or sexual assault at work compared to transgender men (Grant et al., 2011). Although studies show that the transgender population as a whole endures unequal treatment and adversity, disparities within this population are also important to recognize.

### ***Mental Health, Substance Use, & Sexual Health***

Not only are transgender people frequent targets of gender-based acts of discrimination, but they are also at high risk for adverse health outcomes as a result of the interpersonal and institutional marginalization. For one, traumatic experiences with discrimination can result in poor mental health outcomes. One study suggested that discrimination is correlated with higher psychological distress, and mental health issues are especially prevalent among transgender individuals (Bockting, Miner, Romine, Hamilton, & Coleman, 2013). In a sample of 1,093 transgender persons, 40.1% of participants showed psychological distress, about 44.1% of participants exhibited depression, and 33.2% reported experiences with anxiety (Bockting, Miner, Romine, Hamilton, & Coleman, 2013). In terms of disparities by transgender subgroups, the odds of depression were 2.19 times higher among transgender women than transgender men, and the odds of anxiety were 1.36 times higher (Bockting, Miner, Romine, Hamilton, & Coleman, 2013). In addition, suicide rates among transgender people have been shown to be extremely high. In the National Transgender Discrimination Survey, 41% of transgender participants indicated that they had ever attempted suicide, which was more than twenty-five times higher than the attempted suicide rates among the general

population (Grant et al., 2011). These attempted suicide rates were also higher among certain groups. When results were stratified by employment status, 55% of those who had lost a job due to their gender identity reported attempting suicide (Grant et al., 2011). Furthermore, 61% of physical assault survivors and 64% of sexual assault survivors had attempted suicide (Grant et al., 2011).

Transgender persons may also turn to substance use after experiencing discrimination. Discrimination has been suggested to be positively associated with smoking and failed smoking cessation attempts, and in one survey, almost 1.5 times more transgender people reported smoking daily or occasionally, compared to the general population (Gamarel et al., 2016; Grant et al., 2011). Of the transgender individuals surveyed, 26% of participants also indicated that they were currently using or had used alcohol or drugs to cope with gender-based mistreatment (Grant et al., 2011). Those who had been physically or sexually assaulted or had lost a job due to discrimination also reported higher rates of alcohol and drug use (Grant et al., 2011). Disparities regarding substance use exist within the transgender population as well. In one study of transgender individuals, 34% of transgender women had used intravenous drugs in their lifetime, compared to 18% of transgender men (Clements, Marx, Guzman, Ikdea, & Katz, 1998).

Drug use may lead to the high burden of HIV seen among transgender people. The National Transgender Discrimination Survey reported that the HIV infection rate among transgender people was 2.64%, almost four times higher than the rate among the general adult population in the United States (Grant et al., 2011). Furthermore, transgender women are disproportionately affected by HIV compared to transgender men. Of the transgender people who were diagnosed with HIV between 2009 to 2014,

84% of these individuals were transgender women (Centers for Disease Control and Prevention, 2017a). The prevalence rates for HIV among transgender women are high, ranging from 22% to 35% (Baral et al., 2013; Clements-Noelle, Marx, & Katz, 2001).

### ***Physical Health***

While many studies have examined the mental health, substance use, and sexual health outcomes among the transgender population, limited research exists about the physical health of transgender adults, with the exception of one study conducted among older transgender adults. Researchers found that compared to cisgender participants, transgender participants were at higher risk for poorer physical health and had a higher likelihood of having a disability, and experiences with stigma and victimization were positively associated with these outcomes (Fredriksen-Goldsen et al., 2014). Results also indicated that transgender individuals had an obesity rate of 40%, which was higher than the obesity rate of 25% for cisgender participants (Fredriksen-Goldsen et al., 2014).

### ***Physical Activity***

In light of these adverse health outcomes, physical activity may provide direct benefits to improving health. For example, regular physical activity is correlated with improved symptoms of anxiety and depression (Dunn, Trivedi, & O'Neal, 2001; Warburton, Nicol, and Bredin, 2006). The benefits of participating in physical activity also include the reduced risk of obesity, cardiovascular disease, hypertension, diabetes mellitus, colon cancer, and osteoporosis (Warburton, Nicol, and Bredin, 2006). In these ways, participation in physical activity can be an indicator of physical health.

The literature has shown that transgender persons are at disproportionate risk for negative mental and physical health outcomes, yet transgender persons are less physically

active. The study conducted with older transgender adults revealed that 23% of transgender participants reported low levels of physical activity, compared to 15% of cisgender participants (Fredriksen-Goldsen et al., 2014). Another study of transgender adults supported this finding, suggesting that transgender individuals were less likely to participate in physical activity than cisgender individuals (Muchicko, Lepp, & Barkley, 2014). It is possible that this low engagement in physical activity among transgender individuals may be connected to gender-based discrimination experiences and body image issues, but these relationships have not yet been explored.

### **Theoretical Framework**

As a guiding framework for this study, the Social Cognitive Theory (SCT) will be used. SCT introduces the idea of reciprocal determinism, which considers the dynamic interaction between the individual, environment, and behavior (Bandura, 1986). In these ways, SCT can be deployed to better understand how behavioral changes occur in relation to personal and environmental factors (Bandura, 1986).

As suggested by the literature, transgender individuals face pervasive interpersonal and institutional discrimination in their environment, from hostile social interactions to denied opportunities in various public settings. This type of gender-based discrimination perpetuated by society can be considered as an environmental factor. Body image issues, an individual-level factor, may also be especially relevant to consider since transgender persons often experience dissonance between their assigned sex and their gender identity. These environmental and personal elements may lead to multiple adverse health outcomes, and while physical activity may improve one's health status, this behavior does not have high rates of uptake among transgender persons. SCT posits that

various multi-level factors constantly influence each other and can be assessed to determine how they ultimately connect to physical activity; thus, SCT provides the framework for this study's research questions. In fact, SCT has frequently been used to guide physical activity interventions and research (Young, Plotnikoff, Collins, Callister, & Morgan, 2014).

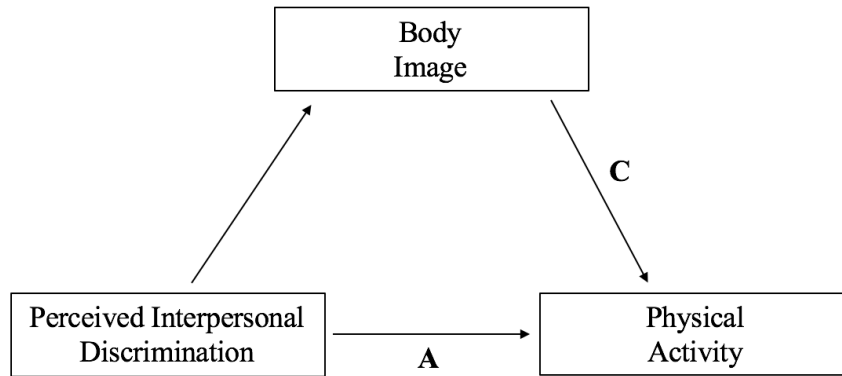
### **Purpose of Study**

This study will focus on transgender women since they are a particularly vulnerable group within the transgender population, as they report more experiences of discrimination and worse health outcomes. Using the SCT as the theoretical framework then, the purpose of this study is to examine five research questions among transgender women:

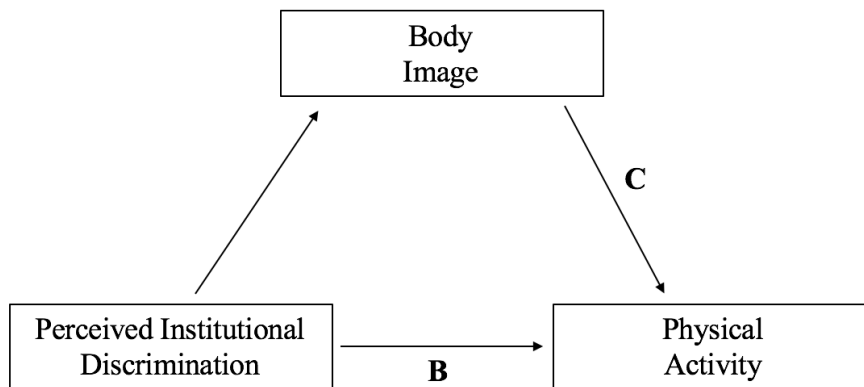
1. What is the association between perceived interpersonal discrimination and physical activity? (Figure 1, Pathway A)
2. What is the association between perceived institutional discrimination and physical activity? (Figure 2, Pathway B)
3. What is the association between body image and physical activity? (Figures 1 and 2, Pathway C)
4. Does body image mediate the relationship between perceived interpersonal discrimination and physical activity? (Figure 1)
5. Does body image mediate the relationship between perceived institutional discrimination and physical activity? (Figure 2)



*Figure 1. Relationship between Perceived Interpersonal Discrimination and Physical Activity Mediated by Body Image*



*Figure 2. Relationship between Perceived Institutional Discrimination and Physical Activity Mediated by Body Image*



Based on previous literature and the SCT, the following hypotheses were made:

1. Hypothesis 1: Transgender women who experience higher perceived interpersonal discrimination will have lower levels of physical activity.
2. Hypothesis 2: Transgender women who experience higher perceived institutional discrimination will have lower levels of physical activity.
3. Hypothesis 3: Transgender women with more negative body image will have lower levels of physical activity.
4. Hypothesis 4: Body image will mediate the relationship between perceived interpersonal discrimination and physical activity.
5. Hypothesis 5: Body image will mediate the relationship between perceived institutional discrimination and physical activity.

Not only will the results of this study add to existing literature and improve understanding of the health of transgender women, but findings may also be used to design interventions that promote physical activity as a healthy coping strategy among this vulnerable group. This study may also inform discrimination-related policy recommendations to protect the welfare and livelihoods of transgender individuals.

## LITERATURE REVIEW

### **Discrimination & Physical Activity**

Studies have shown that compared to cisgender individuals, transgender persons are less likely to participate in physical activity (Fredriksen-Goldsen et al., 2014; Muchicko, Lepp, & Barkley, 2014). To better understand the barriers to physical activity among transgender individuals, a groups of researchers conducted a systematic literature review on transgender involvement in sports (Jones, Arcelus, Bouman, and Haycraft, 2017). This review demonstrated that the primary barrier to engagement in physical activity was a non-inclusive or unsafe environment (Jones, Arcelus, Bouman, & Haycraft, 2017). For example, several reviewed studies found that transgender individuals feared being harassed or outed in public settings, such as gyms, swimming pools, changing rooms, and toilets, and transgender persons who held these fears were less likely to participate in physical activity (Hargie, Mitchell, & Somerville, 2015; Ellis, McNeil, & Bailey, 2014). Such fears stemmed from discrimination due to gender identity, and one study also suggested that experiences of peer victimization were positively associated with less participation in physical activity (Muchicko, Lepp, & Barkley, 2014).

The systematic review also demonstrated that because many sports policies were restrictive, transgender individuals frequently reported negative experiences with competitive sports (Jones, Arcelus, Bouman, & Haycraft, 2017). Policies often excluded transgender persons from sports on the presumption that transgender participants would have an unfair athletic advantage over cisgender competitors (Jones, Arcelus, Bouman, & Haycraft, 2017). In these ways, transgender people can be prohibited from participating

in competitive sports, or they may be required to provide documentation that they are taking medical hormones for transitioning (Jones, Arcelus, Bouman, & Haycraft, 2017). Researchers found that exclusion from physical activities appeared to cause distress among transgender persons (Hargie, Mitchell, & Somerville, 2015).

### **Body Image & Physical Activity**

Studies have shown a correlation between body image and physical activity among cisgender persons (Hausenblas & Fallon, 2006); thus, body image issues may also contribute to the low levels of physical activity exhibited in transgender individuals.

Body image is especially important to consider among transgender persons because gender identity is closely related to perceptions of the body. In fact, research has shown that transgender individuals frequently experience body image issues, which arise from the dissonance between their assigned sex and gender identities (Ålgars, Santtila, & Sandnabba, 2010; Vocks, Stahn, Loenser, & Legenbauer, 2009; Lindgren & Pauly, 1975). Studies have demonstrated that compared to cisgender controls, those with conflicted gender identities exhibited more negative body image, which included feeling less attractive and disliking parts of their bodies (Ålgars, Santtila, & Sandnabba, 2010; Vocks, Stahn, Loenser, & Legenbauer, 2009; Lindgren & Pauly, 1975). To reconcile gender conflict, transgender individuals may undergo medical transitioning or adopt a gender expression that better aligns with their gender identity (American Psychiatric Association, 2016). While some studies have described an association between transitioning and improved body image (Kraemer, Delsignore, Schnyder, & Hepp, 2008; Fleming, MacGowan, Robinson, Spitz, & Salt, 1982), other researchers did not find this relationship to be significant (Vocks, Stahn, Loenser, & Legenbauer, 2009). Even among

those who experience gender conflict, body image issues can vary. One study found that transgender women had significantly lower body satisfaction than transgender men, and transgender women were more dissatisfied with their genital areas, posture, face, and hair (van de Grift et al., 2015).

Not only can body image be influenced by internal conflict, but body image is also influenced by social reactions to one's physical appearance. In one qualitative study, researchers found that social distress was related to body dissatisfaction (McGuire, Doty, Catalpa, & Ola, 2016). Transgender participants were concerned about how others would perceive them and described feeling insecure about their self-image due to these fears (McGuire, Doty, Catalpa, & Ola, 2016). Because transgender participants frequently face discrimination in their social interactions, it is possible that discrimination could also shape their concepts of body image. In fact, a study with college women showed that exposure to information about stereotypes of attractiveness, as well as exposure to cases of discrimination based on these stereotypes, were significantly associated with poorer body image (Lavin & Cash, 2001). Although this research was not conducted with transgender individuals, the study suggested that societal norms can affect body image.

As the literature has shown, body image issues are especially prevalent among transgender persons, and body image may be related to whether a transgender individual decides to engage in physical activity. Due to their gender identities, transgender persons may have unique body image issues, which are compounded by the gender-based discrimination they may face when engaging in physical activity.

### **Research Gap**

Not only is the research on physical activity among transgender persons limited, but a systematic review also found that most studies that have assessed physical activity were qualitative studies, which have small sample sizes and low generalizability (Jones, Arcelus, Bouman, & Haycraft, 2017). Furthermore, the majority of the literature focused on competitive sports rather than general physical activities, such as jogging or going to the gym (Jones, Arcelus, Bouman, & Haycraft, 2017). Barriers to physical activity may include gender-based discrimination or body image issues, but to date, no research has assessed these relationships among transgender women, who are a particularly vulnerable subgroup of the transgender population. Therefore, this quantitative study seeks to fill these research gaps and advance the field with a better understanding of the associations of perceived interpersonal and institutional discrimination, body image, and physical activity.

## METHODS

### Study Procedures

This study involved conducting secondary analysis of data collected during a previous study. The purpose of the previous study was to examine the associations between environmental stressors and a range of health risk behaviors and health outcomes among transgender women. Venue-based and snowball sampling methods were employed to recruit participants in Atlanta, Georgia. Venues included those that provided HIV clinical care and prevention services, mental health counseling, job assistance, housing support, and other services to the transgender population in the area. Transgender advocates actively recruited participants through word-of-mouth and notified the study team when they identified potential participants. Other community-based outreach strategies included partnering with local advocacy groups and LGBT service organizations to advertise the study. These groups disseminated information about the study to potential participants, such as distributing printed materials with contact information for the study.

All potential participants were screened for eligibility. To be eligible, potential participants had to meet the following criteria: (1) 18 to 25 years of age, (2) assigned male sex at birth and self-identified as female, transgender, or other, and (3) reported anal sex with a cisgender male or non-transgender male in the previous six months. If deemed eligible, participants were asked to provide written informed consent for a structured, quantitative survey. These surveys were administered in-person by a graduate research assistant who was trained to use non-judgmental statements and affirmative body language. Surveys took approximately 45 minutes to complete, and a portable electronic

tablet was used to record responses in Qualtrics software. The Institutional Review Board at Georgia State University provided approval for the study. Data collection occurred from August 2014 to June 2015.

Permission was requested from the Principal Investigator to access the dataset, codebook, and questionnaire from the previous study. The dataset consisted of 92 observations, all of which were included in this current study. The Institutional Review Board at Emory University provided approval to conduct secondary data analysis using this dataset. The following demographic, predictor, mediating, and outcome variables of interest for this study were cleaned, recoded, and analyzed.

## **Measures**

### ***Demographic Variables***

***Age*** was measured as a continuous variable through the following question: “What is your current age?” ***Race*** was determined from the question “How do you self-identify in terms of your race?” Response options included White, Black or African American, American Indian or Alaska Native, and Native Hawaiian or other Pacific Islander. Those who identified with more than one race was categorized as multi-racial. ***Ethnicity*** was measured as a binary variable. Participants were asked “How do you self-identify in terms of your ethnicity?” Answer choices included Hispanic or Latina or not Hispanic or Latina.

***Education*** was assessed by asking participants “What is the highest level of education you completed?” Seven response options were initially possible: never attended school, grades 1-8, grades 9-11, grade 12 or GED, some college/associate's degree/technical degree, bachelor's degree, or any post-graduate studies. These response



options were recoded so that the variable had four levels: less than a high school diploma, high school diploma or GED diploma, some college/associate's degree/technical degree, or bachelor's degree or higher. *Employment status* was determined by asking participants "What best describes your employment status? Are you..." Response options initially consisted of eight categories: employed full-time, employed part-time, a homemaker, a full-time student, retired, disabled for work, unemployed, or other. This variable was recoded into three categories by combining homemaker, full-time student, retired, disabled for work, unemployed, and other into one response option: not employed. Thus, this variable ultimately consisted of the following categories: employed full-time, employed part-time, and not employed. *Relationship status* was assessed with the following question: "What is your current relationship status? By relationship, we mean someone you consider to be a boyfriend/girlfriend, partner, or significant other." Answer options consisted of in a relationship or not in a relationship.

In addition, the variable *body mass index (BMI)* was measured by asking participants "What is your height?" and "What is your current weight?" Height was reported in feet and inches and recoded into inches, and weight was reported in pounds. BMI was computed by dividing weight (in pounds) by height (in inches) squared and multiplying by 703. BMI was then coded into various categories based on the Centers for Disease Control and Prevention Guidelines (2017b): underweight (<18.5), normal weight (18.5-24.9), overweight (25.0-29.9), and obese ( $\geq$ 30.0). Lastly, *stage of transition* was measured by asking participants "How would you describe where you are in the transition process?" Five answer options were available: I have not started the transition process yet, I recently started the transition process, I have somewhat transitioned to

being female, I have mostly transitioned to being female, and I have completed the transition process.

### ***Predictor Variables***

***Perceived Interpersonal Discrimination:*** Perceived interpersonal discrimination was operationalized as verbal or non-verbal hostility in the social environment, committed by strangers, peers, or partners due to one's gender identity. Perceived interpersonal discrimination was measured with an index consisting of three items: (1) Have you ever been verbally abused or harassed by a stranger in public because of your gender identity or presentation? (2) Have you ever been verbally abused or harassed by a family member or friend because of your gender identity or presentation? (3) Have you ever been physically abused or beaten by a romantic or sexual partner because of your gender identity or presentation? Response options were binary and consisted of (1) yes or (0) no. Scores across the three items were summed, and total scores could range from 0 to 3, with a higher score indicating higher perceived interpersonal discrimination.

***Perceived Institutional Discrimination:*** Perceived institutional discrimination was operationalized as unequal opportunities in various environmental settings, such as workplaces, housing departments, and health clinics, due to one's gender identity. Perceived institutional discrimination was measured with an index that was previously used in a national study of transgender persons (Clements-Nolle, Marx, & Katz, 2006). This index consisted of four items: (1) Have you ever been fired from a job because of your gender identity or presentation? (2) Have you ever experienced problems getting a job because of your gender identity or presentation? (3) Have you ever been denied or evicted from housing because of your gender identity or presentation? (4) Have you ever

experienced problems getting health or medical services because of your gender identity or presentation? Response options were binary and consisted of (1) yes or (0) no. Scores across the four items were summed, and total scores could range from 0 to 4, with a higher score indicating higher perceived institutional discrimination.

### ***Predictor and Mediating Variable***

***Body Image:*** Body image was operationalized as level of happiness with appearance and was measured using seven items. All items were prefaced with the stem “How happy are you with...,” and participants were asked about their face, arms, chest, legs, feet, hair, and voice. Participants responded to these items on a 5-point Likert scale from (1) very unhappy to (5) very happy. Scores were averaged and could range from 1 to 5, with higher scores indicating more positive body image. Cronbach’s alpha reliability for this scale was 0.74, suggesting adequate internal consistency of scale items.

### ***Outcome Variable***

***Physical Activity:*** Physical activity was measured as a continuous variable by asking participants “On how many of the past 7 days did you participate in vigorous exercise for at least 20 minutes or moderate exercise for at least 30 minutes?” Responses ranged from 0 to 7 days, with more days indicating higher levels of physical activity.

### **Data Analysis**

Data were analyzed using IBM SPSS Statistics version 24 and SAS version 9.4. Descriptive statistics, such as means and frequencies, were first calculated for every study variable for the entire sample. To determine whether any demographic variables should be included as controls in the multivariable and mediation analyses, bivariate analyses using Pearson R tests, independent T-tests, and one-way ANOVA tests were conducted

between each of the demographic variables and the outcome variable of physical activity. Demographic variables were included in subsequent analyses if  $p < 0.20$ .

Then, the following three multivariable tests were conducted between each of the predictor variables and the outcome variable to test hypotheses 1, 2, and 3: a multiple linear regression between perceived interpersonal discrimination and physical activity, a multiple linear regression between perceived institutional discrimination and physical activity, and a multiple linear regression between body image and physical activity. All three regression models used the Enter method and controlled for demographic covariates associated with physical activity in bivariate analyses ( $p < 0.20$ ).

To test hypotheses 4 and 5, mediation analyses were conducted by assessing the significance of indirect effects through bootstrapping to obtain confidence intervals. Bootstrapping was used for two reasons: this approach did not assume samples had normal distributions, and bootstrapping yielded more accurate results and had higher power than other mediation tests (Hayes, 2018). To estimate indirect effects then, the PROCESS macro written by Hayes (2018) was used. The syntax was modified to generate 10,000 bootstrap samples and 95% confidence intervals, and analyses also controlled for demographic covariates associated with physical activity in bivariate analyses ( $p < 0.20$ ). This approach was used to test whether perceived interpersonal discrimination had an indirect effect on physical activity through body image, and to assess whether perceived institutional discrimination had an indirect effect on physical activity through body image.

## RESULTS

### Descriptive Analyses

A total of 92 transgender women participated in this study, with an average age of 34.8 years (sd=10.9). The majority of participants identified as Black or African American (n=77, 83.7%), with fewer identifying as White (n=10, 10.9%), American Indian or Alaska Native (n=3, 3.3%), Asian (n=1, 1.1%), or multiracial (n=1, 1.1%). Regarding ethnicity, most participants were not Hispanic or Latina (n=86, 93.5%), compared to those who did identify as Hispanic or Latina (n=6, 6.5%).

When asked about the highest level of education completed, responses varied across the sample. Some participants had less than a high school diploma (n=14, 15.2%), but most had a high school diploma or GED diploma (n=32, 34.8%) or had completed some college, an associate's degree, or a technical degree (n=32, 34.8%). Some participants had higher levels of education, completing a bachelor's degree or higher (n=14, 15.2%). For employment status, the majority of participants were not employed (n=58, 63.0%). The rest were employed either full-time (n=21, 22.8%) or part-time (n=13, 14.1%). In addition, 56.5% (n=52) of participants reported that they were not in a relationship, while 43.5% (n=40) were in a relationship.

For BMI, a few participants were underweight (n=4, 4.3%), and most were normal weight (n=44, 47.8%). About half of participants were either overweight (n=23, 25.0%) or obese (n=21, 22.8%). Furthermore, in terms of transition stage, 8.9% (n=8) of participants reported not having started the transition process yet, and 17.8% (n=16) recently started the process. The rest of the participants were further along in the transition process, reported having somewhat transitioned to being female (n=23, 25.6%),

mostly transitioned to being female (n=29, 32.2%), or completed the transition process (n=14, 15.6%).

For the predictor variables, the mean score for perceived interpersonal discrimination was 1.4 (sd=1.0), and about a fifth of participants reported experiencing no perceived interpersonal discrimination (n=20, 21.7%). The average score for perceived institutional discrimination was 0.9 (sd=1.1), with more than half of participants reporting no perceived institutional discrimination (n=46, 51.1%). For the predictor and mediating variable, the mean body image score for participants was 3.9 (sd=0.7), and the majority of participants were happy with their appearance (n=46, 50.5%). Lastly, for the outcome of physical activity, participants reported completing moderate or vigorous exercise for an average of 2.2 (sd=2.1) days over the past seven days. About a third of participants did not participate in physical activity on any day (n=28, 31.1%). Descriptive statistics for all study variables are summarized in Table 1.

**Table 1. Descriptive statistics of study variables**

<b>Study Variable</b>	<b>Mean (sd)</b>	<b>N (%)</b>
<i>Demographic Variables</i>		
Age	34.8 (10.9)	
Race		
White		10 (10.9)
Black or African American		77 (83.7)
American Indian or Alaska Native		3 (3.3)
Asian		1 (1.1)
Multiracial		1 (1.1)
Ethnicity		
Not Hispanic or Latina		86 (93.5)
Hispanic or Latina		6 (6.5)
Education		
Less than a high school diploma		14 (15.2)
High school diploma or GED diploma		32 (34.8)
Some college, associate's degree, or technical degree		32 (34.8)
Bachelor's degree or higher		14 (15.2)

Employment		
Employed full-time		21 (22.8)
Employed part-time		13 (14.1)
Not employed		58 (63.0)
Relationship Status		
Not in a relationship		52 (56.5)
In a relationship		40 (43.5)
BMI		
Underweight		4 (4.3)
Normal weight		44 (47.8)
Overweight		23 (25.0)
Obese		21 (22.8)
Transition Stage		
I have not started the transition process yet		8 (8.9)
I recently started the transition process		16 (17.8)
I have somewhat transitioned to being female		23 (25.6)
I have mostly transitioned to being female		29 (32.2)
I have completed the transition process		14 (15.6)
<b><i>Predictor Variables</i></b>		
Perceived Interpersonal Discrimination (0-3)	1.4 (1.0)	
No perceived interpersonal discrimination (0)		20 (21.7)
Some perceived interpersonal discrimination (1-3)		72 (78.3)
Perceived Institutional Discrimination (0-4)	0.9 (1.1)	
No perceived institutional discrimination (0)		46 (51.1)
Some perceived institutional discrimination (1-4)		44 (48.9)
<b><i>Predictor and Mediating Variables</i></b>		
Body Image (1-5)	3.9 (0.7)	
Unhappy with appearance (1-2)		11 (12.1)
Neutral about appearance (3)		34 (37.4)
Happy with appearance (4-5)		46 (50.5)
<b><i>Outcome Variable</i></b>		
Physical Activity (0-7)	2.2 (2.1)	
No physical activity (0)		28 (31.1)
Some physical activity (1-7)		62 (68.9)

### **Bivariate Analyses**

To assess whether any demographic variables should be included as controls for the multivariable and mediation analyses, variables were determined to be significantly associated with the outcome if they reached  $p < 0.20$  in bivariate analyses. Thus, four

demographic variables were found to be significant with physical activity at the  $p < 0.20$  level: race ( $F(4,85)=2.123$ ,  $p=0.085$ ), ethnicity ( $t=-2.650$ ,  $df=88$ ,  $p=0.010$ ), education ( $F(5,84)=1.526$ ,  $p=0.190$ ), and employment ( $F(2,87)=2.621$ ,  $p=0.078$ ). The other demographic variables did not have a statistically significant association with physical activity, including age ( $r=-0.061$ ,  $p=0.571$ ), relationship status ( $t=0.034$ ,  $df=88$ ,  $p=0.973$ ), BMI ( $F(3,86)=0.191$ ,  $p=0.902$ ), or transition stage ( $F(4,84)=0.175$ ,  $p=0.951$ ). The results of these bivariate analyses are summarized in Table 2.

**Table 2. Bivariate analyses between demographic variables and physical activity**

Demographic Variable	Bivariate Test			P-value
	Pearson R Correlation Statistic	Independent T-test Statistic	One-Way ANOVA F-test Statistic	
Age	-0.061			0.571
Race			2.123	0.085*
Ethnicity		-2.650		0.010*
Education			1.526	0.190*
Employment			2.621	0.078*
Relationship Status		0.034		0.973
BMI			0.191	0.902
Transition Stage			0.175	0.951

\* Demographic variable significant at  $p < 0.20$ , to be included as controls in multivariable and mediation analyses.

### **Multivariable Analyses**

Three multiple linear regressions were performed with perceived interpersonal discrimination, perceived institutional discrimination, or body image as the predictors, and with physical activity as the outcome. When controlling for race, ethnicity, education, and employment, there was not a statistically significant association at the  $p < 0.05$  level between interpersonal discrimination and physical activity ( $B = -0.012$ , 95%



CI= -0.483, 0.430,  $p=0.908$ ), or between institutional discrimination and physical activity ( $B=0.158$ , 95% CI= -0.119, 0.692,  $p=0.163$ ). Furthermore, body image was not significantly correlated with physical activity ( $B=0.090$ , 95% CI= -0.384, 0.897,  $p=0.428$ ) when controlling for race, ethnicity, education, and employment. The results of these multivariable analyses are presented in Table 3.

**Table 3. Multivariable analyses between predictor variables and physical activity**

Predictor Variable	Beta	95% Confidence Interval	P-value
Perceived Interpersonal Discrimination	-0.012	(-0.483, 0.430)	0.908
Perceived Institutional Discrimination	0.158	(-0.119, 0.692)	0.163
Body Image	0.090	(-0.384, 0.897)	0.428

### Mediation Analyses

Analyses were conducted to determine whether perceived interpersonal discrimination or perceived institutional discrimination had significant indirect effects on physical activity through body image. Results showed that two participants who differed by one unit of perceived interpersonal discrimination were estimated to differ by 0.0219 units in their reported physical activity as a result of those perceiving more interpersonal discrimination having poorer body image, which translated into more physical activity. However, this indirect effect was not statistically different from zero (95% CI = -0.1510, 0.0643). Furthermore, two participants who differed by one unit of perceived institutional discrimination were estimated to differ by 0.0029 units in their reported physical activity as a result of the tendency for those who experienced more perceived institutional discrimination to have improved body image, which led to increased physical activity. Similar to the other result, this indirect effect was not found to be statistically different

from zero (95% CI = -0.0451, 0.0639). Data from these mediation analyses are summarized in table 4.

**Table 4. Mediation analyses with body image between predictor variables and physical activity**

<b>Predictor Variable</b>	<b>Indirect Effect</b>	<b>95% Confidence Interval</b>
Perceived Interpersonal Discrimination	-0.0219	(-0.1510, 0.0643)
Perceived Institutional Discrimination	0.0029	(-0.0451, 0.0639)

## DISCUSSION

Previous literature has demonstrated that transgender individuals frequently encounter interpersonal and institutional discrimination and are at risk of negative body image as a result of their gender identity (Lombardi, Wilchins, Priesing, & Malouf, 2001; Al Ramiah et al., 2010; Grant et al., 2017; Ålgars et al., 2010; Vocks et al., 2009; Lindgren & Pauly, 1975; van de Grift et al., 2015). These experiences can place a transgender individual at disproportionate risk for poor health, and while physical activity can improve one's health status, studies have suggested that transgender persons are less physically active than cisgender persons (Fredriksen-Goldsen et al., 2013; Muchicko, Lepp, & Barkley, 2014). Despite these health disparities and the vulnerable nature of transgender persons, especially that of transgender women, the research on physical activity among this population is limited. This study sought to address the gap in research by examining the associations between perceived interpersonal or institutional discrimination and physical activity, as well as body image and physical activity, among transgender women in Atlanta, GA. In addition, the study assessed whether body image mediated the relationships between perceived interpersonal or institutional discrimination and physical activity.

### **Main Findings by Hypothesis**

***Hypothesis 1: Transgender women who experience higher perceived interpersonal discrimination will have lower levels of physical activity.***

Based on this study, perceived interpersonal discrimination is not associated with physical activity.

***Hypothesis 2: Transgender women who experience higher perceived institutional discrimination will have lower levels of physical activity.***

This study's results indicated that there is not a relationship between perceived institutional discrimination and physical activity.

***Hypothesis 3: Transgender women with more negative body image will have lower levels of physical activity.***

This study's results suggested that body image is not correlated to physical activity.

***Hypothesis 4: Body image will mediate the relationship between perceived interpersonal discrimination and physical activity.***

Because no significant indirect effects were observed, body image did not mediate the relationship between perceived interpersonal discrimination and physical activity.

***Hypothesis 5: Body image will mediate the relationship between perceived institutional discrimination and physical activity.***

Indirect effects were not significant, so body image did not mediate the association between perceived institutional discrimination and physical activity.

### **Analysis of Main Findings**

#### ***Hypotheses 1 and 2***

The hypothesized associations between perceived interpersonal or institutional discrimination and physical activity were not supported by the results, which may have been due to various reasons. For one, the measures used may not have fully captured the multifaceted nature of discrimination. This study operationalized perceived interpersonal and institutional discrimination as the number of instances in which one had faced certain

discriminatory situations based on their gender identity or presentation. However, transgender women may be contending with multiple types of discrimination beyond their gender identity. Marginalization can occur not only on the basis of gender, but can also manifest based on race, class, sexual orientation, and even weight. One study of a large population of adults found a significant association between weight-based discrimination and physical activity, so those who perceived more mistreatment based on their weight were less physically active than those who perceived less discrimination (Jackson & Steptoe, 2017). In this study, about half of the transgender women who participated were categorized as overweight or obese, so it is possible that weight-based discrimination was a factor in their physical activity levels, yet was not measured.

Another study assessed the relationship between perceived racial discrimination and physical activity among low-income-housing residents, and although results were not statistically significant, the study highlighted the importance of examining the mechanisms through which discrimination leads to lower physical activity among certain disadvantaged populations (Shelton et al., 2009). For example, the researchers suggested that institutional discrimination operates through residential segregation, which has led to a concentration of racial and ethnic minorities in low-income neighborhoods (Shelton et al., 2009). These neighborhoods have less access to resources, such as safe parks that encourage physical activity, so this form of institutional discrimination may have contributed to disparities in physical activity (Shelton et al., 2009). With the current study's sample of transgender women primarily identifying as Black or African American, participants may have faced intersecting forms of discrimination that limited physical activity, which was not captured through the measures.

Furthermore, this study measured perceived interpersonal and institutional discrimination by asking participants whether they had ever experienced certain situations. However, multiple measures that assess different patterns of discrimination may have been needed. In one large observational study of African American adults, researchers differentiated between everyday discrimination, lifetime discrimination, and burden of discrimination (Sims et al., 2016). Everyday discrimination measured unfair treatment on a day-to-day basis while lifetime discrimination assessed unfair treatment over a lifetime, and burden of discrimination considered whether experiences of discrimination were stressful or made life harder (Sims et al., 2016). Researchers found that while everyday discrimination and lifetime discrimination were significantly related to physical activity among women, only lifetime discrimination was associated with physical activity among men (Sims et al., 2016). Burden of discrimination was not significant for either women or men (Sims et al., 2016). The differential results from the Sims et al. (2016) study demonstrate the importance of capturing discrimination in various ways, for different patterns of discrimination. For this current study, only lifetime discrimination was measured. This study's results may have also been limited by the dichotomous response options (yes/no) available for the discrimination items, which did not capture the severity of discrimination or its variable effects on everyday life, including physical activity, among the sample.

Lastly, in terms of the measures of perceived discrimination used in this study, the items used to assess interpersonal discrimination asked about verbal abuse or harassment by a stranger, family member, or friend, as well as physical abuse by a romantic or sexual partner, if possible. However, it is possible that a participant may have experienced verbal abuse or

harassment from romantic or sexual partners, or may have been physically abused or beaten by a stranger, family member, or friend. Studies have shown that different forms of gender-based discrimination against transgender women can be committed by peers of all types, whether they are unfamiliar persons or known peers (Lombardi, Wilchins, Priesing, & Malouf, 2001; Al Ramiah et al., 2010; Grant et al., 2017). Furthermore, this study's measure of perceived institutional discrimination considered situations in the workplace, housing sector, and healthcare domains, but did not encompass other institutions, such as educational or law enforcement settings. In fact, one report showed that 78% of transgendered participants had experienced gender-based harassment while they were in school, and 29% of participants reported being harassed or disrespected by police due to their gender identity (Grant et al., 2017). In these ways, the items used to measure discrimination in this study may be too narrow to account for the range of oppressive actions committed by various actors in various settings.

### ***Hypothesis 3***

Not only is discrimination a complex topic to measure, but so is body image and physical activity. Results assessing the association between body image and physical activity may differ based on how these two variables are measured. One study of adult women explored these differences by measuring three components of body image, as well as by measuring physical activity objectively and subjectively (Rote, Swartz, & Klos, 2013). The three components of body image included attitudes towards physical appearance, attitudes towards physical ability, and perceptions of a healthy body (Rote, Swartz, & Klos, 2013). Physical activity was measured by an accelerometer, which the researchers then categorized into light, moderate, or vigorous exercise (Rote, Swartz, &

Klos, 2013). Physical activity was also assessed by asking participants to report the minutes per day they spent engaging in moderate and vigorous exercise (Rote, Swartz, & Klos, 2013). Results suggested that there was not a significant relationship between satisfaction with physical appearance and either measures of physical activity (Rote, Swartz, & Klos, 2013). However, attitudes about physical ability and perceptions of a healthy body were positively associated with the objective measure of physical activity, but only attitudes about physical ability was significantly correlated to the subjective measure of physical activity (Rote, Swartz, & Klos, 2013).

This current study measured body image by assessing level of satisfaction with physical appearance, and the other dimensions of body image were not considered. Furthermore, physical activity was measured subjectively through self-report, as participants were asked about the number of days in the past week that they completed vigorous or moderate exercise for a certain number of minutes. However, vigorous and moderate exercise were not explicitly defined, so participants may have interpreted this survey question differently. In these ways, the questions used to evaluate body image and physical activity may have lacked the validity to adequately test the relationship between these two variables.

#### ***Hypotheses 4 and 5***

These hypotheses were mainly exploratory due to the lack of literature on body image as a mediator for physical activity among transgender women. As discussed, measuring discrimination, body image, and physical activity is not simple, and the approach used to assess these variables in this study may have contributed to the insignificant findings. Another reason for the null results may be related to the study's



unique sample. Contrary to the results from previous literature, the transgender women in this study reported relatively low levels of interpersonal and institutional discrimination and more positive body image. These surprising results may be due to the location where the study took place. Although Georgia is located in the southern part of the country that is known to be conservative, the city of Atlanta has enacted comprehensive non-discrimination policies that protect the rights of and ensure the equal treatment of lesbian, gay, bisexual, and transgender (LGBT) persons (City of Atlanta, n.d.). These laws prohibit businesses, housing agents, and service providers from committing discrimination based on gender identity or sexual orientation (City of Atlanta, n.d.). The city of Atlanta also has a designated human relations commission to investigate discrimination claims, as well as a liaison unit that works with the police department (City of Atlanta, n.d.). Additionally, Atlanta offers services and employment benefits that are aimed at meeting the needs of the LGBT population (City of Atlanta, n.d.). In these ways, this study setting appears to be inclusive of transgender persons, which may have led to a unique sample reporting lower levels of discrimination and higher body image scores than participants in previous studies.

### **Limitations**

Although the associations of discrimination, body image, and physical activity in this study were not significant, findings should be considered in the context of the study's limitations. As previously mentioned, this study's measures of interpersonal and institutional discrimination, body image, and physical activity posed as limitations. Several other methodological limitations should be considered. Because this study relied on self-report, data may have been over-reported or under-reported due to recall bias.

Social desirability bias may have also been an issue since discrimination, body image, and physical activity can be sensitive topics of discussion.

In addition, limitations were apparent with the study design and the sampling method. Because this study relied on an observational, cross-sectional design, causal inferences and temporality could not be determined. Convenience sampling was also used, and a small sample of participants were recruited from one city, primarily in settings that provided services tailored to transgender persons. Therefore, results may not be generalizable to transgender women who do not receive services at these organizations, nor those living outside of Atlanta, Georgia.

### **Implications & Recommendations**

Although the findings were not statistically significant, this study still adds to the existing body of literature and has implications for future research and policy. To the author's knowledge, this is the first study to assess the role of interpersonal discrimination, institutional discrimination, and body image on physical activity among transgender women. One of the study's strengths lies in its focus on the Social Cognitive Theory and its considerations of both individual and environmental factors that may contribute to physical activity. This study also examines a unique, understudied population of transgender women who may be less likely to engage in physical activity and are at higher risk for obesity. In fact, about a third of transgender women in this sample reported no days of physical activity over the past week, and about half were categorized as overweight or obese. The Centers for Disease Control and Prevention suggests that some physical activity is better than none at all, and any amount of exercise can still have health benefits (2017c). Because exercise can improve both physical and

mental health, it is important for future research and interventions to consider how to increase physical activity among transgender women.

Additional research is also recommended to address this study's limitations. Future studies should aim to improve upon this study's measures by considering the complexities of discrimination, body image, and physical activity. It is recommended that a measure of discrimination be comprehensive and account for intersectionality and multiple forms of marginalization, as well as variable patterns of discrimination. Different components of body image beyond satisfaction of one's physical appearance should be assessed, and physical activity should be directly measured through objective means. If physical activity is measured subjectively, more specific definitions of exercise is needed. In addition, it is important for a measure of physical activity to capture and differentiate between the frequency, duration, mode, and intensity of exercise.

Lastly, this study demonstrated that measures for variables frequently assessed in cisgender populations may not be appropriate for the transgender population, which may face unique challenges related to discrimination, body image, and physical activity. Qualitative research is needed to explore the experiences of the transgender community, and specifically among transgender women, so that measures can be adapted to fit the realities of being transgender. Improved measures will lead to results with improved validity, and through this research, health practitioners, public health officials, and policy makers may better understand how to improve the health of transgender women and the transgender population as a whole.

## **Conclusion**

Transgender women are an especially vulnerable subgroup who may be less likely to participate in physical activity. However, because physical activity is a modifiable behavior that can have positive mental and physical health outcomes, it is important to continue to assess the predictors of physical activity and any mediators that can be targeted for intervention. The associations of discrimination, body image, and physical activity should be further studied with more transgender women in additional contexts.

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