Eating disorder symptoms in the LGBTQ+ community: A review of risk and protective factors and investigating the role of sexuality and body image.

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Thesis Portfolio Abstract

Background: Sexual and gender diverse individuals are at greater risk of experiencing eating disorders (ED) and ED symptoms. This portfolio held an overarching aim to explore ED symptoms within this at-risk community, whilst attempting to diversify an area of research largely dominated by samples of heterosexual and cisgender individuals.

Methods: A meta-analysis of risk and protective factors for LGBTQ+ individuals developing ED symptoms was accomplished. An empirical project was conducted examining the relationship between ED symptoms and sexuality concepts in transgender and gender non-conforming youth and young adults. This utilised an observational, cross-sectional design, and tested two main mediation models that positioned body image and gender dysphoria as potential mediators. It also sought knowledge regarding participants experiences of accessing ED services, with particular focus on discussion of sexuality and gender.

Results: The meta-analysis included 71 studies, synthesising 555 effect sizes from a total of 27,196 participants. Thirty-nine risk and seven protective factors were identified to be of significance, to varying effects. Several largest effects pertained to cognitive aspects of the body, e.g., drive for thinness, body dissatisfaction, and body appreciation. The empirical study revealed significant, negative correlational relationships between ED symptoms and sexual esteem, motivation, and assertiveness. The mediatory role of body image on ED symptoms and sexual esteem was confirmed. Descriptive analysis concluded respondents largely felt their care was not effective in addressing their needs, with the topics of sexuality and gender identity seldom discussed.

Conclusions: Taken together, these studies afford this field a greater understanding of ED symptoms as experienced by sexual and/or gender diverse individuals. Findings are positioned to both provide evidence for as well as challenge our theoretical understanding of EDs within this community, which should be used to inform practice. Implications for clinical practice, policy development and implementation, and future research are considered.

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Chapter 1: Introduction to the Thesis Portfolio

This introductory chapter aims to provide important contextual information regarding this thesis portfolio. This includes considering use of language and terminology, and providing definitions; outlining the current understanding of eating disorders (EDs) generally, as well as more specifically for sexual and/or gender diverse individuals; and describing relevant models of EDs which are referenced throughout the thesis. It concludes providing an overview of the thesis chapters.

Language and Terminology

Language is a powerful tool for expression and communication; it can be enriching or demoralising depending on how it is wielded (Carr, 2021). For this reason, it feels vital to consider the language used within this research. This feels particularly important to acknowledge when using language relating to individuals diverse in their sexual and/or gender identity given it unfortunately has long been, and continues to be, used as a tool to project discrimination, violence, and hatred towards this community. Language also has a profound role in upholding systemic inequality and intersectional oppression (Carr, 2021).

There are many ways we can describe sexuality and gender identity, and the terms used will likely differ from person to person in response to their own understanding of themselves, and their experiences. Authors have attempted to be considerate of language used, but we equally acknowledge that this may not align with how individuals wish to describe their own identity. To support the readability of this thesis portfolio, frequently used terms are defined below in Table 1.

Table 1. Definitions of Frequently Used Terminology within the Thesis Portfolio.

Terminology	Definition
Sexual orientation	A multidimensional construct made up of at least three dimensions: 1) sexual identity, 2) attractions to the same or other sexes, and 3) sex/gender of sexual partners. Identity, attraction, and behaviour are not always concordant.
LGBTQ+	An abbreviation often used as a stand-alone term to include all sexual and gender minorities, standing for lesbian, gay, bisexual, transgender, queer plus. The term Gender, Sexual, and Relationship Diversity (GSRD) has recently been increasing in

Table 1. (Continued)

	usage within health and academic areas, as an effort to provide a more intersectional position to the understanding gender, sexuality, and relationships (British Association for Counselling and Psychotherapy, 2019). However, LGBTQ+ was the term adopted within the thesis proposal to ensure that this research is understood to focus specifically on those from minoritised sexual and gender identities as opposed to normative groups such as heterosexual and cisgender individuals, which the term also GSRD aims to incorporate.
Sexual minority	A term used to refer to individuals who are attracted to people of the same gender or more than one gender.
Gay	A person emotionally, romantically, or sexually attracted to members of the same gender. Gay may not be the term used by younger people or racial/ethnic minorities.
Lesbian	A woman who is emotionally, romantically, or sexually attracted to other women. Lesbian may not be a term used by younger people or racial/ethnic minorities.
Bisexual/pansexual	A person emotionally, romantically, or sexually attracted to more than one sex, gender, or gender identity, although not necessarily simultaneously or to the same degree. Bisexuality generally refers to people who feel attracted to more than one gender, whilst pansexuality typically refers to those who feel an attraction to people regardless of gender.
Queer	An umbrella term used to describe sexual and gender identities other than straight and cisgender. Although historically a pejorative term, the word has since been reclaimed by members of the LGBTQ+ community.
Asexual	A person who may not experience sexual attraction to anyone of any gender.
Sex	Combinations of physical characteristics (including things like genitalia, chromosomes, or sex hormone levels) typical of men and boys, or women and girls.
Gender identity	An individuals' internal, deeply held sense and subjective experience of their own gender. It does not necessarily correspond to an individual's assigned sex or presumed sex at birth.
Gender minority	A term used to refer to individuals whose gender identity is different to the sex they were assigned at birth.
Transgender	An umbrella term for individuals whose gender identity, gender expression, or behaviour does not conform to that typically associated with the sex they were assigned at birth.
Cisgender	An individual whose gender identity algins with their assigned sex at birth.
Cisnormativity	The societal expectation or assumption that all people are cisgender.
Gender non-conforming/ non-binary	An individual whose gender identity does not conform to the gender expression, presentation, behaviours, roles, or expectations that falls outside of the gender binary (man or woman). Someone who is gender non-conforming may feel a mix of genders, or no gender.

Table 1. (Continued)

Gender incongruence	A term used to describe a marked and persistent discrepancy between an individual's experienced gender and the sex they were assigned at birth.
Gender dysphoria	A sense of discomfort or distress that a person experiences, due to a discrepancy/ incongruence between their gender identity and the sex they were assigned at birth.

Note. Terms adapted from Hunt et al. (2018), Nagata et al. (2020), and Joy et al. (2022).

Eating Disorders

EDs are characterised as persistent disturbances in eating behaviours, that may result in either excessive or insufficient food intake (Rikani et al., 2013). Disordered eating behaviours may include dietary restriction, excessive overeating, and/or compensatory strategies (self-induced vomiting, excessive physical exercise), often accompanied by cognitive and perceptual disturbances such as body image dissatisfaction, and overestimation of weight and size (Fairburn & Harrison, 2003).

The Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5; American Psychiatric Association, 2013) includes several ED classifications such as anorexia nervosa, bulimia nervosa, binge eating disorder, pica, rumination disorder, and avoidant/restrictive food intake disorder. Other categories include other specified feeding or eating disorder, and unspecified feeding or eating disorder. EDs commonly have high comorbidity with other mental health difficulties, including obsessive-compulsive disorder, addition, depression, and borderline personality disorder (Brytek-Matera & Czepczor, 2017). Both medical complications and suicide attempts are significantly elevated in individuals experiencing EDs, relative to the general population (Schaumberg et al., 2017), with anorexia nervosa holding the highest mortality rate of any other mental health difficulties (Edakubo & Fushimi, 2020).

The aetiology of EDs is described to be heterogeneous, likely involving an interaction of several factors that are biological, developmental, psychological, and sociocultural in nature (Rikani et al., 2013); no one model of EDs has been widely accepted (Cooper, 1995). Understanding the

underlying mechanisms that contribute towards the aetiology and maintenance of EDs affords researchers and clinicians integral knowledge regarding prevention efforts and treatment approaches.

Eating Disorders in Sexual and Gender Diverse Individuals

ED presentations occur across diverse populations, identities, and individual characteristics. There is a widespread perception that EDs affect mostly white, cisgender women from wealthy, industrialised countries (Halbeisen et al., 2022), owing to the large body of research centring their investigations on this population. Though, in more recent developments, LGBTQ+ individuals have been highlighted to experience disordered eating at a similar or greater rate compared to their nonmarginalized counterparts (Mason et al., 2021). Within group differences in the magnitude of disordered eating have also been illustrated, with sexual minority males and transgender and/or gender non-conforming (TGNC) individuals suggested to be at most prominent risk (Calzo et al., 2017; Diemer et al., 2015). It is especially critical that factors contributing to the high rates of ED aetiology in this community, and the mechanisms that maintain this, are identified and utilised to inform and underpin clinical practice (Calzo et al., 2017).

Models of Eating Disorders

Theoretical models (e.g., the transdiagnostic model, the sociocultural model, etc) have long attempted to explain aetiology and maintenance of EDs, with these models largely focusing on and emphasising differing risk contexts and factors. Whilst these models often differ in their predominant focus, the aetiology of EDs is agreed to be multifactorial and thus there may be some level of overlap illustrated in the contributing variables described in each model (Striegel-Moore & Cachelin, 2001). Such models have largely been generated from and tested within White, heterosexual and cisgender samples. Whilst these models may still be pertinent to sexual and/or gender diverse individuals, identifying risk factors unique to this community is vital if we wish to better understand and address the elevated risk within this population (Mason et al., 2021).

Furthermore, theoretical models have provided a foundational framework for understanding the mental health disparities in minoritised individuals generally. These have then been applied and/or

modified to support our understanding of the development and maintenance of EDs for individuals with minoirtised identities, such as those diverse in their sexuality and/or gender. Several studies also attempt to understand EDs in this population by integrating more than one theoretical model (e.g., Velez et al., 2016; Brewster et al., 2019; Barnhart et al, 2022). These models will be described in more detail below.

Transdiagnostic Model

The transdiagnostic, cognitive-behavioural model of EDs (Fairburn et al., 2003) describes the core processes theorised to contribute and maintain ED pathology irrespective of diagnostic category (including anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specified). This model evolved as an extension to one of the most widely studied and accepted models of EDs; the cognitive-behavioural model of Bulimia Nervosa (BN), (Fairburn et al., 1986).

It proposes that a dysfunctional system of self-evaluation is a central component to the maintenance of EDs (Fairburn et al., 2003). The model suggests that individuals with EDs evaluate their self-worth largely, if not exclusively, on their perceived ability to control their weight, shape, or eating (Fairburn et al., 2003). This over-evaluation drives behavioural features of EDs such as dietary restraint and body checking/ avoidance, and cognitive features such as preoccupation with eating and body image concerns. Additionally, four maintenance mechanisms are then posited within the model: core low self-esteem, clinical perfectionism, interpersonal problems, mood intolerance. This theory suggests that not all maintaining mechanisms operate in equal manner across individuals and that, rather, some factors may be more significant for some individuals than others to the maintenance of their ED symptoms (Lampard et al., 2012). The distinctive features of this model are well-recognised and utilised across classifications of EDs within diagnostic manuals (e.g., DSM-5; American Psychiatric Association, 2013), and to inform clinical practice irrespective of diagnosis (e.g., CBT-E; Fairburn et al., 2008).

This model has amassed a strong evidence base across ED classifications (Byrne et al., 2017; Fairburn et al., 2015) and has also been adapted for inpatient care settings and younger aged service

users (Dalle Grave et al., 2013; Dalle Grave et al., 2019), as well as those with severe and enduring presentations (Calugi et al., 2017). However, the predominant focus of all-female samples within this research represents a flaw in the generalisability of this model and its outcomes; there is an overall paucity of research on treatment of EDs in minority populations (Marques et al., 2011), which extends to our limited understanding of the applicability of this model for sexual and/or gender diverse individuals experiencing ED symptoms.

Sociocultural Models

Sociocultural models of EDs are well-established, offering a framework to understand the impact of dominant sociocultural influences on disordered eating. Sociocultural models have several elements in common, concluding that disordered eating is partially due to the external pressure women face to achieve the 'thin ideal' (Striegel-Moore et al., 1986). External pressure is proposed to stem from family, friends, the media (The Tripartite Influence Model; Thompson et al., 1999) and significant others (Schaefer et al., 2017). The driving mechanism for disordered eating in this model is the internalisation of such external pressure (Keery et al., 2004). Thin-ideal internalisation has a profound association with body dissatisfaction (Stice & Whitenton, 2002), leading to increased risk for ED development (Halliwell & Harvey, 2006). This model has also been extended to acknowledge the hypothesised mechanisms by which bulimia nervosa may be developed, coining this the Dual Pathway Model (Stice et al., 1996). Critique of this model however suggests that a more comprehensive explanation of how each of these factors explicitly lead to disordered eating is required (Fitzsimmons-Craft et al., 2014).

Whilst it is clear this model was initially developed with the female experience in mind, the applicability of this model in sexual minority individuals experiencing disordered eating has grown in interest. Preliminary support for the applicability of this model for sexual minorities has been provided (e.g., Hazzard et al., 2019), yet there are concerns that such models do not sufficiently explain all variance in disordered eating behaviours in this sample (Tylka & Andorka, 2012). Less exploration has occurred relating to the applicability of this model in explaining disordered eating in TGNC samples (Muratore et al., 2022).

Objectification Theory

Objectification theory (Fredrickson & Roberts, 1997) has also been widely explored regarding its relevance to ED development, treatment, and prevention. Originally developed to explain body image dissatisfaction in cisgender women, it recognises the consequences of a culture that sexually objectifies the female body. It theorises that individuals may internalise the observer's perspective of their own self. This consequently can give rise to body monitoring and surveillance, subsequent shame and anxiety and thus, body image concerns and disordered eating (Fredrickson & Roberts, 1997).

A recent meta-analysis concluded that self-objectification may be of equal importance in understanding aetiology and maintenance of disordered eating for both heterosexual and homosexual women, and may play a larger role for homosexual men relative to heterosexual men (Schaefer & Thompson, 2018). Research also provides support to the relevance of this model in understanding disordered eating in TGNC individuals (Brewster et al., 2019; Velez et al., 2016).

Minority Stress Theory and Social Safety

Minority stress theory (Meyer, 2003) provides a framework for understanding mental health disparities across minoritised groups. This model posits that sexual and/or gender diverse individuals experience distinct and chronic stressors related to their identity. Such experiences are theorised to occur on three levels: 1) external stressors, such as structural discrimination and direct experiences of victimisation and prejudice, 2) one's own expectations that external stressors will occur, resulting in increased vigilance and stress, and 3) internalisation of negative social attitudes (Meyer, 2003). These stressors, alongside universal stressors, significantly compromise the wellbeing of LGBTQ+ individuals (Russell & Fish, 2016). This is suggested to, in part, also negatively influence attitudes and behaviours relating to healthcare seeking and access within this community (Alencar Albuquerque et al., 2016).

Specifically, minority stress theory has been illustrated to explain disproportionate rates of disordered eating behaviours in the LGBTQ+ community compared with their heterosexual, cisgender

counterparts (Parker & Harriger, 2020). Stigma-related stressors represent meaningful correlates of both negative body image outcomes and disordered eating in sexual and/or gender diverse individuals (Barnhart et al., 2022; Barnhart et al., 2023). Furthermore, multiple minority stress theory which highlights the cumulative nature of minority stress, emphasises the detrimental impact of the intersection of multiple marginalised identities on mental health (Balsam et al., 2011); e.g., LGBTQ+ individuals who are also of the Global Ethnic Majority (all ethnic groups except white British and other White groups). The model however also suggests that through minority stress, one may also develop coping and resilience (Meyer, 2003) on both a microsystem and exosystem level (Bronfenbrenner, 1979).

Whilst the minority stress model has guided much research on the wellbeing of sexual and/or gender diverse individuals, outcomes of studies yield inconsistent findings (Diamond et al., 2021). It has been posited that a missing component of minority stress theory, that could account for this inconsistency, is social safety (Diamond & Alley, 2022). This concept is defined as reliable social connection, belonginess, inclusion, recognition, and protection (Diamond & Alley, 2022); essential throughout the human lifespan (Holt-Lunstad & Uchino, 2019). Diamond & Alley (2022) offer a compelling exploration into how this may be overlooked by the minority stress model, suggesting that to reduce health disparities experienced by sexual and/or gender diverse individuals we must reduce minority stress whilst increasing social safety.

Conclusion

The models outlined above aim to provide initial orientation to the current understanding of ED symptoms within those who identify as LGBTQ+. These offer a helpful springboard to understand disordered eating within this sample and will be referred to throughout the continuation of the portfolio; seeking to understand, consolidate, and challenge these models in relation to the findings of this research.

Thesis Aims and Overview

This thesis portfolio broadly aims to develop and diversify our present understanding of EDs within the LGBTQ+ community. Chapter 2 presents a meta-analysis which elucidates both risk and protective factors for ED symptoms within the LGBTQ+ population, written for publication to the *International Journal of Eating Disorders*. Whilst there is a wealth of empirical research investigating specific risk and protective variables for EDs in this community, to the author's knowledge, there has been no attempt to synthesise these using meta-analytic methodology. Chapter 3 follows to bridge the findings of the previously described meta-analysis and the upcoming empirical paper.

Chapter 4 reports the empirical paper, in which the relationship between ED symptoms and sexuality concepts were investigated in individuals identifying as TGNC. Body image and gender dysphoria were explored as potential mediators to the significant relationships observed. It also sought to understand participants' experiences of accessing ED services. This aimed to broaden our understanding of ED symptoms within the TGNC, hoping to add to the minimal but vital research base that acknowledges TGNC individuals as a group worthy of investigation separate to the wider LGBTQ+ community. This was felt to be particularly important given emerging findings that TGNC individuals represent a high-risk group for developing disordered eating behaviours and EDs. This paper was written for publication to the *International Journal of Transgender Health.*.

Chapters 5 and 6 were written to provide supplementary information regarding the methodology and results, respectively, for both the meta-analysis and empirical paper. Finally, Chapter 7, provides a synthesis of the overall thesis portfolio findings, positioning these within the wider context of existing research and theoretical models in the field, as well as current clinical practice and policy. A critical appraisal and general reflections of the conducted work is also offered.

Chapter 2: Meta-Analysis

Risk and Protective Factors for eating disorder symptoms among the LGBTQ+ community: a meta-analysis.

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Abstract

Objective: Individuals of marginalised sexual and/or gender identities are at greater risk of experiencing eating disorder (ED) symptoms, at both clinical and subclinical level. Existing research has explored the factors contributing to this risk, though a comprehensive synthesis of results had not yet been accomplished. Therefore, the purpose of this meta-analysis was to elucidate risk and protective factors for ED symptoms among individuals who identify as LGBTQ+.

Method: Searches were carried out across four databases. Included studies were assessed for quality and risk of bias. Subgroup analyses were undertaken to describe observable differences in factor estimates between groups within the LGBTQ+ community. Sensitivity analyses were also carried out to account for risk of bias.

Results: Seventy-one studies were included, synthesising 555 effect sizes from a total of 27,196 participants. Sixty-two factors were explored; 39 risk factors and seven protective factors were identified to be of significance to varying effects. Largest effects reported pertained to cognitive aspects related to the body.

Discussion: This meta-analysis reports several risk and protective factors that may hold significant influence on the development and maintenance of ED symptoms for LGBTQ+ individuals. Findings are interpreted in relation to existing research and the theoretical frameworks relevant these relationships. Further research is necessary to fortify our conclusions, particularly in understanding the complexities of these mechanisms across different identities within the community.

Keywords: eating disorder, LGBTQ, sexual minority, gender minority, sexual identity, gender identity, risk factors, protective factors.

Public Significance Statement

Individuals with marginalised sexual and/or gender identities are at greater risk of developing eating disorder symptoms. Research has explored factors contributing to this risk, though a comprehensive synthesis of results had not been accomplished. This study reports emerging risk and protective factors for eating disorders among LGBTQ+ individuals, with the largest effects relating to the body (e.g., drive for thinness, body shame, body appreciation). Implications of these findings are explored.

Introduction

Whilst eating disorders (EDs) and ED symptomology are pervasive across many personal and social identities, research is beginning to shed light on the disparities of ED prevalence between marginalised and non-marginalised groups. A recent focus of this literature is within sexual and/or gender diverse individuals. Broadly, marginalised sexual and/or gender identities report heightened rates of eating pathology, relative to their heterosexual and cisgender counterparts (Simone et al., 2020). Subsequently, sexual and gender-diverse individuals are reported to be at greater risk of experiencing EDs and ED behaviours, such as dietary restriction, purging, and binge eating (Parker & Harriger, 2020).

For lesbian, gay, bisexual, transgender, queer, plus (LGBTQ+) youth (aged 13-24), 9% self-report having a diagnosed ED, with an additional 29% suspecting they have an ED (The Trevor Project, 2022). This can be compared to previous population lifetime prevalence rates for adolescents aged 13-18 at 3% (Swanson et al., 2011) and young adults aged 18-29 at 5% (Hudson et al., 2007). Most notably, transgender boys/men and nonbinary youth assigned female at birth reported the highest rates of having a diagnosed ED, at 12% and 11% respectively. Furthermore, 33% of transgender boys/men and 35% of nonbinary youth assigned female at birth suspected they have an ED. In adults, results from a National Epidemiologic Survey in the US indicate lifetime prevalence of a DSM-5 ED diagnosis (e.g., anorexia nervosa, bulimia nervosa, and binge eating disorder) were between 1.9 and 3.6 times higher among sexual minority respondents relative to heterosexual respondents (Kamody et al., 2020). Lifetime prevalence of EDs in the US, by self-report of a healthcare provider's diagnosis, are reported to be 10.5% for transgender men and 8.1% for transgender women (Nagata, Ganson, et al., 2020). This begins to build a substantial picture of the disparities between LGBTQ+ and non-LGBTQ+ individuals in ED prevalence rates.

Research also goes on to illustrate further variability in ED rates within the LGBTQ+ community, between the varying identities that fall within this population. The significant risk of disordered eating in cisgender, gay men relative to heterosexual men is well established across the evidence base (e.g., Frisell et al., 2010). However, research directly comparing cisgender,

heterosexual women and lesbian women is less consistent. Some studies report greater risk of clinical EDs and disordered eating behaviours for adult and adolescent lesbians (Bell et al., 2019), with occurrence of binge eating reportedly at higher levels than any other sexual identity (Austin et al., 2009). Meanwhile, others conclude there to be no significant difference in ED prevalence or behaviours (Heffernan, 1996; Yean et al., 2013), or that lesbian women may even be at lesser risk for EDs due to the protectiveness that lesbian subculture may offer (Ludwig & Brownell, 1999). Research with bisexual individuals remains in its infancy, but initial conclusions are also conflicting (Parker & Harriger, 2020). Transgender and gender non-conforming (TGNC) individuals are also underrepresented in ED research (Nagata, Ganson, et al., 2020); initial findings suggest TGNC individuals largely report higher rates of EDs and ED symptoms compared to cisgender individuals (e.g., Watson et al., 2017b). However, there are also conflicting findings emerging within this research area. These include that transgender males report lower levels of bingeing and excessive exercise, and transgender females report higher rates of dietary restraint but lower rates of excessive exercise than their cisgender counterparts (Nagata, Murray, et al., 2020).

Furthermore, research has described that sexual and/or gender diverse individuals meeting diagnostic criteria for an ED may report greater symptom severity and increased risk profiles. A longitudinal cohort study reported that sexual and gender minority participants held more acute ED symptoms at point of treatment admission; this coincided with a greater delay between ED onset and treatment initiation and was hypothesised to be a consequence of healthcare providers difficulties in recognising EDs within this population, as well as the barriers sexual and/or gender minority patients often experience when attempting to access care (Mensigner et al., 2020). Additionally, both sexual minority and gender minority individuals experiencing EDs are reported to be more likely to hold a history of self-harm and/or suicidality compared to their heterosexual and cisgender counterparts (Chaphekar et al., 2023; Duffy et al., 2019).

Existing research identifies a myriad of aetiological factors involved in the development of EDs across the population, which are described as being sociocultural, biological, genetic, and psychological in nature (Barakat et al., 2023; Striegel-Moore & Bulik, 2007). Though, the wealth of

research contributing to this understanding stems from largely white, heteronormative and cisnormative samples. Whilst this research may hold some pertinence to sexual and/or gender diverse individuals, the mechanisms by which the greater ED prevalence and risk occurs remains insufficiently understood. Empirical research has attempted to provide evidence for several theories that could contribute to our knowledge of this, emerging from both ED specific models such as sociocultural models (Striegel-Moore et al., 1986) and objectification theory (Fredrickson & Roberts, 1997), as well as models specific to minoirtised groups such as the minority stress model (MSM; Meyer, 2003). However, the exploration of these models specifically for sexual and/or gender diverse individuals experiencing disordered eating remains seldom, and there stands critique regarding whether, individually, these models can fully account for all factors at play within this complex picture (e.g., Diamond & Alley, 2022). This is likely to lead to poorer outcomes for individuals with disordered eating who identify as LGBTQ+, and thus upholds health inequalities for this group.

Subsequently, identifying risk and protective factors for ED symptoms unique to sexual and/or gender diverse individuals explicitly, is vital in understanding and addressing the elevated risk for disordered eating within this population (Mason et al., 2021). Doing so is central to illuminating more effective opportunities for prevention and intervention for this community, chiefly by contributing to and challenging our theoretical understanding of the aetiology and maintenance of eating difficulties for this community.

The Present Study

Over the past decade, there has been a notable increase in ED research relating to the LGBTQ+ population. This is particularly important given the higher prevalence rates, severity of symptoms, and associated risk within this population. The predominant aims of this emerging research were to identify differences between LGBTQ+ and non-LGBTQ+ groups, as well as to investigate the relationships between ED symptoms and one or several other variables. The latter, specifically, has resulted in a need to synthesise such findings, to inform clinical practice when supporting LGBTQ+ individuals who present to healthcare services experiencing EDs and ED symptoms. A recent literature review (Parker & Harriger, 2020) has addressed this, in part, by

describing relevant empirical research illuminating risk factors for the development of EDs and ED symptoms. However, Parker and Harriger (2020) recommend their conclusions require strengthening through a systematic review or meta-analysis, with the addition of protective factors. This meta-analysis therefore aims to elucidate both risk and protective factors for ED symptoms within the LGBTQ+ population. It also aims to describe any observed differences in both risk and protective factors across specific groups within the LGBTQ+ community.

Method

This meta-analysis was developed, conducted, and reported in accordance with the Preferred Reporting for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). The protocol was registered and accepted with the International Prospective Register of Systematic Reviews (PROSPERO; ID CRD42023403387) on 28 February 2023, following a search on PROSPERO illustrating no similar meta-analysis had been registered or conducted.

Selection of Studies

Primary searches for peer reviewed literature were carried out across four electronic databases: MEDLINE Ultimate, PsycINFO, CINAHL Ultimate, as well as EBSCO Academic Search Ultimate to retrieve unpublished, academic literature. Searches were carried out in March 2023, with no publication date restrictions applied. Reference checking of articles identified within the primary search was also utilised as a secondary method of obtaining relevant articles.

Search terms were as follows: (‘eating disorder* OR anorexi* OR ‘anorexia nervosa’ OR bulimi* OR ‘bulimia nervosa’ OR ‘binge eating disorder’ OR BED OR ‘other specified feeding and eating disorder’ OR OSFED OR ‘eating disorder not otherwise specified’ OR EDNOS) AND (LGBT OR lesbian OR gay OR bisexual OR transgender OR queer OR ‘gender non-conforming’ OR ‘gender minorit*’ OR ‘sexual minorit*’ OR LGBTQ).

Eligibility Criteria

The inclusion criteria employed were: (i) studies must include at least a proportion of participants (70% or more) who identify as part of the LGBTQ+ community, (ii) study participants must have completed a validated and reliable measure of ED symptoms, and (iii) studies must have examined relationships between ED symptoms and another variable that could be defined as either a risk or protective factor. The first inclusion criterion aimed to ensure that study findings were largely informed by a significant majority of LGBTQ+ individuals. Related factors (whether risk or protective) were operationalised as variables that were tested for an association with ED symptoms. Definitions of the variables then informed categorisation of the construct as either a risk or protective factor.

Research studies were excluded if data of both LGBTQ+ and non-LGBTQ+ participants were not separated or distinguishable. In studies meeting this exclusionary criterion, contact was attempted with authors to ascertain whether they ran separate group analyses; such enquiries did not lead to any further inclusion of papers. Studies that reported insufficient statistical data to understand the relationship(s) of interest (i.e., a correlation coefficient or a statistic that could be reliably converted into a correlation coefficient was not reported), were also excluded. Non-primary research (e.g., book chapters, literature reviews, systematic reviews, commentaries) were also excluded.

Study Identification

Title and abstract screening, and full-text screening was conducted by the first author; this process was supported through online software “Rayaan QCRI2”. Uncertainty regarding inclusion at full-text screening was resolved through discussion between the authors.

Data Extraction

For each factor of interest, a correlation coefficient (*r*) was extracted or calculated. This coefficient was used as the effect size estimate for several reasons. Firstly, *r* was the most common metric for which effect sizes were reported within the included articles. It also offers highest opportunity for conversion (Trickey et al., 2012). Additionally, correlation coefficients (i.e., *r*) enable

interpretation of practical importance of an effect (Field, 2001) and can be easily computed (Hunter & Schmidt, 2004). Under Peterson and Brown (2005) methodology, β coefficients were converted to *r* provided they reported on univariate regression models (k=5). Odds ratios (k=1), R^2 (k=1), and eta-squared statistics (k=1) were also converted into *r* using Borenstein et al. (2009) and Cohen (1988) methodologies.

Prior to analysis, effect sizes were merged and averaged as required. This was completed under several rules generated by the authors:

a) Data reporting correlation coefficients of factors for specific groups (e.g., gay men, bisexual men etc), were extracted and recorded within such groups.
b) This meta-analysis did not allow for sub-group analysis beyond sexual minority men, sexual minority women, and gender minority individuals. Therefore, when studies reported effect sizes for several sexual or gender identities (e.g., transgender men, transgender women, and non-binary individuals), this data was averaged to provide one correlation coefficient relating to the sub-groups being investigated (e.g., gender minority individuals).
c) If an individual study administered more than one ED measure, thus providing correlation coefficients for these individually with the risk factor of interest, the correlation coefficients were averaged to provide one correlation coefficient to represent ED symptoms as a whole.
d) If studies reported correlation coefficients for more than one ED measure subscale, without reporting a total score, subscale correlation coefficients were averaged to provide one correlation coefficient.
e) If studies investigated a single factor using more than one measure (e.g., body dissatisfaction, measured separately by two body dissatisfaction measures) and reported correlation coefficients for each of these with ED symptoms, then these were averaged to create one correlation coefficient for said factor.
f) Different articles reporting analyses utilising the same dataset were included permitted these studies explored different factors and reported effect-size estimates for these.

g) In studies that reported a non-statistically significant finding without providing the specific effect size, an effect size of zero was assigned. Whilst this is a conservative approach that likely underestimates the true magnitude of the effect, this approach is preferable over excluding non-statistically significant results as this approach could result in an overestimation of the true effect (Rosenthal, 1995).
h) Studies reporting on a factor/ several factors that had not been featured in at least one other study were excluded.

Data Synthesis

Random-effects meta-analyses were conducted using statistical software package *metafor* (Version 4.4-0; Viechtbauer, 2010) in R (Version 4.3.2). Random-effects meta-analytic models were used, based on the identified heterogeneity within the meta-analyses; when there is substantial or moderate heterogeneity, fixed-effect models are unreliable (Field, 2001). Under the random-effects model, the assumption that all studies have the exact same effect size is relaxed, thus allowing for incorporation of between-study errors. Moreover, random-effects models are thought to enable more generalisable conclusions (Hedges & Vevea, 1998).

A series of meta-analyses were conducted for each identified factor, to ascertain risk and protective factors for all LGBTQ+ individuals. During analyses, Pearson *r* correlation coefficients underwent Fisher's Z transformation, then were back-transformed to *r* values for reporting and interpretation. Sub-group analysis was also carried out to understand potential differences in factor estimates across smaller groups within the LGBTQ+ community, as well as to indicate potential causes of heterogeneity among the main results. However, sub-group analysis was only carried out on factors made up of enough included studies, to ensure findings were reliable (Cochrane Handbook, section 10.11.2). Further detail regarding this can be found within the 'Sub-group Analysis' sub-section below.

Table A.1 (Appendix B) reports all effect sizes extracted from the included studies, prior to the necessary averaging of effect sizes according to the meta-analysis rules. Following analysis,

factors were defined as risk or protective based on the statistical output, definition of the factor, and measure employed. Positive correlation coefficients illustrate higher ED symptoms, whilst negative illustrate lower ED symptoms. Effect sizes were defined through Cohen's (1998) guidelines: small (0.1), medium (0.3) and large (≥0.5). Heterogeneity was estimated through Cochran's Q test (Cochran, 1954), prediction intervals, and the I^2 statistic (Higgins & Thompson, 2002; interpreted using Cochrane Handbook, section 10.10.2), aligning with recommendations from Borenstein et al. (2017). Considerable heterogeneity was defined as an I^2 statistic of ≥75% (Higgins et al., 2003; Cochrane Handbook, section 10).

Quality Assessment

Assessment of study quality and risk of bias is an essential component of meta-analyses; it promotes valid, genuine, and accurate outcomes by influencing analysis, interpretation, and conclusions of a review (Higgins & Altman, 2017). This was carried out using the National Heart, Lung, and Blood Institute's Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Institute of Health, 2021, Appendix C). Most included studies were cross-sectional in nature. For the two studies that were not, the specific data extracted from these were cross-sectional in nature. This tool was therefore deemed most suitable in determining quality of all studies included.

This tool guides assessors to focus on key quality-related concepts through each questions posed, to evaluate the internal validity of each study (National Institute of Health, 2021). It assesses 14 key concepts in total, with the outcome of each question informing the overall interpretation of quality and risk of bias. It does not provide an aggregated score to represent quality, as unmet criteria are likely to effect study quality to differing degrees. Quality assessment was not undertaken to inform exclusion of studies based on quality, but to advise data analysis through sensitivity testing. Twenty percent (n=15) of studies were independently double rated by a second reviewer. The degree of inter-rater reliability will be described using Cohen's Kappa coefficient.

Subgroup Analysis

Subgroup analyses were conducted to compare factors across subgroups of sexual and/or gender identity, where a minimum of two effect sizes per factor were reported for two or more subgroups. For this analysis, extracted results were categorised into the following: (1) sexual minority women (e.g., lesbian, bisexual, queer), (2) sexual minority men (e.g., gay, bisexual, queer), (3) gender minority individuals (e.g., transgender, gender non-conforming), and (4) LGB individuals (remaining studies that looked at sexual minority individuals broadly, which did not provide more specific subgroup results). These groups were inductively shaped by how samples were described within the included studies.

It was not possible to run subgroup analysis with more specific groups as, firstly, more specific groups were seldom reported on across included studies. Secondly, if reported, there were often disparities in language used to describe study samples; it did not feel appropriate to merge or re-define groups in these instances, nor would it have been possible to carry out sub-group analysis for all identities existing within the community. Authors recognise that this approach could be described as reductionist, however this subgroup analysis still aims to provide some suggestibility of the differences of risk and protective factors between larger sub-groups that make up the LGBTQ+ community.

Sensitivity Analysis

In response to the quality assessment, sensitivity analysis was undertaken. A “leave-one-out” analysis was conducted, both to support recognition of study outliers and their impact on the overall estimate, as well as to determine the impact of studies deemed “poor” quality and thus high risk of bias.

Publication Bias

Publication bias, referring to systematic differences between findings that are reported and unreported within public domain (Higgins & Altman, 2017), is a major threat to the validity of conclusions from meta-analyses (Shi & Lin, 2019). Though it has been suggested that risk factor

effects are less susceptible to the occurrence of publication bias compared to treatment effects (Brewin et al., 2000), assessment of this was still undertaken to improve validity of findings.

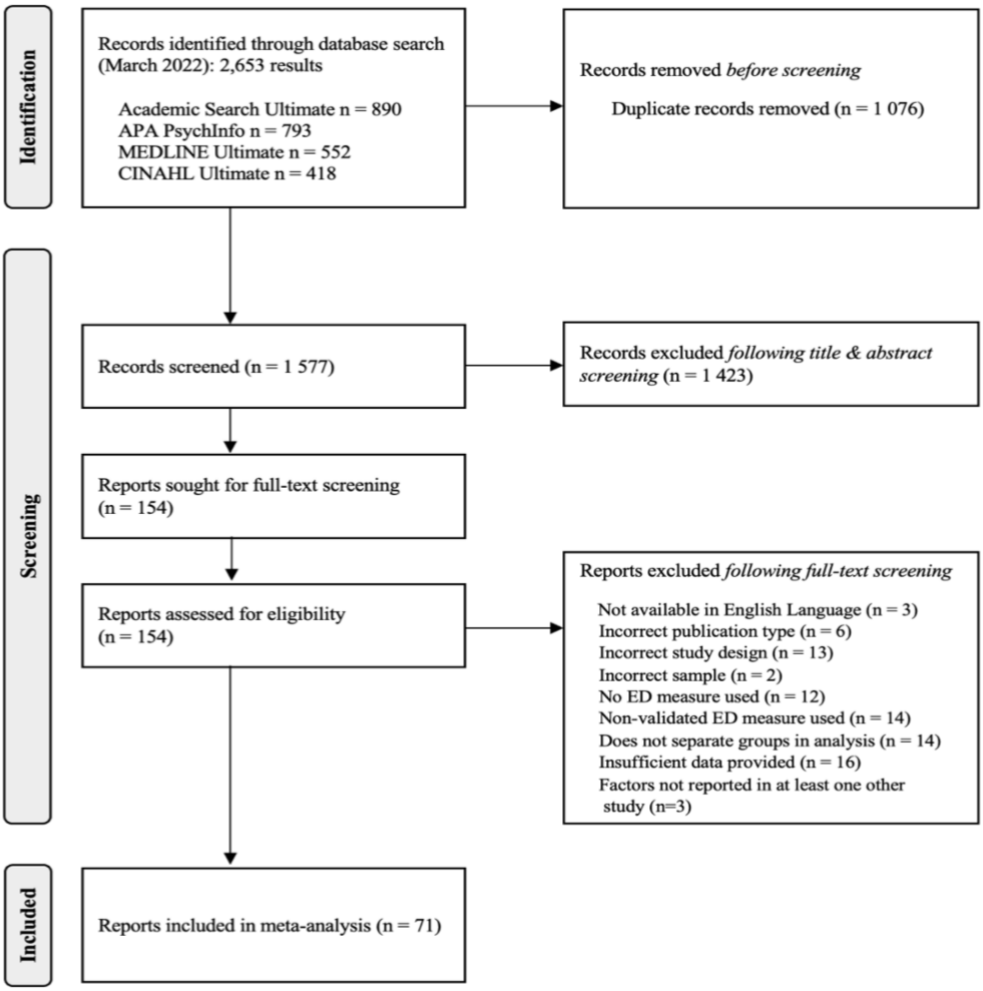
Publication bias was assessed using Duval and Tweedie's (2000) trim-and-fill method. This generates estimations of potentially missing studies, due to publication bias, and responsively adjusts the overall effect estimate accordingly (Shi & Lin, 2019). Additionally, funnel plot asymmetry was assessed through Egger's regression test (Egger et al., 1997), in which a statistically significant result indicates a level of asymmetry illustrative of publication bias. These tests were only carried out in meta-analyses of at least 10 studies, otherwise power would be too low to distinguish chance from real asymmetry (Cochrane Handbook, section 13.3.5.4).

Results

Searches across the databases yielded a preliminary 2,653 articles. Search outputs were merged, and duplicates removed, resulting in 1,577 articles to be reviewed for inclusion. Titles and abstracts were screened in accordance with the pre-determined eligibility criteria, resulting in 154 articles for full-text screening. Articles not eligible for inclusion following full-text screening were excluded, with the first applicable exclusion reason recorded on the PRISMA Flowchart (Figure 1). Reports that were excluded due to not being available in English Language are reported in Appendix D. During full-text screening, reference lists were also searched for relevant studies. This yielded no further articles for retrieval; articles identified as potentially applicable had already been screened and included through the primary search strategy. Screening concluded with 71 articles eligible for inclusion.

Figure 1

PRISMA Flowchart Diagram of Study Identification and Inclusion



The included studies (k=71) yielded 62 factors that were explored in a series of meta-analyses. These factors were generated from 555 effect sizes, with a total sample size of 27,196 participants; sample sizes from individual studies ranged from 12 to 2,733. Studies included in the meta-analysis are identified with an asterisk in the reference section.

Study Characteristics

Characteristics of the included studies are given in Table 2. This reports information such as study details, sample size, sample characteristics, and ED measure utilised.

Most studies were cross-sectional in design (97.2%, k=69). For the remaining two studies, one utilised a mixed quantitative and qualitative approach whilst the other utilised a between-subjects,

experimental design (Ballantyne, 2011 and Taylor & Goodfriend, 2008, respectively); data extracted from these studies, however, were cross-sectional in nature. Study focus was categorised into sexual orientation (78.9%, k=56), gender identity (19.7%, k=14), or both (1.4%, k=1). The studies were largely conducted in countries termed 'high-income' (90.1%, k=64), with 71.8% (k=51) of these carried out in the United States of America. A proportion of included studies were unpublished, grey literature (18.3%, k=13).

Participant age was across the lifespan, ranging from 12 to 85 years. Four studies focused on adolescents (<25 years), with then several other study's mean ages falling within adolescence (10-24; 28.2%, k=20). Most studies had predominantly White/Caucasian participants (defined here as sample being made up of >60% White; k=44), meanwhile almost a third of studies did not report the ethnicity of their participants (32.4%, k=23). Most included studies (94.37%, k=67) recruited community samples; the remaining four (Jones et al., 2018; Linsenmeyer et al., 2021; Nowaskie et al., 2021; Vocks et al., 2009) utilised clinical samples from gender related healthcare services or clinics. Details regarding social economic status, gender identity and sexual orientation can be found in Table 2.

All studies measured ED symptoms utilising self-report assessment methods, with the most frequently used being the Eating Attitudes Test-26 (EAT-26; Garner et al., 1982; 46.5%, k=33), or the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 2008; 29.6%, k=21).

Quality Assessment Outcomes

Quality assessment ratings are reported in Table 2, whilst a breakdown of the scoring matrix for individual studies can be found in Appendix E. The proportion of studies that were rated poor, fair, and good quality were 11.3% (k=8), 63.4% (k=45) and 25.3% (k=18), respectively. Those rated poor in quality accrued several 'no' answers, which resulted in substantial doubt around the study's ability to accurately assess the associations of interest. For papers that were independently double rated, inter-rater agreement was deemed to be of moderate level (Cohen's kappa coefficient=0.66; McHugh, 2012). Discrepancies were then resolved through discussion.

Table 2. Study Characteristics, including Quality Appraisal Ratings.

Study (Country)	Study Design	Study Focus	Whole sample size (sample size of interest if applicable)	Age range, mean (SD) (years)	Race/ Ethnicity (%)	SES/ Income (%)	Gender Identity (%)	Sexual Identity (%)	ED measure(s), method of assessment. Sample results (if reported).	Quality Appraisal Rating
Aiello 2022 (USA) *Unpublished literature*	Cross-sectional	GI: Transgender and non-binary individuals	496	18-61, 26.71 (4.725)	NR	Mean range: $41,000-50,999. 1% $0, 8.47% Less than $10,999/year, 10.89% $11,000-20,999/year, 16.33% $21,000-30,999/year, 16.53% $31,000-40,999/year, 17.94% $41,000-50,999/year, 14.72% $51,000-60,999/year, 6.25% more than $61,000/year, $7.86% Prefer Not to Answer.	27.02% Transmasculine, 48.99% Transfeminine, 10.48% non-binary, 13.51% preferred not to answer.	NR	EAT-26, self-report 41% fell within high-risk cut-off range	Fair
Alleva et al. 2018 (UK)	Cross-sectional	SO: Gay men	432(131)	18-85, 39.13 (13.76)	90.68% White, 3.86% Asian, 0.91% Black, 1.82% Mixed, 2.05% 'Other', 0.45% Rather not say, 0.23% Did not respond.	NR	NR	68.41% Heterosexual, 25.91% Gay, 3.18% Bisexual, 0.68% 'Other', 1.59% Rather not say, 0.23% Did not Respond.	EDE-Q, self-report NR	Fair

Alvy 2013a (USA) *Unpublished literature*	Cross-sectional	SO: Lesbian women	879(479)	35-64, 47.38 (7.12)	92.1% Caucasian American, 7.9% African American.	13.7% <$25,000, 16.6% $25,000-39,999, 22.3% $40,000-59,999, 14.7% $60,000-74,999, 32.6% $75,000+.	NR	Sample of interest 100% Lesbian.	EDI-2, self-report NR	Fair
Amerson 2022 (USA) *Unpublished literature*	Cross-sectional	SO: Bisexual women	757	18-30, 23.59 (3.54)	Ethnicity: 10.4% Hispanic, Latina, or Spanish Origin; 89.6% Not Hispanic, Latina, or Spanish Origin. Race: 79.5% White; 8.7% Multiracial; 4.7% Asian, Asian American, Native Hawaiian, or Pacific Islander; 2.6% Black; 1.1% American Indian or Alaska Native; 3.2% 'Other' Race.	NR	NR	94.5% Bisexual, 31.3% Queer, 24.7% Pansexual, 6% Gay, 3.4% Lesbian, 3% Asexual, 1.9% Questioning, 1.3% Heterosexual, 2.1% Other Sexual Identity.	EPSI, self-report NR	Fair
Ballantyne 2011 (USA) *Unpublished literature*	Mixed (extracted cross-sectional data only)	SO: Gay men	12	19-60, NR	66.7% Caucasian, 8.33% Latin-American, 8.33% African American, 8.33% Asian American and 8.33% Biracial.	NR	NR	100% Gay	EAT-26, self-report All sample displayed ED symptoms. 58.3% high disordered eating (>20 cut off score on EAT-26)	Poor

Barnhart et al. 2023 (China)	Cross-sectional	GI: Transgender and non-binary individuals	200	NR, 22.49 (3.70)	95% Han, 5% Minority.	71.5% <5000Y/per month, 28.5% >5000Y/per month.	57.5% Transgender women, 30% Transgender men, 12.5% Nonbinary individuals.	NR	EDE-Q short form, self-report 31% (n=62) positive probable ED screening status	Good
Barnhart et al. 2022 (China)	Cross-sectional	SO: SM men and women	1051(519)	18-49, 23.71 (4.79)	NR	NR	Sample of interest 100% men.	90.37% Gay and 9.63% Bisexual.	EDE-QS short form, self-report NR	Good
			1051(532)	18-48, 23.8 (4.81)	As above	As above	Sample of interest 100% women.	59.59% Lesbian, 40.41% Bisexual	As above	
Blashill 2010 (USA)	Cross-sectional	SO: Gay men	228	18-75, 31.07 (12.66)	76% Caucasian, 9% Multi-ethnic, 6% Hispanic/Latino, 6% Asian/Asian American, 2% African American/Black, <1% Middle Eastern/Persian, and <1% Native American/Alaskan Native.	NR	NR	100% Gay	EDE-Q (eating concerns and eating restraint subscales), self-report NR	Fair
Blashill & Vander Wal 2009 (USA)	Cross-sectional	SO: Gay men	228	18-75, 31.07 (12.66)	76% Caucasian, 9% Multi-ethnic, 6% Hispanic/Latino, 6% Asian/Asian American, 2% African American/Black, <1% Middle	NR	NR	100% Gay	EDE-Q (eating concerns and eating restraint subscales), self-report NR	Fair

					Eastern/Persian, and <1% Native American/Alaskan Native.					
Brennan et al, 2012 (USA)	Cross-sectional	SO: Gay and bisexual men	400	16-76, 34.1 (11.78)	62.8% White, 16.3% Black, 21% Asian.	NR	NR	87.5% Gay, 8.6% Bisexual.	EAT-26, self-report 14.8% 'high-risk' for disordered eating symptomology	Fair
Brennan et al. 2011 (USA)	Cross-sectional	SO: Gay, bisexual, and men who have sex with men	383	16-51+, NR	59.6% White, 13.8% Black/African/Caribbean, 19.6% Asian, 7% Other.	NR	NR	88% Gay, 8% Bisexual, 3% Heterosexual	EAT-26, self-report 13.6% (n=52) disordered eating risk	Fair
Brewster et al. 2019 (USA)	Cross-sectional	GI: Transgender women	205	16-68, 31.22 (13.79)	74% White/European American, 9% Multiracial, 6% Latina/o, 4% Asian American or Pacific Islander, 4% Black/African American, 2% Native American, and 1% 'other'.	Middle class (41%), working class (35%), upper-middle class (13%), living in poverty (10%), upper-class (1%).	100% transgender women	Exclusively lesbian (21%), bisexual (21%), mostly lesbian (14%), pansexual (13%), 9% heterosexual, other sexual orientation (8%), queer (7%), mostly heterosexual (7%).	EAT-26, self-report NR	Good

Brewster et al. 2014 (USA)	Cross-sectional	SO: Bisexual women	316	18-69, 29.24 (11.17)	81% European American/White, 5% African American/Black, 5% Multiracial, 3% Hispanic/Latino/a American, 3% Asian/Pacific Islander American, 1% Indigenous American/Native American, 2% other races/ethnicities.	45% middle class, 35% working class, 13% upper-middle class, 6% lower class, 1% upper class.	93% Women, 2% Transgender Women, and 5% "Other" (e.g., androgynous, genderqueer)	87% Bisexual, 7% mostly heterosexual, 6% mostly gay/lesbian	EAT-26, self-report NR	Good
Brokjob & Cornelissen 2022 (Norway)	Cross-sectional	GI: Transgender individuals	85	18-59, 25.51 (8.73)	NR	NR	Transgender men (n=53), transgender women (n=18) and non-binary individuals (n=14).	NR	EDE-Q short form, self-report NR	Good
Carper et al. 2010 (USA)	Cross-sectional, group comparison	SO: Gay men	78(39)	NR, 19.31 (0.89)	71.8% non-Hispanic White, 17.9% Latino or Hispanic, 7.7% African American. 2.6% Asian American.	NR	NR	50% Gay, 50% Straight	EDI-3 (drive for thinness subscale only), self-report NR	Poor
Carretta et al. 2019 (USA)	Cross-sectional	SO: Drag performers of which 97%+ identify as gay/queer	218	18-63, 29.45 (11.07)	72% White, 11% Latino/a, 4% African American/Black, 4% Asian American/Pacific Islander. 1% Native	22% upper-middle class, 36% lower-middle class, 34% working class, 8% poor.	83% male/ man, 10% genderqueer/ gender non-conforming, 1% transgender, and 6% different identity.	77% gay, 14% queer, 5% bisexual, 1% asexual, and 3% different orientation.	EAT-26, self-report NR	Fair

					American/Alaskan Native, 7% Biracial/Multiracial, and 1% 'Other'.					
Convertino, Brady et al. 2021 (USA)	Cross-sectional	SO: SM men and women	962(483)	18-30, 23.343 (3.68)	Race: 38.7% White, 30.6% Black/African American, 2.1% Native American/American Indian, 28.6% Asian/Pacific Islander. Ethnicity: 23.6% Hispanic/Latino, 76.4% Non-Hispanic/Latino.	NR	Sample of interest 100% women.	20.1% gay/lesbian, 74.1% bisexual, 2.1% asexual, 3.7% 'other'.	EDE-Q, self-report NR	Fair
			962(479)	18-30, 24.03 (3.76)	Race: 38.4% White, 30.5% Black/African American, 2.7% Native American/American Indian, 28% Asian/Pacific Islander. Ethnicity: 25.1% Hispanic/Latino, 74.9% Non-Hispanic/Latino.	As above	Sample of interest 100% men	49.9% gay/lesbian, 43% bisexual, 2.1% asexual, 5% 'other'.	As above	
Convertino, Elbe et al. 2022 (USA)	Cross-sectional	SO: SM Men	452	18-35, 27.62 (4.57)	Race: 54.6% White, 8.2% Black or African American, 3.1% Native American or American	34.1% less than $30,000; 29.6% $30,000-59,999; 16.9% $60,000-89,999; 18.4%	Sex assigned at birth: 75.7% male, 6% female. Gender identity: 89.7% man, 0.3% agender,	72.8% gay, 20.1% bisexual, 6.6% other.	EPSI, self-report NR	Fair

					Indian, 12.2% Asian or Pacific Islander, 20.1% 'other'. Ethnicity: 37.4% Hispanic or Latino, 62.2% Not Hispanic or Latino.	$90,000 and greater.	1.6% genderqueer, 1.6% genderfluid, 4.3% nonbinary, 2.4% self-described gender identity.			
Cusack et al. 2021 (USA; sample recruited online - pps location NR)	Cross-sectional	GI: Transgender and non-binary individuals	242	18-70, 24.92 (6.5)	82.23% White.	NR	Gender identity: 42.98% trans woman, 18.6% nonbinary, 17.77% transman, 6.61% gender queer/fluid, 4.55% agender, 4.13% woman with a trans history, 2.07% man with a trans history, 0.83% bigender, and 2.48% pps not identifying a primary gender identity. Sex assigned at birth: 53.7% assigned male at birth, 44% assigned female at birth, 0.83% intersex, 1.65% pps opted not to respond.	NR	EDE-Q, self-report NR	Fair
Dakanalis et al. 2012	Cross-sectional	SO: SM men	255(125)	19-25, NR –	NR	NR	NR	100% homosexual	EDI-2 (3 behavioural	Fair

(Italy)				(whole sample)					subscales), self-report NR	
Davids & Green 2011 (USA)	Cross-sectional	SO: SM men and women	439(133)	18-80, bisexual men: 33.22 (13.95), gay men: 26.28 (8.53)	NR	Income, M(SD): Bisexual men: 4.50(2.76), gay men: 5.59(3.39). [Note: ten possible responses for income beginning at '$25,000 and below' and increasing via $9,999 increments to '$105,001 and above'. Average income is based on response number.	Sample of interest 100% men	21.87% gay men, 8.43% bisexual men, 7.75% heterosexual men, 11.62% lesbian women, 31.66% bisexual women, and 18.68% heterosexual women (whole sample).	EDE-Q (composite score created from restraint and eating concern subscales only), self-report NR	Fair
			439(190)	18-80, bisexual women: 27.53 (10.00), lesbian women: 26.00 (7.54)	NR	Income, M(SD): Bisexual women: 4.93(3.17), lesbian women: 5.16(2.86). [Note: ten possible responses for income beginning at '$25,000 and below' and increasing via $9,999 increments to '$105,001 and above'. Average income is based on response number.	Sample of interest 100% women	As above	As above	

De Santis et al. 2012 (USA)	Cross-sectional	SO: Gay men	100	18-51, 32.47 (7.29)	83% 'foreign born' - length of residence in US ranged from less than 1 to 49 years. 'Foreign-born' men had immigrated from Cuba (33%); South America (29%); the Caribbean Islands, excluding Cuba (14%); and Central America (7%).	Ranged from US$0 to US$110,000.00 per year (M=US$40,550.50, SD= US$20,932.47).	NR	100% gay	EAT-26, self-report NR	Good
Duggan & McCreary 2004 (USA)	Cross-sectional	SO: Gay men	96(67)	NR	NR	NR	NR	69.79% gay, 30.21% heterosexual.	EAT-26, self-report NR	Fair
Engeln-Maddox et al. 2011 (USA)	Cross-sectional	SO: Gay men and lesbian women	380(186)	NR, 34.18 (13.09)	NR	33% <$30,000; 32% $30,000-$75,000; 27% >$75,000.	Sample of interest 100% men	100% gay	EAT-26, self-report EAT M(SD): .39(.38)	Fair
			380(186)	NR, 32.98 (12.38)	NR	34% <$30,000; 39% $30,000-$75,000; 26% >$75,000.	Sample of interest 100% women	100% lesbian	EAT-26, self-report EAT M(SD): .30(.34)	
Griffiths, Mitchinson et al. 2018	Cross-sectional	SO: SM men	2733	18-78, 33.93 (11.94)	Cultural background: 50.6% Australian, 15.4% New	NR	99.1% male, 0.4% gender-fluid/gender-queer, gender-neutral or non-	68.4% exclusively gay/homosexual, 21.4% mostly	EDE-Q (short, 12-item), self-report NR	Fair

(Australia, New Zealand)					Zealand, 8% North-West European, 6.4% South-East Asian, 3.5% Southern and Eastern European, 2.8% Southern and Central Asian and 2.6% North-East Asian, with 10.7% indicating less prevalent cultural backgrounds (e.g., Indigenous Australian)		binary, 0.3% transgender, and 0.2% as other.	gay/homosexual, 8.4% bisexual, 1.1% mostly straight/heterosexual, 0.4% other and 0.3% pansexual.		
Griffiths, Murray et al. 2018 (Australia)	Cross-sectional	SO: SM men	2733	As above	As above	As above	99.1% male, 0.3% transgender, 0.6% 'other'.	All specified minority sexual orientations (68.4% exclusively gay/homosexual, 21.4% mostly gay/homosexual, 8.4% bisexual, 1.1% mostly straight/heterosexual, 0.7% 'other'.	EDE-Q (short, 12-item), self-report NR	Fair
Haines et al. 2008 (US; sample recruited	Cross-sectional	SO: Lesbian women	126	NR, 35.12 (11.63)	83.7% Caucasian	73.7% middle or upper-middle class	NR	100% lesbian	EAT-26, self-report 12% (n=3) of sample scored	Poor

online - pps location NR)									above clinical cut-off for EAT	
Heffernan 1996 (USA)	Cross-sectional	SO: Lesbian women	203	17-65, 34	84.2% White/European, 4.9% African American, 3.0% Latina, 2.9% Native American, 3.0% Asian, 1.0% Middle Eastern, 1% multiracial or of unspecified ethnicity.	NR	NR	100% lesbian	EDE-Q (22 items out of 38), self-report Questionnaire on Eating and Weight Patterns-revised (QEWP-R) - BED, self-report 0.98% met criteria for current BN, 0.49% met current criteria for AN, 5.4% met criteria for current BED.	Fair
Henn et al. 2019 (Germany)	Cross-sectional	SO: Homosexual and bisexual women	617(295)	Homosexual women: NR, 26.4 (9.21). Bisexual women: NR, 23.98 (6.92).	NR	NR	100% female	61.02% homosexual, 38.98% bisexual	EDE-Q, self-report NR	Fair
Holmes et al. 2021 (USA)	Cross-sectional	SO: Bisexual women	164	18-43, 21.34 (3.55)	73.2% White, 10.4% Multiracial, 9.8% Black or African American, 3% Latina or Hispanic, and 2.4% Asian or Pacific Islander.	20.7% of participants reported current household incomes of less than $10,000; 27.5% from $10,000 to $29,000; 12.8% from $30,000 to $49,000; 11% from	100% cis-gender women	45.1% mostly attracted to opposite sex but to same sex also, 17.1% some preference for opposite sex but attracted to	EAT-26, self-report NR	Fair

						$50,000 to $74,999; 16.4% from $75,000 to $150,000; 6.1% of greater than $150,000 and 5.5% did not report their household income.		same sex also, 18.3% equally attracted to both sexes, 10.4% some preference for same sex but attracted to opposite sex also, 9.1% mostly attracted to same sex but attracted to opposite sex also.		
Hospers & Jansen 2005 (Netherlands)	Cross-sectional	SO: Homosexual men	239(70)	NR, 24(3.3)	NR	NR	NR	100% (n=70) mostly or exclusively attracted to men	EDE-Q, self-report Mean(SD) for homosexual group: 0.96(0.9).	Fair
Jackson 2008 (USA) *Unpublished literature*	Cross-sectional	SO: Gay men	161(75)	Whole sample: 18-25, 20.94 (2.15)	71.4% Caucasian, 11.8% Hispanic, 8.7% Asian American, 5.6% African American, 0.6% American Indian and 1.9% Other - (whole sample).	NR	NR	100%(n=75) categorised as homosexual based on Kinsey scale	EDE-Q, self-report NR	Fair
Jones et al. 2019 (USA)	Cross-sectional	SO: SM women	965(197)	All 18	Race only reported prior to pulling final sample of sexual minority women.	NR	NR	Only attracted to females (n=13), mostly attracted to	EAT-26, self-report Mean(SD): 0-77 and 5.86(6.93) (whole sample)	Good

								females (n=13), equally attracted to females and males (71), mostly attracted to males (n=100).		
Jones et al. 2018 (USA)	Cross-sectional	GI: Transgender individuals	563(416)	NR, 29.49 (13.67)	NR	NR	37.5% female, 62.5% male (gender assigned at birth based on sex characteristics)	NR	EDI-2 (drive for thinness and bulimia subscales), self-report NR	Good
Joshua 2002 (USA) *Unpublished literature*	Cross-sectional	SO: Lesbian women	574(280)	18-77, 39.40 (11.52)	87.9% Caucasian, 4.3% African American/Black, 5.7% Hispanic/Latino, 0.7% Asian, 1.1% Native American/Indian, and 0.4% 'other'.	NR	NR	100% lesbian	Binge Scale (BS, 19 item), self-report, NR Bulimia Test-Revised (BULIT-R, 36-item), self-report, NR	Fair
Kozee & Tylka 2006 (USA)	Cross-sectional	SO: Lesbian women	377(181)	18-26, 21.2(1.9)	Heritage: 82% European heritage, 4% Latin heritage, 2% African heritage, 2% Native U.S. American heritage, 1% Asian heritage, 9% Multiracial.	50% middle class, 26% working class, 22% upper-middle class, 3% upper class.	NR	100% (n=181) lesbians	EAT-26, self-report, EAT-26 M(SD): 61.24(17.78)	Fair

Linsenmeyer et al. 2021 (USA)	Cross-sectional	GI: Transgender and non-binary individuals	164	12-23, 17(2.3)	NR	NR	78% transgender male, 17.1% transgender female, 4.9% nonbinary.	NR	Adolescent Binge Eating Disorder Questionnaire (ADO-BED, 5 item), self-report 8.7% reported previous diagnosis of an ED. ADO-BED - 9.1% screen positive.	Fair
Liubovich 2003 (USA) *Unpublished literature*	Cross-sectional	SO: Lesbian women	276(149)	18-73, 38.75 (11.5) – (lesbian group)	87.2% Caucasian. Remaining were African American, Hispanic, Asian American, foreign nationals, or endorsed 'other' (whole sample)	26.4% <$20,000; 52% $20,000-$49,000; 17.9% $50,000-$100,000, and 3.7% $100,000. Three respondents did not report income. (whole sample)	NR	100% (n=141) lesbians	EDI, self-report NR	Good
Martins et al. 2007 (Australia)	Cross-sectional	SO: Gay men	200(98)	16-40, NR– (whole sample)	NR	NR	NR	100% (n=98) gay men	EDI (drive for thinness subscales), self-report NR	Fair
Mason & Lewis 2015 (USA)	Cross-sectional	SO: Lesbian and bisexual women	164	18-40, Mean range: 18-25	Race: 62.2% White, 12.8% Black, 1.8% American Indian or Alaskan Native, 3.7% Asian, 1.8% Other, 16.5% Multiracial, 1.2%	NR	NR	41.5% only lesbian, 29.3% mostly lesbian, 22% bisexual, 7.2% other.	BES (16-item), self-report NR	Fair

					Missing. Ethnicity: 12.2% Latin/Hispanic origin, 87.2% not of Latin/Hispanic Origin, 0.6% Missing.					
Meyer et al. 2001 (UK)	Cross-sectional	SO: Homosexual men and women	100(20)	NR, 19.85 (0.88)	NR	NR	Sample of interest 100% women	100% (n=20 homosexual	EAT-26, self-report EAT Total - M(SD): 3.65(4.56).	Poor
			100(20)	NR, 20.1 (1.17)	As above	As above	Sample of interest 100% men	100% (n=20) homosexual	EAT-26, self-report. EAT Total - M(SD): 7.60(7.73).	
Mitchell et al. 2021 (USA)	Cross-sectional	GI: Transgender individuals	130	NR, 31.2 (13.7)– (whole sample)	83.8% Non-Latinx White, 5.4% Multiracial, 4.6% Latinx, 3.1% Native American, 1.5% Asian, 1.5% Not Reported. (whole sample)	NR	31.54% Trans women, 32.31% Trans men, 36.15% NB individuals. Assigned sex at birth: 40% male, 59.2%59.2% female, 0.8% Not reported. (whole sample)	NR	EDE-Q (restraint subscale), self-report EDE-Q Restraint - M(SD): 1.95(1.9)	Fair
Moradi & Tebbe 2022 (USA)	Cross-sectional	SO & GI: Sexual and gender minority individuals.	201	18-59, 25.9(8.1)	81.6% White/European American/Caucasian; 6.5% Asian/Asian American; 5% African/African American/Black; 3.5% American	43.3% <$39,000; 25.9% $40,000-79,000; 18.4% $80,000-119,000; 10.4% >$120,000; 2% Missing.	87.6% woman or female, 10.9% genderqueer, 2.5% transgender and woman or female, 6.5% another gender, 1% missing.	Sexual Identity (sample able to report more than one SI): 47.8% queer, 40.3% bisexual,	EAT-26, self-report NR	Good

					Indian/Native American/First Nation; 3% Hispanic/Latino/a American; 1.5% Arab/Arab American/Middle Eastern, 1% Pacific Islander/Pacific Islander American, 9% Biracial or Multiracial, 14.9% own words, 1% missing.			37.3% lesbian, 19.9% gay, 12.9% asexual, 3.5% heterosexual/straight, 12.4% own words (e.g., "pansexual" and "gray-asexual"), 1.5% missing. Sexual orientation (sample able to report more than one SO): 35.3% bisexual, 23.9% exclusively lesbian or gay, 15.4% mostly lesbian or gay, 9% asexual, 1% mostly heterosexual, 13.9% own words, 1.5% missing.		
Muratore et al. 2022 (USA)	Cross-sectional	GI: Transgender and gender-	93	18+(NR range), 34.19 (12.02)	Race: 61.3% White, 17.2% Black/African American, 4.3%	17.2% under $25,000; 8.6% $25,000-34,999; 16.1% $35,000-	Gender identity category: 46.2% transgender women, 33.3%	32.3% bisexual, 14.0% gay, 12.9%	EAT-26, self-report	Good

		expansive individuals			Asian, 5.4% Multiracial, 6.5% American Indian/Alaska Native, 3.2% 'Other', 2.2% Native Hawaiian/other Pacific Islander. Ethnicity: 69.9% Non-Hispanic, Latino/a/x, or Spanish origin; 29% Hispanic, Latino/a/x or Spanish origin.	49,999; 25.8% $50,000-74,999; 12.9% $75,000-99,999; 19.3% above $100,000.	transgender men, 12.9% cross-dresser, 7.5% nonbinary. Gender terms endorsed also reported. Lived gender: 41.9% man, 36.6% woman, 12.9% part-time one gender/part-time another gender, 8.6% neither/genderqueer/nonbinary.	asexual, 15.1% heterosexual, 8.6% lesbian, 8.6% pansexual, 4.3% same gender loving, 2.2% queer, 2.2% other.	Total sample, M(SD): 87.6(28.4)	
Naamani & Jamil 2021 (Lebanon)	Cross-sectional	SO: Gay men	129	18-49, NR.	NR	1.6% less than $200, 2.3% $201-$500, 7.8% $501-$1000, 11.6% $1001-$1500, 14% $1501-$2000, 12.4% $2001-$3000, 20.2% $3001-$5000, 30.2% more than $5000.	NR	100% gay	EAT-26, self-report 27.1% EAT-26 score equal to or more than 20 (clinical cut off)	Good
Nagata et al. 2022a (USA)	Cross-sectional (recruited from previous longitudinal, cohort study)	SO: SM individuals	2261 (1090)	NR, 42.1 (15.1)	83.9% White, 6.5% Hispanic/Latino/a, 3% Asian/Pacific Islander, 1.7% Black/African American, 0.6% Native American, 4.2% Multiracial/ 'Other'.	NR	100% Cisgender men	100% Gay	EDE-Q, self-report M(SD)–Weight & Shape Concern: 2.5(1.7). Preoccupation & Restriction: 0.6(1). Dietary Restraint: 2.2(2). Eating Shame 0.6(1)	Fair

2261(100)	NR, 38(12.8)	81.7% White, 3.2% Hispanic/Latino/a, 7.5% Asian/Pacific Islander, 2.2% Black/African American, 5.4% Multiracial/ 'Other'.	As above	100% Cisgender men	100% 'Bisexual plus' (bisexual, pansexual, or polysexual identities)	EDE-Q, self-report M(SD)–Weight & Shape Concern: 2.4(1.6). Preoccupation & Restriction: 0.7(1.1). Dietary Restraint: 2(2). Eating Shame 0.6(0.9)
2261(564)	NR, 38(14.3)	84.1% White, 6% Hispanic/Latino/a, 1.2% Asian/Pacific Islander, 1.6% Black/African American, 0.4% Native American, 6.8% Multiracial/ 'Other'.	As above	100% Cisgender women	100% Lesbian	EDE-Q, self-report M(SD)–Weight & Shape Concern: 2.4(1.6). Preoccupation & Restriction: 0.6(1). Dietary Restraint: 2.1(2). Eating Shame 0.8(1.1)
2261(507)	NR, 31.9(9.6)	83% White, 4.7% Hispanic/Latino/a, 3% Asian/pacific Islander, 2.8% Black/African American, 0.2% Native American, 6.4% Multiracial/ 'Other'.	As above	100% Cisgender women	100% 'Bisexual plus' (bisexual, pansexual, or polysexual identities)	EDE-Q, self-report M(SD)–Weight & Shape Concern: 2.7(1.7). Preoccupation & Restriction: 0.8(1.1). Dietary Restraint: 1.9(2). Eating Shame 1(1.2)

Nagata et al. 2022b (USA)	Cross-sectional (recruited from previous longitudinal, cohort study)	GI: gender minority individuals	1653 (1120)	NR, 30(9.8)	79.8% White, 3.8% Hispanic/Latino/a, 2.9% Asian/Pacific Islander, 1.1% Black/African American, 0.3% Native American, 12.1% Multiracial/ 'Other'.	NR	100% Gender-expansive individuals	NR	EDE-Q, self-report EDE-Q Global score–M(SD): 1.8(1.3).	Fair
			1653(352)	NR, 30.9(9.8)	86.7% White, 3.4% Hispanic/Latino/a, 0.3% Asian/Pacific Islander, 2.8% Black/African American, 0.3% Native American, 6.5% Multiracial/ 'Other'.	As above	100% Transgender men	As above	EDE-Q, self-report EDE-Q Global score - M(SD): 1.7(1.3).	
			1653(181)	NR, 41.2(15)	89.6% White, 3.5% Hispanic/Latino/a, 0.6% Asian/Pacific Islander, 6.4% Multiracial/ 'Other'.	As above	100% Transgender women	As above	EDE-Q, self-report EDE-Q Global score–M(SD): 2(1.3)	
Nowaskie et al. 2021 (USA)	Cross-sectional	GI: Transgender individuals	166	NR, 31.11 (13.05)	1.8% Asian/Asian American, 13.9% Black/African American, 71.1% Caucasian/White	NR	47.6% transgender men, 52.4% transgender women.	NR	EDE-Q, self-report NR	Fair

					, 6.6% Latino/Hispanic, 6.6% 'Other'.					
Parent & Bradstreet 2017 (USA)	Cross-sectional	SO: Gay and bisexual men	401(197)	18-73, 35.33 (16.11)	75% White, 11% Hispanic/Latino, 7% Asian, 4% Multiracial, 2% Black, 1% 'Other'.	NR	NR	89% gay, 11% bisexual.	EAT-26, self-report EAT-26 for GB sample, M(SD): .50(.91)	Fair
Picot 2006 (USA) *Unpublished literature*	Cross-sectional	SO: Gay and lesbian individuals	1028(389)	NR, 34(8.9)	8.5% African American, 0.8% Asian American, 77.6% European American, 3.3% Latino, 1.5% Native American/Pacific Islander, 1.5% African/Caribbean, 0.3% Indian, 6.4% 'Other'.	NR	1NR	79.4% endorsed a gay sexual orientation	EAT-26, self-report EAT-26 Range: 0-75, M(SD): 10(9.8)	Fair
			1028(381)	NR, 33.9(9.4)	11.6% African American, 1.3% Asian American, 73.7% European American, 3.7% Latino, 3.4% Native American/Pacific Islander, 0.5% African/Caribbean, 4.5% 'Other', 1.3% Missing.	NR	NR	72.4% endorsed a lesbian sexual orientation	EAT-26, self-report EAT-26 Range: 0-50, M(SD): 9.3(9.1)	Fair
Polsky 2006 (USA)	Cross-sectional, group	SO: lesbian women	309	18-60, 29.5 (9.56)	66.3% Caucasian, 7.4% African American, 10%	22.7% below $10,000; 32.4% $10,000-$30,000; 19.4% $30,001-	NR	100% lesbian	EAT-26, self-report	Fair

Unpublished literature	comparison				Latina, 7.1% Asian American, 9.1% 'Other'.	$50,000; 14.6% $50,001-$70,000; 6.1% $70,001-$90,000; 4.5% over $90,000.			EAT-26 Range: 0-44. 6.5% (n=23) met criteria for ED	
Reilly & Rudd 2006 (USA)	Cross-sectional	SO: gay men	213	18-62, 34.3 (10.3)	87.3% White	30.5% $20,000 to $40,000 income (after taxes)	NR	100% gay	EAT-26, self-report EAT-26 Range: 0-46, M(SD): 7.29(7.04)	Fair
Rezeppa et al. 2021 (USA)	Cross-sectional, secondary data	SO: SM adolescents	528	14-18, 15.77 (1.1)	60.6% White, 11.7% Black, 10.8% Latina, 4.9% Asian/Pacific Islander, 10.4% Mixed Race, 1.5% Native American/ 'Other'.	NR	100% Cisgender female	15.2% Lesbian/gay; 70.8% Bisexual/pan sexual; 14% Queer/Questioning/'Other'	EPSI, self-report EPSI Binge Eating M(SD): 13.59(7.72); EPSI Purging M(SD): 3.16(4.95); EPSI Restricting M(SD: 9.52(6.2)	Fair
Rodrigues de Oliveria 2022 (Portugal) *Unpublished literature*	Cross-sectional	SO: LGB+ individuals	1292(255)	18-65, 29.87 (11.27)– (whole sample)	NR	NR	74.5% cisgender women, 25.5% cisgender men (whole sample)	Overall - 80.3% and 19.7% LGB+. Specific breakdown - 2.2% lesbian women, 5.4% gay men, 8.5% bisexual individuals, 0.9% asexual individuals, 1.9% pansexual individuals,	Dutch Eating Behavior Questionnaire (DEBQ): emotional eating behavior and restrained eating behavior subscales, self-report. Emotional Eating Behaviour Subscale M, SD: 2.47(0.95). Restrained Eating Behaviour	Good

								0.8% other, 80.3% heterosexual individuals (whole sample)	Subscale M, SD: 2.31(0.85).	
Serier et al. 2022 (USA)	Cross-sectional	SO: SM individuals(veterans)	1363(805)	NR, M(SD)–Lesbian:28.18 (6.98), Bisexual: 24.9 (5.35)	Race: 74.6% White, 17.8% Black, 5.1% Asian, 4.4% 'Other', 4.1% American Indian/Alaskan Native, and 0.7% Native Hawaiian/Pacific Islander (whole sample). Ethnicity: 82.6% non-Hispanic (whole sample).	NR	100% female	81.5% heterosexual or straight, 6.3% lesbian, and 12.2% bisexual (whole female sample)	Eating Disorder Diagnostic Scale (EDDS-5), self-report Probable diagnoses. Per group–Lesbian: 2% BN, 2% BED; Bisexual: 3.1% BN, 5.1% BED, 9.2% Atypical AN, 3.1% low frequency BED	Fair
			1363(558)	NR, M(SD)–Gay: 31.27 (12), Bisexual: 29.43 (14.41)	As above	As above	100% male	96.8% heterosexual or straight, 2% gay, and 1.2% bisexual (whole male sample)	Eating Disorder Diagnostic Scale (EDDS-5), self-report Probable diagnoses per group–Gay: 9.1% BN, 18.2% atypical AN. Bisexual: 14.3% atypical AN.	
Serpa 2004 (USA) *Unpublished literature*	Cross-sectional	SO: Gay men	192(96)	19-55, 37.45 (7.1)	2.08% African American, 3.13% Asian, 79.17% Euro-American, 12.5% Latino/Hispanic,	2.08% Did not respond; 13.54% <$30,000; 29.17% $30,000-$59,999; 25% $60,000-$89,999; 7.29%	100%(n=96) men	100%(n=96) gay	EDI-2, self-report (drive for thinness, bulimic attitudes and behaviours, body	Good

					1.04 Native American, 4.17% 'Other'.	$90,000-$119,999; 13.54% $120,000-$149,999; 1.04% $150,000-$180,000, and 8.33% >$180,000.			dissatisfaction subscales) NR	
Siconolfi et al. 2009 (USA)	Cross-sectional	SO: Gay and bisexual men	219	NR, 33 (10.67)	64% White, 8.2% Black/African American, 9.1% Asian/Pacific Islander, 18.3% Latino, and less than 1% 'Other'.	NR	100% cisgender men	90.9% gay, homosexual or queer, 6.7% bisexual, and 2.3% unsure of sexual orientation.	EAT-26 (17 items), self-report EAT: 2.57(0.6)	Fair
Strong et al. 2000 (USA)	Cross-sectional, group comparison	SO: Gay and lesbian individuals	392(103)	NR, 23.10 (NR)	77.67% Caucasian	NR	100% cisgender males	100% (n=103) gay	EAT-26, self-report. EAT-26: 7.68(9.96)	Fair
			392(82)	NR, 23.32 (NR)	85.37% Caucasian	As above	100% cisgender females	100%(n=82) lesbian	EAT-26, self-report EAT-26: 7.74(9.59)	
Taylor & Goodfriend 2008 (USA)	Experimental between groups (extracted cross-sectional data only)	SO: Gay men	60	NR, 31.23 (10.33)	NR	NR	NR	100% gay	EAT-26 (diet, bulimia, and oral control subscales), self-report, NR EDI, self-report, NR	Poor
Testa et al. 2017	Cross-sectional	GI: Transgender individuals	442	18-70, 32.49 (13.18)	87.6% White, 2.9% African American, 1.6% Asian American,	38.4% <$30,000; 22.1% $30,000-59,999; 14% $60,000-89,999;	34.84% Transfeminine and 65.16% Transmasculine	NR	EAT-26, self-report	Fair

(USA, Canada)					0.7% American Indian/Alaska native, 0.9% Native Hawaiian/Pacific Islander, 3.4% Multiracial, 2% 'Other'. 6.3% identify as Hispanic/Latino.	14.7% $90,000-149,999; 12.2% $100,000-149,999; 8.6% >$150,000.			EAT-26, M(SD) - TFS: 11.16(10.72). TMS: 8.45(10.09)	
Torres 2007 (USA) *Unpublished literature*	Cross-sectional	SO: Gay and bisexual men	201(138)	NR, 34.24 (12.17)–(whole sample)	2.5% African American/Black, 1% Native American, 4.5% Asian/Pacific Islander, 5% Hispanic/Latino, 0.5% Indian/Southeast Asian, 80.1% Caucasian/White, 0.2% Middle Eastern, 5% Multiethnic, 1.5% 'other' (whole sample)	NR	Sex: 100% male. Gender: 0.5% woman, 97% man, 2.5% transgender: male-to-female. (whole sample).	54.2% (n=109) homosexual, 31.3% (n=63) heterosexual, 14.4% (n=29) bisexual. (whole sample)	EAT-26, self-report NR	Fair
Urban et al. 2022 (USA)	Cross-sectional	GI: Transgender and non-binary individuals	212	NR, 27.19 (6.22)	4.2% Asian/Asian American/Pacific Islander, 3.3% Biracial, 0.5% Black/African American, 9% Hispanic/Latinx, 3.8% Multiracial, 2.4% Native/Indigenous/Alaskan Native, 88.2%	NR	37.7% transgender men, 6.6% transgender women, 68.9% nonbinary, 13.2% self-identified their gender.	2.54% heterosexual/ straight, 22.6% bisexual, 10.8% lesbian, 13.7% gay, 59% queer, 19.3% self-identify.	EDE-Q, self-report EDE-Q, M(SD): 3.06(1.29)	Good

					White, 2.8% self-identify/ 'Other'.					
Vocks et al. 2009 (Germany, Austria, Switzerland)	Cross-sectional, group comparison	GI: MtF and FtM Transexuals	356(131)	MtF transgender group: NR, 37.27 (11.18). FtM transgender group: NR, 34.95 (7.99)	NR	NR	67.18% Male-to-Female transgender individuals, 42.82% Female-to-Male transgender individuals	NR	EDE-Q, self-report NR	Fair
Wagenbach 1996 (USA) *Unpublished literature*	Cross-sectional	SO: Gay and lesbian individuals	182(51)	NR, 26.96 (10.07)	83% Caucasian, 6% African American, 7% Asian, 2% Hispanic, 2% "Other"(whole sample)	Income M(SD): 62,954(33,112)– gay men only	NR	28.02% (n=51) gay men–(whole sample)	EDI-2 (drive for thinness and bulimia subscales), self-report NR	Fair
			182(47)	NR, 29.53 (9.31)	As above	Income M(SD): 58,750(28,302)– lesbian women only	As above	25.82% (n=47) lesbian women–(whole sample)	EDI-2 (drive for thinness and bulimia subscales), self-report NR	
Wang & Borders 2017 (USA)	Cross-sectional	SO: SM men	116	18-40, 24.8 (5.35)	90% European American/White	NR	59.5% male	Males: 91% gay, 7% bisexual, 1% 'other' (queer, pansexual, asexual). Females: 39% lesbians, 41%	EAT-26, self-report NR	Poor

								bisexual, 20% 'other'.		
Watson et al. 2016 (USA)	Cross-sectional	SO: Bisexual women	353	18-61, 27.13 (7.94)	76.8% non-Latina White; 8.2% Multiracial/Multi-ethnic; 6.5% Hispanic, Latina or Latinx; 4.5% Asian or Pacific Islander; 3.4% Black or African American; 0.3% Native American; 0.3% missing.	NR	89.2% cisgender, 7.7% genderqueer, 1.4% transgender, 1.7% self-described.	100% bisexual women	EAT-26, self-report NR	Good
Watson et al. 2015 (USA)	Cross-sectional	SO: SM women	243	18-58, 29.22 (9.10)	83.1% White, 3.7% Hispanic/Latina, 3.7% Black/African American, 2.9% Asian/Pacific Islander, 2.9% Multiracial/Ethnic, 0.8% Native American/American Indian, 0.4% Middle Eastern, and 1.6% identified with another racial/ethnic group not listed.	NR	NR	44% lesbian, 25.9% bisexual, 12.8% queer, 11.5% pansexual, 1.7% questioning, 0.8% omnisexual, 1.2% identified with another sexual identity not listed.	EAT-26, self-report NR	Good
Williamson & Spence 2001	Cross-sectional	SO: Gay men	202	14-75, 34.68 (NR)	NR	NR	NR	100% gay or bisexual based on Kinsey	EDI-2, self-report NR	Fair

(UK)								7-point continuum: 1.49% rating of 3, 1.49% rating of 4, 23.76 rating of 5, and 73.27% rating of 6.		
Williamson & Hartley 1998 (UK)	Cross-sectional, group comparison	SO: Gay men	88(41)	15-25, 19.49 (NR)	17.6% from ethnic minorities (whole sample)	NR	NR	46.59% gay men (whole sample)	EAT-26, self-report EAT-26 Total score (gay participants only) - mean: 39.78. 21.95% scored above clinical cut off (20)	Poor
Wiseman & Moradi 2010 (Worldwide–USA, Canada, UK, India, & others).	Cross-sectional	SO: SM men	231	17-70, 32.67 (13.83)	77% White/Caucasian, 5% Hispanic or Latino, 4% Asian American/Pacific Islander, 1% African American, 11% Multiracial or 'other' races/ ethnicities, 2% did not report.	NR	97% men, 2% transgender	66% exclusively gay, 20% mostly gay, 12% bisexual, 2% mostly heterosexual	EAT-26, self-report EAT-26 range: 1.08-4.62, M(SD): 2.35(0.70)	Fair
Yean et al. 2013 (USA)	Cross-sectional	SO: Gay/lesbian and bisexual individuals	693(116)	18-60, 21.23 (5.56)– (whole sample)	71% Caucasian, with remainder ethnically diverse: 7.4% African American, 4.6% Hispanic, 13.4%	NR	100% cisgender individuals	16.74% gay/bisexual men	EAT-26, self-report EAT-26 M(SD): 9.06(11.3)	Good

			Asian/Pacific Islander, 3.3% Native American, 0.3% 'Other'/did not respond–(whole sample)				
	693(86)	As above	As above	As above	As above	12.41% gay/bisexual women	EAT-26, self-report EAT-26 M(SD): 12.24(13.72)

Note. USA = United States of America, UK = United Kingdom, GI = Gender Identity, SO = Sexual Orientation, SM = Sexual Minority, NR = Not Reported, pps = Participants, ED = Eating Disorder, BN = Bulimia Nervosa, AN = Anorexia Nervosa, BED = Binge Eating Disorder, EAT = Eating Attitudes Test, EDE-Q = Eating Disorder Examination Questionnaire, EDI = Eating Disorder Inventory, EPSI = Eating Pathology Symptoms Inventory, BES = Binge Eating Scale.

Factor Estimates

Sixty-two factors were reported on, across more than one study. Meta-analyses were carried out for each factor, with the main results conveyed in Table 3. This reports, for each factor, the number of studies being synthesised (*k*), the pooled sample size (*N*), the estimate of overall effect size (*r*), 95% confidence intervals, and the significance test of weighted effect size estimate (*z*). Heterogeneity was assessed and reported through the heterogeneity estimate (*Q*) and I^2 Statistic. To support interpretation, factors have been grouped iteratively under subheadings. Factors for which a single effect size was reported across all included studies were not included in the meta-analysis, though have been documented in Table A.2 (Appendix F).

Table 3. Results from Individual Meta-Analyses on Risk and Protective Factor Estimates for Eating Disorder Symptoms.

				95% CI's							
Factor	***k***	***N***	***r***	***LL***	***UL***	***z***	***p***	***Q***	***df***	***p***	***I^2 (%)***
Individual Characteristics											
BMI**	20	5040	0.15	0.06	0.24	3.27	**.001**	146.03	19	<.0001	90.23
Exercise frequency	3	542	0.11	-0.09	0.3	1.07	.283	10.94	2	.004	81.2
Social sensitivity****(SMM only)*	2	456	0.44	0.35	0.52	8.94	**<.0001**	1.25	1	.26	19.79
Experience of child sexual abuse****(SMM only)*	2	783	0.17	0.1	0.24	4.88	**<.0001**	0.96	1	.33	0
Pornography use (frequency)****(SMM only)*	2	2800	0.12	0.08	0.16	6.33	**<.0001**	0.42	1	.52	0
Utilisation of risk-related behaviours											
Appearance- and Performance-Enhancing Drug and Substance Use***	5	3404	0.35	0.22	0.47	5.09	**<.0001**	45.73	4	<.0001	93.59
Sexual risk taking***	2	1157	0.15	0.07	0.23	3.62	**.0003**	1.82	1	.18	45.13
Drug and alcohol use	2	556	0.11	-0.09	0.3	1.05	.29	5.23	1	.02	80.88
Psychological Factors – General											
Depressive symptoms***	16	3221	0.3	0.23	0.36	8.9	**<.0001**	54.95	15	<.0001	71.43
Anxiety symptoms***	4	945	0.38	0.25	0.5	5.29	**<.001**	10.01	3	.02	78.18
Interoceptive awareness deficits***	3	546	0.34	0.2	0.47	5.56	**<.0001**	6.55	2	.04	69.55
Emotion regulation difficulties***	2	419	0.33	0.25	0.42	7.04	**<.0001**	0.24	1	.62	0
Perfectionism***	2	476	0.25	0.16	0.33	5.46	**<.0001**	0.04	1	.89	0
Rumination	2	280	0.46	-0.2	0.83	1.39	.16	33.19	1	<.0001	96.99
Psychological Factors – Body Specific											
Body dissatisfaction***	24	4792	0.49	0.41	0.57	10.09	**<.0001**	274.17	23	<.0001	92.08
Body surveillance***	15	3238	0.41	0.31	0.49	7.89	**<.0001**	131.25	14	<.0001	88.63
Body shame***	14	3033	0.56	0.48	0.63	11.68	**<.0001**	146.6	13	<.0001	87.71
Drive for muscularity***	13	3463	0.31	0.19	0.42	4.96	**<.0001**	187.78	12	<.0001	92.26
Drive for thinness***	5	1032	0.73	0.62	0.81	8.94	**<.0001**	18.68	4	.0009	89
Body-related appearance anxiety***	3	307	0.54	0.45	0.61	10.34	**<.0001**	1.66	2	.44	0
Upward body image comparisons***	3	1269	0.49	0.42	0.55	12.32	**<.0001**	4.49	2	<.0001	54.96
Downward body image comparisons***	2	1051	0.53	0.36	0.67	5.32	**<.0001**	13.13	1	.0003	92.39
Muscularity dissatisfaction****(SMM only)*	2	2961	0.26	0.13	0.38	3.93	**<.0001**	3.99	1	.05	74.94
Body fat dissatisfaction****(SMM only)*	2	2961	0.69	0.51	0.82	5.8	**<.0001**	18.12	1	<.0001	94.48
Height dissatisfaction****(SMM only)*	2	2961	0.22	0.18	0.25	11.88	**<.0001**	0.94	1	.33	0
Positive body dysmorphic disorder screen***	2	962	0.32	0.2	0.43	4.97	**<.0001**	4.29	1	.04	76.68
Concern for physical appearance***	2	192	0.27	0.13	0.4	3.8	**.0001**	0.09	1	.77	0
Societal Influences											
Discrimination (related to SO and/or GI)***	15	4678	0.25	0.16	0.34	5.14	**<.0001**	91.16	14	<.0001	90.57
Sexual objectification***	9	2320	0.25	0.18	0.31	7.23	**<.0001**	18.75	8	.016	60.25
Sociocultural appearance-related pressure***	7	1964	0.44	0.3	0.57	5.54	**<.0001**	38.47	6	<.0001	89.46

Factor	*k*	*N*	*r*	95% CI's *LL*	95% CI's *UL*	*z*	*p*	*Q*	*df*	*p*	I^2 (%)
Community affiliation/involvement*	7	2350	0.12	0.01	0.22	2.13	**.03**	37.04	6	<.0001	84.7
Perceived media influences promoting thinness**	2	192	0.38	0.15	0.58	3.11	**.002**	3.11	1	0.08	67.81
Social desirability	2	98	0.01	-0.23	0.25	0.11	.91	1.45	1	0.23	31.04
Internalised Societal Influences											
Internalised homonegativity***	18	5286	0.23	0.16	0.3	6.36	**<.0001**	98.77	17	<.0001	85.22
Internalised sociocultural attitudes towards appearance***	13	3770	0.44	0.37	0.51	10.12	**<.0001**	116.24	12	<.0001	85.96
Identity concealment***	7	2386	0.3	0.15	0.43	3.96	**<.0001**	38.33	6	<.0001	92.31
Internalised muscularity appearance ideal***	5	1915	0.29	0.15	0.41	3.97	**<.0001**	36.87	5	<.0001	88.56
Internalised thin/low body fat appearance ideal***	4	1876	0.41	0.28	0.52	5.88	**<.0001**	36.91	4	<.0001	89.06
Self-objectification****(SMM only)*	3	323	0.28	0.14	0.41	3.87	**.0001**	3.56	2	.17	43.35
Internalised transphobia***(GM only)*	2	305	0.38	0.1	0.6	2.6	**.009**	5.94	1	.02	83.17
Gender-related Factors											
Minority stress****(GM only)*	4	916	0.33	0.2	0.45	4.73	**<.0001**	12.53	3	.01	73.05
Transition status *(GM only)*	3	497	0.04	-0.09	0.16	0.55	.58	4.08	2	.13	50.98
Gender role conflict****(SMM only)*	2	303	0.23	0.12	0.33	3.99	**<.0001**	0.06	1	.81	0
Gender dysphoria**(GM only)*	2	297	0.3	0.03	0.54	2.17	**.03**	4.96	1	.03	79.84
Non-affirmation of gender identity *(GM only)*	2	535	0.3	-0.03	0.57	1.76	.08	9.22	1	.002	89.15
Protective Factors											
Age	29	8371	-0.03	-0.07	0.00	-1.88	.06	61.02	28	<.001	54.87
Self-esteem***	15	2960	-0.36	-0.4	-0.32	-15.57	**<.0001**	22.45	14	0.07	35.72
Femininity	6	571	-0.06	-0.21	0.08	-0.86	.39	13.29	5	.02	60.06
Income/SES	6	1549	-0.01	-0.12	0.09	-0.25	.8	18.54	5	.002	74.74
Masculinity	6	896	-0.00	-0.16	0.15	-0.05	.96	14.33	5	.01	65.61
Education	5	1678	-0.04	-0.15	0.07	-0.64	.53	16.01	4	.003	80.05
Community connectedness	4	1236	-0.09	-0.19	0.01	-1.74	.08	10.28	4	.04	64.5
Body appreciation***	3	586	-0.43	-0.49	-0.36	-10.88	**<.0001**	-.11	2	.95	0
Body satisfaction***	3	919	-0.39	-0.46	-0.32	-9.46	**<.0001**	3.18	2	.2	38.81
Degree of 'outness'	3	757	-0.04	-0.28	0.21	-0.31	.75	27.18	2	<.0001	91.16
Stage of identity	3	378	-0.01	-0.11	0.09	-0.17	.86	1.5	2	.47	0
Ethnicity – Black**(SMM only)*	3	1002	-0.2	-0.38	-0.01	-2.05	**.041**	21.62	2	<.0001	89.27
Ethnicity – Asian*(SMM only)*	2	783	-0.21	-0.44	0.05	-1.61	.11	13.51	1	.0002	92.60
Body esteem***	2	837	-0.34	-0.41	-0.26	-8.29	**<.0001**	1.45	1	.23	30.99
Downward (favourable) social comparison***	2	323	-0.23	-0.33	-0.13	-4.24	**<.0001**	0.96	1	.33	0
Positive personal evaluation of physical appearance	2	192	-0.15	-0.3	0.01	-1.8	.07	1.24	1	.26	19.66
Transgender congruence****(GM only)*	2	330	-0.16	-0.26	-0.05	-2.87	**.004**	0.03	1	0.86	0

Note. SO = Sexual Orientation, GI = Gender Identity, BMI = Body Mass Index, SES = Socioeconomic Status, SMM = Sexual Minority Men, GM = Gender Minorities. *p≤.05, **p≤.01, ***p≤.001

Risk Factors

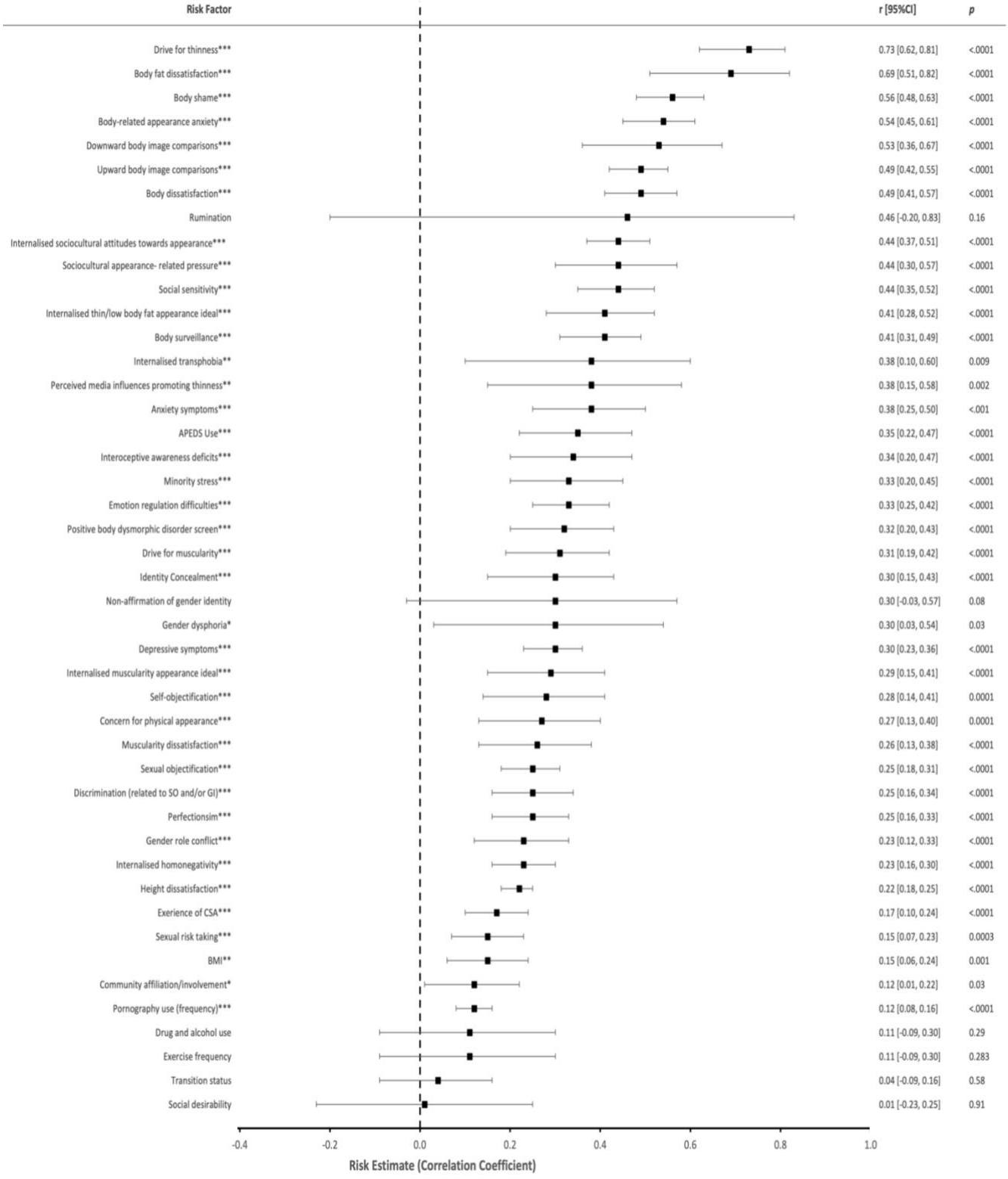
Figure 2 presents a forest plot of all 45 risk factors investigated. Across these factors, thirty-nine were identified to be of significance. Fifteen were considered small effects: BMI, experience of child sexual abuse, pornography use (frequency), sexual risk taking, perfectionism, muscularity dissatisfaction, height dissatisfaction, concern for physical appearance, discrimination (related to SO and/or GI), sexual objectification, internalised homonegativity, internalised muscularity appearance ideal, self–objectification, gender role conflict, community involvement.

Nineteen were of medium effect: social sensitivity, appearance– and performance–enhancing drug and substance use, depressive symptoms, anxiety symptoms, interoceptive awareness deficits, emotion regulation difficulties, body dissatisfaction, body surveillance, drive for muscularity, upward body image comparisons, positive body dysmorphic disorder screen, sociocultural appearance–related pressure, perceived media influences promoting thinness, internalised sociocultural attitudes towards appearance, internalised thin/low body fat appearance ideal, internalised transphobia, minority stress, gender dysphoria, and identity (SO and/or GI) concealment.

Lastly, five factors were considered large effects: body shame, drive for thinness, body–related appearance anxiety, downward body image comparisons, and body fat dissatisfaction.

Figure 2

Forest Plot Illustrating all Risk Factor Estimates



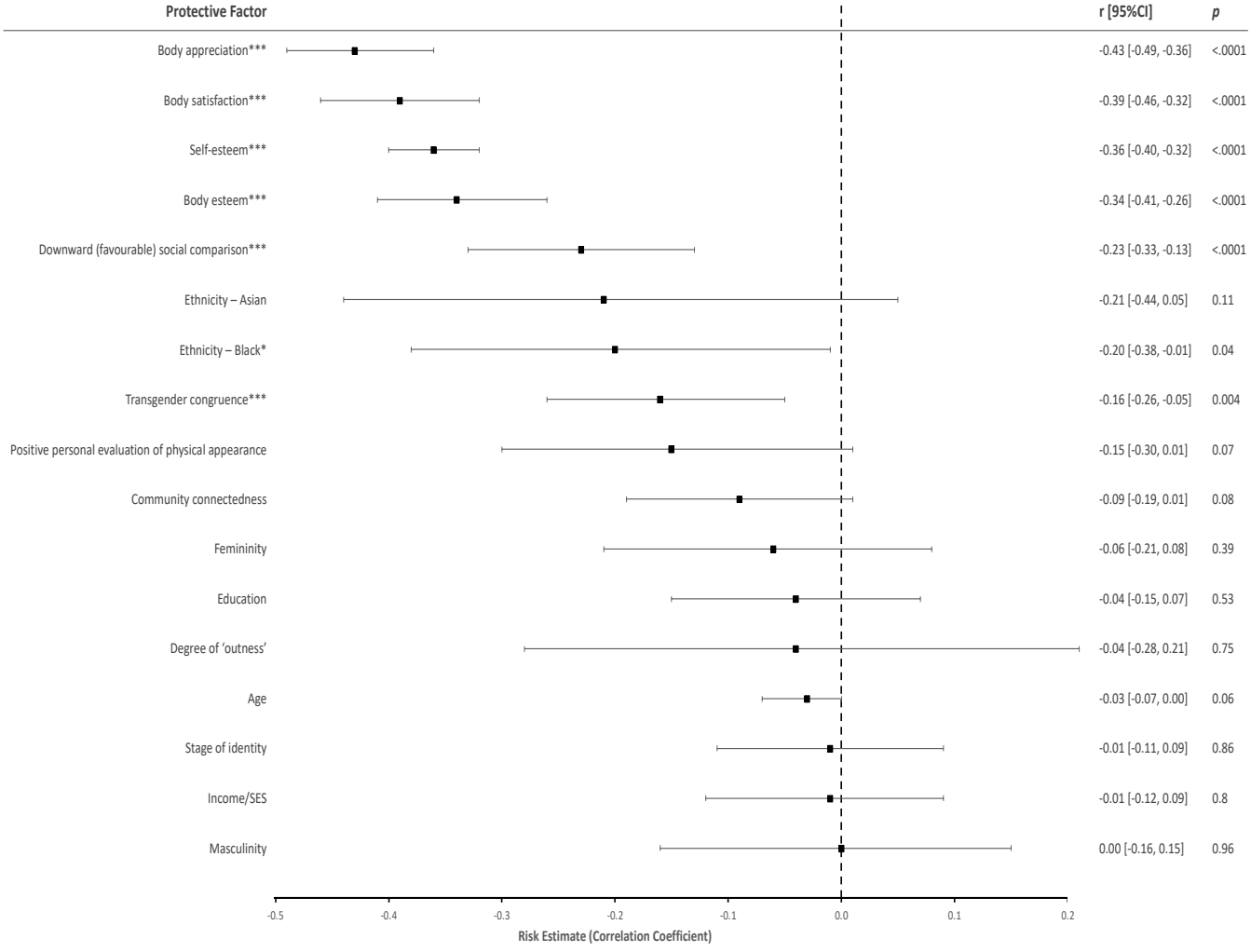
Note. *p≤.05, **p≤.01, ***p≤.001

Protective Factors

Factors serving a protective function were also of interest. Seven protective factors were identified to be significant, to either small (ethnicity [black], downward [favourable] social comparison and transgender congruence) or medium effects (body appreciation, body esteem, body satisfaction, self-esteem). Figure 3 presents a forest plot of all protective factors.

Figure 3

Forest plot illustrating all protective factor estimates



Note. *p≤.05, **p≤.01, ***p≤.001

Subgroup Analysis

Twenty-three factors were suitable for subgroup analysis: 17 risk and six protective factors. This analysis was only carried out for studies that reported a minimum of two effect sizes for two or more subgroups per factor. Table 4 reports the results of the subgroup analyses, including correlation coefficient (*r*), 95% CI, significance level (*p*), and an indication of heterogeneity (I^2). Subgroup differences can be observed for nine effect estimates: anxiety symptoms, BMI, body dissatisfaction, community affiliation/involvement, depressive symptoms, discrimination (related to sexual orientation/gender identity), identity concealment, sexual objectification, and sociocultural appearance–related pressure. These are described further within Chapter 6.

Table 4. Results from Subgroup Analysis – Factor Estimates by Subgroup

			95% CI's				
Factor	***k***	***r***	***LL***	***UL***	***SE***	***p***	***I^2 (%)***
Age							
SMW	11	-0.00	-0.07	0.06	0.03	.00	71.72
SMM	10	-0.07	-0.13	-0.01	0.03	**.02***	51.05
GM	7	-0.04	-0.09	0.01	0.02	.12	0
***Anxiety symptoms*†**							
SMW	2	0.29	0.21	0.38	0.05	**<.0001*****	0
GM	2	0.47	0.21	0.67	0.15	**.0001*****	84.44
APEDS							
SMW	2	0.3	0.08	0.49	0.12	**.01***	94.53
SMM	2	0.31	0.09	0.51	0.12	**.01***	94.89
***BMI*†**							
SMW	7	0.09	0.03	0.15	0.03	**.003****	39.92
SMM	8	0.2	0.05	0.33	0.08	**.01***	88.89
GM	4	0.06	-0.26	0.37	0.17	.71	94.7
***Body dissatisfaction*†**							
SMW	5	0.59	0.42	0.72	0.12	**<.0001*****	91.22
SMM	13	0.51	0.39	0.62	0.08	**<.0001*****	93.23
GM	6	0.37	0.29	0.44	0.04	**<.0001*****	58.75
Body shame							
SMW	8	0.55	0.43	0.66	0.08	**<.0001*****	92.82
SMM	5	0.58	0.47	0.66	0.08	**<.0001*****	71.06
Body surveillance							
SMW	8	0.44	0.24	0.61	0.05	**<.0001*****	80.04
SMM	5	0.42	0.34	0.5	0.12	**<.0001*****	87.46
***Community affiliation/involvement*†**							
SMW	4	0.05	-0.09	0.19	0.07	.48	85.26
SMM	3	0.19	0.08	0.31	0.06	**.001*****	69.61
***Depressive symptoms*†**							
SMW	4	0.33	0.25	0.4	0.04	**<.0001*****	14.95
SMM	9	0.26	0.17	0.34	0.06	**<.0001*****	71.54
GM	2	0.44	0.11	0.68	0.18	**.01****	88.96

Factor	*k*	*r*	95% CI's		*SE*	*p*	I^2 (%)
			LL	*UL*			
Discrimination (related to SO and/or GI)†							
SMW	10	0.18	0.14	0.22	0.02	**<.0001*** **	45.77
SMM	3	0.31	-0.27	0.73	0.31	0.29	96.37
GM	2	0.44	0.35	0.53	0.06	**<.0001*** **	0
Drive for muscularity							
SMW	3	0.35	0.26	0.44	0.05	**<.0001*** **	56.14
SMM	9	0.27	0.11	0.41	0.08	**.001*** **	93.41
Drive for thinness							
SMW	2	0.8	0.68	0.87	0.13	**<.0001*** **	78.41
SMM	3	0.67	0.51	0.79	0.13	**<.0001*** **	84.69
Femininity							
SMW	2	-0.33	-0.78	0.09	0.22	.12	69.83
SMM	4	0.05	-0.57	0.15	0.05	.37	0
Identity concealment†							
SMW	3	0.19	0.07	0.3	0.06	**.002** **	73.45
SMM	3	0.35	0.08	0.57	0.14	**.01** **	95.01
Income/ SES							
SMW	2	0.00	-0.19	0.19	0.1	.97	72.96
SMM	3	0.03	-0.12	0.19	0.08	.67	71.88
Internalised muscularity appearance ideal							
SMW	2	0.21	0.1	0.31	0.06	**.0002*** **	57.17
SMM	3	0.25	0.06	0.43	0.1	**.01** **	86.49
Internalised sociocultural attitudes towards appearance							
SMW	4	0.47	0.32	0.6	0.09	**<.0001*** **	90.02
SMM	6	0.4	0.26	0.52	0.08	**<.0001*** **	88.86
GM	2	0.48	0.38	0.57	0.06	**<.0001*** **	10.12
Internalised thin/low body fat appearance ideal							
SMW	2	0.38	0.28	0.47	0.06	**<.0001*** **	58.36
SMM	2	0.38	0.05	0.63	0.18	**0.03***	96.75
Internalised homonegativity							
SMW	9	0.19	0.12	0.26	0.04	**<.0001*** **	75.59

Factor	*k*	*r*	95% CI's		*SE*	*p*	I^2 *(%)*
			LL	*UL*			
SMM	9	0.29	0.16	0.4	0.07	**<.0001*** **	88.67
Masculinity							
SMW	2	0.2	-0.25	0.66	0.23	.38	71.83
SMM	4	-0.07	-0.26	0.11	0.09	.45	61.8
Self–esteem							
SMW	4	-0.36	-0.42	-0.31	0.03	**<.0001*** **	0
SMM	10	-0.35	-0.41	-0.28	0.04	**<.0001*** **	49.72
Sexual objectification†							
SMW	5	0.25	0.18	0.32	0.04	**<.0001*** **	44.83
SMM	2	0.16	-0.04	0.36	0.11	0.12	64.89
Sociocultural appearance- related pressure†							
SMW	2	0.39	-0.01	0.68	0.21	0.06	93.17
SMM	4	0.42	0.22	0.59	0.12	**.0001*** **	82.66

Note. APEDS = Appearance- and Performance-Enhancing Drug and Substance Use, BMI = Body Mass Index, GI = Gender Identity, GM = Gender Minorities, SES = Socioeconomic Status, SO = Sexual Orientation, SMM = Sexual Minority Men, SMW = Sexual Minority Women. *p≤.05, **p≤.01, ***p≤.001 †Factors with observable subgroup differences.

Sensitivity Analysis of Factor Estimates

Sensitivity analysis was conducted to ascertain the degree to which studies rated high risk of bias influenced overall results. Factors which contained one study determined to be of low quality (17 factors in total) were re-analysed using the leave-one-out method. This highlighted only one substantial change to results: identity concealment, following removal of Wang and Borders (2017), remained significant to $p<.0001$ though decreased from medium ($r=0.31$) to small effect ($r=0.25$).

Factors where their effect estimate was shaped by more than one study deemed low quality (body dissatisfaction, femininity, internalised homonegativity, masculinity, and self-esteem) were also initially examined through the leave-one-out method. This highlighted no observable influence of individual high risk of bias studies, on the overall estimate. Following this, the meta-analyses for these factors were repeated, to assess whether the combination of low-quality studies were holding an accumulative influence on the effect estimate. Body dissatisfaction's factor estimate, following removal of Taylor and Goodfriend (2008) and Williamson and Hartley (1998) increased slightly, resulting in change from a significant medium effect ($r=0.49$, $p<.0001$) to a significant large effect ($r=0.5$, $p<.0001$, $N=4691$, $k=22$).

Additional leave-one-out sensitivity analysis was also carried out to support recognition of study outliers, assessing the degree to which any one study was driving the overall estimate compared with other included studies. Community affiliation/involvement's significant small effect was being driven notably by Davids and Green (2011)'s SMM effect; once removed, this was no longer significant ($r=.09$, $p=.1$). Additionally, exercise frequency became a significant small effect ($r=0.21$, $p=.0001$) when leaving out Davids and Green (2011)'s SMW effect size; this left two studies in the meta-analyses, both of which reported effects for SMM samples only.

Publication Bias

Eleven factors were examined for publication bias (age, BMI, body dissatisfaction, body shame, body surveillance, depressive symptoms, drive for muscularity, discrimination [related to SO and/or GI], internalised homophobia/homonegativity, internalised sociocultural attitudes towards

appearance, and self-esteem). These factors were comprised of at least 10 studies, ensuring appropriate power for the analysis (Cochrane Handbook, section 13.3.5.4). Egger's regression test highlighted significant funnel plot asymmetry for BMI (p=0.002) and depressive symptoms (p=0.008). The trim-and-fill method also suggested presence of publication bias for BMI and depressive symptoms, as well discrimination (related to SO and/or GI) and drive for muscularity. Trim-and-fill funnel plots for these factors can be found in Appendix G.

BMI and depressive symptoms were identified to have predicted several missing studies on the left side of the funnel plots (six and five studies, respectively) suggesting that, when accounting for publication bias, both would generate smaller estimated effect sizes. BMI's factor estimate was found to be no longer statistically significant (r=0.06, p=0.23), whilst depressive symptoms effect size decreased from a medium to small effect (r=0.25, p=<.0001).

Alternatively, trim-and-fill analysis imputed additional studies on the right side of the funnel plots for discrimination (related to SO and/or GI) and drive for muscularity; the inclusion of these predicted studies would generate larger effect sizes than reported within the main analysis. Taking this into account, discrimination increased from small to a medium effect (r=0.31, p=<.0001), whilst drive for muscularity's effect increased, remaining at medium effect (r=0.41, p=<.0001).

Discussion

This meta-analysis sought to elucidate and synthesise risk and protective factors for ED symptoms within the LGBTQ+ population, as well as describe observed differences within subgroups of this community. Whilst such factors have been extensively researched synthesised for the general population, this is the first meta-analysis to do so specifically for the LGBTQ+ community. Sixty-two factor estimates were identified, from 71 included studies, of which 39 were identified to be significant risk factors and seven significant protective factors. Of these significant factors, 29 were of either medium or large effect, suggestive of pertinent factors that should be considered when attempting to understanding ED development and maintenance in those who identify as LGBTQ+.

Due to the broad scope of this meta-analysis and the large potential for interpretation of results, the most prominent risk and protective factors will be discussed; seeking to understand, consolidate, and critically appraise these findings in relation to current theoretical understanding, clinical practices, and related research.

Risk factors were grouped iteratively to support ease of interpretation. Many factors, of both medium and large effect, related to body-specific psychological factors. Meanwhile, others related to general psychological factors (e.g., anxiety, depression, emotion regulation deficits), societal (externalised and internalised) influences, as well as individual characteristics. These findings are in accordance with risk factor research across the general population, where factors relating to preoccupation with the body (i.e., drive for thinness, body dissatisfaction, body image concerns, body shame), sociocultural influences (i.e., internalisation of sociocultural attitudes towards appearance) and negative affect (i.e., anxiety, depression) are reported to be main contributors to ED development (Jacobi et al., 2004; Polivy & Herman, 2002).

Several risk factors identified for this sample related to individual characteristics. It is widely understood that EDs typically manifest during adolescence or early childhood, in the general population (Smink et al., 2012). This review highlighted that younger age was not significantly correlated with an increase in ED symptoms, other than for SMM. BMI was reported to be of significant small effect, which then was reported to be negligible when accounting for publication bias. Furthermore, the findings related to race and ED risk are curious, appearing to conflict with emerging findings in the wider literature that ED prevalence does not differ depending on ethnicity (Cheng et al., 2019). The lack of representation of racial and ethnic diversity in the included may be underpinning such findings. It is apparent more research is required to expand our understanding of ED risk in those with minoritised backgrounds, as well as to then the intersectional impact of being an individual of numerous minoritised identities.

The relationships between ED symptoms and depressive symptoms, anxiety symptoms and emotion regulation difficulties individually were found to be significant to medium effect; these

findings align with a recent review that sought to understand the association between EDs and other mental health difficulties (Tan et al., 2023), with these associations being described as bidirectional. Interoceptive awareness deficits as a risk factor similarly is explored across wider populations, with a recent meta-analysis concluding that large interoceptive deficits commonly occur in in individuals with EDs, irrespective of diagnosis (Jenkinson et al., 2018). Whilst causality cannot be ascertained, this suggests that members of the LGBTQ+ experiencing ED symptoms are likely to also experience symptoms of other mental health conditions. It is important for services to acknowledge such co-morbidity when considering treatment approaches for LGBTQ+ individuals, as it associated with more severe symptomatology, chronic course of impairment, increased treatment dropout, and poorer treatment outcomes (Beech et al., 2021).

The most pertinent risk and protective factors, holding largest effects, related to the cognitive experience of one's body (e.g., drive for thinness and for muscularity, body dissatisfaction, body shame, body appreciation). The associations between eating difficulties and body-specific factors are well established, for example body dissatisfaction (Stice et al., 2011; Parker & Harriger, 2020) and body shame (Nechita et al., 2021) are recognised as potent predictors for EDs across varying identities. The transdiagnostic, cognitive-behavioural model of EDs (Fairburn et al., 2003) is a well-known model, often used to inform clinical practice. This model positions a dysfunctional system for evaluating the self, which then drives cognitive features of ED symptomatology such as body dissatisfaction and body image concerns, at the core of ED psychopathology. These findings appear to confirm the applicability of this component of the model, for LGBTQ+ individuals. Additionally, perfectionism and self-esteem are also theorised within this model to be important mechanisms for the maintenance of ED symptoms (Fairburn et al., 2003). This is also consistent with this study's findings, with perfectionism identified as a to be a significant risk factor whilst self-esteem a significant protective factor. Despite little research highlighting and discussing self-esteem and its relationship with disordered eating within an LGBTQ+ sample, low self-esteem is a consistently cited risk factor for increased ED pathology within the general population (e.g., Mora et al., 2020). Subsequently, its emergence as a protective factor aligns well with our current understanding in the

field. These findings suggest preliminary evidence of the relevance of the transdiagnostic cognitive-behavioural model (Fairburn et al., 2003) for LGBTQ+ individuals experiencing ED symptoms.

Furthermore, some factors described within sociocultural models of EDs were examined as part of this meta-analysis. Firstly, relating to external influences consistent with The Tripartite Influence Model (Thompson et al., 1999), sociocultural appearance-related pressure and perceived media influences promoting thinness were found to be significant risk factors. The driving mechanism for ED symptoms within this model is reported to be the internalisation of these external pressures (Keery et al., 2004). Internalised sociocultural attitudes towards appearance, internalised muscularity appearance ideal, and internalised thin/low body fat appearance ideal were also identified as significant risk factors. Sociocultural theory suggests that the development and maintenance of EDs is then influenced by the previously stated factors through body dissatisfaction (Stice & Agras, 1998; Vander Wal et al., 2008); body dissatisfaction was also established as a significant risk factor. Whilst this meta-analysis cannot talk to the degree of which these factors interact and relate to each other, it has emphasised the significance of each of these individual relationships on ED symptoms for LGBTQ+ individuals. This suggests that this model may also be relevant in understanding ED symptom development and maintenance for this community.

Relating to objectification theory, sexual objectification was found to be a significant risk factor. Sexual objectification experiences, within this theory, are reported to hold an important influence on self-objectification which together may give rise to unhelpful body-related cognitions and behaviours and in turn, ED symptomology (Fredrickson & Roberts, 1997). Self-objectification was found to be of significance, aligning with the findings of a similar meta-analysis (Schaefer & Thompson, 2018) that sought to understand this relationship in the general population. Though, their results reflected a medium effect size, compared to the small effect size found within this meta-analysis. This could be interpreted by concluding that these experiences are more pertinent in shaping ED symptoms in the general population, or alternatively could be reflective of the fact that in this meta-analysis this estimate was pooled from a small number of studies (k=3) with only SMM as their

samples. More research is required to fully understand the relevance of this model in the development and maintenance of ED symptoms for LGBTQ+ individuals.

With this meta-analysis suggesting some preliminary applicability of the three models explored above, not one model can be commended as most applicable for this community. It may be that all models have a role to play, when seeking to understand the risk for developing and maintaining EDs for those of the LGBTQ+ community. However, with these models also being evidenced as applicable for heterosexual and/or cisgender individuals, this does not offer any potential explanations for the increased risk of EDs and ED symptoms LGBTQ+ individuals are reported to be at. This may be as these models consistently overlook the impact of identity. The minority stress model (Meyer, 2003) may be of particular importance in understanding this.

Minority stress, as a broad concept, was found to be a significant risk factor for EDs, though this was only explored in studies involving samples with gender diverse identities. This model proposes three mechanisms by which increased ED psychopathology may occur: 1) external stressors, 2) one's own expectations that external stressors will occur, and 3) internalisation of negative social attitudes (Meyer, 2003). Examples for each of these mechanisms were explored within this meta-analysis across subgroups (e.g., discrimination relating to sexual and/or gender identity, identity concealment, and internalised homophobia and transphobia, respectively), which were all identified as significant risk factors of small to medium effect. This proposes that ED symptoms may be inherently intertwined with sexual and/or gender identity and the stressors experienced in relation to this. To conclude, consideration of identity through minority stress may be the missing element to ED-focused theoretical models, to help support explanation of the increased risk for ED symptoms within this community.

Additionally, coping and resilience are important components of the minority stress model, occurring on an individual and group level. These are thought to ameliorate the impact of any experienced minority-related stressors (Meyer, 2003). Whilst these specific components were not illuminated in this study, the finding that community affiliation/ involvement is a significant risk

factor is curious. This model and related empirical research otherwise positions community involvement as a protective factor to negative mental health outcomes for LGBTQ+ individuals (Reed & Miller, 2016; Salfas et al., 2019). Sub-group analysis went on to suggest this was only significant for sexual minority men. These findings could be understood through the increased intra-minority stress reported to occur within groups of gay and bisexual men (Pachankis et al., 2020), as well as the widely recognised association between competitiveness and ED pathology, in those experiencing disordered eating (Osborn, 2023). Further research is required to better understand reasoning for this finding, which may help broaden the utility of resilience as a preventative and protective factor for ED symptoms within this community.

A critique of the MSM is that it overlooks social safety as an important component (Diamond & Alley, 2022). Consistent with both LGBTQ+ specific (e.g., Blashill & Vander Wal, 2009) and non-LGBTQ+ specific studies (Vander Wal et al., 2008), social sensitivity was noted as an important construct influencing ED symptomology. Whilst social sensitivity is not synonymous with social safety, it has been suggested that lack of social safety leads individuals to be increasingly sensitive to social information and environments (Slavich, 2022), and so may be preliminary evidence to this idea.

Most identified protective factors within this meta-analysis, discounting self-esteem, emerged from a small collation of studies (k= 2–3), with heterogeneity ranging from 0-89%. Consequently, it is recognised that more empirical research is required to fully elucidate protective factors for developing ED symptoms in those who identify as LGBTQ+.

Limitations and Future Directions for Research

To interpret the findings of this meta-analysis, consideration of its limitations is required. Firstly, over three quarters (78.9%, k=56) of the included studies investigated factors within sexual diverse individuals only. Conclusively many of the findings, but particularly the effects that were largely if not completely pooled from sexual minority samples, may not be generalisable to those with diverse gender identities only.

A significant strength of this study is that it sought to address factors pertinent to the whole LGBTQ+ community, whilst also utilising sub-group analysis to ascertain subgroup differences. However, linked to this, a notable limitation was the high heterogeneity present. This is likely due to several reasons, most remarkably being the inclusion of all LGBTQ+ individuals, all ED symptoms, and the range of validated ED measures included. It was deemed most appropriate to devise this meta-analysis in such a broad way, given it is the first of its kind. The LGBTQ+ community, however, is hugely diverse and there are obvious limitations to investigating risk and protective factors for the whole community in such a way. Authors acknowledge these findings should be a springboard from which more specific research can be generated from e.g., elucidating risk factors for anorexia in gay men or risk factors for binge eating disorder in lesbian women.

Whilst this heterogeneity weakens the confidence with which we can draw conclusions, subgroup analysis was partially successful in reducing heterogeneity within some analyses of subgroups. Though, the way in which subgroups were defined, can also be considered reductive and with little sensitivity towards the nuances within what is a diverse community. The potential for this was noted during the conception of this meta-analysis, but ultimately was difficult to avoid given the subgroups were shaped iteratively from predominant categories within the included literature.

Furthermore, with many of the factor estimates identified stemming from the use of correlation methodologies, these cannot be specifically concluded to precede the outcome of ED symptoms (Striegel-Moore & Cachelin, 2001). To strengthen the clarity and precision of our founded understanding within this at-risk group, there is a need for further empirical research, particularly of longitudinal methodology, to obtain a greater understanding of the factors that may precede ED symptomology. This is particularly required for bisexual, transgender, and gender non-conforming individuals, given these specific identities are underrepresented in existing research and are also often grouped together with other identities.

Finally, as acknowledged by Simone et al. (2020), our understanding of the cumulative stress and intersectional impact of being an individual of numerous minoritised identities is insufficient.

This meta-analysis was unable to shed light on intersectionality specifically but suggested that LGBTQ+ individuals who hold diverse ethnic/racial identities may be in some way protected from the experience of ED symptoms. This conclusion should be interpreted with great caution, given this is not the predominant understanding across ED research (e.g., Austin et al., 2011; Rodgers et al., 2017). Moreover, individuals who occupy multiple minoritised social identities (e.g., combined racial/ethnic and gender minority statuses) are suggested to be at greater risk for EDs compared to individuals who hold each identity separately (Beccia et al., 2019). Given minority stress is experienced in excess for individuals with stigmatised social identities (Sarno et al., 2021), and this was identified in this meta-analysis to correlate with increased ED symptoms, the importance of further research into ED symptoms and intersectionality is emphasised. This understanding is imperative if we are to strive towards decreasing the health inequality that exists for minoritised groups.

Clinical Implications

Whilst holding in mind the limitations outlined above, the findings from this meta-analysis hold important implications for clinical practice. This meta-analysis has progressed our awareness regarding the most profound risk and protective factors for EDs and ED symptoms within the LGBTQ+ population. Whilst this is likely to differ on an individual level, and further research is required to strengthen our understanding of how these impact different sexual and/or gender minorities in more nuanced ways, this can support clinicians and services to provide more effective assessment and formulation, as well as responsive and informed intervention. Service delivery for LGBTQ+ individuals should be shaped by the theoretical conclusions explored above. It is understood that current delivery of ED services is often shaped by a cognitive behavioural approach, informed by the transdiagnostic model (Fairburn et al., 2003). Whilst this appears to remain applicable for LGBTQ+ people, it must be acknowledged that this is likely to overlook the importance of identity on ED symptoms in this community. Therefore, clinicians should also bring in the MSM (Meyer, 2003) in an improved effort to provide person-centred assessment, formulation, and treatment considerate of one’s sexual and/or gender identity.

Furthermore, clinicians must be aware of the important relational considerations to their approach, given minority stress and related stressors increase risk for the development and maintenance of ED symptoms in this sample. Clinicians may directly or indirectly contribute to experiences of minority stress (e.g., through upholding and communicating heteronormative/ cisnormative assumptions; erasing the nuanced experience of LGBTQ+ individuals; and engaging in stigmatising, discriminatory or micro-aggressive behaviours). Without acknowledging and addressing this propensity for harm, services may act to maintain disordered eating in LGBTQ+ individuals.

Conclusion

This meta-analysis identified both risk and protective factors that could hold significant influence on the development and maintenance of ED symptoms for individuals from marginalised sexual and/or gender identities. These findings, whilst tentative, emphasise the applicability of the transdiagnostic model of EDs and MSM for ED symptoms within the LGBTQ+ population. Clinicians should use this knowledge to inform assessment, formulation, and treatment. Further research is necessary to fortify our conclusions, particularly when considering the complexities of different identities within the community.

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Competing Interests

No competing interests of meta-analysis authors to declare.

Data Availability Statement

Data sharing is not applicable to this meta-analysis due to being secondary research; no new data were created or analysed. The included appendices document the data set synthesised and analysed as part of this meta-analysis.

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Note. References marked with an asterisk were included in the meta-analysis.

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Chapter 3: Bridging Chapter

Meta-analysis Findings

The meta-analysis reported in Chapter 2 presents the stark conclusions within research that LGBTQ+ individuals are at elevated risk of experiencing EDs and ED symptoms, responding to this by exploring both the risk and protective factors that may influence such vulnerability. Results are broad in nature, though also attempt to describe differences within smaller subgroups of the LGBTQ+ population. A significant number of emerging risk factors related to the cognitive experience of the body. More research is required to understand relationships between ED and other variables within this community, and the mechanisms by which these occur. Most notably, this research is particularly required for bisexual, transgender, and gender non-conforming individuals.

Transgender and Gender Non-Conforming Individuals: An Underrepresented Group

Prevalence of EDs and ED symptomatology among transgender and gender non-conforming (TGNC) individuals is a new and limited area of research. Despite this, initial findings and conclusions are stark. A recent systematic review and meta-analysis documented alarming rates of ED diagnosis or disordered eating behaviours in transgender individuals comparatively to cisgender individuals (Rasmussen et al., 2023). Furthermore, it noted that transgender men display higher levels of ED symptomology than transgender women and, interestingly, indicated transgender men have higher levels of EDs than cisgender women. Given the vast recognition of cisgender women as being at heightened risk comparatively to other genders and subsequently research historically has placed vital focus on this at-risk group; the comparative elevated risk for transgender men is important to note. There is a dearth of research specifically seeking to understand ED prevalence rates in gender non-conforming individuals separately to transgender individuals. Keski-Rahkonen (2023) summarises that about 20-50% of TGNC individuals report engaging in disorder eating, above 30% screen positive for ED symptoms, and 2-12% have a diagnosed ED from a health professional.

In attempts to understand this disproportionately high rates in gender diverse individuals, several studies have interpreted these findings through the lens of the minority stress model (Hendricks & Testa, 2012; McGregor et al., 2023). McGregor et al. (2023) describe the complex

interplay by which several unique factors pertinent to TGNC individuals (such as stigma, discrimination, and prejudice) contribute to increased levels of minority stress and in turn ED symptomology. Minority stress is also positioned to support our understanding in the negative experiences many TGNC individuals report when seeking and accessing mental health care (Alencar Albuquerque et al., 2016; Kcomt et al., 2020).

Sexuality and its Relationship with ED Symptoms

Sexual wellbeing is considered to be imperative to overall wellbeing, with sexual, mental, and physical health being deeply intwined (Anderson, 2013). Sexuality can be defined as a multidimensional concept, encompassing negative aspects of sexuality (e.g., dysfunction, risk, violence, and coercion) and positive aspects of sexuality (satisfaction, esteem, and pleasure), as well as sexual identity, beliefs, behaviours, perspectives, and social organisation (Agocha et al., 2014).

The link between ED symptoms and sexuality has long been proposed. This broadly concludes that this relationship is multi-faceted; the reduction of sexual desire observed in individuals with disordered eating is constructed to be a potential consequence of low body weight, as well as transdiagnostic ED symptomatology such as body image disturbances, body uneasiness, shape concerns, and dietary restraint (Castellini et al., 2017; Castellini et al., 2012). It has such been emphasised that sexual dysfunction should be acknowledged as a core feature of ED presentations, as opposed to a resultant complication (Cassioli et al., 2020). More specifically, sexuality is reported to fluctuate across individuals with differing ED symptoms (Pinheiro et al., 2009); individuals presenting with symptoms of anorexia nervosa are likely to exhibit decreased sexual activity, whilst individuals presenting with symptoms of bulimia nervosa are more likely to exhibit increased activity (Eddy et al., 2004). Though, to note, both disorders are associated with substantial dysfunction despite being dichotomous and may be underpinned by personality type (constricted and controlled/ emotionally dysregulated) rather than ED diagnosis itself (Eddy et al., 2004). The conclusions and implications emerging from this research area, however, are confined to the cisgender samples they stem from; to the authors knowledge, no empirical studies explore this complex relationship within TGNC individuals.

Overview of Empirical Paper

The empirical paper presented in Chapter 4 investigates the relationship between ED symptoms and sexuality concepts in individuals who identify as TGNC. The mediatory roles of body image concerns and gender dysphoria within this relationship are also explored, which may be particularly pertinent in light of the meta-analysis finding that cognitive concerns relating to the body may place LGBTQ+ individuals at greater risk for ED symptoms. It also seeks to elicit TGNC individuals' experiences relating to accessing ED services, specifically around the consideration of sexuality and gender identity. In doing so, it reports preliminary findings that should be utilised as a springboard for further study in this research area, as well as considerations for clinical services regarding working towards providing affirming, supportive, and holistic care for TGNC presenting with EDs.

Chapter 4: Empirical Paper

The relationship between eating disorder symptoms, sexuality, and body image, in transgender and gender non-conforming individuals.

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Abstract

Transgender and/or gender non-conforming (TGNC) individuals are at greater risk of eating disorders (EDs) and disordered eating behaviours. Sexual dysfunction has been preliminarily linked to ED symptomology; not yet investigated in gender-diverse samples. This study is the first to examine the relationship between ED symptoms and sexuality concepts in TGNC individuals, with body image and gender dysphoria as potential mediators. It also sought to understand participants' experiences of accessing ED services. Seventy-four TGNC youth and young adults completed an online survey. Correlational analyses revealed significant relationships between ED symptoms and sexual esteem, motivation, and assertiveness. The mediatory role of body image on ED symptoms and sexual esteem was confirmed. Descriptive analysis concluded respondents largely felt their care was not effective in addressing their needs, with the topics of sexuality and gender identity seldom discussed. Fear of a lack of understanding was confirmed as a significant barrier to this. Replication of this study is required to ascertain a firmer understanding of the relationship between ED symptoms and sexuality, and the variables underpinning this, for TGNC individuals. ED services must work to provide affirming spaces in which these concepts can be explored effectively, to work toward improved outcomes for TGNC individuals.

Keywords: eating disorders, sexuality, transgender, gender non-conforming, body image.

Introduction

Eating disorders (EDs) are characterised as persistent disturbances of eating behaviours, including aspects of dietary restriction, excessive overeating, and/or compensatory strategies, accompanied by cognitive disturbances such as body image dissatisfaction, and overestimation of weight and size (Fairburn & Harrison, 2003). Historically, ED research has centred our understanding of this condition in the experiences of white, cisgender, female samples (Dunkley et al., 2020). Over time, this has grown to acknowledge the experience of cisgender, male samples (Jones & Morgan, 2010).

Research is slowly advancing in its attempts to understand prevalence and aetiology of EDs and ED symptoms among marginalised populations, for example individuals who identify as transgender and/or gender non-conforming (TGNC). Though, notably, ED-related research within the TGNC community is frequently conducted in the context of the wider lesbian, gay, bisexual, transgender, queer, plus (LGBTQ+) community. Whilst this research is in its infancy, it is building a stark picture of the disproportionately high rates of EDs and disordered eating behaviours TGNC people experience, compared to their cisgender counterparts (Rasmussen et al., 2023). Increasingly, data has begun suggesting that TGNC individuals may hold higher prevalence of EDs than cisgender women (Riddle & Safer, 2022), a group previously described as being most at risk.

The aetiology and maintenance of ED symptoms in TGNC individuals may be, in part, attributed to their gender identity (Parker & Harriger, 2020). Whilst this is a relatively new area of research (Coelho et al., 2019), there may be merit to these factors in attempting to explain the increased prevalence of EDs and ED symptoms within this community. For example, TGNC individuals report engaging in disordered eating behaviours (e.g., dietary restriction) in an effort to suppress characteristics related to their birth sex or to accentuate characteristics of their desired gender (Ålgars et al., 2012). Through an intersectional lens, emerging research also suggests that the factors contributing to this elevated risk are governed by the entanglement of systems that uphold power and social oppression. These include unmet gender affirmation needs and limited access to gender affirming care, embedded traditional sociocultural gender ideals, and prevalence of

stigmatisation and discrimination towards gender diverse individuals (Wesp et al., 2019). Furthermore, TGNC identity can result in exposure to specific factors that could increase ED symptoms such as: gender incongruence, gender role conflict (i.e., conflict that might arise within oneself when societal messages of restrictive gender norms do not align with one's own beliefs about their gender identity), and gender dysphoria (Parker & Harriger, 2020; Milano et al., 2020). These findings link with the understanding offered by the minority stress model in that negative experiences related to one's gender identity may give rise to internal negative self-views (Meyer, 2003), which in turn has been identified to lead to increased eating-related difficulties in this group (Gordon et al., 2021).

Another evolving area of ED-related research is the reported mirroring between core psychopathological symptoms of EDs, such as body image concerns, and sexual dysfunction (Castellini et al., 2015). Sexual dysfunction is typically described to encompass four important constructs: sexual desire, arousal, orgasm, and pain (Castellini et al., 2010). Whilst it has been acknowledged that sexuality is almost completely absent within the field of ED research (Spivak-Lavi & Gewirtz-Meydan, 2022), emerging conclusions from such research emphasises that sexual dysfunction should be acknowledged as a core feature of ED presentations, as opposed to a resultant complication (Cassioli et al., 2020).

A critique of the body of empirical research these conclusions stem from, however, is that the studies are largely comprised from homogenous samples of cisgendered individuals, mostly assigned female at birth. As a result, this research has poor generalisability across other gender identities. Given the established interplay between ED symptoms and sexuality, and the increased risk for EDs in TGNC individuals, the relationship between these variables in this specific sample is an area warranting investigation. Understanding this complex relationship is likely to improve both identification and treatment of individuals with EDs (Castellini et al., 2015).

A commonly documented risk factor within ED research, across the general population, is body dissatisfaction (e.g., Wertheim et al., 2001; Barakat et al., 2023). Notably, TGNC individuals are

suggested to report higher rates of body dissatisfaction compared to their cisgender individuals; specifically, body dissatisfaction presents more significantly in those who experience greater gender incongruence between their experienced gender and assigned sex (Parker & Harriger, 2020). In the case that this results in increased levels of discomfort or stress, this is evident of gender dysphoria (Coleman et al., 2012). Furthermore, both sexuality and body image dissatisfaction are noted to be related; higher body image disturbances are associated with higher sexual dysfunction in the general population (Martin et al., 2023) and within an ED clinical sample (Tolosa-Sola et al., 2019). Specifically, body image disturbances may lead to decreased sexual desire, arousal, pleasure, and satisfaction (McCool-Myers et al., 2018; Quinn-Nilas et al., 2016); a finding concluded again from largely heterosexual, female samples. This is considered important to investigate from TGNC individuals' perspectives, given research identifies TGNC individuals to be at higher risk for both ED symptoms and body dissatisfaction.

A recent literature review acknowledged that barriers to gender affirming care contribute to increased engagement in ED behaviours for the TGNC community (McGregor et al., 2023). Specific barriers include fear of being pathologised or stigmatised against, direct and/or indirect experiences of poor or harmful care, and mistreatment including misgendering and misnaming (Snow et al., 2019; McGregor et al., 2023). Findings from qualitative research carried out with TGNC individuals provides further evidence to these conclusions (Duffy et al., 2016). Such experiences are likely to lead to a worsening of both physical and mental health conditions to detrimental effect (White Hughto et al., 2015), which may be best understood through the minority stress model (Meyer, 2003). Kcomt et al. (2020) offers substantial commentary on the impact of systematic deficiencies of healthcare and the subsequent minority stress placed on TGNC individuals. This includes reference to the societal exclusion and erasure of transgender identities, bodies, and experiences, through cisnormativity (the assumption that everyone identifies as the gender they were assigned at birth) and the lived experience of microaggressions, discrimination, and stigma when accessing care (Bauer et al., 2009; Ansara, 2015). Moreover, individuals who occupy multiple marginalised identities experience increased levels

of exclusion and discrimination when seeking and accessing care, intersecting in a manner that afflicts them to further health inequalities (Kcomt et al., 2020).

There is little research acknowledging TGNC individuals' experiences of accessing care from ED services specifically. One qualitative study reported none of their participants conveyed positive experiences of accessing care from ED services, with 40% having not felt comfortable to disclose their transgender status (Duffy et al., 2016). These findings are concerning, particularly given the complex interplay between ED symptoms and one's gender identity (Jones et al., 2018). This also raises a question around how acceptable and helpful treatment can be for TGNC individuals if they cannot, in some cases, effectively and safely explore the role of their gender identity on their ED symptoms. Alarmingly, TGNC individuals accessing ED treatment generally reported this to be ineffective and, at times, harmful (Duffy et al., 2016).

Research Questions and Aims

With previous research illustrating a relationship between ED symptoms and sexuality across the population, the first aim of the present study was to examine this relationship within a sample of TGNC individuals. It was hypothesised that there would be a significant positive linear relationship between ED symptoms and sexuality-related concerns, meanwhile positive sexuality-related domains (e.g., sexual esteem) were hypothesised to be negatively correlated with ED symptoms. These hypotheses were shaped upon previous research in presumed cisgender samples (Cassioli et al., 2020; Castellini et al., 2015). Given the paucity of related research within gender minority groups, it was unclear how well this relationship would apply to those identifying as TGNC.

Furthermore, another aim of this study was to investigate, through exploratory analysis, whether the relationship between ED symptoms and dimensions of sexuality were mediated by body image and gender dysphoria, posing two further research questions:

1) What is the role of body image as a mediator of the relationship between ED symptoms and sexuality?

2) What is the role of gender dysphoria as a mediator of the relationship between ED symptoms and sexuality?

The final aim was to understand the views of TGNC individuals who had received support for an ED, regarding how their sexuality and gender identity was considered within their care, generating the following research question:

(3) In those who have received support from ED services, what are their views towards how their sexuality and gender identity were considered?

Collectively, by investigating these, this will support growth in understanding around the mechanisms by which this relationship may occur in TGNC individuals, and whether sexuality and gender identity are reported to be considered within ED services, from this sample's perspective.

Method

This study utilised an observational, cross-sectional design, and tested two main mediation models. The appropriateness and suitability of this design is emphasised by the utilisation of this within similar studies investigating the relationship between ED symptoms and sexuality (Cassioli et al., 2020; Dunkley et al., 2020; Tolosa-Sola et al., 2019).

Participants

Participants were youth or young adults (aged 16-30 years old) who identified as TGNC and were experiencing eating-related difficulties or disorders. Specific experience of eating-related difficulties and disorders was not ensured in any way and was, instead, governed by participants own identification with these terms. Participants were requested to provide details of their ED diagnosis, if applicable.

The age range for this sample was shaped by the awareness that EDs typically emerge during late adolescence and early adulthood (Rohde et al., 2015), with there being some differences of onset age depending on ED diagnosis (Striegel-Moore & Bulik, 2007). It also aligned with the most

reported ages of TGNC participants engaging in other ED related research (Cusack et al., 2021; Urban et al., 2022). Given the dearth of similar research relating to both sexuality and ED symptoms within this sample, it was felt indicated to focus on an area of the population most at risk (TGNC youth and young adults) as a starting point in addressing the proposed research questions.

Measures

Demographics

Participants completed a demographic-based questionnaire (Appendix I), including indicators of age, ethnicity, sexual orientation, gender identity and, if applicable, ED diagnosis.

ED Symptoms

ED symptoms were assessed using the Eating Disorder Examination Questionnaire (EDE-Q) 6.0 (Fairburn & Beglin, 2008, Appendix J). A 28-item self-report version of the Eating Disorder Examination, an investigator-based interview (Fairburn & Cooper, 1993), both are considered gold standard for assessing severity and type of ED pathology (Fairburn & Beglin, 1994). The EDE-Q is a widely used, well-validated measure generating data on both behavioural and cognitive characteristics of EDs, providing scores for four subscales: Restraint, Eating Concern, Weight Concern, and Shape Concern. A global score can be obtained by calculating a weighted average of the subscale scores, with a higher score reflecting greater eating-related concerns (Fairburn & Beglin, 2008). Questions requesting participants weight and height were omitted. A large body of research similarly utilises the EDE-Q with a TGD sample (e.g., Cusack et al., 2021; Urban et al., 2022) with community norms for both transgender and gender-expansive adults being established (Nagata, Compte, et al., 2020; Nagata, Murrary, et al., 2020). The measure is reported to have adequate to excellent internal consistency with transmasculine, transfeminine, and nonbinary youth and adult transgender men and women (McGregor et al., 2023), though it has not specifically been validated within sexual or gender diverse populations.

Sexuality Concepts

Sexuality was measured using the self-report Multidimensional Sexuality Questionnaire (MSQ; Snell et al., 1993; Appendix K). This measure constructs an understanding of the psychological tendencies related to sexuality as a broad concept. It is a 60-item measure comprised of 12 subscales: Sexual Esteem, Sexual Preoccupation, Internal Sexual Control, Sexual Consciousness, Sexual Motivation, Sexual Anxiety, Sexual Assertiveness, Sexual Depression, External Sexual Control, Sexual Monitoring, Fear of Sexual Relations, and Sexual Satisfaction (definitions of these concepts can also be found in Appendix K). Participants were asked to rate the extent to which a statement applies to them on a 5-point Likert scale (0= not at all characteristic of me, to 4= very characteristic of me). Subscale scores range from 0 to 20, with higher scores indicating greater amounts of each respective sexual tendency. This measure notably was only one of few sexuality-related measures developed that was sex non-specific. It is indicated to have adequate reliability and construct validity (Snell et al., 1993), though, whilst it has been used in other research with TGNC samples (e.g., van de Grift et al., 2017), it has not officially been validated within this population.

Transgender-specific Body Image Concerns

The Trans-specific Sexual Body Image Worries (T- Worries) Scale (Dharma et al., 2019; Appendix L) was utilised to assess body image concerns within the sample. This brief self-report scale consists of five items, representing sexual body image concerns specific to TGNC individuals. Participants were asked to rate the extent of their worry on a 5-point Likert scale (0= not at all [worried], to 4= very [worried]). All items were summed, producing a total score ranging from 0 to 20; higher scores represent higher sexual BI concern. This scale is reported to have good reliability, with an adequate internal consistency (α=.82).

Gender Dysphoria

Feelings of gender dysphoria were measured through the Utrecht Gender Dysphoria Scale – Gender Spectrum (UGDS-GS; McGuire et al., 2020; Appendix M). The UGDS-GS is a revised self-report measure of the widely used and validated Utrecht Gender Dysphoria Scale (Steensma et al.,

2013), with the revision increasing inclusivity across the gender spectrum and gaining a more longitudinal understanding of gender dysphoria (McGuire et al., 2020). The UGDS-GS is comprised of 18-items which elicit two subscale scores: Gender Dysphoria (higher score indicates greater dysphoria) and Gender Affirmation (higher score indicates greater connection with one's affirmed gender). Participants are asked to select the response which best describe their agreement to each statement, on a 5-point Likert scale (1= disagree completely, to 5= agree completely). The measure is reported to have excellent internal consistency (cronbach's alpha= .91) and good construct validity in a TGNC sample (McGuire et al., 2020).

ED Service Use Questionnaire

A brief researcher-developed questionnaire, comprised of 14 closed questions, was also administered to those who self-disclosed previous and/or current ED service use (Appendix N). This aimed to ascertain service user attitudes in relation to the consideration of their sexuality and gender identity within their care. Participants were first screened to see whether this questionnaire was applicable to them and, if eligible, were asked whether their use of service was past, current, or both. If having accessed ED services more than once, they were directed to answer this questionnaire thinking about their most recent experience. Participants were first asked whether their sexuality and gender identity had been discussed during their care, and then requested to rate their level of agreement to the provided statements on a 5-point Likert scale (0= strongly disagree, to 4= strongly agree). Statements were developed following review of the literature looking to understand the experiences of TGNC individuals when accessing general mental health support (e.g., Pinelli, 2019; Grant, 2020) as well as the wider populations experiences of accessing support for an ED (e.g., Escobar-Koch et al., 2010; Babb et al., 2022). Due to being researcher developed, this questionnaire lacks appropriate reliability and validity data.

Procedure

Recruitment

The principal recruitment strategy was through social media campaign, utilising convenience and snowball sampling methodology, with the main research routinely sharing the developed research

advertisement poster (Appendix O) via ‘X’ (formerly known as ‘Twitter’). The poster included an explanation of the study, with eligibility criteria; contact details for the main researcher in case of questions; and, both an online link and QR code leading to the questionnaire. Organisations, communities, and individuals whose online content aligned with the project’s areas of interest were also approached, through their social media accounts, requesting whether study information could be shared with their respective audiences. This amounted to the advertisement poster being ‘retweeted’ 449 times and viewed 103,079 times. Individuals viewing the advertisement materials, as well as participants both prior and following study completion, were also requested to share the study with individuals within their networks who might be suitable to take part.

Participant Journey

Upon accessing the questionnaire, potential participants were provided with the participant information sheet (Appendix P) which provided details such as purpose of the research, inclusion and exclusion criteria, the voluntary nature of participation, what participation would involve, how data would be used, right to withdraw, and researcher contact details. Given their wish to proceed, this was followed by an online consent form (Appendix Q). Potential participants were informed of the option to be entered into a prize draw for the chance to win one of five £20 Amazon gift vouchers.

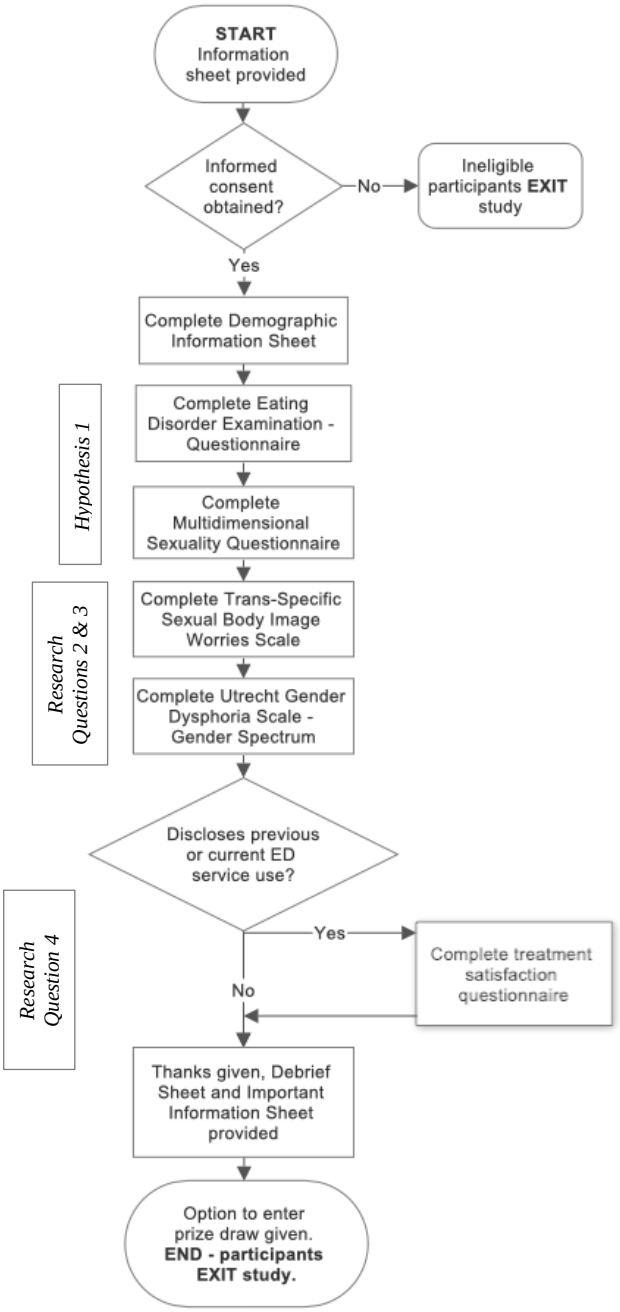
Following survey completion, participants were offered the opportunity to be directed to a stand-alone survey in which email contact information was requested for the purpose of entering the prize draw and/or receiving a summary of research findings (Appendix R). This allowed for participant contact information to sit separately to survey data, maintaining anonymity. The prize draw was utilised to recognise the time participants gave to completing the survey; incentives support increased participation, particularly when provided following survey completion (Kaye & Johnson, 1999).

Participants completed the series of measures via ‘Online Surveys’, in a pre-determined order described in Figure 4. Following survey completion, participants were provided with a debrief sheet

(Appendix S) reiterating the study's purpose and providing participants with signposting to relevant support services as required.

Figure 4

Flow Chart detailing the Participant Journey



Ethics

The University of East Anglia's Faculty of Medicine and Health Sciences Research Ethics Subcommittee granted ethical approval for the project (ETH2223-0066, 11th January 2023; Appendix T). Additional information relating to ethical considerations of the project is detailed in Chapter 5.

Patient and Public Involvement (PPI)

PPI input was sought from an ED and gender identity perspective, however, participation was limited to Experts by Experience from an ED perspective only; this included individuals with personal experience of having or caring for someone with an ED. During project planning, the PPI group engaged in discussions about the study's focus and its meaningfulness, procedure development, and participant-facing documents such as the advertisement poster, information sheet, and questionnaire. As the study advanced into its recruitment phase, maintaining PPI engagement and retention became challenging, likely exacerbated by the researcher's limited resource. Collectively, this resulted in significant barriers to sustained PPI following the planning phase.

Analytic Strategy

Analyses were performed using IBM Statistical Package for the Social Sciences (SPSS, Version 25; IBM Corp, 2017). Pre-analysis tests were undertaken to investigate whether data met required assumptions for specific testing; outcomes to this informed the analytic strategies employed and are detailed within the results section.

Primary Statistical Analysis

To investigate whether eating-related difficulties and sexuality concepts were correlated, a series of bivariate correlation analyses were conducted. An a priori power analysis was performed through G*Power (Version 3.1; Faul et al., 2009) to anticipate the sample size required for adequately powered correlation analyses (one tailed, α=.05, ß=.8). This estimated a minimum of N=67 was required to detect a moderate effect size of 0.3 (Cohen, 1988; Appendix U). A sample size of 76 was sought to effectively examine the primary research aim, whilst accounting for removal of any unsuitable datasets. Post-hoc power analysis was conducted using G*Power (Version 3.1; Faul et al.,

2009). This indicated that the obtained sample size following removal of unsuitable datasets (N=74) had a reasonable power of 0.79, when calculating this for the largest observed effect (r= -.28). However, the analysis was likely underpowered to detect smaller effects (Appendix V), resulting in potential inflation of type II error.

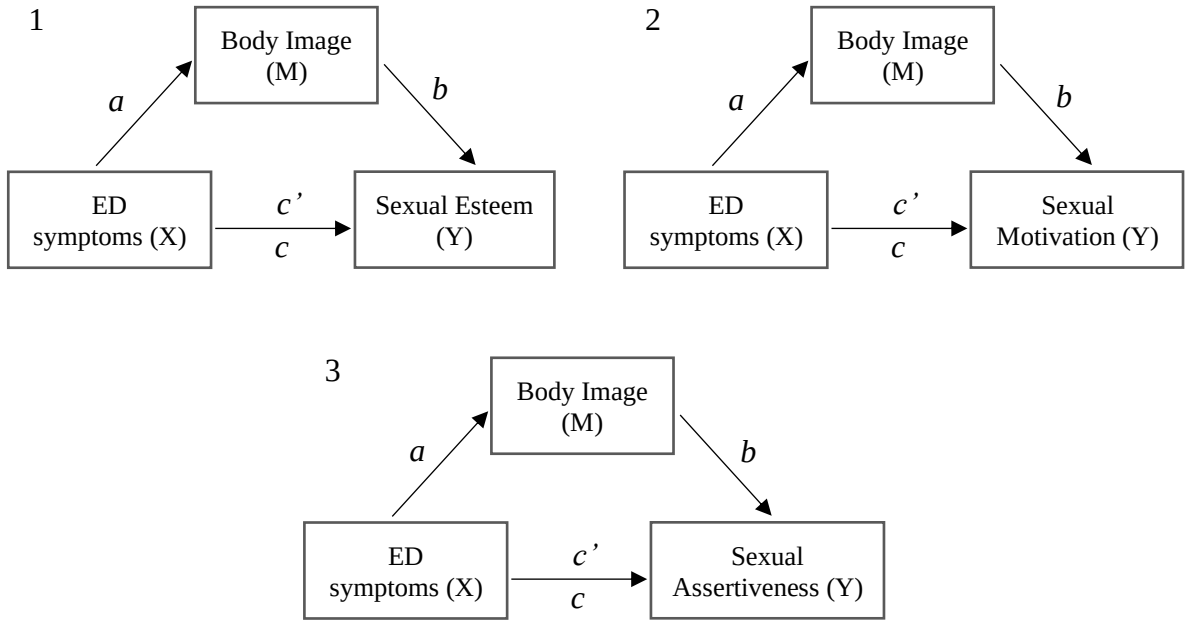
Secondary Statistical Analysis

Mediation analyses were performed using PROCESS macro tool for SPSS (v4; Hayes, 2022), via percentile bootstrap methods with 5,000 resamples and 95% confidence intervals. Percentile bootstrapping was indicated over both bias corrected and bias corrected and accelerated bootstrapping, as these methods tend to evoke slightly higher Type I error rates (Hayes, 2018) and are reported to be overly liberal (Fritz et al., 2012). This also follows the recommendations of Tibbe and Montoya (2022). Further rationale for this methodological approach to mediation is provided in Chapter 5.

Statistical diagrams of the mediation models of interest are presented in Figure 5 and 6. Exploratory mediations were carried out with the sexuality concepts that emerged as having a significant correlational relationship with ED symptoms: sexual esteem, motivation, and assertiveness. Fritz and MacKinnon (2007) report that, for a mediation via percentile bootstrapping, a sample size of 78 would be required to detect moderate effect sizes (0.39) for both α and β paths. As this strand of analysis was exploratory, it was not a specific recruitment aim to achieve this sample size however this notes that this analysis was underpowered.

Figure 5

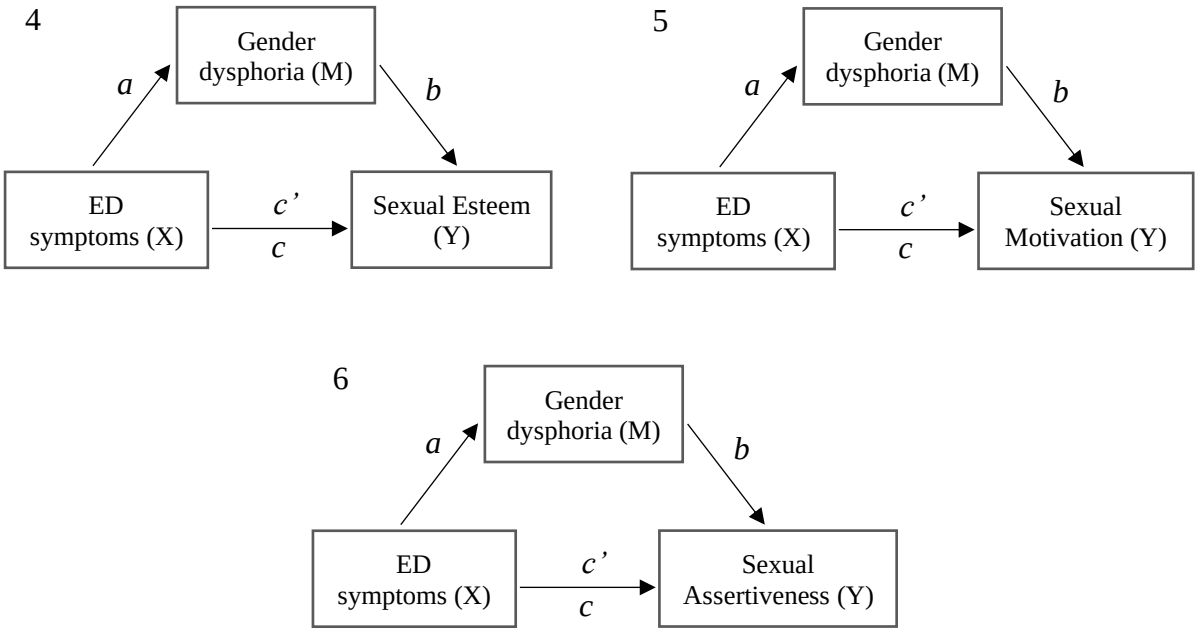
Mediation Models 1-3: the indirect effect of body image on the relationship between ED symptoms and sexuality concepts.



Note. X= Independent variable, Y= Dependent variable, M= Mediator. *C':* direct effect of X on Y; *ab:* indirect effect of X on Y through M; *c:* total effect of X on Y (*c*' + *ab*).

Figure 6

Mediation Models 4-6: the indirect effect of gender dysphoria on the relationship between ED symptoms and sexuality concepts.



Note. X= Independent variable, Y= Dependent variable, M= Mediator. *C':* direct effect of X on Y; *ab:* indirect effect of X on Y through M; *c:* total effect of X on Y (*c*' + *ab*).

Descriptive Analysis of Experiences of Service Use

Descriptive statistical analysis was used to address the final research question. This approach was seen as most appropriate given the scaled responses gained from the ED service use questionnaire.

Results

Sample Characteristics

In total, 76 responses to the online survey were collected; two participant datasets were excluded from analysis due to falling outside of the age range of interest (>30 years of age). This left 74 participants suitable for inclusion in the analysis. Participant characteristics are reported in Table 5.

The final data set included responses from TGNC individuals ranging from 16 through to 30 years of age (M = 23.9, SD = 3.7). Participants largely identified as White (English/ Welsh/ Scottish/ Northern Irish/ British/ Irish or any other White background; 89.2%, n=66).

In terms of sexual identity, 44.6% (n=33) identified as queer, 40.5% (n=30) bisexual, 18.9% gay/lesbian/homosexual (n=14), and 17.6% (n=13) for both pansexual and asexual separately. A small percentage of the sample (5.4%, n=4) chose to provide their own description of their sexual identity. Regarding gender identity, over half of the sample identified as non-binary (64.9%, n=48), whilst 27% (n=20) identified as male, 13.5% (n=10) female, 9.5% (n=7) agender, and 8.1% (n=6) provided their own description of their gender identity. A small percentage (2.7%, n=2) chose 'do not know' as their response. Three quarters of the sample (75.7%) aligned themselves as identifying with the umbrella term 'transgender', whilst 9.5% reported not being sure. A large majority of participants (79.7%) reported being assigned female sex at birth.

Regarding ED diagnoses, 37.8% reported having a past or current diagnosis: 57.1% of which was anorexia nervosa (including 'a-typical' subtypes), 21.4% other specified feeding and eating disorder/ eating disorder not otherwise specified, 17.8% bulimia nervosa, 14.3% binge eating disorder, and 3.6% avoidant/ restrictive food intake disorder.

Table 5. Demographic Characteristics of the Full Sample (N=74).

Characteristic	n or M(SD)	% or Range
Age(years)	23.9(3.7)	16 – 30
Ethnicity		
White: English/ Welsh/ Scottish/ Northern Irish/ British	57	77.03
White: Irish	3	4.05
Asian/ Asian British: Chinese	1	1.35
Asian/ Asian British: Bangladeshi	1	1.35
Black/ African/ Caribbean/ Black British: African	2	2.7
Mixed/ Multiple ethnic groups: White and Black Caribbean	1	1.35
Mixed/ Multiple ethnic groups: White and Black African	1	1.35
'Other' Ethnic Group: Arab	1	1.35
White: Any other White background	6	8.11
Asian/ Asian British: Any other Asian background	1	1.35
Sexual Orientation*		
Straight/ Heterosexual	1	1.35
Gay/ Lesbian/ Homosexual	14	18.92
Bisexual	30	40.54

Table 5. (Continued)

Pansexual	13	17.57
Queer	33	44.59
Asexual	13	17.57
Do not know/ unsure	2	2.7
Own description	4	5.41
Gender Identity*		
Male	20	27.03
Female	10	13.51
Non-binary (e.g., genderqueer, genderfluid, gender non-conforming)	48	64.86
Agender	7	9.46
Do not know	2	2.7
Own description	6	8.11
Transgender Identity		
No	11	14.86
Yes	56	75.68
Do not know	7	9.46
Sex assigned at birth		
Male	9	12.16
Female	59	79.73
Female, but I am intersex	1	1.35
Prefer not to answer	5	6.76
ED Diagnosis (no/yes)		
No	46	62.16
Yes	28	37.84
ED Diagnosis (details)*		
Anorexia nervosa (including 'a-typical' subtypes)	16	57.14
Bulimia nervosa	5	17.86
BED	4	14.29
ARFID	1	3.57
OSFED/EDNOS	6	21.43
Not Reported	1	3.57

Note. N=74. *Participants could select more than one coding response, and thus these demographic values do not sum to N of 74/100%. BED = Binge Eating Disorder, ARFID = Avoidant/Restrictive Food Intake Disorder, OSFED = Other Specified Feeding and Eating Disorder, EDNOS = Eating Disorder Not Otherwise Specified.

Table 6 reports descriptive statistics for the sample, across all collected measures. Considering ED psychopathology, 40.5% of the sample scored above the clinical cut-off for EDE-Q global score (2.8). Over half of the sample then scored above cut-off for the shape concern and weight concern subscales (59.5% and 58.1%, respectively).

The MSQ provides no established cut-offs for interpreting what might be a high or low for each construct. However, this sample's mean values are interpretable against mean values provided in Snell et al. (1993), from a sample of 386 undergraduate males and females. The following construct means were lower in this sample compared with Snell et al. (1993), with percentage difference

provided in parenthesises: Sexual Esteem (-47.15%), Sexual Preoccupation (-30.41%), Internal Sexual Control (-25.55%), Sexual Consciousness (-24.26%), Sexual Motivation (-33.79%), Sexual Assertiveness (-32.13%) and Sexual Satisfaction (-36.81%). Meanwhile, the following construct means were higher: Sexual Anxiety (+69.47%), Sexual Depression (+91.52%), External Sexual Control (+8.53%), Sexual Monitoring (+16.61%), and Fear of Sexual Relationships (+37.99%).

There is little research allowing for a thorough contextualisation of the T-Worries sample mean and there is no established cut-off for dichotomising high and low sexual body image worries (Dharma et al., 2019). T-Worries total score can fall between zero and 20; the sample mean falling at 12.82 represents 64.1% of the total possible score.

In relation to the UGDS-GS, the mean value can fall from 1 and 5. For the gender dysphoria subscale, a value closer to four may indicate greater gender dysphoria (McGuire et al., 2020). A suggested cut-off score is not provided for gender affirmation, but it is recognised that a higher value indicates greater affirmation. The sample's mean values represent a slightly elevated score for gender dysphoria but that falls slightly below the provided value for notably gender dysphoria, alongside considerable gender affirmation.

Table 6. Clinical Characteristics of the Full Sample (N=74) across all Variables and Subscales.

Variable	Mean	SD
EDE-Q Global Score	3.53	1.33
Restraint Subscale	2.78	1.97
Eating Concern	3.11	1.46
Shape Concern	4.33	1.31
Weight Concern	3.91	1.53
MSQ		
Sexual Esteem	6.96	5.71
Sexual Preoccupation	6.59	3.18
Internal Sexual Control	9.88	4.55
Sexual Consciousness	10.27	5.4
Sexual Motivation	6.78	5.98
Sexual Anxiety	9.27	6.4
Sexual Assertiveness	7.35	5.02
Sexual Depression	7.45	6.29
External Sexual Control	4.58	4.5
Sexual Monitoring	6.74	5.83
Fear of Sexual Relationships	10.46	4.21
Sexual Satisfaction	8.05	5.71

Table 6. (Continued)

T-Worries	12.82	4.85
UGDS-GD		
Dysphoria	3.79	.92
Affirmation	4.34	.77

Note. N=74. EDE-Q = Eating Disorder Examination Questionnaire 6.0, MSQ = Multidimensional Sexuality Questionnaire, T-Worries = Trans-specific Sexual Body Image Worries, UGDS-GD = Utrecht Gender Dysphoria Scale – Gender Spectrum.

Correlation Analyses

A series of correlations were performed, to determine the relationship between eating difficulties and sexuality concepts (Table 7). Inspection of the data and tests of normality, through the Kolmogorov-Smirnov test, indicated predominant non-normality across the variables of interest and so Spearman's rho non-parametric correlation analyses were carried out. The exception to this was when inspecting the relationship between EDE-Q global score and MSQ sexual anxiety as both variables met parametric assumptions. In this case, a Pearson correlation was conducted. The statistical outputs for the tests of normality are reported in Chapter 6. As multiple comparisons were conducted, a sequentially rejective multiple test procedure (Bonferroni-Holm; Holm, 1979) was considered however not employed. Rationale for this decision is provided in Chapter 5.

The results indicate no statistically significant relationships between ED symptoms and sexual preoccupation (r=-.07, p=.284), internal sexual control (r=-.01, p=.455), sexual consciousness (r=-.11, p=.169), sexual anxiety (r=.05, p=.334), sexual depression (r=.07, p=.286), external sexual control (r=.17, p=.08), sexual monitoring (r=.17, p=.077), fear of sexual relations (r=.11, p=.168), and sexual satisfaction (r=.07, p=.277).

Of interest, were three significant negative correlations between ED symptoms and sexual esteem (r= -.2, p=.048), sexual motivation (r= -.21, p=.034) and sexual assertiveness (r= -.28, p=.007). To recapitulate, as ED symptoms increase, sexual esteem, sexual motivation, and sexual assertiveness decrease.

Table 7. Correlation Matrix for Study Variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 EDEQ-GS	--															
2 MSQ Sexual Esteem	-.195*	--														
3 MSQ Sexual Preoccupation	-.067	.45***	--													
4 MSQ Internal Sexual Control	-.013	.484***	.334**	--												
5 MSQ Sexual Consciousness	-.113	.628***	.615***	.5***	--											
6 MSQ Sexual Motivation	-.214*	.69***	.786***	.451***	.745***	--										
7 MSQ Sexual Anxiety	.051†	-.392***	.097	-.146	-.053	-.103	--									
8 MSQ Sexual Assertiveness	-.282**	.702***	.454***	.366***	.587***	.652***	-.42***	--								
9 MSQ Sexual Depression	.067	-.312**	.093	-.231*	-.047	-.008	.794***	-.41***	--							
10 MSQ External Sexual Control	.165	-.141	.024	-.205*	-.013	.006	.366***	-.249*	.454***	--						
11 MSQ Sexual Monitoring	.167	-.283**	.191	.008	.004	.005	.686***	-.179	.583***	.44***	--					
12 MSQ Fear of Sexual Relations	.113	-.601***	-.178	-.237*	-.256*	-.378***	.73***	-.542***	.629***	.466***	.668***	--				
13 MSQ Sexual Satisfaction	.07	.561***	.247*	.483***	.494***	.419***	-.453***	.53***	-.584***	-.163	-.219*	-.425***	--			
14 T-Worries	.333*	-.417***	.071	-.188	-.083	-.113	.354***	-.189	.281**	.014	.367***	.397***	-.155	--		
15 UGDS-GD Dysphoria	.141	-.062	.038	-.205*	.023	.032	-.099	.159	-.037	-.084	-.052	-.031	.035	.501***	--	
16 UGDS-GD Affirmation	.073	.171	.089	-.067	.115	.102	-.238*	.289**	-.259*	-.174	-.116	-.27*	.2*	.284**	.596***	--

*Note. *p<.05 (one-tailed), **p<.01 (one tailed), ***p<.001 (one-tailed). † Pearson's parametric correlation carried out; all other relationships examined through Spearman's rho nonparametric correlation.* EDEQ-GS = Eating Disorder Examination Questionnaire – Global Score, MSQ = Multidimensional Sexuality Questionnaire, T-Worries = Trans-specific Sexual Body Image Worries. UGDS-GD = Utrecht Gender Dysphoria Scale –Gender Spectrum.

Mediation Analyses

Mediation testing sought to explore the relationship between ED symptoms and several sexuality concepts: sexual esteem, sexual motivation, and sexual assertiveness. These were identified as having a significant relationship, through correlation analysis, and so were the focus for these exploratory analyses. Whilst mediation can exist without a direct effect between an independent and dependent variable (Zhao et al., 2010; Hayes, 2013), significance of correlation indicated these concepts may be of increased interest to explore. Mediation variables of interest were transgender-specific body image and gender dysphoria. Mediation was accepted if the indirect effect (*ab* path) was observed to be significant (Hayes, 2013; Zhao et al., 2010). Rationale for this definition of mediation is supplied in Chapter 5. Correction for multiple comparisons were not applied due to the exploratory nature of these analyses.

Prior to mediation analysis, tests were conducted to ensure the assumptions required for regression analyses were met, confirming independence of residuals, linearity of relationships among the variables, homoscedasticity of data, non-existence of multicollinearity for independent variables, and normally distributed error values (Clement & Bradley-Garcia, 2022). Independence was indicated through Durbin-Watson statistic (Durbin & Watson, 1950) and multicollinearity through the variance inflation factor, whilst linearity, homoscedasticity and normality were visually assessed using scatterplots, histograms, and P-P plots. These were assessed for each mediation model; all assumptions were sufficiently met. To note, in assessing for normality, histograms and P-P plots at times indicated non-severe non-normality. Data was not transformed for these cases as regression is reported to be robust against non-severe violations of normality (Hayes, 2018). The statistical outputs for the assumption testing are provided in Chapter 6.

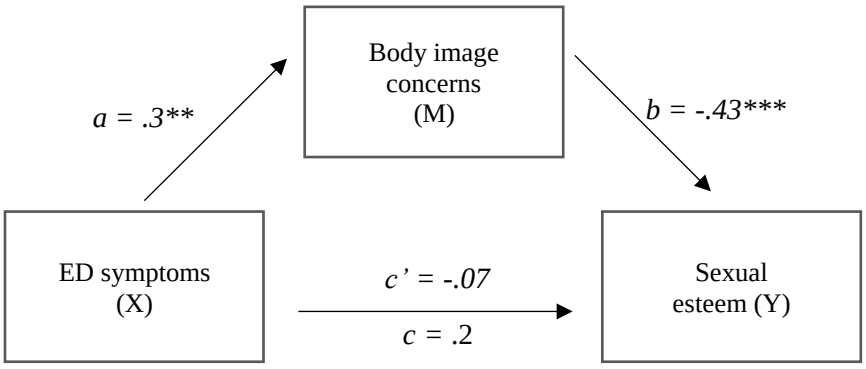
Results from mediation model two (ED symptoms and sexual motivation, via body image concerns), model four (ED symptoms and sexual esteem, via gender dysphoria) and model five (ED symptoms and sexual motivation, via gender dysphoria) indicated mediation is unlikely to be taking place. Furthermore, mediation models three and six (ED symptoms and sexual assertiveness, via body image concerns and via gender dysphoria separately) had no evidence of mediation but indicated

statistically significant direct effects (β= –.28, t(72)= –2.5, p= .01). For full reporting of the statistical results of these models, see Chapter 6.

Results from mediation model one indicated presence of an indirect effect (full mediation) for ED symptoms and sexual esteem, by transgender-specific body image concerns. ED symptoms and sexual esteem were not directly significantly associated (β= –.07, t(72)= –.64, p= .53). Meanwhile, it was found that ED symptoms was positively related to transgender-specific body image concerns (β= .3, t(72)= 2.71, p= .008) and transgender-specific body image concerns was negatively related to sexual esteem (β= .43, t(72)= –3.9, p=.0002). With both the a-path and b-path being of statistically significant level, the indirect effect (*ab*) was also statistically significant. This confirms the mediating role of transgender-specific body image concerns on the relationship between ED symptoms and sexual esteem (β= –.13, 95% percentile CI: [–.28, –.02]). To conclude, these findings suggest that ED symptoms does not directly predict sexual esteem, but ED symptoms predict transgender-specific body image concerns, which then predicts sexual esteem (Figure 7).

Figure 7

Statistical Diagram of Mediation Model 1: the indirect effect of body image on the relationship between eating-related difficulties and sexual esteem.



Note. X= Independent variable, Y= Dependent variable, M= Mediator. *p<.05, *p<.01, *p<.001.

c': direct effect of X on Y; *ab:* indirect effect of X on Y through M; *c:* total effect of X on Y (*c*' + *ab*).

Descriptive Analysis of Experiences of Service Use

Within the recruited sample, just less than half (47.4%, n=36) had received either past or current support for their eating-related difficulties and so were eligible to complete to this strand of the survey. Broadly, most respondents (55.7%, n=20) responded disagree (30.6%) or strongly disagree (25%) when asked whether they feel the care they received effectively addressed their needs. Comparatively, 19.4% (n=7) and 11.1% (n=4) selected agree and strongly agree, respectively.

Over three quarters of respondents (77.8%, n=28) had not spoken to their healthcare professional(s) about their sexuality/ sexual functioning, whilst the remaining (22.2%, n=8) had. Meanwhile, over half of respondents (58.3%, n=21) had not spoken with their healthcare professional(s) regarding their gender identity, whilst the remaining (41.7%, n=15) had. Further questionnaire responses are described in more detail below and are summarised visually in Figure 8 and Figure 9, grouped by sexual functioning and gender identity.

Sexual Functioning

The majority (80.5%, n=29) either responded agree or strongly agree to fear of a lack of understanding being a barrier to them speaking about their sexuality/ sexual functioning as part of their care. In response to the following statement ‘broadly, I feel satisfied with how my sexuality/ sexual functioning was/ has been considered during my treatment’, respondents had mixed views: 33.3% (n=12) answered strongly disagree, 27.8% (n=10) neither agree or disagree, and 19.4% (n=7) agree.

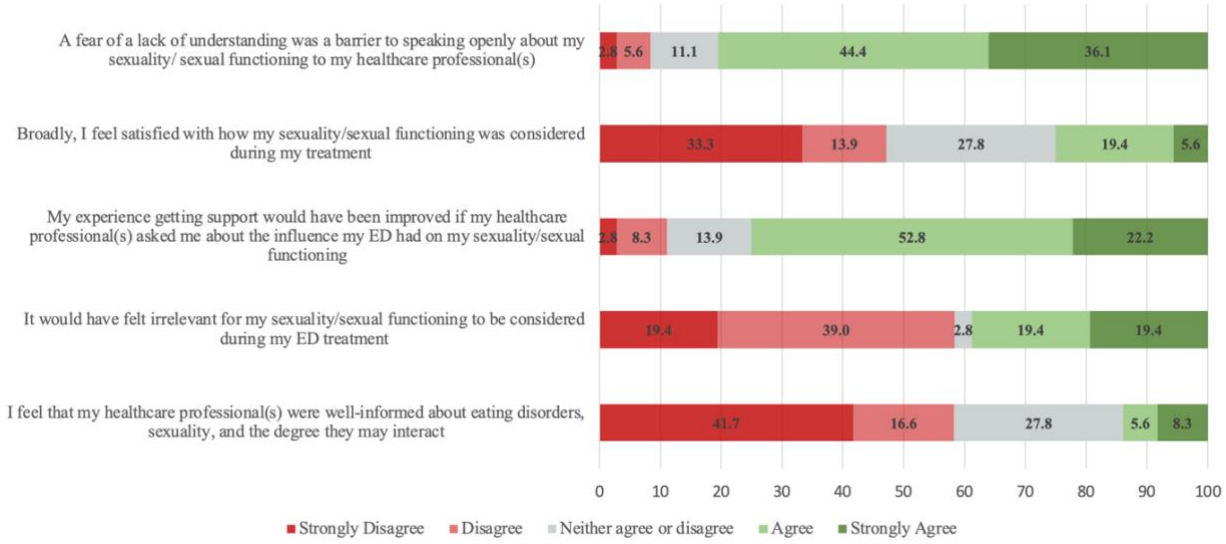
Three quarters of respondents (75%, n=27) either agreed or strongly agreed that their experience getting support for their ED would have been improved if their healthcare professional(s) asked them about the influence their ED had on their sexuality. Respondents (39%, n=14) largely shared disagreeing with the statement ‘it would feel/ have felt irrelevant for my sexuality/ sexual functioning to be considered during my ED treatment’.

Lastly, when asking participants to what extent they agreed with the statement: ‘I feel that my healthcare professional(s) were well-informed about EDs, sexuality, and the degree they may

interact', the majority (41.7%, n=15) responded strongly disagree, whilst another 16.6% (n=6) responded disagree. Notably, only 13.9% collectively agreed (n=2), or strongly agreed (n=3) with this statement.

Figure 8

Use of ED Service Questionnaire Results – Sexual Functioning



Gender Identity

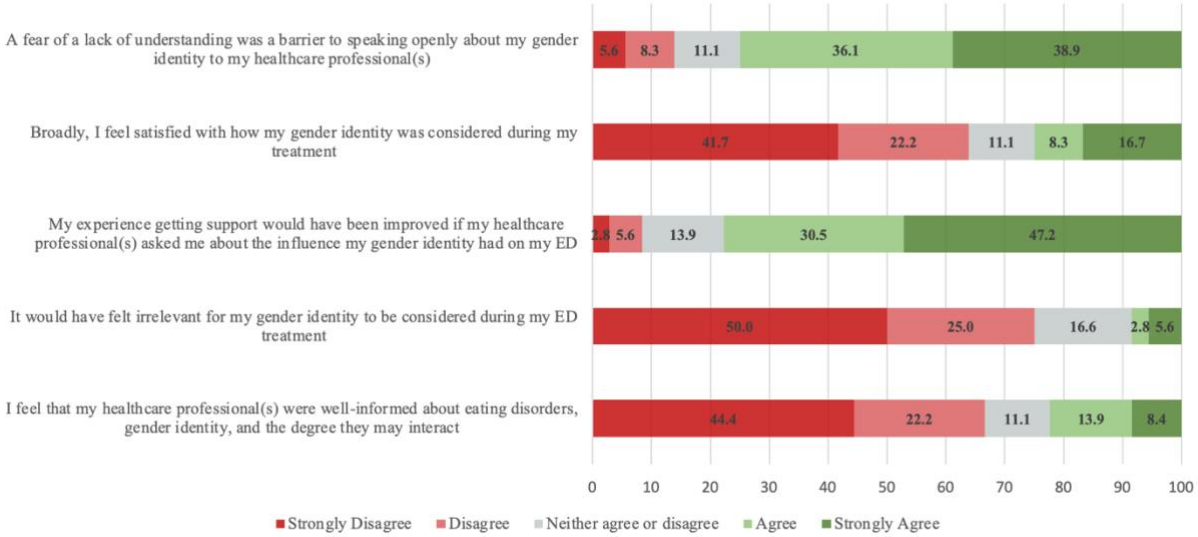
Three quarters (75%, n=27) of respondents reported that they either agreed (36.1%, n=13) or strongly agreed (38.9%, n=14) that 'fear of a lack of understanding was a barrier to speaking openly about my gender identity to my healthcare professional(s)'. Comparatively, 8.3% (n=3) and 5.6% (n=2) responded disagree and strongly disagree, respectively. Participants responses varied in response to the statement 'broadly, I feel satisfied with how my gender identity was/ has been considered during my treatment'. The majority answered strongly disagree (41.7%, n=15), followed by disagree (22.2%, n=8), whilst 8.3% (n=3) responded agree and 16.7% (n=6) responded strongly agree; a small percentage (11.1%, n=4) responded neither agreeing nor disagreeing.

Over three quarters of respondents (77.7%) either agreed (30.5%, n=11) or strongly agreed (47.2%, n=17) that their experience getting support for their ED would have been improved if their healthcare professional(s) asked them about the potential interaction between their gender identity and ED. Contrastingly only 5.6% (n=2) respondents disagreed, and 2.8% (n=1) respondents strongly disagreed. Notably, half of respondents (50%, n=18) strongly disagreed with the statement 'it would feel/ have felt irrelevant for my gender identity to be considered during my ED treatment'. Furthermore, a quarter of respondents (25%, n=9) disagreed. Collectively, only 8.3% (n=3) reported either agreeing (2.8%, n=1) or strongly agreeing (5.6%, n=2) with this statement.

Finally, the majority of respondents (44.4%, n=16) stated that they strongly disagreed with the statement: 'I feel that my care providers are well-informed about EDs, gender identity, and the degree they may interact'. Furthermore, 22.2% (n=8) responded that they disagreed with this statement whilst 11.1% (n=4) stated neither agreeing nor disagreeing. The remaining respondents shared that they agreed (13.9%, n=5) or strongly agreed (8.4%, n=3).

Figure 9

Use of ED Service Questionnaire Results – Gender Identity



Discussion

The primary aim of this study was to investigate the relationship between ED symptoms and sexuality concepts within a sample of TGNC youth and young adults. Exploratory mediation analysis then sought to examine the association between ED symptoms and sexuality, positioning both transgender-specific body image and gender dysphoria as potential mediators. Mediation models were tested for the three sexual concepts which were found to have a significant correlational relationship with ED symptoms: sexual esteem, motivation, and assertiveness.

Relationship between ED Symptoms and Sexuality Concepts

Overall, the findings partially supported the research hypotheses, with it being concluded that ED symptoms were related to some sexuality concepts (sexual esteem, motivation, and assertiveness). These findings were consistent with existing literature reporting on the relationship between ED symptoms and sexuality as a broader concept (Pinheiro et al., 2009; Castellini et al., 2012; Price et al., 2020). However, several null hypotheses were accepted relating to other sexuality concepts (e.g., anxiety, consciousness, satisfaction). With sexuality acknowledged as a multidimensional concept, this study sought to offer a deeper level of understanding in how sexuality relates to ED symptoms. There is limited exploration of the relationship between ED symptoms and sexual esteem, motivation, and assertiveness further than the present study. Therefore, these findings require corroboration through further empirical research, ideally with larger samples.

Research suggests women with ED symptoms indicate poorer sexual desire (Cassioli et al., 2020; Pinheiro et al., 2009), satisfaction (Spivak-Lavi & Gewirtz-Meydan, 2022), arousal (Price et al., 2020), and greater sexual anxiety (Pinheiro et al., 2009). The disparities between these findings and the present study's findings (specifically in relation to sexual satisfaction and anxiety) could be attributed to several factors. Firstly, there may be observable differences in the relationship between these concepts for TGNC individuals compared to the cisgender, female samples the above findings emerged from. Secondly, the present study was underpowered and so we might conclude that the rejection of the null hypothesis in these instances could be false; failing to detect the true effect due to low power. Thirdly, in women, sexual function is suggested to differ depending on ED subtypes e.g.,

anorexia subtypes report higher prevalence of reduced sexual desire compared to other ED diagnoses (Pinheiro et al., 2009). Therefore, as this study included all EDs and ED symptoms, this may have lessened the ability to conclude findings that align with the conclusions of existing research. Finally, gender transition is suggested to influence sexuality and sexual experiences (Thurston & Allan, 2018), therefore stage of transition within the sample may be an important confounder to consider within these bivariable relationships.

Mediators of ED Symptoms and Sexuality Concepts

Transgender-related body image concerns mediated the relationship between ED symptoms and sexual esteem (the tendency to positively evaluate one's capacity to relate sexually with another person; Snell et al., 1993). The other mediation models explored for body image and gender dysphoria were not statistically significant. Whilst no research has attempted to define the mechanisms by which ED symptoms and sexuality may relate to each other for TGNC people, research across the field can be drawn upon in attempt to understand these findings.

Firstly, aligning with this study's findings, research emphasises the negative correlational relationship between ED symptoms and body image disturbances for TGNC individuals (Parker & Harriger, 2020). Body image in this specific sample is associated with disordered eating patterns, suggested to be in part due to an active effort to meet gendered ideals of body appearance (Heiden-Rootes et al., 2023). Sociocultural theory (Stice & Agras, 1998) may position these findings as evidence for the impact of gendered sociocultural pressures of appearance on body image satisfaction within this sample, which may then contribute to ED development (Vander Wal et al., 2008).

Secondly, the relationship between body image and sexuality for TGNC is less explored. Research outside of this sample highlights that body image disturbances may lead to a decrease in overall sexual functioning and satisfaction (McCool-Myers et al., 2018; Quinn-Nilas et al., 2016). Whilst sexual esteem is not specifically explored within these studies, the definition of it within this study refers closely to one's felt ability to relate sexually with another; a fundamental concept underpinning overall sexual functioning. Bringing together the findings described above, it is perhaps

unsurprising that body image in this study was observed to mediate the relationship between ED symptoms and sexual esteem. This emphasises conclusions that the body is often a central source of suffering for TGNC individuals (Jones et al., 2016).

Alternatively, the mediatory role of gender dysphoria was not supported. This conclusion is surprising given individuals experiencing gender dysphoria may be more likely to report higher rates of disordered eating (Milano et al., 2020) and gender dysphoria may contribute to barriers TGNC individuals face in relation to sexual experiences and sexual development (Doorduin & van Berlo, 2014). Further to such conclusions, the relationships between these variables for this sample is seldom conceptualised within research. More research is required to better understand the extent that gender dysphoria may relate with both ED symptoms and sexual functioning, particularly due to the underpowered analysis and selective focus on only three sexual concepts within this study.

Experience of Seeking and Accessing ED-related Care

This project also reported TGNC individuals' experience of accessing ED care, in relation to the consideration of their sexuality and gender identity. It was concluded that most respondents felt their care did not effectively address their needs, with the large majority not speaking with their health care professional about their sexuality or gender identity. Fear of lack of understanding was confirmed as a significant barrier to speaking about these, with respondents largely reporting they viewed their healthcare professional(s) as uninformed about how sexuality and gender identity may interact with their eating difficulties. Most respondents felt as though their experience getting support for their ED would have been improved had healthcare providers asked about how their sexuality and gender identity interact with their ED.

Whilst this specific focus is novel, existing research findings highlight the challenges TGNC individuals face in accessing vital healthcare. Aligning with the findings of this study, a recent systematic review (Snow et al., 2019) reported fear of being pathologised and/or stigmatised against and staff incompetency as significant barriers to seeking and accessing mental health care. Similar research describes these obstacles as functioning on both an interpersonal and structural level, more

widely including harassment, abuse, and discrimination; knowledge deficits within services; and organisational policies that are underpinned by cisnormative assumptions (Kcomt et al., 2020). This may lead to TGNC individuals consciously and subconsciously being perceived as 'other' by healthcare staff, which in turn may lead to prejudice, oppression, and subtle micro-aggressions such as misgendering or marginalising (Ansara, 2015). Such experiences, or indeed the expectation that these experiences will occur, can lead to avoidance or underutilisation of healthcare in TGNC individuals (Vermeir et al., 2019).

These barriers provide reasoning to the reported attitudes within this study. Minority stress theory (Meyer, 2003) emphasises that external stressors such as the barriers explored above lead to internal stressors (internalised transphobia, identity concealment), which then increase risk for negative mental health outcomes (McConnell et al., 2018), including suicide risk and self-harm (Gnan et al., 2019), across this sample. Furthermore, these experiences may also reduce felt sense of social safety which is theorised to play a role in maintaining mental health disparities between those minoritised and those who are not (Diamond & Alley, 2022).

Positioning this study's findings alongside the findings above emphasises the vital need to address the systematic deficiencies of healthcare for TGNC individuals. This is particularly poignant given such minority stressors may delay early intervention, which is important for timely and effective treatment of EDs (Koreshe et al., 2023), as well as contribute to the increased risk of development and maintenance of ED symptoms for TGNC individuals (Parker & Harriger, 2020).

Clinical Implications

The present study is one of the first to examine the relationship between ED symptoms and sexuality, for TGNC individuals. With the relationship between ED symptoms and concepts of sexuality having a firm evidence base in samples of cisgender individuals (Martin et al., 2023; Spivak-Lavi & Gewirtz-Meydan, 2022), and this relationship beginning to be understood for TGNC individuals, it strengthens recommendations that sexuality should be considered within ED assessment, formulation, and treatment. Furthermore, in thinking about treatment, Spivak-Lavi and

Gewirtz-Meydan (2022) offered the recommendation that if clinical services seek to address both ED symptoms and sexuality concerns, dyadic therapy may be a more appropriate route opposed to the individual orientated approach ED services usually take. Though, the effectiveness of dyadic therapy in reducing co-existing eating- and sexuality-related difficulties would be required first, before ED services are likely to consider implementing this approach.

Findings suggest that ED symptoms and sexual esteem may be mediated by transgender-specific body image, though more research is required to confirm this mediated relationship. Many body image-related factors have been described to increase risk of EDs and ED symptoms in gender minority individuals (Parker & Harriger, 2020); it is an central factor to consider within ED treatment. This study, combined with existing findings, highlights the importance of considering body image when targeting ED symptoms alongside sexuality concerns for TGNC individuals.

Practitioners should be aware of the importance of considering both sexual functioning and gender identity with TGNC individuals, given their report that these felt important constructs to consider when understanding their presenting ED symptoms. Based on these findings, it is a strong recommendation that such topics should be routinely explored during assessment and formulation stages of care and, as appropriate, should then be used to inform treatment approaches. Training offers for healthcare staff related to sexuality and gender identity may be vital in ensuring exploration of these topics are done in a sensitive and affirming manner. Qualitative research may have a role in fleshing out these findings in a way that could help to inform clinical services more directly, and co-production with TGNC individuals should be utilised in these efforts. These findings, combined with existing findings within the evidence base also provides vital information to policymakers in relation to the broader context of shaping ED services in a way that is considerate and affirmative of, and is responsive to the needs of TGNC individuals. This is imperative given we know that TGNC individuals are at heightened risk of experiencing EDs and ED symptoms, particularly if we hope to address the systemic health inequality faced by those of minoritised social identities, which both the NHS Constitutions (NHS England, 2015) and NHS Long Term Plan (2019) position as a priority.

Limitations

This study was not without limitations. First, its cross-sectional design precludes inferences relating to causality. Though, to challenge this limitation, this methodological design is suggested to be useful in establishing preliminary evidence for newer research areas (Wang & Cheng, 2020) and so may offer a springboard for further research of a higher quality design.

The nonprobability sampling method employed is likely to have invoked self-selection bias (Meyer & Wilson, 2009). Furthermore, this study may have been limited by recruitment and data collection being carried out online, via social media, with volunteers likely to differ from the target population in socio-demographic characteristics (Jordan et al., 2013). These two methodological limitations, paired together, are likely to have some weighting on the generalisability of the study findings. Continuing to reference methodological limitations, it is also curious to consider whether the use of a more generalised measure of body image, as opposed to the transgender-specific body image measure utilised, may have resulted in differing findings. Perhaps, a more general measure may have better elucidated body image concerns for TGNC individuals which relate to the whole body, rather than the specific characteristics of the body relating to an individuals assigned sex at birth, and in turn its relationship with ED symptoms and sexuality.

Furthermore, the sample was primarily made up of those White in ethnicity; study conclusions should be generalised to ethnic minority TGNC individuals with extreme caution. This limitation mimics a critical, longstanding limitation of ED research in that it over-represents the experience of white participants and thus overlooks the importance of recognising and addressing the role of intersectionality in increasing risk for EDs (Halbeisen et al., 2022).

Additionally, the study merged TGNC individuals into one sample and did not seek to understand how these concepts may differ across transgender and gender non-conforming individuals separately, which could be described as reductionist. Lastly, research into sexual functioning for individuals with EDs report differences across specific ED symptoms. For example, women with AN symptomatology are more likely to exhibit lower sexual desire, when compared with women with BN symptomatology

(Pinheiro et al., 2009). Whilst this study hoped to ascertain a broad understanding of the relationship between any ED symptoms and sexuality, it would be encouraged for future research to elucidate differences based on particular ED symptomology as this broad inclusion could have worked to neutralise potential important findings.

Future Directions for Research

Being the first of its kind, this study would value from replication to establish the relationship more fully between ED symptoms and sexual concepts, and the mechanisms by which this relationship may occur. Body image is emerging as an important variable within this relationship, and so it would be interesting to further elucidate the helpfulness of addressing body image concerns to positively impact both ED symptoms and sexual difficulties. It would be valuable to understand the variability of this relationship within the wider group of TGNC individuals, as well as how this may differ depending on ED presentations and symptoms.

Additionally, research has begun to ascertain the experiences of TGNC individuals when accessing healthcare services. This study's findings supplement this by seeking to understand specific experiences of TGNC individuals when accessing ED services, with particular focus given to the exploration of sexual functioning and gender identity. Clinical services would benefit from a more advanced evidence base that clearly establishes TGNC experiences when accessing ED services, to shape services to be more accessible, affirmative, and in turn more effective. This would hopefully also minimise the likelihood of harmful care which might work to maintain ED symptoms through adding to individuals experience of minority stress. This is vital if we want to work towards addressing the systematic deficiencies within healthcare for TNGC individuals, and work towards ensuring holistic and affirming care for this underrepresented community.

Conclusion

This empirical study is the first to examine the relationship between ED symptoms and sexuality concepts in a sample of TGNC individuals. In conclusion, this study revealed that ED symptoms and sexuality concepts such as sexual esteem and motivation are correlated, whilst ED

symptoms predict sexual assertiveness. Additionally, transgender-related body image was found to solely mediate the relationship between ED symptoms and sexual esteem. Largely, sexuality and gender identity were not considered during TGNC individuals ED care experiences, though this sample reported these to be helpful concepts to explore in relation to their eating difficulties. Fear of a lack of understanding was agreed to be a contributing factor to non-disclosure. Results suggest the importance of acknowledging the role of sexuality and body image among TGNC individuals experiencing ED symptoms. ED services must work to provide safe spaces in which these concepts can be explored in an affirming and helpful way.

Declarations

Funding

This study was completed in partial fulfilment of the degree of Doctorate in Clinical Psychology undertaken at the University of East Anglia.

Disclosure Statement

Authors of the study have no competing interests to declare.

Data Availability Statement

Data will be shared by reasonable request to the corresponding author.

Ethics Approval and Consent

The current study was approved by the University of East Anglia's Faculty of Medicine and Health Sciences Research Ethics Subcommittee granted ethical approval for the project (ETH2223-0066, 11th January 2023). All participants provided confirmation of consent to take part in the current study, following review of the online participant information sheet.

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Chapter 5: Extended Methodology for the Empirical Research Project

This chapter offers further detail regarding the methodological approach undertaken within the empirical research presented in Chapter 4. Broadly, this chapter will provide additional information relating to ethical considerations, and the analytic strategy employed.

Ethical Considerations

This study's design and implementation was guided by principles for the conduct of ethical research, such as: British Psychological Society's (BPS) Code of Human Research Ethics (2014), BPS Code of Ethics and Conduct (2018), as well as specific policies relating to the University of East Anglia; the university in which this research was conducted under. Details regarding specific ethical considerations are outlined below.

Consent, Capacity, and Right to Withdraw

To gain informed consent, participants initially engaging with the study were directed to read the participant information sheet (PIS; Appendix P). This made clear the area of investigation for the study, and provided information required to make an informed decision about whether to take part, or not such as: purpose of the research, inclusion and exclusion criteria, predicted time taken to complete, the voluntary nature of participation and right to withdraw, potential for distress, and data storing and usage. Researchers' contact details were provided alongside an explicit statement around the purpose of these being provided, to support with outstanding questions, queries, or feedback and that we would not be a sufficient or reliable contact in the case of distress and so alternative support services that participants were signposted should be used in this instance.

Specifically thinking about participants aged 16–18, it felt important to include young people in the research project given this age holds particularly vulnerability for developing eating disorder symptoms, however sufficient ethical consideration was required for this subset of participants. In line with the Mental Capacity Act (2005), all eligible participants were presumed to have capacity to self-consent due to being aged 16 years or above. Young people, under 18 years of age, were encouraged to discuss participation with their parent(s)/ carer(s)/ a supportive adult prior to consenting. This

decision however was up to the young person's own discretion. This was felt important based on potential identity concealment in transgender and gender non-conforming individuals.

Following the participant information sheet, participants were invited to provide their informed consent through the provided online consent form (Appendix Q). In completing the online consent form and progressing to the survey, this illustrated a participant's decision to consent. Once participants submitted their responses, they were unable to withdraw consent. Those who did not consent to take part were directed to exit the survey.

Participants were informed of their right to withdraw consent at any point whilst completing the survey. Data of uncompleted and unsubmitted responses were not stored. Participants were made aware that, following submission of their responses, they would not be able to withdraw consent due to the anonymity the survey provided.

Anonymity, Confidentiality and Data Management

The survey was anonymous in nature, and participants were informed of this; no identifying information was directly collected, nor were there opportunity for open text responses in which participants could have disclosed information that could have been identifying. Following survey completion, participants were able to supply their email address if wishing to enter the prize draw and/or receive a summary of findings (Appendix R). In this case, participants were redirected to a separate survey link, allowing for separate storage of the main data set, and any identifying, personal information to preserve confidentiality of the responses. There was no way of linking a participant's responses to their email address.

Technical safeguards were put in place to protect the privacy of participant information. In line with UEA's Information Classification and Data Management policy, data was stored securely on UEA Office 365 OneDrive for Business. Documents were password protected with access to the main data set restricted to the researcher team only, and personal email addresses were accessed by the lead researcher only. Personal information was deleted once prizes had been distributed.

Participant Distress and Debriefing

In developing the project, several precautions were taken to minimise the likelihood of adverse events, such as distress, arising. The project was considered unlikely to incur adverse events, given its design and methodological approach; participation in anonymous online mental health-related surveys is associated with low prevalence of increased distress (Batterham et al., 2018).

The PIS (Appendix P) provided caution that, in some cases, the questionnaire's contents could prove distressing. Informing potential participants of this, they were able to hold autonomy over whether they choose to participate and were encouraged not to take part if they suspected the survey topics could cause them distress. They were also made aware of their right to withdraw at any time when completing the survey without any consequence if required.

Following survey completion, participants were provided a debrief sheet (see Appendix S) which provided a brief repeat of study information and conveyed thanks for participation. Signposting to support services related to the study's focuses (e.g., BEAT Eating Disorders and LGBT Foundation) was also provided.

Analytic Strategy

Multiple Comparison Testing

Multiple comparisons were conducted as part of the primary correlation and secondary mediation statistical analyses. In response to this, multiple comparison testing was explored. Several post hoc approaches to these were researched, with both the Bonferroni correction (Bonferroni, 1936) and sequentially rejective multiple test procedure (Bonferroni-Holm; Holm, 1979) identified to be most appropriate. Both procedures work to adjust probability (*p*) values, in accordance with the number of statistical tests carried out. It was concluded that a sequentially rejective multiple test procedure was most appropriate, given it is reported to be uniformly more powerful and less conservative than the Bonferroni method (Chen et al., 2017). This would be particularly important given the number of corrections required for the 12 correlational analyses undertaken.

However, after further research, it was decided that no multiple comparison adjustment would be applied. Research holds vastly dichotomous views on whether multiple comparison corrections should be made, with some holding the position that it should be mandatory whilst others view it as unnecessary (Armstrong, 2014). It has been recommended that undertaking multiple comparison testing should be weighed up by considering the importance of avoiding particular types of error (be that type 1 or type II) and depending on the circumstances and aim of the study (Streiner & Norman, 2011). Broadly multiple comparison testing is thought to result in an inflation of type II error in its attempts to reduce probability of type I error occurrence (Perneger, 1998), it may be overly cautious (Lee & Lee, 2018), and can even result in premature dismissal of important areas of research that would benefit from further investigation (Streiner & Norman, 2011). Given these reflections, alongside the fact that this research study was the first of its kind, it felt better indicated to not undertake multiple comparison testing. In doing so, authors aimed to ensure transparency regarding this approach, accounting for this when interpreting the results (Perneger, 1998). For the mediation strand of the analysis, corrections were deemed unnecessary due to this being exploratory, which may be regarded as hypotheses for further investigation (Armstrong, 2014).

Mediation Analysis

Methodological Approach to Mediation.

Many tests exist to establish mediated effect (Fritz & MacKinnon, 2007), and there are many considerations that should be accounted for when deciding which methodology may be most appropriate. The first that may be considered is sample size and adequate power. Given this mediation analysis was exploratory in nature, this was felt to be a less important concern but that required some attention to aim towards achieving more accurate conclusions. Bootstrapping is identified to require a smaller sample to attain the same statistical power, in comparison to that of the Sobel test or Baron & Kenny's (1986) Causal Steps method (Fritz & MacKinnon, 2007). Furthermore, Causal Steps was noted to lead to the most type II errors, with too conservative type I error rates (MacKinnon et al., 2007). The Sobel test has also been identified to have a major flaw in that it requires the assumption that the sampling distribution of the indirect effect is normal, despite this tending to be asymmetric

with nonzero skewness and kurtosis (Hayes, 2009). Research has continued to suggest that bootstrapping is one of the more powerful methods for testing variable effects (MacKinnon et al., 2004), and would yield more valid and reliable results (Hayes, 2018).

In then considering the bootstrapping approaches, percentile bootstrapping was indicated over both bias corrected and bias corrected and accelerated bootstrapping as these methods tend to evoke slightly higher Type I error rates (Hayes, 2018). Utilising PROCESS, in which percentile bootstrapping is the default methodology, is noted to be resistant to the effects of type I error caused by potential outliers (Creedon & Hayes, 2015). Bringing these conclusions together, it was indicated that percentile bootstrapping would be the most appropriate methodology for this statistical analysis, above the more traditional approaches also considered (e.g., Sobel, Causal Steps).

Defining Mediation.

Significant consideration was also given to the interpretation of the mediation output. There is substantial discussion around whether a direct relationship between the dependent and independent variable needs establishing first, for mediation to be present (Baron & Kenny, 1986; MacKinnon et al., 2000; Hayes, 2013). The requirement of a significant direct path from the independent variable (X; ED symptoms in the present model) to the dependent variable (Y; sexuality concepts in the present model) before pursuing further mediation analysis has traditionally been publicised and accepted (Baron & Kenny, 1968). However, more contemporary research recognises this to be a traditional, outdated approach (Hayes, 2013), naming that it ultimately runs the risk of prematurely dismissing important findings if mediation cannot be investigated unless a direct effect is established (Zhao et al., 2010). This first requirement of Baron & Kenny's (1968) sequence in establishing mediation has since been discouraged (MacKinnon et al., 2000; Hayes et al., 2009; Kenny et al., 1998). An alternative recommendation is focusing on the indirect effect and its significance; the only requirement for determining mediation is that the indirect effect (*ab* path) is significant (Zhao et al., 2010). This understanding of establishing mediation was therefore employed within the current study.

Chapter 6: Extended Results Chapter for the Meta-Analysis and Empirical Paper

This purpose of this additional chapter is to report further results of the statistical testing briefly summarised within both Chapters 2 and 4. Relating to the meta-analysis, this chapter will offer extended written and visual results of the subgroup analysis. Concerning the empirical paper, the statistical outputs for the assumption testing and mediation models are described.

Meta-Analysis

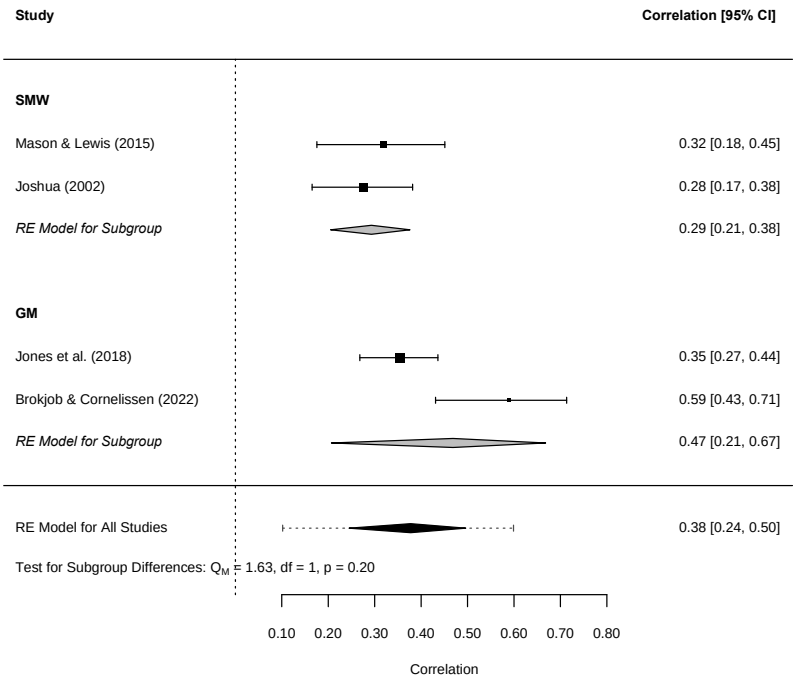
Subgroup Analysis

Anxiety Symptoms.

The anxiety symptoms risk estimate was made up of studies focusing on SMW and GM; subgroup analysis highlighted differences in effect estimate between these groups. Anxiety symptoms yielded a statistically significant small effect (r=0.29, p<.0001) for SMW, and a statistically significant medium effect for GM (r=0.47, p=.0001); illustrated in Figure 10. Heterogeneity, measured by I^2, remained substantial for GM (84.44%), but reduced to 0% for SMW. Though, these results require cautious interpretation due to the minimal number of studies per subgroup (k=2).

Figure 10

Forest plot for anxiety symptoms, organised by subgroup

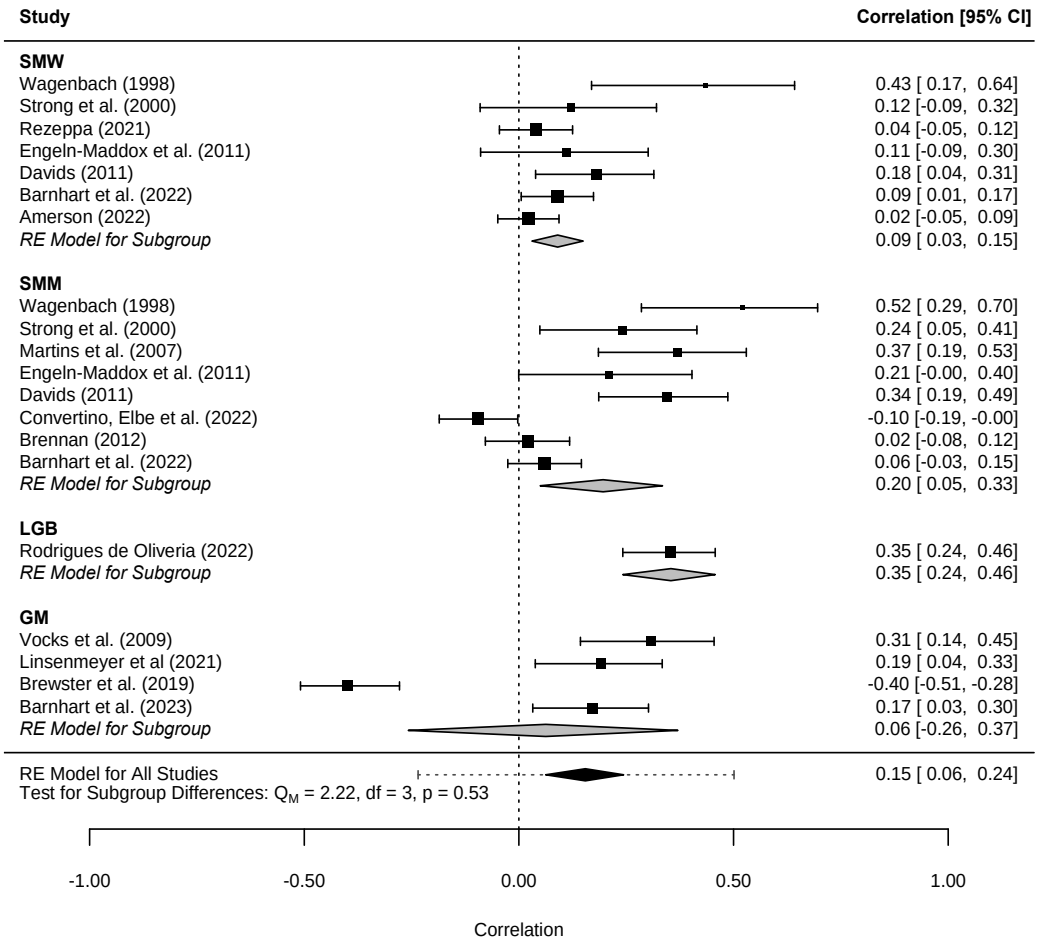


BMI.

The BMI risk estimate differed between SMW, SMM and GM (r=0.09, r=0.2 and r=0.06, respectively, see Figure 11); though this effect was not statistically significant for GM. Notably, compared to the main analyses reporting negligible effect, SMM alone showed a small effect size. Heterogeneity was considerable for SMM (I^2=88.89%) and GM (I^2=94.7%), and moderate for SMW (I^2=39.92%). The LGB subgroup was not explored within the analysis, due to its effect being shaped by one study only.

Figure 11

Forest plot for BMI, organised by subgroup

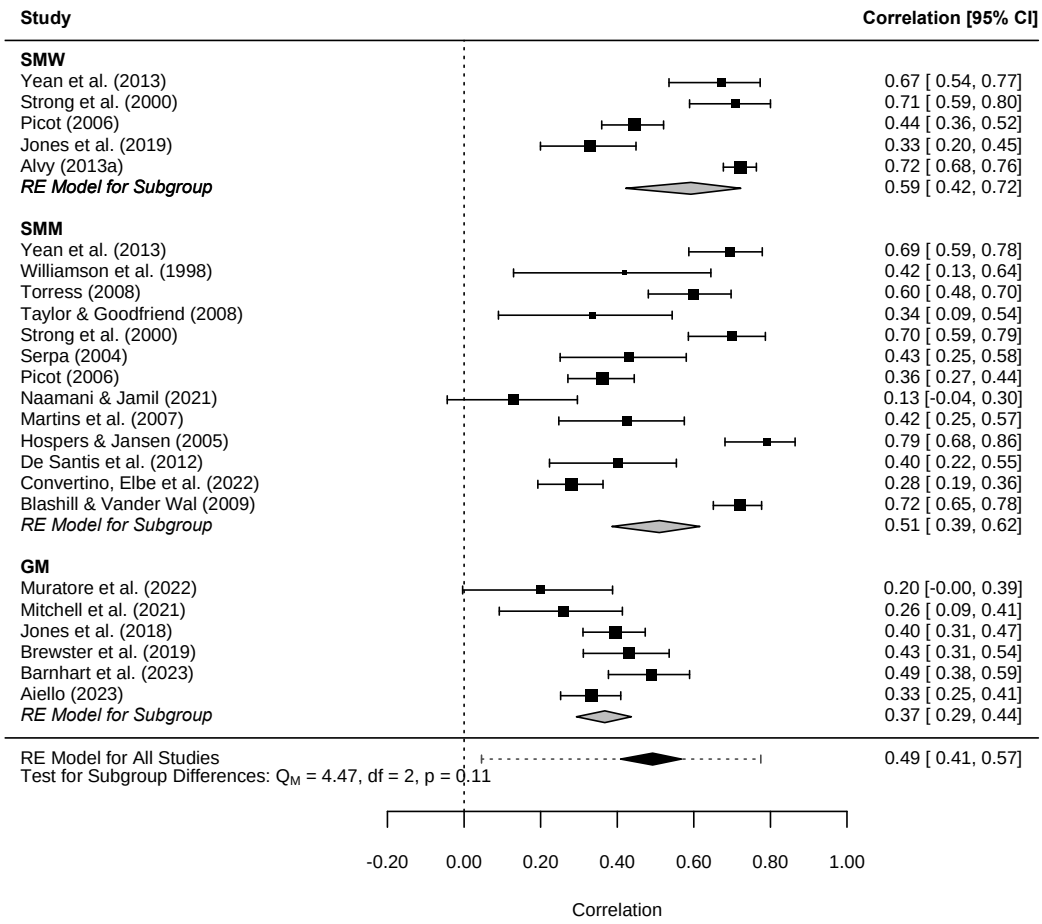


Body Dissatisfaction.

The overall risk estimate for body dissatisfaction was a statistically significant medium effect (r=0.49, p<.0001). Subgroup analysis highlighted that body dissatisfaction is a statistically significant risk factor (p<.0001) for both SMW and SMM, to large effect (r=0.59 and r=0.51, respectively). This reduced to a statistically significant medium effect for GM (r=0.37, p<.0001); see Figure 12. Considerable heterogeneity is apparent for both SMW (I^2=91.22%) and SMM (I^2=93.23%), and substantial for GM (I^2=58.75%).

Figure 12

Forest plot for body dissatisfaction, organised by subgroup

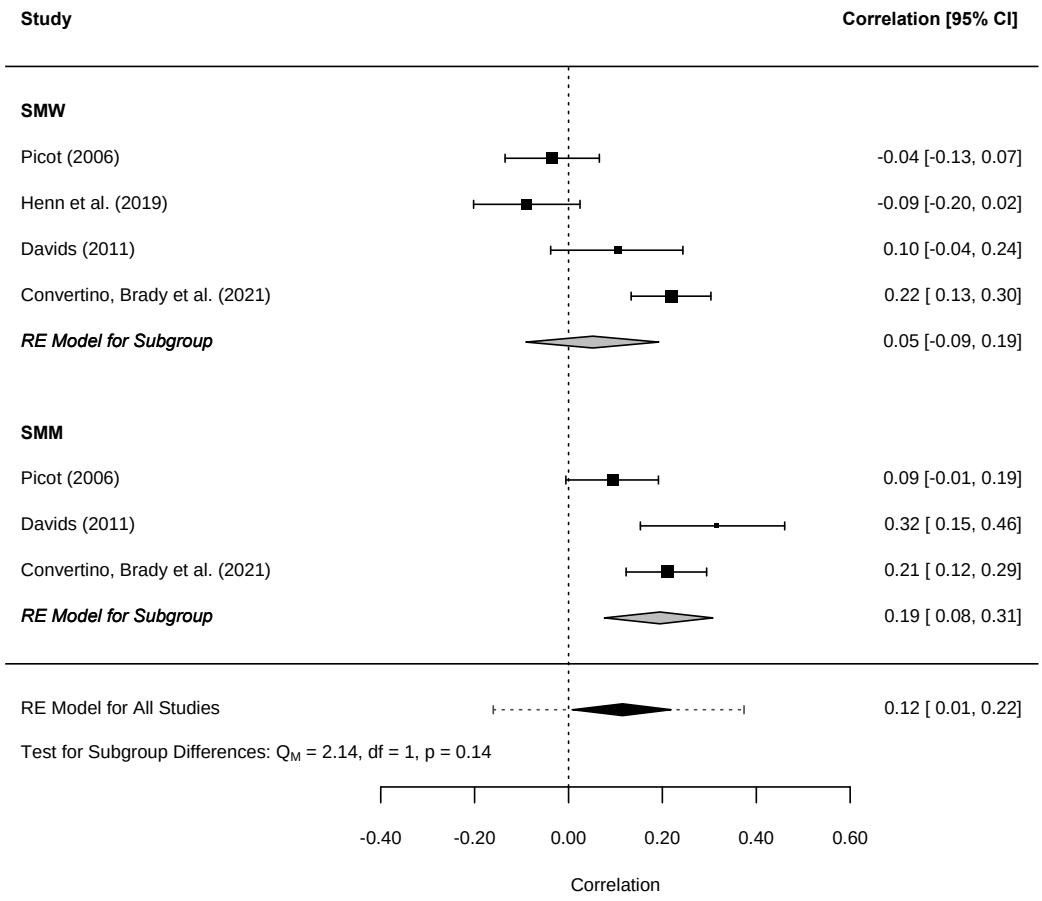


Community Affiliation/ Involvement.

Comparing SMW and SMM for the effect of community affiliation/ involvement highlighted that, whilst for SMW this effect is negligible and not statistically significant (r=0.05, p=.48, 95% CI=-0.09, 0.19), for SMM the effect estimate is of small effect (r=0.19, p=.001); see Figure 13. There is substantial heterogeneity within each subgroup (SMW I^2=85.26%, SMM I^2=69.61%) and so, due to these inconsistencies, the validity of the effect estimate for each subgroup is uncertain.

Figure 13

Forest plot for community affiliation/involvement, organised by subgroup

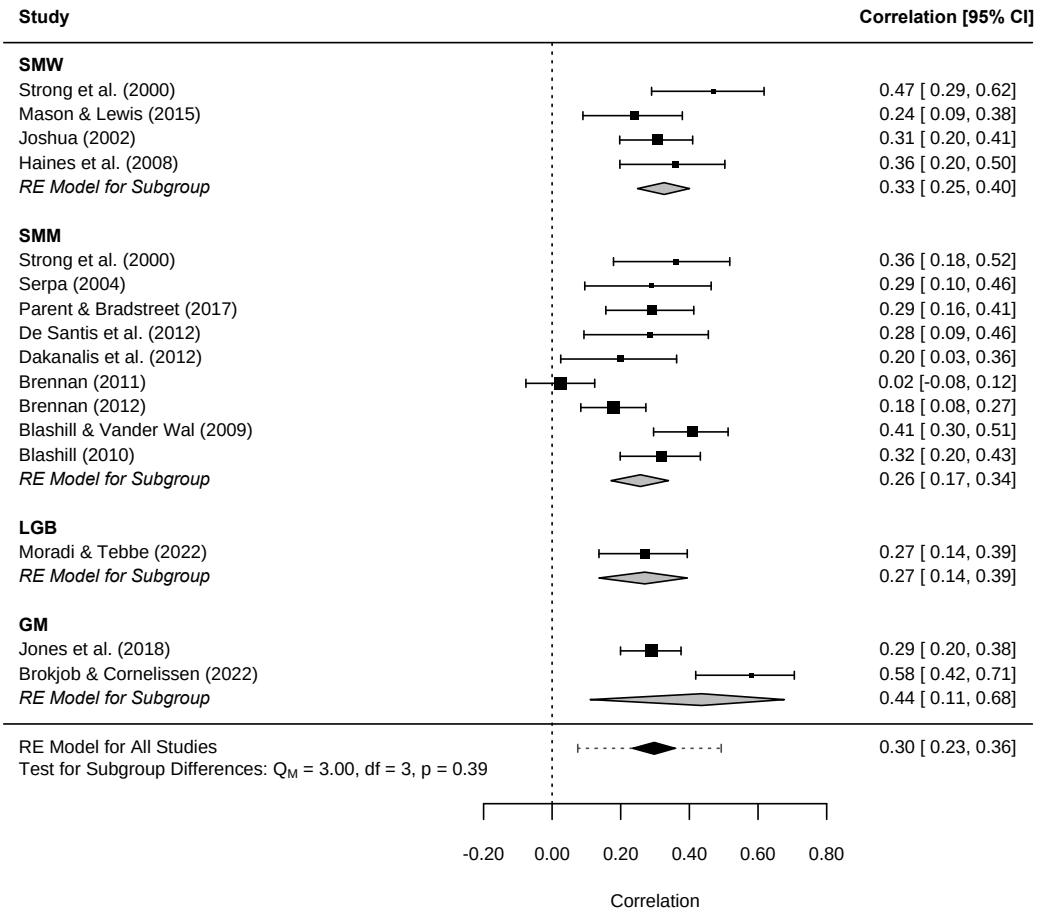


Depressive Symptoms.

Depressive symptoms are of statistically significant medium effect when all effect sizes are pooled together (r=0.30). This largely remains similar across subgroups, with some slight differences: SMM is considered to be of small effect (r=0.26, p<.0001), whilst SMW and GM both are considered to be of medium effect (r=0.33, p<.0001, and r=0.44, p=.01); see Figure 14. GM results reflect considerable heterogeneity (I^2=88.96%) and SMM results reflect substantial heterogeneity (I^2=71.54%), however results suggest heterogeneity may not be important for SMW (I^2=14.95%). GM results are also pooled from only two studies and so, along with the considerable heterogeneity, it's medium effect should be interpreted with caution. The LGB subgroup was not explored within the analysis, due to its effect being shaped by one study only.

Figure 14

Forest plot for depressive symptoms, organised by subgroup

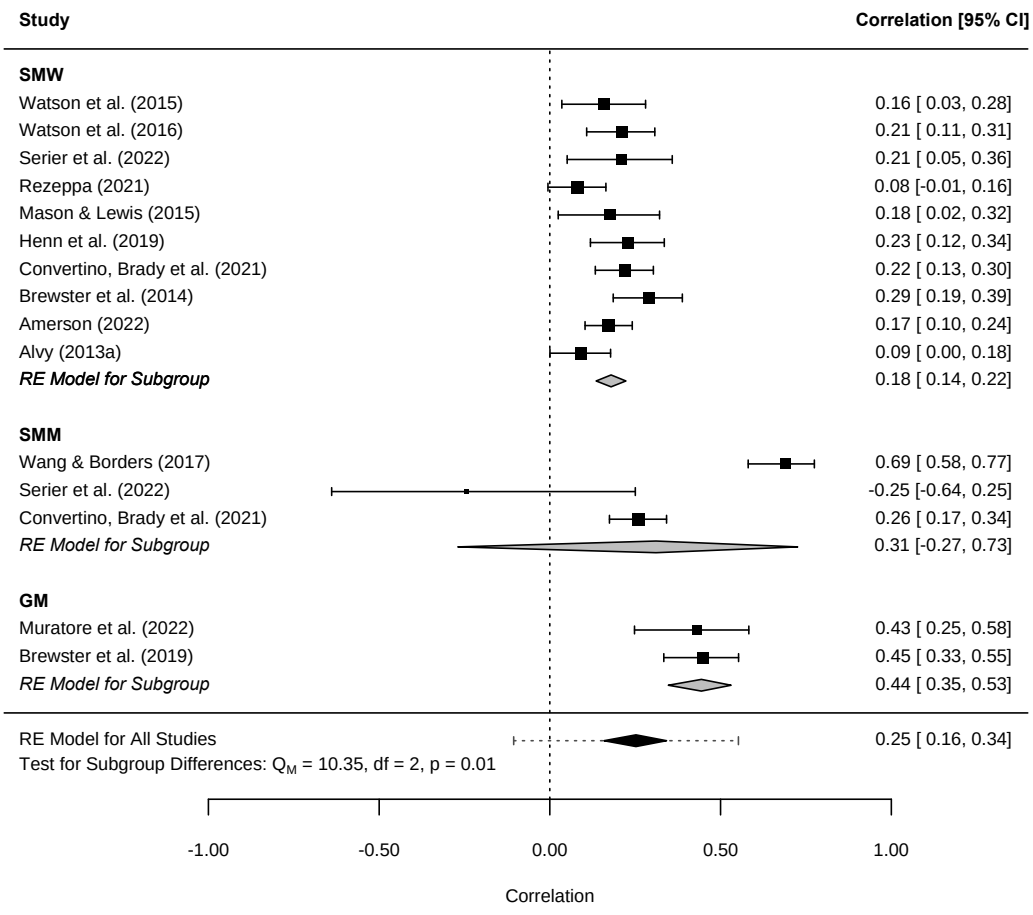


Discrimination (related to SO and/or GI).

For SMW, there is a statistically significant small effect of SO and/or GI related discrimination on ED symptoms (r=0.18, p<.0001), with heterogeneity considered to be of little importance (I^2=14.95%). For GM, this increases to medium effect (r=0.44, p<.0001) with no heterogeneity (I^2=0%). Contrastingly, discrimination is not statistically significant for SMM (p=.29), which is likely to be in at least part impacted by the considerable levels of unexplained heterogeneity across the included studies (I^2=96.37%); Serier et al (2022) recruited sexual minority male veterans only, which could offer some explanation for the stark differences in effect sizes within this subgroup. These results are displayed in Figure 15.

Figure 15

Forest plot for discrimination (related to SO and/or GI), organised by subgroup

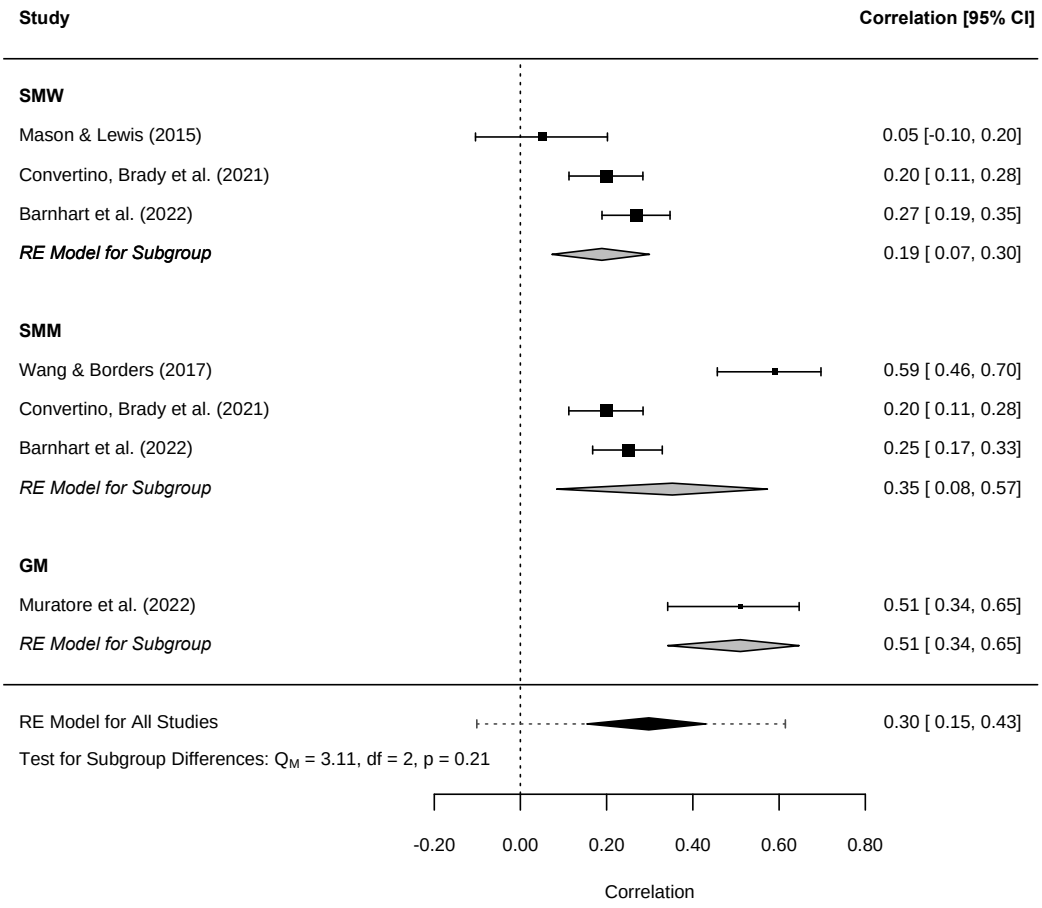


Identity Concealment.

Whilst both significant, SMW and SMM effect estimates vary (SMW: small [*r*=0.19], SMM: medium [*r*=0.35]); see Figure 16. Unexplained heterogeneity for the SMM subgroup was considerable (I^2=95.01%), with the lower and upper bound varying from a negligible to large effect (95% CI: 0.08, 0.57). GM was not explored within subgroup analysis, due to its effect being shaped by one study only.

Figure 16

Forest plot for identity concealment, organised by subgroup

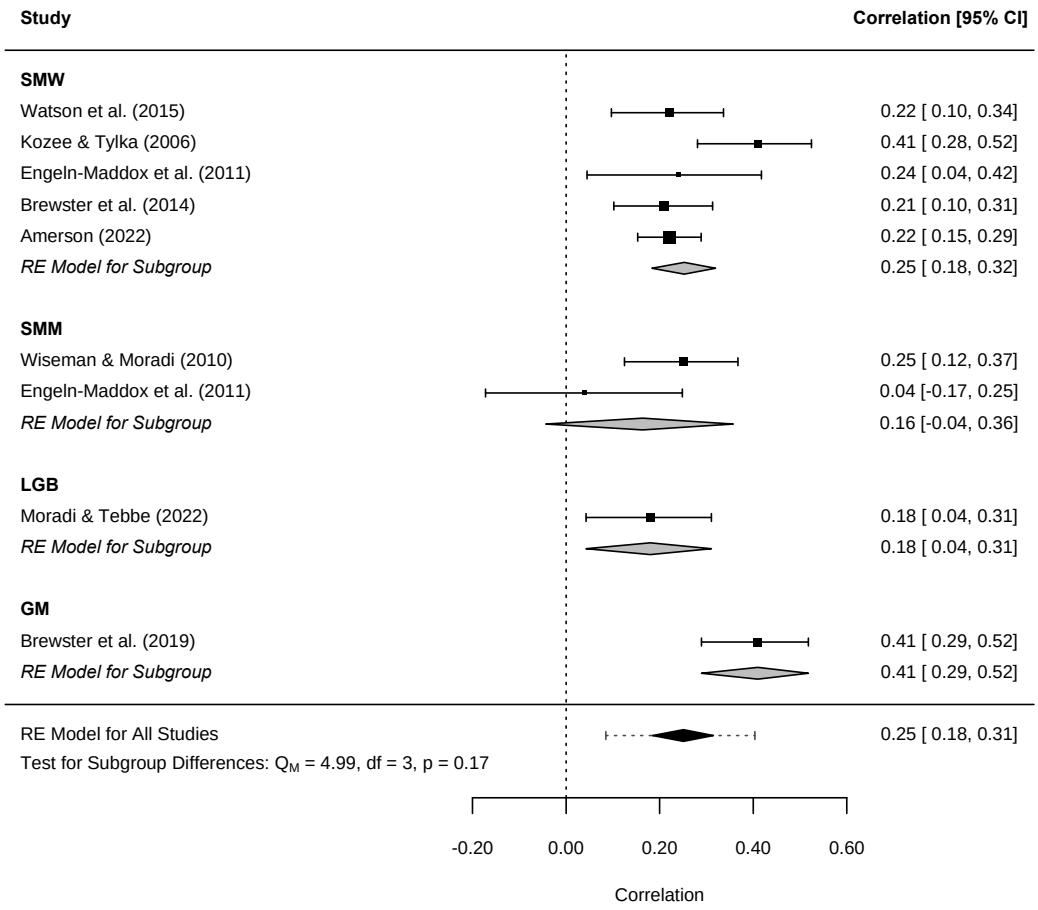


Sexual Objectification.

Subgroup analysis highlighted differences in the effect estimates for SMW and SMM. Sexual objectification was considered to have a statistically significant small effect (r=0.25, p=<.0001) on ED symptoms for SMW, with moderate heterogeneity (I^2=44.83); heterogeneity decreased comparatively to the main analysis when looking only at SMW. Contrastingly, this effect was not statistically significant for SMM (p=.12). Figure 17 reports these findings. Again, both the LGB and GM subgroups were not explored within subgroup analysis due to their effect being shaped by only one study each.

Figure 17

Forest plot for sexual objectification, organised by subgroup

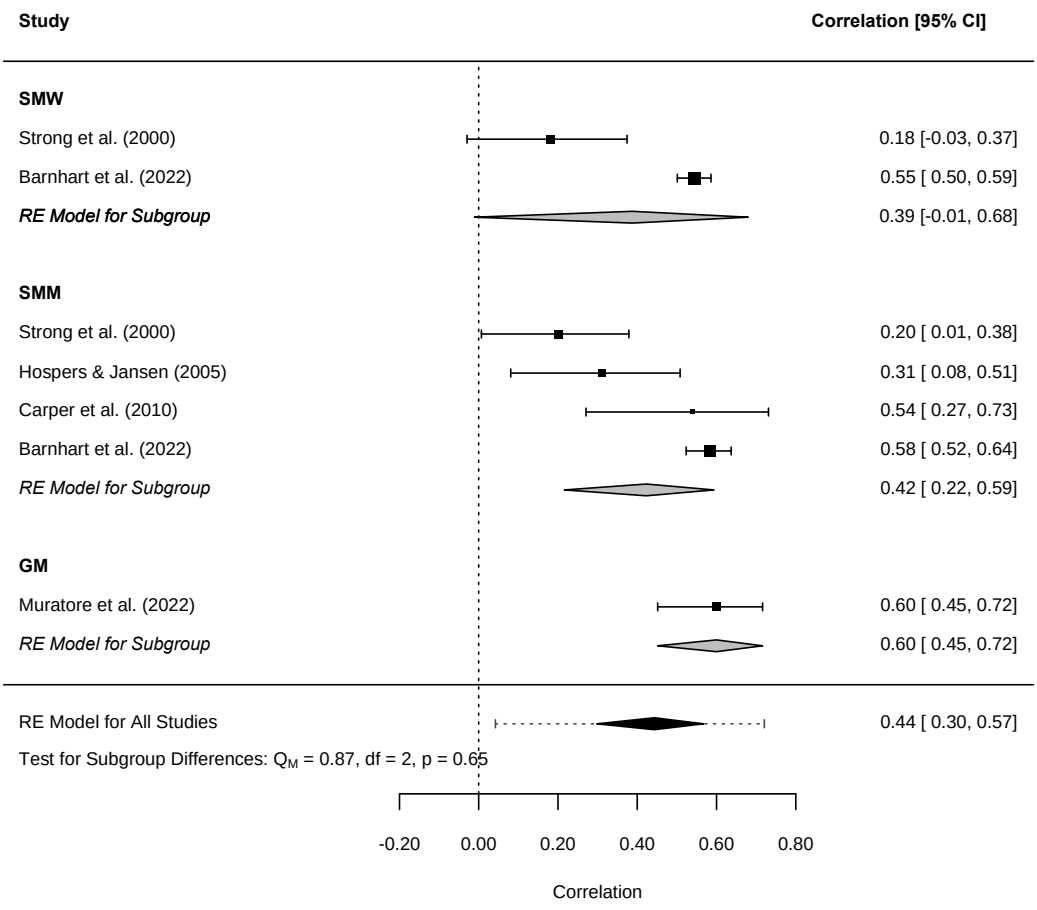


Sociocultural Appearance-related Pressure.

Within the main analysis, sociocultural appearance-related pressure was of a statistically significant medium effect (r=0.44, p<.0001). Carrying out subgroup analysis highlighted that this effect was only statistically significant for SMM (p=.0001), to medium effect (r=0.42). Meanwhile, the effect was not statistically significant for SMW (p=.06). See Figure 18 for a visual report of these findings. Heterogeneity was substantial within both SMM and SMW groups (I^2=82.66% and 93.17%, respectively), and were pooled from a small number of studies. Therefore, the validity of these effect estimates is uncertain. GM subgroups were not explored within subgroup analysis due to its effect being shaped by one study only.

Figure 18

Forest plot for sociocultural appearance-related pressure, organised by subgroup



Empirical Study

Correlation Analyses

Test of Normality.

Normality was tested through the Kolmogorov-Smirnov test of normality, determining whether the dependent and independent data were normally distributed prior to correlational analysis. The Kolmogorov-Smirnov test is used to test the null hypothesis that the specified data comes from a normal distribution. All variables underwent normality testing, with the results reported in Table 8.

Table 8. Kolmogorov-Smirnov Test of Normality Output

Variable	*D*	*df*	*p*
EDE-Q Global Score	.09	74	.2
EDE-Q Restraint Subscale	.17	74	<.001***
EDE-Q Eating Concern Subscale	.09	74	.19
EDE-Q Shape Concern Subscale	.14	74	.00**
EDE-Q Weight Concern Subscale	.11	74	.02*
MSQ Sexual Esteem	.14	74	<.001***
MSQ Sexual Preoccupation	.19	74	<.001***
MSQ Internal Sexual Control	.11	74	.04*
MSQ Sexual Consciousness	.13	74	.00**
MSQ Sexual Motivation	.14	74	.00**
MSQ Sexual Anxiety	.09	74	.2
MSQ Sexual Assertiveness	.13	74	.01**
MSQ Sexual Depression	.15	74	<.001***
MSQ External Sexual Control	.16	74	<.001***
MSQ Sexual Monitoring	.17	74	<.001***
MSQ Fear of Sexual Relationships	.12	74	.01*
MSQ Sexual Satisfaction	.13	74	.01*
T-Worries	.13	74	.00**
UGDS-GD Dysphoria	.11	74	.03*
UGDS-GD Affirmation	.2	74	<.001***

Note. MSQ = Multidimensional Sexuality Questionnaire. *$p \leq .05$, **$p \leq .01$, ***$p \leq .001$.

Overall, the results indicated that the following MSQ subscales do not follow a normal distribution: sexual esteem, D(74) = .14, p= <.001; sexual preoccupation, D(74) = .19, p= <.001; internal sexual control, D(74) = .11, p= .04; sexual consciousness, D(74) = .13, p= .00; sexual motivation, D(74) = .14, p= .00; sexual assertiveness, D(74) = .13, p= .01; sexual depression, D(74) = .15, p= <.001; external sexual control, D(74) = .16, p= <.001; sexual monitoring, D(74) = .17, p= <.001; fear of sexual relationships, D(74) = .12, p= .01; and, sexual satisfaction D(74) = .13, p= .01.

Similarly EDE-Q restraint, D(74)= .17, p<.001; shape concern, D(74)= .14, p=.00; and weight concern, D(74)= .11, p=.02, subscales and non-normal. This was also true for T-Worries D(74)= .13, p=.00 and both UGDS-GD subscales: dysphoria, D(74)= .11, p=.03; and affirmation, D(74)= .2, p<.001). These results indicated the null hypothesis of normality required rejecting for these variables.

Alternatively, the null was accepted for the EDE-Q global score and MSQ sexual anxiety, both obtaining D(74)= .09, p=.2, and EDE-Q eating concern subscale, D(74)= .09, p=.19.

Mediation Analyses

Assumption Testing.

Several mediation models were conducted within Chapter 4. Prior to these being undertaken, the assumptions required for multiple linear regressions were addressed and adhered to. This included ensuring independence of residuals, linearity of relationships among the variables, homoscedasticity of data, multicollinearity of independent variables, and normally distributed error values (Clement & Bradley-Garcia, 2022). The statistical output of these tests will be reported in turn below.

Independence was assessed through examination of the Durbin-Watson statistic (Durbin & Watson, 1950) for the independent variables of the mediation models (EDE-Q global score and either T-Worries or UGDS-GS). The Durbin-Watson statistic ranged from 2.067 to 2.434. The assumption of independence was confirmed, with values falling between 1 and 3 (Field, 2013).

To test existence of multicollinearity, the variance inflation factor (VIF) was generated and interpreted for each mediation model. This sought to investigate the degree to which the independent variables (EDE-Q global score and T-Worries or UGDS-GS) were correlated with each other. To confirm the assumption that multicollinearity does not exist, the VIF should not be above 10 (Miles, 2005). The VIF was 1.102 when testing EDE-Q global score and T-Worries, whilst the VIF for EDE-Q global score and UGDS-GS was 1.007. This concluded that multicollinearity did not exist within the models.

The assumptions of linearity and homoscedasticity were ensured through visual inspection of generated scatterplots. Linear relationships between all variables in the model were determined as data appeared horizontal within the scatterplots. Homoscedasticity was also observed using these same scatterplots, in which visual inspection of the residuals was concluded to also be rectangular in shape; error could be concluded as scattered randomly across the different values of the dependent variables (Clement & Bradley-Garcia, 2022). Appendix W showcases the generated scatterplots from which these conclusions were drawn.

Finally, the assumption of normality was tested by ensuring that the residuals were normally distributed (Hayes, 2018). This was confirmed through the construction and visual inspection of histograms and P-P plots. Although Kolmogorov-Smirnov tests of normality were previously carried out in relation to correlational analyses, this method of normality testing is perceived to have high sensitivity to extreme values and therefore may be overly conservative in identifying non-normality (Ghasemi & Zahediasl, 2012). Furthermore, regression is reported to be robust against non-severe violations of normality (Hayes, 2018). Therefore, graphical inspection and interpretation of the data was favoured in this instance. Findings from these observations are briefly described below for each mediation model in turn, with the Histograms and P-P plots provided in Appendix X.

For mediation models 1–3 (body image as a mediator of the relationship between ED symptoms and sexual esteem, sexual motivation, and sexual assertiveness, respectively), visual inspection of the histograms indicated data to be very slightly positively skewed. Visual inspection of the P-P plot showed the points were not perfectly aligned along the diagonal line. It was therefore concluded that data slightly deviated from normal; as this was non-severe, data transformation was not indicated (Hayes, 2018).

For mediation models 4 and 6 (gender dysphoria as a mediator of the relationship between ED symptoms and sexual esteem, and sexual assertiveness, respectively) the histograms and P-P plots indicated data was largely normally distributed. Finally, for mediation model 5 (gender dysphoria as a mediator of the relationship between ED symptoms and sexual motivation) the histograms and P-P

plots suggested non-severe non-normality. Again, this diversion from normality was seen to be slight enough that transformation was not required.

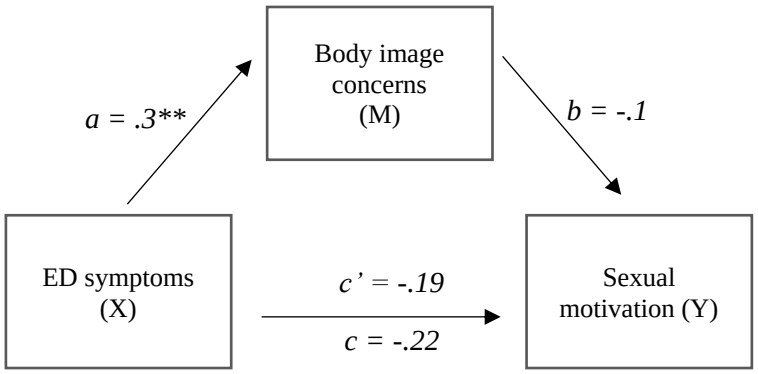
Non-significant Mediation Models.

Whilst no other mediation models were found to be significant further to mediation model reported in-text of the empirical paper, it may be valuable to report the non-significant findings in greater detail than provided in Chapter 4.

Mediation model 2 (ED symptoms and sexual motivation, via body image concerns; Figure 19) broadly indicated no mediated effect as the indirect effect (*ab* path) was observed to be statistically non-significant (β= –.03, 95% percentile CI: [–.13, .05]). As already noted and described in chapter 4 for model 1, the a-path between ED symptoms and transgender-specific body image was found to be of statistical significance (β= .3, p= .008).

Figure 19

Statistical Diagram of Mediation Model 2: the indirect effect of body image on the relationship between ED symptoms and sexual motivation.

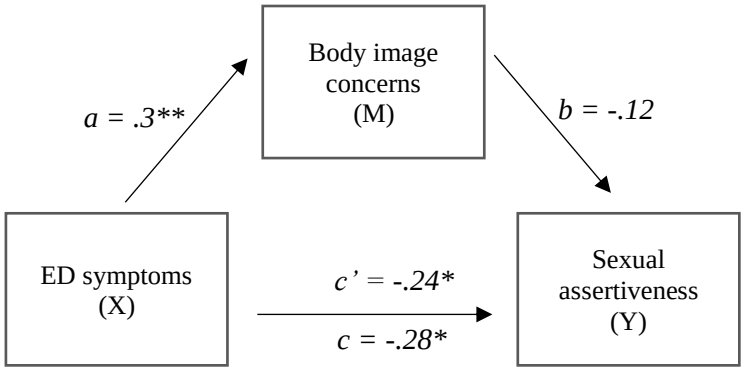


Note. X= Independent variable, Y= Dependent variable, M= Mediator. *p<.05, *p<.01, *p<.001. *c':* direct effect of X on Y; *ab:* indirect effect of X on Y through M; *c:* total effect of X on Y (*c*' + *ab*).

Results from mediation model 3 (ED symptoms and sexual assertiveness, via body image concerns; Figure 20) highlighted no evidence of a mediated effect through the indirect (*ab*) path: β= –.04, 95% percentile CI: (–.14, .04). However, a statistically significant direct effect (*c'* path) between ED symptoms and sexual assertiveness was illustrated *(β= –.24, t(72)= –2.1, p= .04).*

Figure 20

Statistical Diagram of Mediation Model 3: the indirect effect of body image on the relationship between ED symptoms and sexual assertiveness.

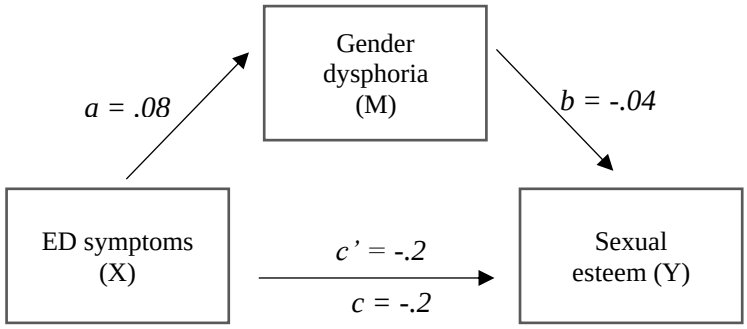


Note. X= Independent variable, Y= Dependent variable, M= Mediator. *p<.05, *p<.01, *p<.001. *c':* direct effect of X on Y; *ab:* indirect effect of X on Y through M; *c:* total effect of X on Y (*c*' + *ab*).

Mediation model 4 (ED symptoms and sexual esteem, via gender dysphoria; Figure 21) illustrated no mediated effect, with the indirect effect (*ab* path) emerging as statistically non-significant (β= –.00, 95% percentile CI: [–.05, .05]). All other paths were also non-significant.

Figure 21

Statistical Diagram of Mediation Model 4: the indirect effect of gender dysphoria on the relationship between ED symptoms and sexual esteem.

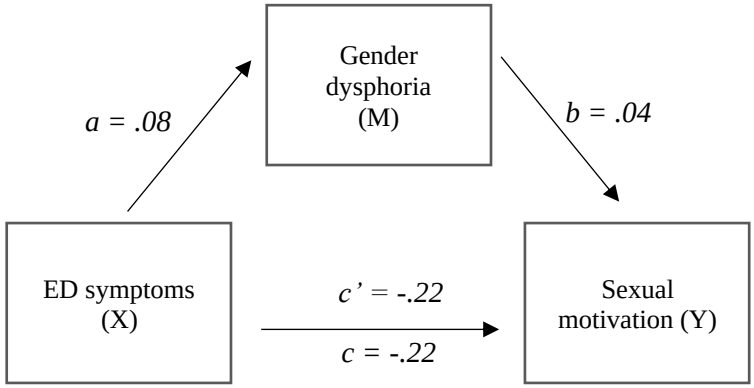


Note. X= Independent variable, Y= Dependent variable, M= Mediator. *p<.05, *p<.01, *p<.001. *c':* direct effect of X on Y; *ab:* indirect effect of X on Y through M; *c:* total effect of X on Y (*c*' + *ab*).

Similarly, mediation model 5 (ED symptoms and sexual motivation, via gender dysphoria; Figure 22) also indicated mediation is unlikely to be taking place, with the indirect effect (*ab* path) emerging as statistically non-significant (β= .00, 95% percentile CI: [–.03, .06]). All other paths were also non-significant.

Figure 22

Statistical Diagram of Mediation Model 5: the indirect effect of gender dysphoria on the relationship between ED symptoms and sexual motivation.

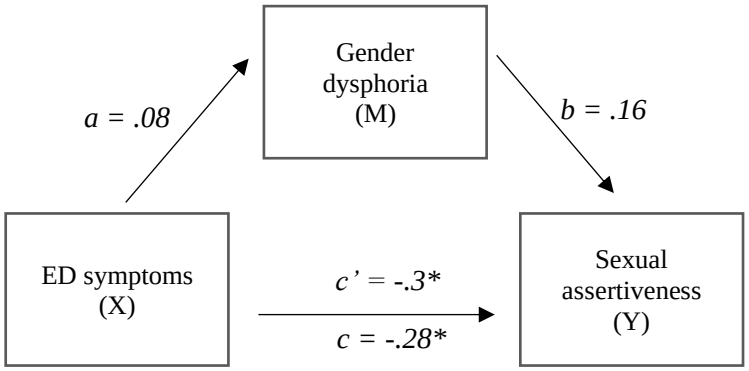


Note. X= Independent variable, Y= Dependent variable, M= Mediator. *p<.05, *p<.01, *p<.001. *c':* direct effect of X on Y; *ab:* indirect effect of X on Y through M; *c:* total effect of X on Y (*c*' + *ab*).

Finally, mediation model 6 (ED symptoms and sexual assertiveness, via gender dysphoria; Figure 23) illustrated no evidence of a mediated effect through the indirect (*ab*) path: β= .01, 95% percentile CI: (–.02, .1). However, a statistically significant direct effect (*c'* path) between ED symptoms and sexual assertiveness was illustrated (*β= –.3, t(72)= –2.6, p= .01).*

Figure 23

Statistical Diagram of Mediation Model 6: the indirect effect of gender dysphoria on the relationship between ED symptoms and sexual assertiveness.



Note. X= Independent variable, Y= Dependent variable, M= Mediator. *p<.05, *p<.01, *p<.001. *c':* direct effect of X on Y; *ab:* indirect effect of X on Y through M; *c:* total effect of X on Y (*c*' + *ab*).

Chapter 7: Discussion and Critical Evaluation Chapter

This thesis offers a unique contribution to the field of eating disorders (EDs) and ED symptomology, pursuing the vital need to diversify our current understanding to acknowledge the experiences of sexual and/or gender diverse individuals. This chapter provides a synthesis of the combined findings emerging from both the meta-analysis and empirical study, whilst acknowledging the wider context of current theoretical understandings, clinical practice, and research these fall within. It also critically appraises the work undertaken, discussing strengths and limitations of the conducted research. It concludes with a final summary of the portfolio.

Summary of Findings

Meta-Analysis

The meta-analysis identified both risk and protective factors for ED symptoms, in individuals from marginalised sexual and/or gender identities. This understanding was achieved through the inclusion of 71 studies, which yielded 62 factors. These factors were generated from 555 effect sizes, with a total sample size of 27,196 participants. Thirty-nine significant risk factors and seven significant protective factors were identified and reported on.

Most notably, the meta-analysis concluded that several significant risk factors identified, of both medium and large effects, were factors that related to cognitive and behavioural concepts of the body. These included drive for thinness, drive for muscularity, body surveillance, body shame, and body fat dissatisfaction. Interestingly, several protective factors identified also related to one's own experience of the body: body appreciation, body esteem, and body satisfaction.

Negative body image, referring to body dissatisfaction and one's excessive cognitive and behavioural investment in physical appearance (Cash, 2002a), has long been identified as a key component of disordered eating (Stice & Shaw, 2002; Cornelissen & Tovée, 2021). Furthermore, body image dissatisfaction has been recognised as a significant proximal factor for a broad range of EDs and disordered eating behaviours within LGBTQ+ specific research (Kimmel & Mahalik, 2005; Jones et al., 2019; Bandini et al., 2013). Whilst some suggestions have been made toward differences of body dissatisfaction across LGBTQ+ subgroups, for example suggesting that lesbians may

experience lower body dissatisfaction (Alvy, 2013), this conclusion has been more recently challenged. More recent research, holding larger and more diverse samples of lesbians, conclude high levels of body dissatisfaction within lesbian adults (Parker & Harriger, 2020) alike other sexual minority groups. These findings align with the subgroup analysis within this meta-analysis, in that the relationship between body dissatisfaction and ED symptoms were of significant medium effects for both sexual minority men (SMM) and women (SMW).

Gender diverse individuals are suggested to report higher rates of body dissatisfaction compared to cisgender individuals, and to be of increased risk for experiencing ED symptoms (Parker & Harriger, 2020; McGuire et al., 2016). Despite this, gender-diverse individuals were much less represented within the included studies, compared to those diverse in their sexual orientation. This resulted in significant risk and protective factors related to one's body (such as drive for thinness, drive for muscularity, body surveillance, body shame, and body esteem), only being pooled from SMM and SMW samples. Therefore, such findings cannot be generalised to those who identify as transgender and/or gender non-conforming.

Other factors were also highlighted to be significantly correlated with ED symptoms. In summary, these included: BMI, experience of child sexual abuse, perfectionism, discrimination (related to sexual orientation and/or gender identity), sexual objectification, internalised homophobia, self-objectification, depression and anxiety symptoms, emotion regulation difficulties, internalised sociocultural attitudes towards appearance, minority stress, identity concealment and gender dysphoria. Whilst these can all be interpreted individually, most interestingly when collated together, these provide supporting evidence towards the applicability of current theoretical models that attempt to explain the aetiology and maintenance of ED symptoms across the general population, as well as explain the increased risk of poorer mental health generally within the LGBTQ+ community. This included providing evidence to theories such as the transdiagnostic model (Fairburn et al., 2003), sociocultural model, (Thompson et al., 1999; Schaefer et al., 2017), objectification theory (Fredrickson & Roberts, 1997), and minority stress theory (Meyer, 2003).

Empirical Study

The empirical paper sought to examine the relationship between ED symptoms and sexuality concepts within a sample of transgender and/or gender non-conforming (TGNC) individuals, with body image concerns and gender dysphoria posited as potential mediators. Additionally, it looked to gain an understanding of participants' experiences of accessing ED services, particularly in relation to the consideration of their sexual functioning and gender identity. Seventy-four TGNC youth and young adults (aged 16-30 years) self-reporting eating-related difficulties took part, completing an online survey comprised of several questionnaires relating to variables of interest (ED symptoms, sexuality, transgender-specific body image, gender dysphoria, and experience of service use).

This study identified significant relationships between ED symptoms and sexual esteem, motivation, and assertiveness. As this was the first study of its kind, with a TGNC sample, these findings can only be compared to studies that explore similar concepts within cisgender samples. Ultimately, these findings were found to be consistent with existing literature which reports a positively correlated relationship between ED symptoms and sexual dysfunction as a broad concept (Castellini et al., 2012; Price et al., 2020). There is limited exploration of the relationship between ED symptoms and different domains that fall within our understanding of sexuality and sexual functioning, and thus there requires further research to corroborate these findings. Within this, several learnings from this study, reported within Chapter 4's discussion and the critical evaluation section below, could be applied to improve methodological rigour and thus acquire more robust results and conclusions.

Mediation models were carried out with the sexuality variables found to hold a significant correlational relationship with ED symptoms. The mediatory role of body image on ED symptoms and sexual esteem (the tendency to positively evaluate one's capacity to relate sexually with another person; Snell et al., 1993) was confirmed. No other mediation models were statistically significant. There is a dearth of research attempting to define the mechanisms by which ED symptoms and sexuality may relate to each other, generally as well as for TGNC people. Whilst these findings

therefore cannot be compared to similar research, they were interpreted in relation to research exploring the direct relationships between each variable within the model.

Descriptive analysis concluded respondents largely felt their care was not effective in addressing their needs, with the topics of sexuality and gender identity seldom discussed. Participants largely confirmed that these would have been helpful concepts to explore, though fear of a lack of understanding was confirmed as a barrier to exploring these within their care experiences. This aligns with the well-documented barriers TGNC individuals experience when attempting to access mental healthcare that is both affirmative of their gender identity and effective in addressing their needs (Snow et al., 2019; Duffy et al., 2016).

Overall Synthesis of Studies and their Findings

Taken together, these findings emphasise the importance of the role of body image concerns on ED symptoms, across the LGBTQ+ community. These findings are in accordance with risk factor research across samples of heterosexual and cisgender individuals, where such factors relating to preoccupation with the body are reported to be main contributors to ED development (Jacobi et al., 2004; Polivy & Herman, 2002). However, it should be held in mind that whilst the meta-analysis attempted to identify such factors within the LGBTQ+ community broadly, a large proportion of included studies related to sexual identity only as opposed to gender identity. Meanwhile, the empirical study focused specifically on TGNC individuals and body image in relation to transgender identity. Both studies conclude that body image is an important factor that influences ED symptomology in individuals diverse in their sexual and/or gender identity.

Factors specific to the LGBTQ+ community that contribute to the risk of EDs and ED symptom development and maintenance were also illuminated. These findings were of particular interest, given LGBTQ+ individuals are reported to be at greater risk for developing EDs and ED symptoms, compared to heterosexual, cisgender individuals (Parker & Harriger, 2020). Such factors included discrimination (related to one's sexual orientation and/or gender identity), identity concealment, internalised homophobia/ transphobia, and minority stress. Linking these findings with

the findings of the empirical paper, emphasises that individuals diverse in their sexual and/or gender identity need healthcare professionals to understand the relationship between ED symptoms and issues pertinent to their identity. This would help to ensure that LGBTQ+ individuals presenting to ED services recognise professionals as knowledgeable in understanding such factors important to their experience of disordered eating, as well as ensuring that treatment approaches are considerate of these nuanced needs. It can also be concluded that, based on the findings of the meta-analysis, if LGBTQ+ individuals do not receive care that is non-judgemental, safe, and affirmative of their identity, this could ultimately work to increase and maintain ED symptoms for these individuals.

Critical Evaluation: Strengths and Limitations

This chapter will now move into offering a critical appraisal of the collective contribution both the meta-analysis and empirical paper provide to our understanding of ED symptoms in individuals who identify as LGBTQ+.

Broadly, it is felt that both studies offer a novel contribution to the existing evidence base, supporting an imperative movement toward diversifying our understanding of ED presentations to account for the experiences of sexual and/or gender diverse individuals. Whilst this strength is evident across both studies, it may be counterbalanced by the fact this was achieved through what could be described as a reductionist approach; not able to account for the specific nuances that may exist across differing identities within this community. To explain, firstly the meta-analysis attempted to pull together our understanding of ED symptoms to encompass the whole of the LGBTQ+ community and then secondly, when carrying out sub-group analysis, participants were placed into broad subgroups (sexual minority men, sexual minority women, gender minorities) as informed by the included studies. Furthermore, the empirical paper grouped transgender individuals and gender non-conforming individuals together. Whilst the author recognises this, given these studies aimed to contribute to a limited research base, it is conversely wondered whether this broader approach was an important first step in providing rationale for the need of then more specific research, to elucidate within group differences.

Furthermore, the research that makes up the portfolio's findings could have benefitted from larger, more diverse samples. The meta-analysis largely included studies from high income countries (i.e., USA, UK), and studies that acquired mostly White/ Caucasian participants. To add to this limitation, the empirical paper's sample also comprised largely of individuals White in ethnicity. A critical, longstanding limitation of ED research in that it over-represents the experience of White individuals (Halbeisen et al., 2022); this research portfolio unfortunately echoes this re-occurring shortcoming. Despite its ability to achieve our aim in diversifying our understanding of EDs and ED symptoms within sexual and/or gender minority people, it continues to underrepresent those from minoirtised ethnic backgrounds. This lack of ethnic representation in ED research may work to perpetuate the unhelpful and refuted understanding that EDs mostly affect those White in ethnicity (Halbeisen et al., 2022).

Theoretical Implications

This research holds many theoretical implications for understanding ED symptoms in those who identify as LGBTQ+, as well for those who identify more specifically as TGNC. Whilst Chapter 2 gives an account of several theoretical models applicable to the meta-analysis' findings, this section focuses on two main theories relevant to the combined findings of both papers.

Transdiagnostic, Cognitive-Behavioural Model of EDs

The transdiagnostic, cognitive-behavioural model of EDs (Fairburn et al., 2003) may help to explain the number of body-related risk and protective factors emerging in the meta-analysis. This model suggests that a "dysfunctional scheme for self-evaluation" (that includes cognitive and behavioural components of negative body image such as drive for thinness, body fat dissatisfaction, and body shame) is at the core of ED psychopathology (Fairburn et al., 2003). The empirical paper also emphasised the role of body-related concerns for TGNC individuals, when considering the relationship between ED symptoms and sexual functioning. This model also suggests that perfectionism contributes to this dysfunctional scheme for self-evaluation, which was also found to be a significant factor in the meta-analysis. As a result, this provides preliminary evidence to the

applicability of the dysfunctional scheme for self-evaluation part of the model, for understanding ED symptoms in LGBTQ+ individuals.

This model goes on to propose a further network of inter-related maintaining mechanisms for the persistence of EDs. The emergence of self-esteem as a protective factor within the meta-analysis, confirms the model's conclusion that core low self-esteem maintains ED psychopathology within this sample. Therefore, again suggesting components of this model relate well with LGBTQ+ individuals and their experiences of ED symptoms. However, elements of this model are equally refuted by our findings. This includes the view that engagement in disordered eating behaviours works to maintain disordered eating behaviours themselves (e.g., dietary restriction is theorised to lead to increased likelihood for episodes of binge eating which, if they occur, often go on to perpetuate restriction or purging behaviours; Linardon, 2018). Such factors were not observed within this meta-analysis. This could be indicative of a shortfall of current ED research in that it does not sufficiently explore these potential maintaining factors, or rather may align with other existing research (e.g., Bartholomay et al., 2023) that challenges this theorised maintaining mechanism.

It therefore appears that this model may, in some ways, be sufficient as a starting point to summarise and describe poignant risk and protective factors for ED symptoms within LGBTQ+ individuals. However, it notably has areas of little applicability to this sample, according to the results of the meta-analysis; this may be equally reflective of these findings being pooled from an underdeveloped research base. Though, most notably, this model lacks sufficient exploration of and the ability to address the impact of identity (e.g., sexual orientation/ gender identity, in this instance) on the development and maintenance of ED symptoms, which appears to play a clear and integral role in understanding ED symptoms within this community.

Minority Stress and Social Safety

Compared to the lack of consideration given to identity in the previous model, the minority stress model provides a framework for understanding the identity-related factors illuminated to play a role in the development of ED symptoms, for LGBTQ+ individuals. The minority stress theory

(Meyer, 2003) cites three levels of distinct and chronic identity related stressors; significant factors emerging from the meta-analysis aligned with each of these levels. This included external stressors (e.g., discrimination), one's expectations that external stressors may occur (e.g., identity concealment), and internalisation of negative social attitudes (e.g., internalised homophobia and transphobia). This highlights the ability for this model to be utilised when attempting to understand the development and maintenance of ED symptoms in LGBTQ+ individuals. This conclusion aligns with conclusions of empirical research that test the applicability of this model for sexual and gender diverse samples experiencing disordered eating (Muratore et al., 2022; Barnhart et al., 2022; Barnhart et al., 2023). Thus, the use of this model in this context is further strengthened.

Furthermore, the empirical paper reinforces these conclusions through the findings that, although sexuality and gender identity were felt to be important factors to consider in making sense of participants' disordered eating, a fear of lack of understanding regarding identity stifled such conversations. This provides further evidence for the levels of stressors cited in this model, and how these may serve to actively maintain ED symptomology even in those seeking and accessing support.

Clinical Implications

Clinical treatment is often underpinned by the transdiagnostic, cognitive-behavioural model of EDs (Fairburn et al., 2003). This research portfolio suggests that this approach may be applicable for those accessing services who are diverse in their sexual and/or gender identity, as they consider ED symptoms in the context of body image concerns. Often the first line of treatment for EDs is cognitive behavioural therapy (CBT-ED; NICE, 2017), utilising treatment manuals such as Fairburn (2008), Waller et al. (2007), and Waller et al. (2019). These share commonalities in their focus to address cognitions and emotions underpinning ED psychopathology, through nutritional and behavioural changes (Mulkens & Waller, 2021). Whilst body image concerns may be considered briefly within this approach, this is unlikely to be sufficient given this study positions body image as vital to consider within this sample. Furthermore, these manuals do not support consideration of the important nuances of body image and ED symptoms, in the context of sexuality and gender diversity.

Other recommended treatment approaches for adults and young adults include the Maudsley Model of Anorexia Nervosa Treatment for Adults (MANTRA) and family therapy (NICE, 2017), respectively, each having developed a strong evidence base for their efficacy (Byrne et al., 2017; Schmidt et al., 2013; Lock, 2015). The core focus of MANTRA is to address the maintenance loop involving the emotional and social mind, i.e., emotional processing and dysregulation, particularly in interpersonal contexts (Schmidt et al., 2018). Meanwhile family-based treatment focuses on parental strengths and resources in promoting positive change to reduce ED behaviours (Lock & Le Grange, 2013). Body image disturbance is not explicitly addressed within these approaches (Glashouwer et al., 2019) which may limit their applicability to LGBTQ+ individuals given these findings. Furthermore, if family therapy is considered as a treatment option for a young person diverse in their sexuality or gender identity, it is imperative to consider the potential for family generated minority stress (e.g., rejection, homophobic/transphobic attitudes, invalidation, and explicit disapproval; Diamond et al., 2022) both during and outside of the intervention.

Furthermore, clinicians must be aware of important relational considerations to their approach, given minority stress has been suggested to increase risk for the development and maintenance of ED symptoms in this sample. Clinicians may directly or indirectly contribute to experiences of minority stress (e.g., through upholding and communicating heteronormative/ cisnormative assumptions; erasing the nuanced experience of LGBTQ+ individuals; and engaging in stigmatising, discriminatory, or micro-aggressive behaviours). Without acknowledging and addressing this propensity for harm, services may act to maintain disordered eating in LGBTQ+ individuals. This is particularly important given this portfolio strongly suggests that sexuality and gender identity should be explored routinely with those presenting to ED services. Ultimately, this needs to be done in a considerate, sensitive, responsive, and affirming manner to avoid perpetuating ED symptoms and bolstering the already evident mental health inequality.

Offering and embedding training within services relating to sexuality and gender identity should be a priority for this reason. Such training should be shaped by findings that are emerging from qualitative studies of LGBTQ+ individuals relating to their experiences of accessing healthcare (see

Rees et al., 2021 for an integrative review of qualitative studies). However, the suggestion of the need for general LGBTQ+ training for staff in healthcare services, alone, is not viewed to be sufficient enough to generate required systemic change. Whilst research suggests this approach is effective in leading to the acquisition of essential LGBTQ+ knowledge (Donisi et al., 2020), research seeking to understanding LGBTQ+ individual's experiences of accessing healthcare continues to emphasise the inadequate state of current care despite rollout of such training opportunities (Rees et al., 2021). Subsequently, the growing availability of such training programmes and recommendations for staff to undertake such training, has not resulted in improved care experiences for LGBTQ+ individuals (Hunt et al., 2019). Training materials that seek to invoke emotional intelligence and empathy towards LGBTQ+ individuals, as opposed to information and awareness raising may be better effective (Hunt et al., 2019). Training offers could also benefit from being delivered or at least co-produced by individuals from the LGBTQ+ community, with co-production being described as able to generate profound systemic change (Cahn & Gray, 2004), with transformative outcomes to the service user (Dunston et al., 2009). The efficacy and impact of the implementation and outcomes from co-production specifically for those identifying as LGBTQ+, however, is lacking. Empirical research with this focus is needed to ensure co-production with LGBTQ+ individuals works in a way that promotes more positive outcomes for this community. To conclude, services need to do more than encourage uptake of LGBTQ+ training which aims to transfer knowledge alone, as this has been suggested to be ineffective in changing practice routines (Wensing et al., 1998); the continually reported dissatisfaction of LGBTQ+ individuals in response to the services and care they receive emphasises this.

At a policy level, these suggestions align with NHS England's 'National LGBT Action Plan' (Government Equalities Office, 2018), and may help to begin working towards dispelling the dominant, harmful culture of heteronormativity and cisnormativity within mental health service (Rees et al., 2021). However, despite being years on from publication, negative experiences relating to accessing healthcare are still regularly cited by LGBTQ+ people (e.g., Snow et al., 2019; Carlile, 2019), which was confirmed by the descriptive analysis carried out within the empirical project. To

add to this evidence, a UK Government Equities Office survey revealed 40% of transgender individuals had negative experiences related to healthcare (Hunt et al., 2019); arguably this policy has not been effectively implemented at service level.

Furthermore, the Health and Care LGBTQ+ Inclusion Framework (NHS Confederation, 2022) identifies six core pillars of action in creating and maintaining inclusive environments and cultures within health and care provisions. However, named challenges include that these inclusive policies can be met with contention particularly when relating to gender-diverse people, and that understanding the concept of hetero- and cis-normativity and non-gendered language can be difficult for some professionals (NHS Confederation, 2022). Targeted equality and diversity training may address these challenges (Hunt et al., 2019), but ultimately uptake of such policies presently rely on the 'opt-in' of leadership teams. Arguably, if engagement in the implementation of these pillars rely on encouragement given to organisation leaders alone (who themselves may meet such suggestions with contention, hostility, disagreement, or neutrality that leads to inaction) heteronormativity and cisnormativity within services is largely likely to prevail. This works to maintain pervasive harmful experiences for sexual and gender-diverse individuals and perpetuates barriers to accessing care (Vermeir et al., 2018; Snow et al., 2019), sustaining the evident health inequality for LGBTQ+ individuals.

Acknowledged as an ethical duty to take effective measures to reduce inequalities within healthcare (Skuban-Eiseler et al., 2023), we are undoubtably, at present, continuing to witness a significant shortfall to this duty for sexual and gender diverse individuals. This is in direct contradiction to the equality and diversity actions laid out by the NHS Constitutions (NHS England, 2015) and NHS Long Term Plan (2019). Significant work is required by policy makers to ensure such written actions are being implemented and upheld within services, and likewise within such reviews that shape the provision of care for transgender and gender diverse youth. To bring this back to the findings of this portfolio, heteronormative and cisnormative cultures are posited to actively maintain ED symptoms for LGBTQ+ individuals and so by not addressing this in a bottom-up approach actively perpetuates the observed health inequality.

The recently published ‘Cass Review’ (Cass, 2024) was commissioned by NHS England with aim to review evidence and provide recommendations regarding gender identity services for children and young people. An overarching recommendation of the report was for a major expansion in care for transgender, non-binary, and gender diverse children and young people. This aligns with the broad conclusions outlined above, in that services at present appear to be falling short of meeting the needs of individuals with diverse gender identities. However, it is important to acknowledge the growing critique and concerns raised in response to the Review, with commentary that positions the report as a weapon already being utilised to harm transgender and gender non-conforming individuals. Concerns include its alignment with prejudicial anti-transgender views and cis-normative rhetoric, which go on to underpin harmful recommendations; the positioning of transgender identity as something to be pathologised; it’s lack of co-production or consideration of the voice of transgender individuals; and it’s flawed and biased methodological framework (McNamara et al., 2024; Therapists Against Conversion Therapy & Transphobia, 2024; Horton, 2024; Grijseels, 2024). The Review could therefore be interpreted to further distance clinical practice from the values expressed in the NHS Constitution, thus strengthening the systemic failings of healthcare policy for transgender individuals whilst perpetuating harmful transphobic and stigmatising discourse within society.

Research Implications and Future Directions

Collectively, these findings emphasise the need for further research to be carried out to bolster our growing understanding of ED symptoms in sexual and/or gender diverse individuals; this research is required if we are to strive towards decreasing the health inequality that exists for this community. Further research is particularly required for individuals who identify as bisexual and transgender, given these identities have long been overlooked within this research area. Specifically, the lack of research pertaining to gender diverse identities compared to sexual diverse identities was highlighted by the meta-analysis described in Chapter 2. Furthermore, research to elucidate variability of current findings within specific subgroups of the LGBTQ+ community, and how these may differ depending on ED presentations and symptoms would be valuable.

Moreover, in reviewing this research through the lens of the long-standing criticism of ED research in that it over-represents the experience of white individuals and overlooks the importance of intersectionality (Halbeisen et al., 2022), there remains a vital need to understand the role of intersectionality in increasing risk for EDs. Preliminary conclusions of research that attempts to address this suggests that individuals who occupy multiple minoritised social identities (e.g., combined racial/ethnic and gender minority statuses) face greater risk for EDs compared to individuals who hold each identity separately (Beccia et al., 2019). Given the conclusions of this portfolio, which positions several components of minority stress to individually contribute to risk of experiencing ED symptoms for LGBTQ+ individuals (in which included studies were made up of largely White samples), it is imperative that we understand whether this risk then increases for those who occupy several minoirtised identities. Furthermore, aiming to better understand potential individual- and community-based protective factors, including for those with intersecting identities, would be incredibly valuable. It is hoped this would improve prospects of tackling the health inequality for individuals with diverse sexual and/or gender identities, in a way that is inclusive of individuals who may also occupy another minoritised social identity.

Additionally, to strengthen the clarity of our understanding around ED symptoms within this at-risk group, there is also a need for further empirical research particularly of longitudinal methodology. This would work to support identification of specific risk factors that precede the development of ED symptomology (Striegel-Moore & Cachelin, 2001), which could support improved prevention efforts in this community. The empirical study would benefit from replication with a larger sample, as well as further examination into the relationship between ED symptoms and other sexuality concepts. Furthermore, whilst research is growing to acknowledge experiences the LGBTQ+ community hold in accessing and receiving mental healthcare broadly, ED services would greatly benefit from further, focused research to understand the specific experiences LGBTQ+ individuals have when receiving care for an ED. This would provide vital information that could be used to inform ED service delivery and development.

Author Reflections

Conducting this research has been largely energising, recognising the contribution this research could have in diversifying and broaden our understanding of EDs in sexual and/or gender diverse individuals. In turn, it was motivating to hold in mind that this research could also result in important theoretical and clinical implications that may contribute towards the improvement of ED related healthcare outcomes for LGBTQ+ individuals.

However, at times, conducting this research has been saddening. Specifically, with the growth of positive attention the empirical paper's recruitment poster gained across 'X' (previously known as Twitter), this also began to attract hateful replies made towards those diverse in their gender identities. This experience occurred as the author was coming to the stage in the meta-analysis where risk factors were being identified. Risk factors referencing the significant impact of societal influences (such as discrimination related to sexual and/or gender identity) and internalised societal influences (such as identity concealment and internalised transphobia), were beginning to emerge. To ultimately observe these societal influences occurring in real time, and being able to connect this with elevated ED symptoms experienced by this community, felt both angering and upsetting. A timely response worked to hide these comments, but this ultimately served as a reminder of the wider political and social climate TGNC individuals face which positions them at the receiving end of hateful, transphobic speech.

This provided all the more motivation to continue with these research efforts, to work toward contributing to a hopeful, wider movement of improving healthcare for those who identify as TGNC. What is clear though is the fact that to ultimately address the health inequality between LGBTQ+ and heterosexual, cisgender individuals is a societal shift that sits on a much larger scale.

Overall Conclusion

Taken together, these studies afford this field a greater understanding of ED symptoms as experienced by sexual and/or gender diverse individuals. They collectively provide preliminary evidence for the applicability of both the transdiagnostic cognitive-behavioural model (Fairburn et al.,

2003) and minority stress model (Meyer, 2003) in understanding the development and maintenance of ED symptoms in the LGBTQ+ community. The overall findings hold important clinical implications, which can advise service development and delivery in providing effective and affirmative care to sexual and/or gender diverse individuals. Further empirical research is required to strengthen the conclusions of the empirical paper, to ascertain a deeper understanding of the needs of LGBTQ+ individuals when accessing ED services, and to bolster our findings related to risk and protective factors to better comprehend the applicability of the discussed theoretical models across sub-groups of the LGBTQ+ community. These efforts would come together to build a better understanding of the aetiology and maintenance of ED symptoms in the LGBTQ+ community, which could then inform vital, tailored preventative efforts and treatment approaches for these at-risk individuals.

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DETAILED MANUSCRIPT PREPARATION GUIDANCE

Abstract

The Abstract provides a succinct summary of the article content. The recommended format and word limit vary by article type.

Structured abstracts have a recommended maximum of 250 words and should be organized into:

Objective: state the primary purpose of the article, or major question addressed in the study. **Method**: indicate the sources of data, give brief overview of methodology, or, if it is a review article, how the literature was searched and articles were selected for discussion. For research-based articles, briefly note study design, how participants were selected, and major study measures. If your data are based on a preregistered study, provide the preregistration number or link. **Results**: summarize the key findings. **Discussion**: indicate main clinical, theoretical, or research applications/implications.

Main Text File

The main text file should be in MS Word and include the following content and recommended formatting:

Main body, formatted as Introduction, Method, Results, and Discussion, as recommended by the International Committee of Medical Journal Editors (ICMJE) (**J. Pharmacol. Pharmacother. 2010, 1, 42–58**). Exceptions to these formatting recommendations include Commentaries, Forum articles, and Perspective articles.

A Public Significance statement (< 70 words) that explains why this research is important and is written in plain English for a general, educated public. Figure titles should be supplied as a complete list in the text.

References

Please refer to article types regarding the number of permissible references. This journal offers Free Format submission and authors may submit using their preferred referencing style, as long as consistency is applied throughout the manuscript. The typesetter will apply the American Psychological Association reference style on manuscripts accepted for publication. If authors wish, they may review reference style guidelines prior to submission.

Tables

Tables should include a descriptive title and, if needed, footnotes defining abbreviations and any other information critical to interpreting the data shown.

Figures

Figures should have legends (and if needed, notes) that succinctly describe the information being displayed. Figures should be uploaded in the highest resolution possible.

Supporting Information

Supporting Information is information that is supplementary and not essential to the article but provides greater depth and background. Examples include more detailed descriptions of therapeutic protocols, results related to exploratory or post-hoc analyses, and elements otherwise not suitable for inclusion in the main article, such as video clips, large sections of tabular data, program code, or large graphical files. It is *not* appropriate to include in the Supporting Information any text that would normally go into a Discussion section; all discussion-related material should be presented in the main article.

Authors should mention the Supporting Information in the text of the main article to provide context for the reader and highlight where and how the supplemental material contributes to the article. View Wiley's FAQs on Supporting Information.

Supporting (supplemental) information should be submitted in separate files.

If accepted for publication, Supporting Information is hosted online together with the article and appears without editing or typesetting.

Note: Authors are encouraged to utilize publicly available data repository for data, scripts, or other artefacts used to generate the analyses presented in the paper; in such cases, authors should include a reference to the location of the material in the Method section (rather than in Supporting Information).

Additional Guidance Regarding Manuscript Preparation

The IJED reaches a global audience. Authors are encouraged to consider the implications of their research for populations, settings, or policies beyond those applicable to their own local circumstances.

For studies involving human participants, to aid comprehensive and consistent reporting across regions/countries and cultures, the IJED provides **Demographic Characteristics Reporting Guidelines**.

Authors for whom English is not their first language are encouraged to seek assistance from a native or fluent English speaker to proofread the manuscript prior to submission.

Footnotes to the text are not allowed and any such material should be incorporated into the text as parenthetical matter.
Terminology. Authors should refrain from using terms that are stigmatizing, discriminatory, or ambiguous. The journal rejects stand-alone nouns that refer to individuals by their diagnosis or condition (e.g., "anorexics," "obese," "diabetics," etc.), race and ethnicity identification (e.g., "Whites," "Hispanics," etc.), or presumed disadvantaged status ("minorities"). "Participants" should be used in place of "subjects." For further explanation and examples, see "*Speaking of that: Terms to avoid or reconsider in the eating disorders field*" (DOI: 10.1002/eat.22528.)
Abbreviations: Only abbreviate terms if they are used repeatedly and the abbreviation is helpful to the reader. Initially, use the word in full, followed by the abbreviation in parentheses. Thereafter, use the abbreviation only.
Units of measurement: Please use the International System of Units. Access www.bipm.fr for more information.
Numbers under 10 should be spelt out, except for: measurements with a unit (8 mmol/L); age (6 weeks old), or lists with other numbers (11 dogs, 9 cats, 4 gerbils).
Trade Names: Chemical substances or drugs should be referred to by the generic name only, not by trade names. For proprietary drugs, the proprietary name and the name and location of the manufacturer should be added in parentheses.

Systematic Reviews and Meta-Analyses:
These articles critically review the status of a given research area and propose new directions for research and/or practice. Both systematic and meta-analytic review papers are welcomed if they review a literature that is advanced and/or developed to the point of warranting a review and synthesis of existing studies.
Reviews of topics with a limited number of studies are unlikely to be deemed as substantive enough for this IJED review paper type. The journal does not accept papers that merely describe or compile a list of previous studies without a critical synthesis of the literature that moves the field forward.

All systematic reviews and meta-analyses must follow the **PRISMA Guidelines**, summarized in the Page et al. (2021) article entitled *"The PRISMA 2020 statement: an updated guideline for reporting systematic reviews"* (J. Clin. Epidemiol.).
WORD LIMIT (EXCLUDING ABSTRACT, REFERENCES, TABLES, OR FIGURES): 7,500 words
Required Elements for all IJED Review Papers:
In addition to the required PRISMA components for systematic reviews, meta-analyses, and scoping reviews described above, all of these review article types must also include the following:

- Search date: All IJED review papers must include the month/year that the last literature search was conducted. This date must be within 6 months of the manuscript submission date.
- Unpublished research: IJED review papers should aim to include all available literature on the topic, regardless of publication status. Authors should attempt to locate unpublished data by using online databases (e.g., ProQuest, ETHoS, MedRxiv, PsyArXiv, gov) and directly contacting authors if relevant data are not included in published or unpublished works.
- Sociodemographic characteristics: A full description of the age, sex assigned at birth and/or gender, race, ethnicity, and socioeconomic status of participants in the reviewed studies must be included in all IJED review papers. Please see the IJED Demographic Characteristics Reporting Guidelines for more information definitions of these variables. Please note that reporting this sociodemographic information is required for all IJED review papers (rather than just recommended), as these data are critical for future meta-analyses and for understanding to whom the current literature base applies. In terms of reporting the data, authors should include separate columns/entries for the sociodemographic variables in tables describing the studies included in the review. If a paper included in the review does not report these demographic variables, then "NR" (Not Reported) must be indicated in the appropriate table cells. All review papers must also explicitly discuss in the main manuscript text the diversity of the samples and the ways in which this diversity (or lack thereof) may impact the generalizability and representativeness of the review's results and conclusions.
- Non-English language articles: In the interest of representing the global literature, authors are strongly encouraged to include non-English language articles where practically possible. Minimally, authors are expected to initially search the literature without filtering out non-English language articles. In their PRISMA flow diagram, authors should report the number of articles they excluded based on language. References of articles excluded due to language barriers should be saved in a supplemental file, along with English-language abstracts if available. The supplemental file containing these references and abstracts must be uploaded when submitting the review article. While not required, to the extent possible, we encourage authors to pursue opportunities for accessing non-English language papers such

as inviting collaborators with the requisite language skills; employing translation software; or seeking expert assistance in translating articles.

Recommended Elements for all IJED Review Papers:

Authors are encouraged to pre-register their systematic reviews, meta-analyses, and scoping reviews to detail their review strategy/protocol with regard to their research questions, inclusion/exclusion criteria, databases searched, search terms used, synthesis/analytic methods, etc. Examples of pre-registration systems that could be used include Prospero (https://www.crd.york.ac.uk/prospero/) for systematic reviews and meta-analyses, and the Open Science Framework (OSF; https://osf.io/) for scoping reviews.

Appendix B. Individual effect sizes utilised within the meta-analysis, categorised into factors.

Table A.1. Factors and their Effect Sizes, Extracted from Included Studies.

Factor	Study	Year	N	r	r (averaged from)	Moderator	Assessment of Factor	Comments
Emotion regulation difficulties	Rodrigues de Oliveria	2022	255	0.316	0.404, 0.228	LGB	Difficulties in Emotion Regulation Scale (DERS), emotion regulation strategies subscale	Two DEBQ subscales (emotional eating behaviour and restrained eating behaviour) averaged.
	Mason & Lewis	2015	164	0.36	NA	SMW	Mental Health Inventory (MHI), behavioral/ emotional control subscale	
Internalised homophobia/ homonegativity	Ballantyne	2011	12	0.28	NA	SMM	Reactions to Homosexuality Scale	Value provided before (0.28) and after (0.6) outlier removed. Correlation coefficient before outlier removed extracted and used in MA, as little rationale given for why outlier was removed.
	Barnhart et al	2022	519	0.41	NA	SMM	Internalized Homophobia Scale - Revised (IHS-R)	
	Barnhart et al	2022	532	0.3	NA	SMW	IHS-R	
	Brennan	2012	400	0.13	NA	SMM	Internalised Homonegativity Scale (IHS)	
	Convertino, Brady et al	2021	479	0.22	NA	SMM	IHS-R	
	Convertino, Brady et al	2021	483	0.17	NA	SMW	IHS-R	
	Reilly & Rudd	2006	213	0.14	NA	SMM	Nungesser Homosexual Attitudes Inventory	
	Torres	2007	138	0.11	-0.1, 0.32	SMM	IHS	Homosexual and bisexual men correlation coefficients averaged.
	Wang & Borders	2017	116	0.6	NA	SMM	Lesbian, Gay, and Bisexual Identity Scale (LGBIS), Internalized Homonegativity subscale	
	Williamson & Spence	2001	202	0.42	NA	SMM	Homosexuality Attitudes Inventory (adapted version)	
	Wiseman & Moradi	2010	231	0.2	NA	SMM	IHS	
	Alvy	2013a	479	0.09	NA	SMW	IHS	
	Brewster et al	2014	316	0.27	NA	SMW	LGBIS, Internalized Homonegativity subscale	

	Haines et al	2008	126	0.09	NA	SMW	Lesbian Internalized Homophobia Scale (LIHS)	
	Joshua	2002	280	0.012	0.033, -0.01	SMW	Lesbian Sexual Identity Variables - 4 items re: (1) sexual orientation, (2) comfort with one's sexuality (internalised homophobia), (3) extent of disclosure, (4) time 'out', and (5) affiliation with the GLB community	Binge Scale and Bulimia Test-Revised measures' coefficients averaged.
	Mason & Lewis	2015	164	0.16	NA	SMW	IHS-R	
	Watson et al	2016	353	0.33	NA	SMW	Coping with Discrimination Scale (CDS), Internalization subscale	
	Watson et al	2015	243	0.24	NA	SMW	LIHS	
Internalised transphobia	Muratore et al	2022	93	0.51	NA	GM	Gender Minority Stress and Resilience Measure (GMSR), Internalized Transphobia subscale	
	Urban et al	2022	212	0.25	NA	GM	Transgender Identity Scale	
Upward body image comparisons	Barnhart et al	2022	519	0.52	NA	SMM	Upward Physical Appearance Comparison Scale (UPACS)	
	Barnhart et al	2022	532	0.43	NA	SMW	UPCAS	
	Carretta et al	2019	218	0.53	NA	SMM	UPACS, Upward Comparison subscale	
Downward body image comparisons	Barnhart et al	2022	519	0.61	NA	SMM	Downward Appearance Comparison Scale (DACS)	
	Barnhart et al	2022	532	0.45	NA	SMW	DACS	
Drive for muscularity	Brennan	2012	400	0.24	NA	SMM	Drive for Muscularity Scale (DMS)	
	Barnhart et al	2022	519	0.67	0.61, 0.73	SMM	DMS, Attitudes and behaviours subscale	Reported correlation coefficients for DMS attitudes and behaviours subscales separately. Averaged to provide one correlation coefficient for overall scale.
	Barnhart et al	2022	532	0.42	0.43, 0.41	SMW	DMS, Attitudes and Behaviours subscales	Reported correlation coefficients for DMS attitudes and behaviours subscales separately. Averaged to provide one correlation coefficient for overall scale.
	Convertino, Elbe et al	2022	452	0.1	-0.04, 0.24	SMM	Muscle Dysmorphic Disorder Inventory, Drive for Size subscale	EPSI (cognitive restraint and dietary restriction) averaged to provide one correlation coefficient.
	Davids & Green	2011	133	-0.09	-0.05, -0.13	SMM	DMS	Bisexual and gay men correlation coefficients averaged.
	Duggan & McCreary	2004	67	0.31	NA	SMM	DMS	

	Martins et al	2007	98	0.26	NA	SMM	DMS	
	Parent & Bradstreet	2017	197	0.17	0.28, 0.06	SMM	DMS	Reported correlation coefficients for DMS attitudes and behaviours subscales separately. Averaged to provide one correlation coefficient for overall scale.
	Picot	2006	389	0.317	NA	SMM	DMS	
	Picot	2006	381	0.314	NA	SMW	DMS	
	Yean et al	2013	116	0.263	NA	SMM	DMS	
	Yean et al	2013	86	0.262	NA	SMW	DMS	
	Muratore et al	2022	93	0.56	NA	GM	DMS	
Identity Concealment (Sexual Orientation and Gender Identity)	Barnhart et al	2022	519	0.25	NA	SMM	Self-Concealment Scale (SCS)	
	Barnhart et al	2022	532	0.27	NA	SMW	SCS	
	Convertino, Brady et al	2021	479	0.2	NA	SMM	Sexual Orientation Concealment Scale (SOCS)	
	Convertino, Brady et al	2021	483	0.2	NA	SMW	SOCS	
	Wang & Borders	2017	116	0.59	NA	SMM	LGBIS, Concealment subscale	
	Mason & Lewis	2015	164	0.05	NA	SMW	Single item: "How open are you about your sexual preference/orientation?" (Franke and Leary 2001) - higher scores = more concealment	
	Muratore et al	2022	93	0.51	NA	GM	GMSR, Nondisclosure subscale	
Age (as increases)	Barnhart et al	2022	519	0.01	NA	SMM	Demographics questionnaire	
	Barnhart et al	2022	532	0.12	NA	SMW	Demographics questionnaire	
	Brennan	2012	400	-0.18	NA	SMM	Demographics questionnaire	
	Carretta et al	2019	218	-0.06	NA	SMM	Demographics questionnaire	
	Convertino, Brady et al	2021	479	-0.05	NA	SMM	Demographics questionnaire	
	Convertino, Brady et al	2021	483	-0.08	NA	SMW	Demographics questionnaire	
	Convertino, Elbe et al	2022	452	-0.035	0.09, -0.16	SMM	Demographics questionnaire	EPSI (cognitive restraint and dietary restriction) averaged to provide one correlation coefficient.

Davids & Green	2011	133	0.05	0.05, 0.05	SMM	Demographics questionnaire	Bisexual and gay men correlation coefficients averaged.
Davids & Green	2011	190	-0.045	-0.08, -0.01	SMW	Demographics questionnaire	Bisexual and lesbian women correlation coefficients averaged.
Engeln-Maddox et al	2011	87	-0.13	NA	SMM	Demographics questionnaire	
Engeln-Maddox et al	2011	99	-0.04	NA	SMW	Demographics questionnaire	
Naamani & Jamil	2021	129	-0.03	NA	SMM	Demographics questionnaire	
Wagenbach	1998	51	-0.01	0.08, -0.1	SMM	Demographics questionnaire	Two EDI-2 subscales (drive for thinness and bulimia) averaged.
Wagenbach	1998	47	0.165	0.1, 0.23	SMW	Demographics questionnaire	Two EDI-2 subscales (drive for thinness and bulimia) averaged.
Williamson & Spence	2001	202	-0.24	NA	SMM	Demographics questionnaire	
Rodrigues de Oliveria	2022	255	0.051	-0.044, 0.146	LGB	Demographics questionnaire	Two DEBQ subscales (emotional eating behaviour and restrained eating behaviour) averaged.
Amerson	2022	757	-0.108	-0.11, -0.11, -0.22, -0.12, 0.02	SMW	Demographics questionnaire	Correlation coefficients provided for 5 EPSI subscales. All averaged.
Brewster et al	2014	316	0	NA	SMW	Demographics questionnaire	
Heffernan	1996	203	0.22	0.24, 0.2	SMW	Demographics questionnaire	Two EDE-Q subscales (shape and weight concern only) averaged.
Henn et al	2019	295	-0.045	-0.04, -0.05	SMW	Demographics questionnaire	Homosexual and bisexual women correlation coefficients averaged.
Rezeppa	2021	528	0.01	0.01 (for all)	SMW	Demographics questionnaire	Three EPSI subscales (binge eating, purging and restricting) averaged.
Watson et al	2016	353	-0.11	NA	SMW	Demographics questionnaire	
Barnhart et al	2023	200	-0.05	NA	GM	Demographics questionnaire	
Brewster et al	2019	205	0.04	NA	GM	Demographics questionnaire	
Brokjob & Cornelissen	2022	85	-0.06	NA	GM	Demographics questionnaire	
Jones et al	2018	416	-0.055	0.01, -0.12	GM	Demographics questionnaire	Two EDI-2 subscales (drive for thinness, bulimia) averaged.
Linsenmeyer et al	2021	164	-0.1	NA	GM	Demographics questionnaire	

	Testa et al	2017	442	-0.04	0.05, -0.13	GM	Demographics questionnaire	Transmasculine and transfeminine participants correlation coefficients averaged.
	Vocks et al	2009	131	0.003	0.148, -0.143	GM	Demographics questionnaire	Four EDE-Q subscales (restraint, eating concern, weight concern and shape concern) averaged to provide one correlation coefficient for FtM and one for MtF. These groups were then averaged.
BMI (as increases)	Barnhart et al	2022	519	0.06	NA	SMM	Demographics questionnaire	
	Barnhart et al	2022	532	0.09	NA	SMW	Demographics questionnaire	
	Brennan	2012	400	0.02	NA	SMM	Demographics questionnaire	
	Convertino, Elbe et al	2022	452	-0.095	0.03, -0.22	SMM	Demographics questionnaire	Two subscales from EPSI (cognitive restraint and dietary restriction) averaged.
	Davids & Green	2011	133	0.345	0.36, 0.33	SMM	Demographics questionnaire	Bisexual and gay men correlation coefficients averaged.
	Davids & Green	2011	190	0.18	0.25, 0.11	SMW	Demographics questionnaire	Bisexual and lesbian women correlation coefficients averaged.
	Engeln-Maddox et al	2011	87	0.21	NA	SMM	Demographics questionnaire	
	Engeln-Maddox et al	2011	99	0.11	NA	SMW	Demographics questionnaire	
	Martins et al	2007	98	0.37	NA	SMM	Demographics questionnaire	
	Strong et al	2000	103	0.24	NA	SMM	Demographics questionnaire	
	Strong et al	2000	164	0.12	NA	SMW	Demographics questionnaire	
	Wagenbach	1998	89	0.52	0.56, 0.48	SMM	Demographics questionnaire	Two EDI-2 subscales (drive for thinness and bulimia) averaged.
	Wagenbach	1998	51	0.435	0.38, 0.49	SMW	Demographics questionnaire	Two EDI-2 subscales (drive for thinness and bulimia) averaged.
	Rodrigues de Oliveria	2022	47	0.354	0.396, 0.312	LGB	Demographics questionnaire	Two DEBQ subscales (emotional eating behaviour and restrained eating behaviour) averaged.
	Amerson	2022	255	0.022	0.25, 0.24, -0.18, -0.09, -0.11	SMW	Demographics questionnaire	Correlation coefficients provided for 5 EPSI subscales. All averaged.
	Rezeppa	2021	757	0.04	0.18, 0.16, -0.21	SMW	Demographics questionnaire	Three EPSI subscales (binge eating, purging and restricting) averaged.
	Barnhart et al	2023	200	0.17	NA	GM	Demographics questionnaire	

	Brewster et al	2019	205	-0.4	NA	GM	Demographics questionnaire	
	Vocks et al	2009	131	0.307	0.37, 0.243	GM	Demographics questionnaire	Four EDE-Q subscales (restraint, eating concern, weight concern and shape concern) averaged to provide one correlation coefficient for FtM and one for MtF. These groups were then averaged.
Muscularity dissatisfaction	Blashill	2010	228	0.18	0.16, 0.20	SMM	Male Body Attitudes Scale-Revised (MBAS-R), Muscularity subscale	Two subscales from EDEQ (eating concerns and eating restraint) averaged.
	Griffiths, Murray et al	2018	2733	0.31	NA	SMM	MBAS-R, Muscularity subscale	
Body fat dissatisfaction	Blashill	2010	228	0.605	0.59, 0.62	SMM	MBAS-R, Body Fat subscale	Two subscales from EDEQ (eating concerns and eating restraint) averaged.
	Griffiths, Murray et al	2018	2733	0.76	NA	SMM	MBAS-R, Body Fat subscale	
Height dissatisfaction	Blashill	2010	228	0.155	0.13, 0.18	SMM	MBAS-R, Height subscale	Two subscales from EDEQ (eating concerns and eating restraint) averaged.
	Griffiths, Murray et al	2018	2733	0.22	NA	SMM	MBAS-R, Height subscale	
Social sensitivity	Blashill	2010	228	0.395	0.30, 0.49	SMM	Brief Fear of Negative Evaluation Scale (BFNE), only used 8 items for scoring rather than the 12 collected	Two subscales from EDEQ (eating concerns and eating restraint) averaged.
	Blashill & Vander Wal	2009	228	0.48	NA	SMM	BFNE	
Depressive symptoms	Blashill	2010	228	0.32	0.19, 0.45	SMM	Center for Epidemiologic Studies – Depression Scale (CES-D)	Two subscales from EDEQ (eating concerns and eating restraint) averaged.
	Blashill & Vander Wal	2009	228	0.41	NA	SMM	CES-D	
	Brennan	2012	400	0.18	NA	SMM	CES-D, Short	
	Brennan	2011	383	0.024	NA	SMM	CES-D, Short	
	Dakanalis et al	2012	125	0.2	NA	SMM	Beck Depression Inventory (BDI) – II	
	De Santis et al	2012	100	0.284	NA	SMM	CES-D	
	Moradi & Tebbe	2022	201	0.27	NA	LGB	CES-D	
	Parent & Bradstreet	2017	197	0.29	NA	SMM	CES-D	
	Serpa	2004	96	0.29	0.21, 0.36, 0.3	SMM	CES-D	Three EDI subscales (drive for thinness, bulimia and body dissatisfaction) averaged.
	Strong et al	2000	103	0.36	NA	SMM	BDI	

	Strong et al	2000	89	0.47	NA	SMW	BDI	
	Haines et al	2008	126	0.36	NA	SMW	CES-D	
	Mason & Lewis	2015	164	0.24	NA	SMW	MHI, Depression subscale	
	Joshua	2002	280	0.307	0.243, 0.299	SMW	CES-D	Binge Scale and Bulimia Test-Revised measures' coefficients averaged.
	Brokjob & Cornelissen	2022	85	0.58	NA	GM	Patient Health Questionnaire-9	
	Jones et al	2018	416	0.29	0.30, 0.28	GM	Hospital Anxiety and Depression Scale (HADS)	Two EDI-2 subscales (drive for thinness, bulimia) averaged.
Body dissatisfaction	Blashill & Vander Wal	2009	228	0.72	NA	SMM	Male Body Attitudes Scale	
	Convertino, Elbe et al	2022	452	0.28	0.34, 0.22	SMM	Eating Pathology Symptoms Inventory (EPSI)	Two subscales from EPSI (cognitive restraint and dietary restriction) averaged.
	De Santis et al	2012	100	0.402	NA	SMM	Adonis Complex Questionnaire	
	Hospers & Jansen	2005	70	0.79	NA	SMM	Body Shape Questionnaire (BSQ)	
	Martins et al	2007	98	0.425	0.62, 0.23	SMM	Eating Disorder Inventory (EDI), Body Dissatisfaction subscale (BD-Lower Body) and Body Esteem Scale (BD-Upper Body)	Body dissatisfaction measured separately for lower and upper body – correlation coefficients averaged.
	Naamani & Jamil	2021	129	0.13	NA	SMM	Male Body Dissatisfaction Scale	
	Picot	2006	389	0.361	NA	SMM	EDI-2, body dissatisfaction subscale	
	Picot	2006	381	0.444	NA	SMW	EDI-2, body dissatisfaction subscale	
	Serpa	2004	96	0.43	0.45, 0.21, 0.63	SMM	Male Body Dissatisfaction - developed for pilot study (Serpa & Garbanati, 2003)	Three EDI subscales (drive for thinness, bulimia and body dissatisfaction) averaged.
	Strong et al	2000	103	0.7	NA	SMM	BSQ	
	Strong et al	2000	89	0.71	NA	SMW	BSQ	
	Taylor & Goodfriend	2008	60	0.336	0.449, 0.564, -0.004	SMM	EDI, body dissatisfaction subscale	Three subscales of EAT-26 (Diet, Bulimia, and Oral Control) averaged.
	Torres	2007	138	0.6	0.56, 0.64	SMM	BSQ	Homosexual and bisexual men correlation coefficients averaged.
	Williamson & Hartley	1998	41	0.42	NA	SMM	Body Satisfaction Scale	
	Yean et al	2013	116	0.695	NA	SMM	BSQ	
	Yean et al	2013	86	0.671	NA	SMW	BSQ	

	Alvy	2013a	479	0.723	0.64, 0.77, 0.76	SMW	Multidimensional Body-Self Relations Questionnaire (MBSRQ), Appearance Evaluation subscale; MBSRQ, Body Areas Satisfaction subscale and Body Size Drawings	Measured by Appearance Evaluation subscale of MBSRQ, Body Areas Satisfaction Scale (BASS) of the MBSRQ, Body Size Drawings. Correlation coefficients averaged.
	Jones et al	2019	197	0.33	NA	SMW	Body Image Measure	
	Aiello	2023	496	0.333	NA	GM	Body Uneasiness Test	
	Barnhart et al	2023	200	0.49	NA	GM	EDI, body dissatisfaction subscale	
	Brewster et al	2019	205	0.43	NA	GM	Body Image Ideals Questionnaire (BIQ)	
	Jones et al	2018	416	0.395	0.48, 0.31	GM	EDI-2, body dissatisfaction subscale	Two EDI-2 subscales (drive for thinness, bulimia) averaged.
	Mitchell et al	2021	130	0.26	NA	GM	Body Parts Satisfaction Scale-Revised (BPSS-R)	Extracted data for 'overall sample'. Data also provided for separate groups (trans men, trans women, NB individuals) however this was not extracted as there is minimal research within MA that does this so will not be able to treat as subgroup.
	Muratore et al	2022	93	0.2	NA	GM	BIQ	
Child sexual abuse	Brennan	2012	400	0.14	NA	SMM	Demographics questionnaire	
	Brennan	2011	383	0.208	NA	SMM	Demographics questionnaire	
Sexual orientation and gender identity discrimination	Convertino, Brady et al	2021	479	0.26	NA	SMM	Heterosexist Harassment, Rejection, and Discrimination Scale (HHRDS)	
	Convertino, Brady et al	2021	483	0.22	NA	SMW	HHRDS	
	Serier et al	2022	18	-0.245	-0.26, -0.23	SMM	Everyday Discrimination Scale (EDS)	Discrimination experiences in the army. Separate correlation coefficients given for gay and bisexual men were averaged.
	Serier et al	2022	149	0.21	0.21 (both)	SMW	EDS	Discrimination experiences in the military. Separate correlation coefficients given for lesbian and bisexual women were averaged.
	Wang & Borders	2017	116	0.69	NA	SMM	EDS	
	Alvy	2013a	479	0.09	NA	SMW	Experiences of Discrimination Scale	
	Amerson	2022	757	0.173	SOI: 0.14, 0.27, 0.28, 0.21,	SMW	Anti-Bisexual Experiences Scale (ABES), sexual orientation instability, sexual irresponsibility, and interpersonal hostility subscales	Correlation coefficients provided for 5 EPSI subscales – all averaged. Once this was done, the correlation coefficients for the three subscales of ABES were averaged.

					0.04. SI: 0.13, 0.29, 0.25, 0.17, 0.07. IH: 0.08, 0.19, 0.24, 0.19, 0.05			
	Brewster et al	2014	316	0.29	NA	SMW	ABES	
	Henn et al	2019	295	0.23	0.17, 0.29	SMW	EDS, unpublished German translation	Homosexual women and bisexual women correlation coefficients averaged to make one correction coefficient for SM women
	Watson et al	2016	353	0.21	NA	SMW	ABES	
	Brewster et al	2019	205	0.45	NA	GM	HHRDS	
	Muratore et al	2022	93	0.43	NA	GM	GMSR, Discrimination subscale	
	Watson et al	2015	243	0.16	NA	SMW	HHRDS	
	Mason & Lewis	2015	164	0.177	NA	SMW	HHRDS	Combined three separate HHRDS subscales (workplace and school discrimination; harassment and rejection subscale; and other discrimination subscale) - to provide one correlation coefficient for whole scale
	Rezeppa	2021	528	0.08	0.01, 0.1, 0.13	SMW	4-items: frequency of experienced victimization and bullying in past 6 months because of their known or assumed sexual orientation ("being teased or bullied", "hit or beaten up", "treated rudely or unfairly", and called "bad names".	Three EPSI subscales (binge eating, purging and restricting) averaged.
Body surveillance	Dakanalis et al	2012	125	0.7	NA	SMM	Objectified Body Consciousness (OBC) Scale, body surveillance subscale	
	Engeln-Maddox et al	2011	87	0.27	NA	SMM	OBC Scale, body surveillance subscale	
	Engeln-Maddox et al	2011	99	0.42	NA	SMW	OBC Scale, body surveillance subscale	
	Martins et al	2007	98	0.27	NA	SMM	OBC Scale, body surveillance subscale	

	Moradi & Tebbe	2022	201	0.42	NA	LGB	OBC Scale, body surveillance subscale	
	Serpa	2004	96	0.317	0.33, 0.23, 0.39	SMM	OBC Scale, body surveillance subscale	Three EDI subscales (drive for thinness, bulimia and body dissatisfaction) averaged.
	Wiseman & Moradi	2010	231	0.54	NA	SMM	OBC Scale, body surveillance subscale	
	Amerson	2022	757	0.186	0.25, 0.37, 0.16, 0.12, 0.03	SMW	OBC Scale, body surveillance subscale	Correlation coefficients provided for 5 EPSI subscales. All averaged.
	Brewster et al	2014	316	0.48	NA	SMW	OBC Scale, body surveillance subscale	
	Haines et al	2008	126	0.38	NA	SMW	OBC Scale, body surveillance subscale	
	Holmes et al	2021	164	0.5	NA	SMW	OBC Scale, body surveillance subscale	
	Kozee & Tylka	2006	181	0.55	NA	SMW	OBC Scale, body surveillance subscale	
	Brewster et al	2019	205	-0.03	NA	GM	OBC Scale, body surveillance subscale	
	Polsky	2006	309	0.454	NA	SMW	OBC Scale, body surveillance subscale	
	Watson et al	2015	243	0.43	NA	SMW	OBC Scale, body surveillance subscale	
Body shame	Dakanalis et al	2012	125	0.67	NA	SMM	OBC Scale, body shame subscale	
	Engeln-Maddox et al	2011	99	0.33	NA	SMW	OBC Scale, body shame subscale	
	Engeln-Maddox et al	2011	87	0.47	NA	SMM	OBC Scale, body shame subscale	
	Martins et al	2007	98	0.68	NA	SMM	OBC Scale, body shame subscale	
	Moradi & Tebbe	2022	201	0.57	NA	LGB	OBC Scale, body shame subscale	
	Serpa	2004	96	0.4	0.39, 0.33, 0.48	SMM	OBC Scale, body shame subscale	Three EDI subscales (drive for thinness, bulimia and body dissatisfaction) averaged.
	Wiseman & Moradi	2010	231	0.59	NA	SMM	OBC Scale, body shame subscale	
	Amerson	2022	757	0.272	0.35, 0.49, 0.17, 0.28, 0.07	SMW	OBC Scale, body shame subscale	Correlation coefficients provided for 5 EPSI subscales. All averaged.

	Brewster et al	2014	316	0.68	NA	SMW	OBC Scale, body shame subscale	
	Haines et al	2008	126	0.54	NA	SMW	OBC Scale, body shame subscale	
	Holmes et al	2021	164	0.71	NA	SMW	OBC Scale, body shame subscale	
	Kozee & Tylka	2006	181	0.7	NA	SMW	OBC Scale, body shame subscale	
	Polsky	2006	309	0.457	NA	SMW	OBC Scale, body shame subscale	
	Watson et al	2015	243	0.6	NA	SMW	OBC Scale, body shame subscale	
Self-esteem	Davids & Green	2011	133	-0.275	-0.1, -0.45	SMM	Rosenberg Self-Esteem Scale (RSES)	Bisexual and gay men correlation coefficients averaged.
	Davids & Green	2011	190	-0.315	-0.4, -0.23	SMW	RSES	Bisexual and lesbian women correlation coefficients averaged.
	De Santis et al	2012	100	-0.362	NA	SMM	RSES	
	Hospers & Jansen	2005	70	-0.31	NA	SMM	RSES	
	Parent & Bradstreet	2017	197	-0.33	NA	SMM	Physical Self-Description Questionnaire-40 (PSDQ-40), self-esteem subscale (5-item)	
	Picot	2006	389	-0.312	NA	SMM	RSES	
	Picot	2006	389	-0.382	NA	SMW	RSES	
	Reilly & Rudd	2006	213	-0.18	NA	SMM	RSES	
	Jones et al	2018	416	-0.425	-0.37, -0.48	GM	RSES	Two EDI-2 subscales (drive for thinness, bulimia) averaged.
	Joshua	2002	280	-0.371	-0.325, -0.417	SMW	RSES	Binge Scale and Bulimia Test-Revised measures' coefficients averaged.
	Torres	2007	138	-0.425	-0.45, -0.4	SMM	RSES	Homosexual and bisexual men correlation coefficients averaged.
	Williamson & Spence	2001	202	-0.47	NA	SMM	RSES	
	Williamson & Hartley	1998	41	-0.61	NA	SMM	RSES	
	Yean et al	2013	86	-0.366	NA	SMW	RSES	
	Yean et al	2013	116	-0.359	NA	SMM	RSES	
Femininity	Davids & Green	2011	113	0.04	0.18, -0.1	SMM	Personal Attributes Questionnaire (PAQ)	Bisexual and gay men correlation coefficients averaged.
	Davids & Green	2011	190	-0.17	-0.15, 0.19	SMW	PAQ	Bisexual and lesbian women correlation coefficients averaged.

	Hospers & Jansen	2005	70	-0.05	NA	SMM	BSRI	
	Meyer et al	2001	20	-0.035	-0.55, 0.48	SMM	BSRI	Correlation coefficients for Dieting and Oral Control subscales of EAT averaged.
	Meyer et al	2001	20	-0.56	NA	SMW	BSRI	Correlation coefficient only provided for Bulimia subscale of EAT.
	Torres	2007	138	0.115	0.13, 0.01	SMM	BSRI	Homosexual and bisexual men correlation coefficients averaged.
Masculinity	Davids & Green	2011	133	-0.25	-0.13, -0.37	SMM	PAQ	Bisexual and gay men correlation coefficients averaged.
	Davids & Green	2011	190	0.02	-0.22, -0.12	SMW	PAQ	Bisexual and lesbian women correlation coefficients averaged.
	Hospers & Jansen	2005	70	-0.09	NA	SMM	BSRI	
	Meyer et al	2001	20	0	NA	SMM	BSRI	
	Meyer et al	2001	20	0.46	NA	SMW	BSRI	Correlation coefficient only provided for Bulimia subscale of EAT.
	Torres	2007	138	0.1	0.19, 0.01	SMM	BSRI	Homosexual and bisexual men correlation coefficients averaged.
Drive for thinness	Picot	2006	389	0.725	NA	SMM	EDI-2, drive for thinness subscale	
	Picot	2006	381	0.752	NA	SMW	EDI-2, drive for thinness subscale	
	Taylor & Goodfriend	2008	60	0.469	0.864, 0.544, 0.178	SMM	EDI-2, drive for thinness subscale	Three subscales of EAT-26 (Diet, Bulimia, and Oral Control) averaged.
	Yean et al	2013	86	0.845	NA	SMW	EDI-2, drive for thinness subscale	
	Yean et al	2013	116	0.742	NA	SMM	EDI-2, drive for thinness subscale	
Education level	Brennan	2012	400	-0.17	NA	SMM	Demographics questionnaire	
	Convertino, Elbe et al	2022	452	-0.06	0.09, -0.21	SMM	Demographics questionnaire	Two subscales from EPSI (cognitive restraint and dietary restriction) averaged.
	Naamani & Jamil	2021	129	0.19	NA	SMM	Demographics questionnaire	
	Testa et al	2017	442	-0.105	-0.06, -0.15	GM	Demographics questionnaire	Transmasculine and transfeminine participants correlation coefficients averaged.
	Rodrigues de Oliveria	2022	255	0.033	-0.008, 0.074	LGB	Demographics questionnaire	Two DEBQ subscales (emotional eating behaviour and restrained eating behaviour) averaged.
Community affiliation/ involvement	Convertino, Brady et al	2021	479	0.21	NA	SMM	Six items adapted from Social Justice Sexuality Project	

	Convertino, Brady et al	2021	483	0.22	NA	SMW	Six items adapted from Social Justice Sexuality Project	
	Davids & Green	2011	133	0.315	0.36, 0.27	SMM	Gay Community Involvement Scale (GCIS)	Bisexual and gay men correlation coefficients averaged.
	Davids & Green	2011	190	0.105	0.08, 0.13	SMW	GCIS	Bisexual and lesbian women correlation coefficients averaged.
	Picot	2006	389	0.094	NA	SMM	Community Affiliation Scale (6-point scale), based on the Acculturation to Gay Culture scale	
	Picot	2006	381	-0.035	NA	SMW	Community Affiliation Scale (6-point scale), based on the Acculturation to Gay Culture scale	
	Henn et al	2019	295	-0.09	-0.13, -0.05	SMW	Identification and Involvement with the Gay Community Scale - Women's Version	Homosexual and bisexual women correlation coefficients averaged.
Community connectedness	Naamani & Jamil	2021	129	0.08	NA	SMM	Connectedness to the LGBT Community Scale	Two EDI-2 subscales (drive for thinness and bulimia) averaged to provide one correlation coefficient.
	Rodrigues de Oliveria	2022	255	-0.124	-0.058, -0.19	LGB	Community Connectedness Scale	Two DEBQ subscales (emotional eating behaviour and restrained eating behaviour) averaged to provide one correlation coefficient.
	Muratore et al	2022	93	-0.31	NA	GM	GMSR, Community Connectedness subscale	
	Alvy (lesbian)	2013a	479	-0.03	NA	SMW	Single item: "On a scale from 0 to 10, with 0 being not at all and 10 being very much, how connected do you feel to the lesbian community in the greater Pittsburgh area?"	
Income/ socioeconomic status	Convertino, Elbe et al	2022	452	-0.035	0.09, -0.16	SMM	Demographics questionnaire	Two subscales from EPSI (cognitive restraint and dietary restriction) averaged.
	Davids & Green	2011	133	-0.05	-0.01, -0.09	SMM	Demographics questionnaire	Bisexual and gay men correlation coefficients averaged.
	Heffernan	1996	203	0.1	0.16, 0.04	SMW	Demographics questionnaire	Weight Concern EDE-Q subscale and QEWP-R total score averaged.
	Davids & Green	2011	190	-0.095	-0.03, -0.16	SMW	Demographics questionnaire	Bisexual and lesbian women correlation coefficients averaged.
	Testa et al	2017	442	-0.155	-0.18, -0.13	GM	Demographics questionnaire	Transmasculine and transfeminine participants correlation coefficients averaged.
	Naamani & Jamil	2021	129	0.21	NA	SMM	Demographics questionnaire	
Self-objectification	Martins et al	2007	98	0.42	NA	SMM	Self-Objectification Questionnaire (SOQ)	
	Naamani & Jamil	2021	129	0.24	NA	SMM	SOQ	

	Serpa	2004	96	0.187	0.29, -0.04, 0.31	SMM	SOQ	Three EDI subscales (drive for thinness, bulimia, and body dissatisfaction) averaged.
Gender role conflict	Jackson	2008	75	0.251	NA	SMM	Gender Role Conflict Scale (GRCS)	
	Blashill & Vander Wal	2009	228	0.22	NA	SMM	GRCS	
Sexual Objectification	Engeln-Maddox et al	2011	87	0.04	NA	SMM	Interpersonal Sexual Objectification Scale (ISOS)	
	Engeln-Maddox et al	2011	99	0.24	NA	SMW	ISOS	
	Moradi & Tebbe	2022	201	0.18	NA	LGB	Sexual Minority Women's Sexual Objectification Experiences	
	Amerson	2022	757	0.222	0.10, 0.34, 0.33, 0.23, 0.11	SMW	ISOS	Correlation coefficients provided for 5 EPSI subscales. All averaged.
	Brewster et al	2014	316	0.21	NA	SMW	ISOS	
	Kozee & Tylka	2006	181	0.41	NA	SMW	ISOS	
	Wiseman & Moradi	2010	231	0.25	NA	SMM	Sexual Objectification Experiences Scale (8 of 19-items), Measure of Sexual Objectifications Experiences (5 of 7-items), and Cultural Sexual Objectification Scale (3 of 28-items).	
	Watson et al	2015	243	0.22	NA	SMW	ISOS	
	Brewster et al	2019	205	0.41	NA	GM	ISOS	
Degree of 'Outness'	Liubovich	2003	149	0.03	0.1, 0.1, -0.11	SMW	Outness Scale: % of system around pps who knows about their sexual orientation (indicate with mark on a line ranging from 0-100% x 8 - each line a different system member e.g., family member, co-workers etc).	Three EDI subscales (Bulimia, Drive for Thinness and Weight Discrepancy) averaged.
	Rodrigues de Oliveria	2022	255	0.136	-0.043, -0.015 0.644, -0.041	LGB	Outness Inventory	Two DEBQ subscales (emotional eating behaviour and restrained eating behaviour) averaged for both Openness to family and openness to world separately. These were then averaged to provide one correlation coefficient for degree of outness.
	Watson et al	2016	353	-0.27	NA	SMW	Outness Inventory	

Anxiety	Mason & Lewis	2015	164	0.32	NA	SMW	MHI, Anxiety subscale	
	Joshua	2002	280	0.277	0.232, 0.322	SMW	Visual-Analogue Mood Scale - Stress & Anxiety	Binge Scale and Bulimia Test-Revised measures' coefficients averaged.
	Brokjob & Cornelissen	2022	85	0.59	NA	GM	General Anxiety Disorder-7 Questionnaire	
	Jones et al	2018	416	0.355	0.35, 0.36	GM	HADS	Two EDI-2 subscales (drive for thinness, bulimia) averaged.
Stage of identity	Wagenbach	1998	51	-0.075	-0.08, -0.07	SMM	Gay Identity Questionnaire (GIQ)	Two EDI-2 subscales (drive for thinness and bulimia) averaged.
	Wagenbach	1998	47	-0.155	-0.27, -0.04	SMW	GIQ	Two EDI-2 subscales (drive for thinness and bulimia) averaged.
	Joshua	2002	280	0.026	-0.03 8, 0.083	SMW	Sexual Identity Development Scale - designed specifically for use in this study	Binge Scale and Bulimia Test-Revised measures' coefficients averaged.
Interoceptive awareness deficits	Holmes et al	2021	164	0.21	NA	SMW	EDI-3, interoceptive deficits subscale	
	Kozee & Tylka	2006	181	0.35	NA	SMW	EDI-2: interoceptive awareness subscale	
	Moradi & Tebbe	2022	201	0.45	NA	LGB	Body Responsiveness Questionnaire	
Minority stress	Aiello	2023	496	0.18	NA	GM	GMSR, summed nine distal and proximal stressors subscales, and resilience subscale	
	Brokjob & Cornelissen	2022	85	0.37	NA	GM	Daily Heterosexist Experiences Questionnaire, scored to obtain measure of associated distress	
	Cusack et al	2021	242	0.36	NA	GM	GMSR, summed seven distal and proximal stressor subscales	
	Muratore et al	2022	93	0.467	0.43, 0.51, 0.39, 0.46, 0.51, 0.46, 0.51	GM	GMSR, summed seven distal and proximal stressor subscales	GMSR Distal and proximal stressor subscales averaged.
Transgender congruence	Barnhart et al	2023	200	-0.15	NA	GM	Transgender Congruence Scale (TCS)	
	Mitchell et al	2021	130	-0.17	NA	GM	TCS	Extracted data for 'overall sample'. Data also provided for separate groups (trans men, trans women, NB individuals) – this was not extracted as not enough studies included in MA allow further subgroup separation.

Gender dysphoria	Brokjob & Cornelissen	2022	85	0.44	NA	GM	Gender Preoccupation and Stability Questionnaire	
	Urban et al	2022	212	0.18	NA	GM	Utrecht Gender Dysphoria Scale - Gender Spectrum	
Transition Status	Nowaskie et al	2021	166	0.1612	NA	GM	Confirmation of having accessed gender affirming hormones and/or gender affirming surgery	
	Barnhart et al	2023	200	-0.002	NA	GM	Researcher developed self-report measure of 10 transition steps	
	Vocks et al	2009	131	-0.06	-0.07 5, -0.045	GM	Demographics questionnaire	Four EDE-Q subscales (restraint, eating concern, weight concern and shape concern) averaged to provide one correlation coefficient for FtM and one for MtF. These groups were then averaged.
Body Appreciation	Rodrigues de Oliveria	2022	255	-0.428	-0.46 4, -0.392	LGB	Body Appreciation Scale (BAS) – 2	Two DEBQ subscales (emotional eating behaviour and restrained eating behaviour) averaged to provide one correlation coefficient.
	Alleva et al	2018	131	-0.439	NA	SMM	BAS	
	Barnhart et al	2023	200	-0.41	NA	GM	BAS	
Body Satisfaction	Joshua	2002	280	-0.458	MBSRQ: -0.40 5, -0.57 BPSS-R: -0.32 9, -0.524	SMW	MBSRQ, appearance evaluation subscale and BPSS-R	Binge Scale and Bulimia Test-Revised measures' coefficients averaged. Body satisfaction was measured by two measures - correlation coefficients were then averaged to make one correlation coefficient for this factor.
	Parent & Bradstreet	2017	197	-0.37	NA	SMM	PSDQ-40, global physical self-concept subscale (3-item)	
	Testa et al	2017	442	-0.345	-0.21, -0.48	GM	MBSRQ, body areas satisfaction scale	Transmasculine and transfeminine participants correlation coefficients averaged.
Perfectionism	Taylor & Goodfriend	2008	60	0.223	0.108, 0.250, 0.312	SMM	EDI, perfectionism subscale	Three subscales of EAT-26 (Diet, Bulimia, and Oral Control) averaged.
	Jones et al	2018	416	0.25	0.24, 0.26	GM	EDI-2, perfectionism subscale	Two EDI-2 subscales (drive for thinness, bulimia) averaged.
Rumination	Wang & Borders	2017	116	0.69	NA	SMM	Authors modified Rumination about Interpersonal Offences Scale	

	Mason & Lewis	2015	164	0.14	NA	SMW	Cognitive Emotion Regulation Questionnaire	
Sexual Risk/ Irresponsibility	Brennan	2012	400	0.1	NA	SMM	Demographics questionnaire, categorised as any unprotected anal intercourse with a primary partner whose status is serodiscordant or UAI with any secondary partners	
	Amerson	2022	757	0.182	0.13, 0.29, 0.25, 0.17, 0.07	SMW	ABES, sexual irresponsibility subscale	Correlation coefficients provided for 5 EPSI subscales. All averaged.
Body-related appearance anxiety	Moradi & Tebbe	2022	201	0.5	NA	LGB	Appearance Anxiety Scale	
	Carper et al	2010	39	0.64	NA	SMM	Physical Appearance State and Trait Anxiety Scale	
	Duggan & McCreary	2004	67	0.58	NA	SMM	Social Physique Anxiety Scale	
Frequency of pornography use	Duggan & McCreary	2004	67	0.04	NA	SMM	5 items, 5-point scale (from none to more than ten times) - "during the past month how often did you… 1) view pornographic magazines, 2) purchase pornographic magazines, 3) view pornographic videos, 4) purchase pornographic videos, 5) view internet pornography.	
	Griffiths, Mitchinson et al	2018	2733	0.121	NA	SMM	1 item, pps asked how often they watch pornography (rated on 12-point scale)	
Appearance- and Performance-Enhancing Drug and Substance use	Convertino, Brady et al	2021	479	0.2	NA	SMM	3 questions adapted from Growing Up Today Study	
	Convertino, Brady et al	2021	483	0.19	NA	SMW	3 questions adapted from Growing Up Today Study	
	Nagata et al	2022a	1190	0.416	See comment	SMM	4 items, “have you ever used the following/drugs/supplements for the purpose of enhancing appearance or performance"(yes/no response for each of the items).	Beta values for the 4 items were extracted and converted. For gay men 3 were able to be converted and averaged (0.307). For bisexual plus men 2 were able to be converted and averaged (0.525). These were then averaged to provide one beta value for SMM.
	Nagata et al	2022a	1071	0.403	See comment	SMW	Single item, "have you ever used the following/drugs/supplements for the purpose of enhancing appearance or	Beta values for the 4 items were extracted and converted. For lesbian women 3 were able to be converted and averaged (0.453). For

							performance". 4 items provided - yes/no response for each of the items.	bisexual plus women 3 were able to be converted and averaged (0.353). These were then averaged to provide one beta value for SMW.
	Nagata et al	2022b	181	0.52	NA	GM	Lifetime use. Single item, "have you ever used the following/drugs/supplements for the purpose of enhancing appearance or performance". 4 items provided - yes/no response for each of the items.	Transgender women only - values for both transgender men and gender expansive individuals could not be converted.
Exercise frequency	Davids & Green	2011	133	0.21	0.32, 0.11	SMM	Single item, amount of time working out in an average week	Bisexual and gay men correlation coefficient averaged.
	Davids & Green	2011	190	-0.09	-0.07, -0.11	SMW	Single item, amount of time working out in an average week	Bisexual and lesbian women correlation coefficients averaged.
	Siconolfi et al	2009	219	0.205	See comments	SMM	2-items, number of days worked out in the past week, and duration (in hours) of average workout	Three EAT-26 subscales (diet, bulimia, oral control) and two EDI subscales (drive for thinness, bulimia, body dissatisfaction, ineffectiveness, and perfectionism) averaged to provide one correlation coefficient. Averaged factors (hours working out per day, and no. of workouts per week) to create one correlation coefficient.
Drug and alcohol use	Watson et al	2016	353	0.2	NA	SMW	CDS, drug and alcohol use subscale	
	Heffernan	1996	203	0	NA	SMW	Six-point scale from never (1) to every day (6) re: how frequently they had used a given substance over the past year	
Non-affirmation of gender identity	Muratore et al	2022	93	0.46	NA	GM	GMSR, non-affirmation subscale	
	Testa et al	2017	442	0.145	0.03, 0.26	GM	GMSR, non-affirmation subscale	Transmasculine and transfeminine participants correlation coefficients averaged.
Internalisation of sociocultural attitudes towards appearance (general)	Moradi & Tebbe	2022	201	0.46	NA	LGB	Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ), internalization subscale	
	Carper et al	2010	39	0.29	NA	SMM	SATAQ-3, internalization-general subscale	
	Carretta et al	2019	218	0.5	NA	SMM	SATAQ-3, internalization-general subscale	
	Muratore et al	2022	93	0.55	0.55 (both)	GM	SATAQ-4, thin ideal internalization subscale and muscularity ideal internalization subscale	Averaged thin ideal internalization and muscularity ideal internalisation to provide one correlation coefficient for this factor
	Wiseman & Moradi	2010	231	0.44	NA	SMM	SATAQ-I	
	Yean et al	2013	116	0.319	NA	SMM	SATAQ, internalization subscale	

	Yean et al	2013	86	0.446	NA	SMW	SATAQ, internalization subscale	
	Brewster et al	2014	316	0.6	NA	SMW	SATAQ-I	
	Watson et al	2015	243	0.53	NA	SMW	SATAQ, internalization subscale	
	Brewster et al	2019	205	0.45	NA	GM	SATAQ-3, internalization-general subscale	
	Barnhart et al	2022	519	0.583	NA	SMM	SATAQ-4R, thin/low body fat internalisation subscale and muscularity internalization subscale	SATAQ-4R: Internalisation subscales (thinness and muscularity) averaged to provide one correlation coefficient for overall internalisation
	Barnhart et al	2022	1051	0.29	NA	SMW	SATAQ-4R, thin/low body fat internalisation subscale and muscularity internalization subscale	SATAQ-4R: Internalisation (thinness and muscularity) subscales averaged to provide one correlation coefficient for overall internalisation
	Convertino, Elbe et al	2022	452	0.162	0.215, 0.11	SMM	SATAQ-4R, thin/low body fat internalisation subscale and muscularity internalization subscale	SATAQ-4R: Internalisation subscales (thinness and muscularity) – as calculated below – averaged.
Internalisation of Thin/low body fat appearance ideal	Barnhart et al	2022	519	0.52	NA	SMM	SATAQ-4R, thin/low body fat internalisation subscale	
	Barnhart et al	2022	532	0.42	NA	SMW	SATAQ-4R, thin/low body fat internalisation subscale	
	Convertino, Elbe et al	2022	452	0.215	0.23, 0.12	SMM	SATAQ-4R, thin/low body fat internalisation subscale	Two subscales from EPSI (cognitive restraint and dietary restriction) averaged.
	Joshua	2002	280	0.321	0.257, 0.385	SMW	Beliefs About Attractiveness Scale-Revised (BAA-R), importance of being attractive and thin factor	Binge Scale and Bulimia Test-Revised measures' coefficients averaged.
Internalisation of Muscularity appearance ideal	Barnhart et al	2022	519	0.38	NA	SMM	SATAQ-4R, muscularity internalization subscale	
	Barnhart et al	2022	532	0.16	NA	SMW	SATAQ-4R, muscularity internalization subscale	
	Carper et al	2010	39	0.25	NA	SMM	SATAQ-3, internalization-athlete subscale	
	Convertino, Elbe et al	2022	452	0.11	0.14, 0.08	SMM	SATAQ-4R, muscularity internalization subscale	Two subscales from EPSI (cognitive restraint and dietary restriction) averaged.
	Joshua	2002	280	0.268	0.237, 0.298	SMW	BAA-R, importance of being physically fit factor	Binge Scale and Bulimia Test-Revised measures' coefficients averaged.
Sociocultural appearance-related pressure	Barnhart et al	2022	519	0.583	NA	SMM	SATAQ-4R, appearance pressures subscales (family, peer, significant others, media)	Averaged all appearance pressure subscales (family, peer, significant others, and media)

	Barnhart et al	2022	1051	0.545	NA	SMW	SATAQ-4R, appearance pressures subscales (family, peer, significant others, media)	Averaged all appearance pressure subscales (family, peer, significant others, and media) per group (SMM and SMW). Then averaged correlation coefficient of both groups to provide one correlation coefficient for LGBTQ+.
	Carper et al	2010	39	0.54	NA	SMM	SATAQ-3, pressure subscale	
	Hospers & Jansen	2005	70	0.31	NA	SMM	9-item scale developed by authors; higher score = higher perceived appearance peer pressure	
	Strong et al	2000	103	0.2	NA	SMM	Psychosocial Risk Factors Questionnaire, SoThin subscale	
	Strong et al	2000	89	0.18	NA	SMW	Psychosocial Risk Factors Questionnaire, SoThin subscale	
	Muratore et al	2022	93	0.6	0.63, 0.6, 0.57, 0.61, 0.62, 0.57	GM	Perceived Sociocultural Pressures Scale and Tylka's (2005) Modified version for muscularity-oriented social pressures	Averaged PSPS thinness-orientation factors (peer pressure, family pressure and media pressure) and Tykla's PSPS muscularity-orientation factors (peer pressure, family pressure and media pressure) to obtain one correlation coefficient for appearance related pressure.
Positive body dysmorphic disorder screen	Convertino, Brady et al	2021	479	0.38	NA	SMM	Dysmorphic Concerns Questionnaire (DCQ)	
	Convertino, Brady et al	2021	483	0.26	NA	SMW	DCQ	
Social comparison	Davids & Green	2011	133	-0.295	-0.12, -0.47	SMM	Social Comparison Rating Scale (SCRS)	Bisexual and gay men correlation coefficient averaged.
	Davids & Green	2011	190	-0.19	-0.32, -0.06	SMW	SCRS	Bisexual and lesbian women correlation coefficients averaged.
Personal Evaluation of Physical Appearance	Strong et al	2000	103	-0.07	NA	SMM	Psychosocial Risk Factors Questionnaire (PRFQ), view subscale	
	Strong et al	2000	89	-0.23	NA	SMW	PRFQ, view subscale	
Perceived media influences promoting thinness	Strong et al	2000	103	0.27	NA	SMM	PRFQ, media subscale	
	Strong et al	2000	89	0.49	NA	SMW	PRFQ, media subscale	
Social desirability	Wagenbach	1998	51	0.135	0.09, 0.18	SMM	Social Desirability Scale (SDS), higher score indicates greater tendency to respond in a socially desirable manner	Two EDI-2 subscales (drive for thinness and bulimia) averaged.

	Wagenbach	1998	47	-0.115	-0.12, -0.11	SMW	SDS	Two EDI-2 subscales (drive for thinness and bulimia) averaged.
Concern for Physical Appearance	Strong et al	2000	103	0.29	NA	SMM	PRFQ, concern subscale	
	Strong et al	2000	89	0.25	NA	SMW	PRFQ, concern subscale	
Body Esteem	Polsky	2006	309	-0.293	NA	SMW	Body Esteem Scale (BES) - Weight concern factor	
	Rezeppa	2021	528	-0.37	-0.29, -0.56, -0.26	SMM	Body Esteem Scale for Adolescents and Adults (BESAA) - Weight subscale	Three EPSI subscales (binge eating, purging and restricting) averaged.
Ethnicity – Black	Siconolfi et al	2009	219	-0.21	NA	SMM	Demographics questionnaire	
	Brennan	2012	400	-0.03	NA	SMM	Demographics questionnaire	
	Brennan	2011	383	-0.348	NA	SMM	Demographics questionnaire	
Ethnicity - Asian	Brennan	2012	400	-0.08	NA	SMM	Demographics questionnaire	
	Brennan	2011	383	-0.331	NA	SMM	Demographics questionnaire	

Appendix C. NHLBI National Institutes of Health (2021) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies, with Relevant Guidance.

Criteria	Yes	No	Other (CD, NR, NA)*
1. Was the research question or objective in this paper clearly stated?			
2. Was the study population clearly specified and defined?			
3. Was the participation rate of eligible persons at least 50%?			
4. Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?			
5. Was a sample size justification, power description, or variance and effect estimates provided?			
6. For the analyses in this paper, were the exposure(s) of interest (independent variables) measured prior to the outcome(s) being measured?			
7. Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?			
8. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure, or exposure measured as continuous variable)?			
9. Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?			
10. Was the exposure(s) assessed more than once over time?			
11. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?			
12. Were the outcome assessors blinded to the exposure status of participants?			
13. Was loss to follow-up after baseline 20% or less?			
14. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?			

Quality Rating (Good, Fair, or Poor)

Rater #1 initials:

Rater #2 initials:

Additional Comments (If POOR, please state why):

*CD, cannot determine; NA, not applicable; NR, not reported

Guidance for Assessing the Quality of Observational Cohort and Cross-Sectional Studies

The guidance document below is organized by question number from the tool for quality assessment of observational cohort and cross-sectional studies.

Question 1. Research question

Did the authors describe their goal in conducting this research? Is it easy to understand what they were looking to find? This issue is important for any scientific paper of any type. Higher quality scientific research explicitly defines a research question.

Questions 2 and 3. Study population

Did the authors describe the group of people from which the study participants were selected or recruited, using demographics, location, and time period? If you were to conduct this study again, would you know who to recruit, from where, and from what time period? Is the cohort population free of the outcomes of interest at the time they were recruited?

An example would be men over 40 years old with type 2 diabetes who began seeking medical care at Phoenix Good Samaritan Hospital between January 1, 1990 and December 31, 1994. In this example, the population is clearly described as: (1) who (men over 40 years old with type 2 diabetes); (2) where (Phoenix Good Samaritan

Hospital); and (3) when (between January 1, 1990 and December 31, 1994). Another example is women ages 34 to 59 years of age in 1980 who were in the nursing profession and had no known coronary disease, stroke, cancer, hypercholesterolemia, or diabetes, and were recruited from the 11 most populous States, with contact information obtained from State nursing boards.

In cohort studies, it is crucial that the population at baseline is free of the outcome of interest. For example, the nurses' population above would be an appropriate group in which to study incident coronary disease. This information is usually found either in descriptions of population recruitment, definitions of variables, or inclusion/exclusion criteria.

You may need to look at prior papers on methods in order to make the assessment for this question. Those papers are usually in the reference list.

If fewer than 50% of eligible persons participated in the study, then there is concern that the study population does not adequately represent the target population. This increases the risk of bias.

Question 4. Groups recruited from the same population and uniform eligibility criteria
Were the inclusion and exclusion criteria developed prior to recruitment or selection of the study population? Were the same underlying criteria used for all of the subjects involved? This issue is related to the description of the study population, above, and you may find the information for both of these questions in the same section of the paper.

Most cohort studies begin with the selection of the cohort; participants in this cohort are then measured or evaluated to determine their exposure status. However, some cohort studies may recruit or select exposed participants in a different time or place than unexposed participants, especially retrospective cohort studies–which is when data are obtained from the past (retrospectively), but the analysis examines exposures prior to outcomes. For example, one research question could be whether diabetic men with clinical depression are at higher risk for cardiovascular disease than those without clinical depression. So, diabetic men with depression might be selected from a mental health clinic, while diabetic men without depression might be selected from an internal medicine or endocrinology clinic. This study recruits groups from different clinic populations, so this example would get a "no."

However, the women nurses described in the question above were selected based on the same inclusion/exclusion criteria, so that example would get a "yes."

Question 5. Sample size justification
Did the authors present their reasons for selecting or recruiting the number of people included or analyzed? Do they note or discuss the statistical power of the study? This question is about whether or not the study had enough participants to detect an association if one truly existed.

A paragraph in the methods section of the article may explain the sample size needed to detect a hypothesized difference in outcomes. You may also find a discussion of power in the discussion section (such as the study had 85 percent power to detect a 20 percent increase in the rate of an outcome of interest, with a 2-sided alpha of 0.05). Sometimes estimates of variance and/or estimates of effect size are given, instead of sample size calculations. In any of these cases, the answer would be "yes."

However, observational cohort studies often do not report anything about power or sample sizes because the analyses are exploratory in nature. In this case, the answer would be "no." This is not a "fatal flaw." It just may indicate that attention was not paid to whether the study was sufficiently sized to answer a prespecified question–i.e., it may have been an exploratory, hypothesis-generating study.

Question 6. Exposure assessed prior to outcome measurement
This question is important because, in order to determine whether an exposure causes an outcome, the exposure must come before the outcome.

For some prospective cohort studies, the investigator enrolls the cohort and then determines the exposure status of various members of the cohort (large epidemiological studies like Framingham used this approach). However, for other cohort studies, the cohort is selected based on its exposure status, as in the example above of depressed diabetic men (the exposure being depression). Other examples include a cohort identified by its exposure to fluoridated drinking water and then compared to a cohort living in an area without fluoridated

water, or a cohort of military personnel exposed to combat in the Gulf War compared to a cohort of military personnel not deployed in a combat zone.

With either of these types of cohort studies, the cohort is followed forward in time (i.e., prospectively) to assess the outcomes that occurred in the exposed members compared to nonexposed members of the cohort. Therefore, you begin the study in the present by looking at groups that were exposed (or not) to some biological or behavioral factor, intervention, etc., and then you follow them forward in time to examine outcomes. If a cohort study is conducted properly, the answer to this question should be "yes," since the exposure status of members of the cohort was determined at the beginning of the study before the outcomes occurred.

For retrospective cohort studies, the same principal applies. The difference is that, rather than identifying a cohort in the present and following them forward in time, the investigators go back in time (i.e., retrospectively) and select a cohort based on their exposure status in the past and then follow them forward to assess the outcomes that occurred in the exposed and nonexposed cohort members. Because in retrospective cohort studies the exposure and outcomes may have already occurred (it depends on how long they follow the cohort), it is important to make sure that the exposure preceded the outcome.

Sometimes cross-sectional studies are conducted (or cross-sectional analyses of cohort-study data), where the exposures and outcomes are measured during the same timeframe. As a result, cross-sectional analyses provide weaker evidence than regular cohort studies regarding a potential causal relationship between exposures and outcomes. For cross-sectional analyses, the answer to Question 6 should be "no."

Question 7. Sufficient timeframe to see an effect
Did the study allow enough time for a sufficient number of outcomes to occur or be observed, or enough time for an exposure to have a biological effect on an outcome? In the examples given above, if clinical depression has a biological effect on increasing risk for CVD, such an effect may take years. In the other example, if higher dietary sodium increases BP, a short timeframe may be sufficient to assess its association with BP, but a longer timeframe would be needed to examine its association with heart attacks.

The issue of timeframe is important to enable meaningful analysis of the relationships between exposures and outcomes to be conducted. This often requires at least several years, especially when looking at health outcomes, but it depends on the research question and outcomes being examined.

Cross-sectional analyses allow no time to see an effect, since the exposures and outcomes are assessed at the same time, so those would get a "no" response.

Question 8. Different levels of the exposure of interest
If the exposure can be defined as a range (examples: drug dosage, amount of physical activity, amount of sodium consumed), were multiple categories of that exposure assessed? (for example, for drugs: not on the medication, on a low dose, medium dose, high dose; for dietary sodium, higher than average U.S. consumption, lower than recommended consumption, between the two). Sometimes discrete categories of exposure are not used, but instead exposures are measured as continuous variables (for example, mg/day of dietary sodium or BP values).

In any case, studying different levels of exposure (where possible) enables investigators to assess trends or dose-response relationships between exposures and outcomes–e.g., the higher the exposure, the greater the rate of the health outcome. The presence of trends or dose-response relationships lends credibility to the hypothesis of causality between exposure and outcome.

For some exposures, however, this question may not be applicable (e.g., the exposure may be a dichotomous variable like living in a rural setting versus an urban setting, or vaccinated/not vaccinated with a one-time vaccine). If there are only two possible exposures (yes/no), then this question should be given an "NA," and it should not count negatively towards the quality rating.

Question 9. Exposure measures and assessment
Were the exposure measures defined in detail? Were the tools or methods used to measure exposure accurate and reliable–for example, have they been validated or are they objective? This issue is important as it influences confidence in the reported exposures. When exposures are measured with less accuracy or validity, it is harder to see an association between exposure and outcome even if one exists. Also as important is whether the exposures were assessed in the same manner within groups and between groups; if not, bias may result.

For example, retrospective self-report of dietary salt intake is not as valid and reliable as prospectively using a standardized dietary log plus testing participants' urine for sodium content. Another example is measurement of BP, where there may be quite a difference between usual care, where clinicians measure BP however it is done in their practice setting (which can vary considerably), and use of trained BP assessors using standardized equipment (e.g., the same BP device which has been tested and calibrated) and a standardized protocol (e.g., patient is seated for 5 minutes with feet flat on the floor, BP is taken twice in each arm, and all four measurements are averaged). In each of these cases, the former would get a "no" and the latter a "yes."

Here is a final example that illustrates the point about why it is important to assess exposures consistently across all groups: If people with higher BP (exposed cohort) are seen by their providers more frequently than those without elevated BP (nonexposed group), it also increases the chances of detecting and documenting changes in health outcomes, including CVD-related events. Therefore, it may lead to the conclusion that higher BP leads to more CVD events. This may be true, but it could also be due to the fact that the subjects with higher BP were seen more often; thus, more CVD-related events were detected and documented simply because they had more encounters with the health care system. Thus, it could bias the results and lead to an erroneous conclusion.

Question 10. Repeated exposure assessment
Was the exposure for each person measured more than once during the course of the study period? Multiple measurements with the same result increase our confidence that the exposure status was correctly classified. Also, multiple measurements enable investigators to look at changes in exposure over time, for example, people who ate high dietary sodium throughout the followup period, compared to those who started out high then reduced their intake, compared to those who ate low sodium throughout. Once again, this may not be applicable in all cases. In many older studies, exposure was measured only at baseline. However, multiple exposure measurements do result in a stronger study design.

Question 11. Outcome measures
Were the outcomes defined in detail? Were the tools or methods for measuring outcomes accurate and reliable–for example, have they been validated or are they objective? This issue is important because it influences confidence in the validity of study results. Also important is whether the outcomes were assessed in the same manner within groups and between groups.

An example of an outcome measure that is objective, accurate, and reliable is death–the outcome measured with more accuracy than any other. But even with a measure as objective as death, there can be differences in the accuracy and reliability of how death was assessed by the investigators. Did they base it on an autopsy report, death certificate, death registry, or report from a family member? Another example is a study of whether dietary fat intake is related to blood cholesterol level (cholesterol level being the outcome), and the cholesterol level is measured from fasting blood samples that are all sent to the same laboratory. These examples would get a "yes." An example of a "no" would be self-report by subjects that they had a heart attack, or self-report of how much they weigh (if body weight is the outcome of interest).

Similar to the example in Question 9, results may be biased if one group (e.g., people with high BP) is seen more frequently than another group (people with normal BP) because more frequent encounters with the health care system increases the chances of outcomes being detected and documented.

Question 12. Blinding of outcome assessors
Blinding means that outcome assessors did not know whether the participant was exposed or unexposed. It is also sometimes called "masking." The objective is to look for evidence in the article that the person(s) assessing the outcome(s) for the study (for example, examining medical records to determine the outcomes that occurred in the exposed and comparison groups) is masked to the exposure status of the participant. Sometimes the person measuring the exposure is the same person conducting the outcome assessment. In this case, the outcome assessor would most likely not be blinded to exposure status because they also took measurements of exposures. If so, make a note of that in the comments section.

As you assess this criterion, think about whether it is likely that the person(s) doing the outcome assessment would know (or be able to figure out) the exposure status of the study participants. If the answer is no, then blinding is adequate. An example of adequate blinding of the outcome assessors is to create a separate committee, whose members were not involved in the care of the patient and had no information about the study participants' exposure status. The committee would then be provided with copies of participants' medical records, which had been stripped of any potential exposure information or personally identifiable information.

The committee would then review the records for prespecified outcomes according to the study protocol. If blinding was not possible, which is sometimes the case, mark "NA" and explain the potential for bias.

Question 13. Followup rate
Higher overall followup rates are always better than lower followup rates, even though higher rates are expected in shorter studies, whereas lower overall followup rates are often seen in studies of longer duration. Usually, an acceptable overall followup rate is considered 80 percent or more of participants whose exposures were measured at baseline. However, this is just a general guideline. For example, a 6-month cohort study examining the relationship between dietary sodium intake and BP level may have over 90 percent followup, but a 20-year cohort study examining effects of sodium intake on stroke may have only a 65 percent followup rate.

Question 14. Statistical analyses
Were key potential confounding variables measured and adjusted for, such as by statistical adjustment for baseline differences? Logistic regression or other regression methods are often used to account for the influence of variables not of interest.

This is a key issue in cohort studies, because statistical analyses need to control for potential confounders, in contrast to an RCT, where the randomization process controls for potential confounders. All key factors that may be associated both with the exposure of interest and the outcome–that are not of interest to the research question–should be controlled for in the analyses.

For example, in a study of the relationship between cardiorespiratory fitness and CVD events (heart attacks and strokes), the study should control for age, BP, blood cholesterol, and body weight, because all of these factors are associated both with low fitness and with CVD events. Well-done cohort studies control for multiple potential confounders.

Some general guidance for determining the overall quality rating of observational cohort and cross-sectional studies
The questions on the form are designed to help you focus on the key concepts for evaluating the internal validity of a study. They are not intended to create a list that you simply tally up to arrive at a summary judgment of quality.

Internal validity for cohort studies is the extent to which the results reported in the study can truly be attributed to the exposure being evaluated and not to flaws in the design or conduct of the study–in other words, the ability of the study to draw associative conclusions about the effects of the exposures being studied on outcomes. Any such flaws can increase the risk of bias.

Critical appraisal involves considering the risk of potential for selection bias, information bias, measurement bias, or confounding (the mixture of exposures that one cannot tease out from each other). Examples of confounding include co-interventions, differences at baseline in patient characteristics, and other issues throughout the questions above. High risk of bias translates to a rating of poor quality. Low risk of bias translates to a rating of good quality. (Thus, the greater the risk of bias, the lower the quality rating of the study.)

In addition, the more attention in the study design to issues that can help determine whether there is a causal relationship between the exposure and outcome, the higher quality the study. These include exposures occurring prior to outcomes, evaluation of a dose-response gradient, accuracy of measurement of both exposure and outcome, sufficient timeframe to see an effect, and appropriate control for confounding–all concepts reflected in the tool.

Generally, when you evaluate a study, you will not see a "fatal flaw," but you will find some risk of bias. By focusing on the concepts underlying the questions in the quality assessment tool, you should ask yourself about the potential for bias in the study you are critically appraising. For any box where you check "no" you should ask, "What is the potential risk of bias resulting from this flaw in study design or execution?" That is, does this factor cause you to doubt the results that are reported in the study or doubt the ability of the study to accurately assess an association between exposure and outcome?

The best approach is to think about the questions in the tool and how each one tells you something about the potential for bias in a study. The more you familiarize yourself with the key concepts, the more comfortable you will be with critical appraisal. Examples of studies rated good, fair, and poor are useful, but each study must be assessed on its own based on the details that are reported and consideration of the concepts for minimizing bias.

Appendix D. References and Abstracts of Records excluded due to Non-English Language.

1. Lombardo, C., Giacò, M., Picotti, P., & Violani, C. (2007). Orientamento sessuale e ruoli sessuali come fattori di rischio o di protezione per l'insoddisfazione corporea e il comportamento alimentare disturbato. *Giornale italiano di psicologia, Rivista trimestrale*, 3, 653-676. https://doi.org/10.1421/25223

   - *Title provided in English Language:*

     'Sexual orientation and sexual roles as risk factors or protection for body dissatisfaction and eating'.

   - No English translation of Abstract available.

2. Toro-Alfonso, J., Nieves Lugo, K., Borrero Bracero, N. (2010). Cuerpo y Masculinidad: Los Desórdenes Alimentarios en Hombres. *Interamerican Journal of Psychology*, 44, 2, 225-234.

   - *Title provided in English Language:*

     'Body and Masculinity: Eating Disorders in Males'.

   - *Abstract provided in English Language:*

     We developed a descriptive study with a survey to a non-random sample of 300 male university students to explore the presence of eating disorders and its relation with hegemonic masculinity. The questionnaire was composed of a scale to explore eating disorders, a male role scale addressing issues of masculinity. Additionally we included a scale addressing body image. The average age of participants was 23 years. Participants reported university level studies where 39% (n=117) were seniors and 29% (n=86) were in their fifth year. Fourteen percent (n=42) reported graduate studies. Thirteen percent of participants reported eating disorders, 58% identified as gay. Sixteen percent reported dissatisfaction with their body image with 65% identifying as gay. There was a significant relation between identifying as gay, having body image difficulties and showing eating disorders indicators. Thirty-five percent of participants reported high adherence to hegemonic masculinity values and 29% reported moderate adherence. The meaning of the relation between homosexuality and eating disorders is explored. At the same time we explore recommendations for the development of more studies on eating disorders among young males.

     Keywords: Men and eating disorders; Body image in males; Homosexuality and eating disorders.

3. Toro-Alfonso, J., Urzúa, A. M., & Cardona, I. S. (2012). El Cuerpo del Delito: La imagen corporal e indicadores de trastornos alimentarios en una muestra de hombres gay de diez países latinoamericanos. *Revista Argentina de clínica psicológica*, 21, 2, 101-112.

   - *Title provided in English Language:*

     'Body of evidence: Body image and eating disorders in a sample of gay men from ten Latin American countries'

   - *Abstract provided in English Language:*

     Eating disorders are psychological disorders which directly affect the physical health of those who suffer, with a high mortality rate. Women are more likely to suffer from eating disorders than men, which is why most of the investigations have focused on women. However, 10% of patients with eating disorders are male. Body dissatisfaction of men has increased dramatically over the past three decades, drastically reducing the gap with the prevalence rates reported for women. This research involved 1175 gay men in ten Latin American countries (Argentina, Chile, Colombia, Cuba, Guatemala, Mexico, Paraguay, Peru, Puerto Rico and Dominican Republic). These were evaluated by adapted scale of Social construction of masculinity (Levant and Fischer), the scale of attitudes and eating behaviors (Garner and Garfinkel), and adapted scale of body image (Raich and cols.). The results show that 13% of the participants has dissatisfaction with body image, 12% presents indicators of eating disorders. The majority of participants expressed a moderate grip to the traditional model of masculinity established a statistically significant relationship between hegemonic masculinity, dissatisfaction with body image and the presence of difficulties in the food area. We discuss the implications of these findings and the need for alternate conceptualizations to explain the presence of these attitudes and behaviors in a sample of Latin American gay men.

Appendix E. Risk of Bias Assessment scoring matrix for individual studies.

Table A.2. Breakdown of Individual Quality Assessment Outcomes for Included Studies.

Study	Risk of bias criteria														Overall 'Score'	Quality Rating *(poor, fair, good)*
	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Institutes of Health, 2021)																
Aiello (2023)															6	Fair
Alleva et al. (2018)															6	Fair
Alvy (2013a)															6	Fair
Amerson (2022)															8	Fair
Ballantyne (2011)															7	Poor
Barnhart et al. (2023)															8	Good
Barnhart et al. (2022)															8	Good
Blashill (2010)															7	Fair
Blashill & Vander Wal (2009)															7	Fair
Brennan et al. (2012)															7	Fair
Brennan et al. (2011)															7	Fair
Brewster et al. (2019)															8	Good
Brewster et al. (2014)															8	Good
Brokjob & Cornelissen (2022)															8	Good
Carper et al. (2010)															5	Poor
Carretta et al. (2019)															7	Fair
Convertino, Brady et al. (2021)															7	Fair
Convertino, Elbe et al. (2022)															7	Fair
Cusack et al. (2021)															6	Fair
Dakanalis et al. (2012)															5	Fair
Davids et al. (2011)															6	Fair
De Santis et al. (2012)															8	Good
Duggan & McCreary (2004)															5	Fair
Engeln-Maddox et al. (2011)															7	Fair
Griffiths, Mitchinson et al. (2018)															7	Fair
Griffiths, Murray et al. (2018)															6	Fair
Haines et al. (2008)															4	Poor
Heffernan (1996)															5	Fair
Henn et al. (2019)															6	Fair
Holmes et al. (2021)															7	Fair
Hospers & Jansen (2005)															5	Fair
Jackson (2008)															7	Fair
Jones et al. (2019)															8	Good
Jones et al. (2018)															8	Good
Joshua (2002)															7	Fair

Kozee & Tylka (2006)															7	Fair
Linsenmeyer et al. (2021)															6	Fair
Liubovich (2003)															8	Good
Martins et al. (2007)															6	Fair
Mason & Lewis (2015)															7	Fair
Meyer et al. (2001)															4	Poor
Mitchell et al. (2021)															6	Fair
Moradi & Tebbe (2022)															9	Good
Muratore et al. (2022)															8	Good
Naamani & Jamil (2021)															8	Good
Nagata et al. (2022a)															8	Fair
Nagata et al. (2022b)															7	Fair
Nowaskie et al. (2021)															7	Fair
Parent & Bradstreet (2017)															7	Fair
Picot (2006)															7	Fair
Polsky (2006)															8	Fair
Reilly & Rudd (2006)															5	Fair
Rezeppa et al. (2021)															7	Fair
Rodrigues de Oliveria (2022)															8	Good
Serier et al. (2022)															7	Fair
Serpa (2004)															9	Good
Siconolfi et al. (2009)															7	Fair
Strong et al. (2000)															7	Fair
Taylor & Goodfriend (2008)*															5	Poor
Testa et al. (2017)															7	Fair
Torres (2007)															6	Fair
Urban et al. (2022)															8	Good
Vocks et al. (2009)															6	Fair
Wagenbach (1998)															5	Fair
Wang & Borders (2017)															3	Poor
Watson et al. (2016)															8	Good
Watson et al. (2015)															7	Good
Williamson & Spence (2001)															5	Fair
Williamson & Hartley (1998)															3	Poor
Wiseman & Moradi (2010)															7	Fair
Yean et al. (2013)															8	Good

Note. *Taylor & Goodfriend (2008) is experimental in design, however the data extracted for this MA was collected and analysed in a cross-sectional manner. Therefore, quality was appraised using NHLBI's cross sectional tool as this felt most appropriate to allow for more accurate conclusions on quality.

Key

Yes

No OR Couldn't Determine

N/A

Appendix F. Factors not included in the Meta Analysis – of which only a single effect size was reported across all included studies.

Table A.3. Details of Individual Factors Omitted from the Meta-Analyses.

Factor	Study	N	*r*	Group of interest	Assessment of Factor
Neuroticism	Amerson 2022	757	0.234	SMW	International Personality Item Pool
Sexual attraction and behaviour	Amerson 2022	757	0.022	SMW	Demographics questionnaire
HIV status unknown	Brennan 2012	400	0	SMM	Demographics questionnaire
HIV-positive	Brennan 2012	400	-0.05	SMM	Demographics questionnaire
HIV-negative	Brennan 2012	400	0.05	SMM	Demographics questionnaire
STI	Brennan 2012	400	-0.1	SMM	Demographics questionnaire
Ethnicity - White	Brennan 2012	400	0.09	SMM	Demographics questionnaire
Substance use during sex	Brennan 2012	400	0.16	SMM	Demographics questionnaire
Alcohol use during sex – moderate (ref: none)	Brennan 2011	383	-0.122	SMM	Single item – self-reported frequency of alcohol use before or during sex in last three months (none/moderate/regular)
Alcohol use during sex – high (ref: none)	Brennan 2011	383	0.215	SMM	Single item – self-reported frequency of alcohol use before or during sex in last three months (none/moderate/regular)
Race – Other/Mixed Race/Aboriginal/Arab/Latino (ref: White)	Brennan 2011	383	-0.3	SMM	Demographics questionnaire
Importance of physical attractiveness and appearance	Carper et al. 2010	39	0.08	SMM	Physical Attractiveness Questionnaire
Importance assigned to media as a valuable source of info regarding attractiveness	Carper et al. 2010	39	0.17	SMM	Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3), Information subscale

Media consumption/exposure	Carper et al. 2010	39	-0.08	SMM	3-items to assess media exposure (no. of hours watching tv, no. of movies watched per month, no. of hours per week reading magazines)
Hyper-feminine drag	Carretta et al. 2019	218	0.19	SMM	Researcher developed scale – drag queen performance style scale
Gender-fluid drag	Carretta et al. 2019	218	-0.05	SMM	Researcher developed scale – drag queen performance style scale
Drag identity salience	Carretta et al. 2019	218	-0.01	SMM	In-group Identification Scale, Centrality subscale
Years performing drag	Carretta et al. 2019	218	-0.07	SMM	Demographics questionnaire
Frequency of performing drag	Carretta et al. 2019	218	-0.18	SMM	Demographics questionnaire
Acceptance of cosmetic surgery	Carretta et al. 2019	218	0.36	SMM	Acceptance of Cosmetic Surgery Scale
Race/Ethnicity (coded 0 for non-Hispanic or Latino White, and 1 for Hispanic or Latino, Black or African American, Native American or American Indian, Asian or Pacific Islander, or self-described)	Convertino, Elbe et al. 2022	452	-0.03	SMM	Demographics questionnaire
Sex assigned at birth	Convertino, Elbe et al. 2022	452	0.085	SMM	Demographics questionnaire
Trans or gender expansive identity	Convertino, Elbe et al. 2022	452	0.12	SMM	Demographics questionnaire
Muscular appearance intolerance	Convertino, Elbe et al. 2022	452	0.175	SMM	Muscle Dysmorphic Disorder Inventory (MDDI), Appearance Intolerance subscale
Muscular functional impairment	Convertino, Elbe et al. 2022	452	0.26	SMM	MDDI, Functional Impairment subscale
Sexual orientation	Convertino, Elbe et al. 2022	452	-0.135	SMM	Demographics questionnaire
Wellbeing	Cusack et al. 2021	242	-0.48	GM	Mental Health Screening Test (5-items)
Gender rumination	Cusack et al. 2021	242	0.22	GM	Gender Identity Reflection and Rumination Scale
Eating rumination	Cusack et al. 2021	242	0.81	GM	Ruminative Response Scale for Eating Disorders

Sexually objectifying media exposure	Dakanalis et al. 2012	125	0.134	SMM	Rating scale of habitual exposure to TV shows and magazines
Alcohol abuse	De Santis et al. 2012	100	0.382	SMM	Cut Down, Annoyed Guilty, and Eye-Opener Questionnaire
Safer sex behaviors	De Santis et al. 2012	100	-0.256	SMM	Safer Sex Behavior Questionnaire
Muscle and Fitness Media Exposure	Duggan & McCreary 2004	67	0.3	SMM	2-items referring to the viewing or purchasing of muscle and fitness magazines.
Pornography – duration of use	Griffiths, Mitchinson et al. 2018	2733	0.03	SMM	1 item - pps asked when you watch porn, how long do you typically watch it for (rated on sliding scale)
Pornography – cumulative use (past 28 days)	Griffiths, Mitchinson et al. 2018	2733	0.115	SMM	Derived by re-coding answers to questions about frequency of pornography use.
Pornography – amateur versus professional	Griffiths, Mitchinson et al. 2018	2733	-0.016	SMM	1 item – asked to estimate how much of the pornography they watched was amateur versus professional.
Facebook use	Griffiths, Murray et al. 2018	2733	0.12	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
Youtube use	Griffiths, Murray et al. 2018	2733	0.07	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
Dating app use	Griffiths, Murray et al. 2018	2733	0.02	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
Instagram use	Griffiths, Murray et al. 2018	2733	0.1	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
Snapchat use	Griffiths, Murray et al. 2018	2733	0.09	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
Tumblr use	Griffiths, Murray et al. 2018	2733	0.05	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
Twitter use	Griffiths, Murray et al. 2018	2733	0.04	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
LinkedIn use	Griffiths, Murray et al. 2018	2733	0.02	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
Wordpress use	Griffiths, Murray et al. 2018	2733	-0.03	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale

Pinterest use	Griffiths, Murray et al. 2018	2733	0.06	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
Flickr use	Griffiths, Murray et al. 2018	2733	-0.02	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
Blogspot use	Griffiths, Murray et al. 2018	2733	-0.01	SMM	1 item – how often do you use '…', answered on a 6-point Likert scale
Thoughts about using anabolic steroids	Griffiths, Murray et al. 2018	2733	0.15	SMM	1 item – "how frequently do you think about using anabolic steroids", answered on a 6-point Likert scale
Feminist self-identification	Haines et al. 2008	126	0.05	SMW	Single item – 'I consider myself to be a feminist" (Liss, O'Connor, Morosky, & Crawford, 2001)
Family of origin income level	Heffernan 1996	203	-0.107	SMW	Demographics questionnaire
Endorsement of social norms	Heffernan 1996	203	0.226	SMW	Attitudes Toward Attractiveness Scale (13-items) and Attitudes Toward Women Scale (15-items).
Sexual victimisation	Holmes et al. 2021	164	0.17	SMW	Sexual Experiences Survey Short-Form Victimization
Male gender assigned at birth	Jones et al. 2018	416	-0.06	GM	Demographics questionnaire
Female gender assigned at birth	Jones et al. 2018	416	0.06	GM	Demographics questionnaire
Interpersonal distrust	Jones et al. 2018	416	0.285	GM	Eating Disorder Inventory-2, Interpersonal Distrust subscale
Length of time 'out' (in months)	Joshua 2002	280	-0.059	SMW	Lesbian Sexual Identity Variables, 4-items related to (1) sexual orientation, (2) comfort with one's sexuality (internalised homophobia), (3) extent of disclosure, (4) time 'out', and (5) affiliation with the GLB community.
Happiness	Joshua 2002	280	-0.261	SMW	Visual-Analogue Mood Scale, Happiness scale
Confusion	Joshua 2002	280	0.216	SMW	Visual-Analogue Mood Scale, Confusion scale
Social support – availability and satisfaction	Joshua 2002	280	-0.154	SMW	Social Support Questionnaire, Social Support Availability/Number subscale, and Social Support Satisfaction subscale

Guilt	Joshua 2002	280	0.24	SMW	Visual-Analogue Mood Scale, Guilt scale
Shamefulness	Joshua 2002	280	0.367	SMW	Visual-Analogue Mood Scale, Shame scale
Body preoccupation – extent of body concern	Joshua 2002	280	0.558	SMW	Body Shape Questionnaire – Revised
ARFID symptoms	Linsenmeyer et al. 2021	164	0.13	GM	Nine Item Avoidant/Restrictive Food Intake Disorder Screen
Food insecurity	Linsenmeyer et al. 2021	164	0.25	GM	Hunger Vital Sign
Age when a woman first started considering herself as lesbian/gay	Liubovich 2003	149	-0.09	SMW	Demographics questionnaire
Age when a woman first disclosed her sexual orientation to others	Liubovich 2003	149	-0.047	SMW	Demographics questionnaire
Age when a woman first became aware of her attraction to other women	Liubovich 2003	149	-0.003	SMW	Demographics questionnaire
Age when a woman first started questioning that she might be lesbian/gay	Liubovich 2003	149	0	SMW	Demographics questionnaire
Stigma consciousness; anticipated stigma	Mason & Lewis 2015	164	0.25	SMW	Stigma Consciousness Questionnaire
Social isolation	Mason & Lewis 2015	164	0.21	SMW	Friendship Scale
Self-blame	Mason & Lewis 2015	164	0.28	SMW	Cognitive Emotion Regulation Questionnaire (CERQ)
Catastrophising	Mason & Lewis 2015	164	0.25	SMW	CERQ
Misgendering frequency	Mitchell et al. 2021	130	0.08	GM	10-item scale - how often participants experienced different forms of misgendering (developed by authors)
Pride	Muratore et al. 2022	93	0.27	GM	Gender Minority Stress and Resilience Measure, Pride subscale

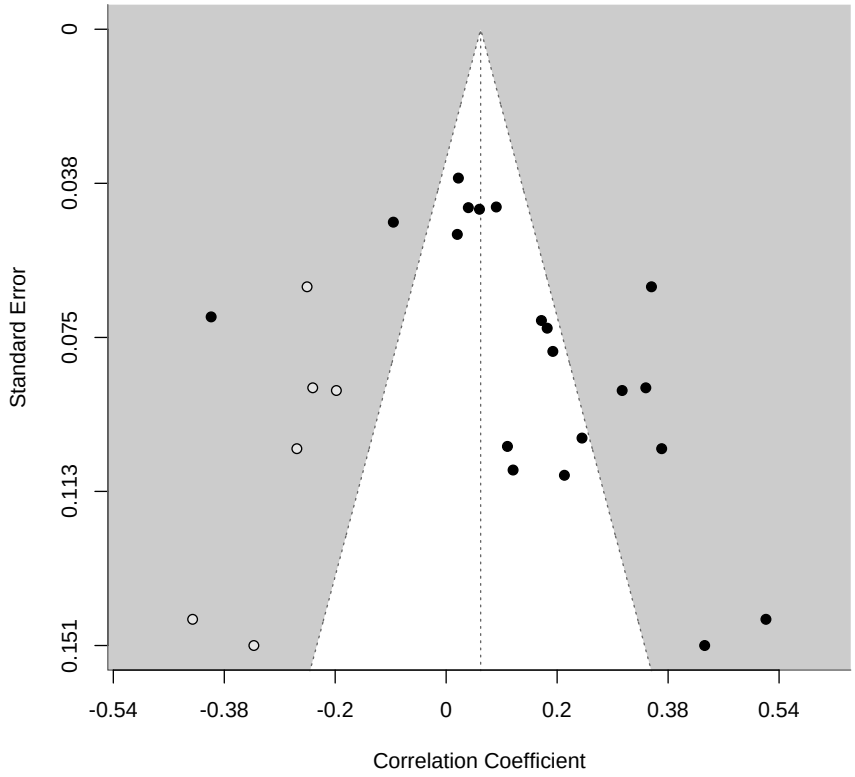
Physical appearance comparison	Muratore et al. 2022	93	0.46	GM	Physical Appearance Comparison Scale
Religious affiliation	Naamani & Jamil 2021	129	0.14	SMM	Demographics questionnaire
Positive minority identity	Naamani & Jamil 2021	129	0.06	SMM	Lesbian, Gay, and Bisexual Identity Scale (LGBIS), Identity Affirmation and Identity Centrality subscales
Guilt-proneness	Naamani & Jamil 2021	129	0.25	SMM	Guilt Inventory
Shame-proneness	Naamani & Jamil 2021	129	0.31	SMM	Internalized Shame Scale
Physical self-concept (positive self-description)	Parent & Bradstreet 2017	197	-0.27	SMM	Physical Self-Description Questionnaire-40 (PSDQ-40), 9 physical self-description subscales of the measure (Strength, Body Fat, Endurance, Sport, Activity, Coordination, Health, Appearance, and Flexibility)
Preoccupation with feeling overweight	Polsky 2006	309	0.551	SMW	Multidimensional Body-Self relations Questionnaire (MBSRQ), Overweight Preoccupation subscale
Positive body image	Reilly & Rudd 2006	213	-0.1	SMM	MBSRQ, Appearance Orientation, Appearance Evaluation, and Body-Areas Satisfaction subscales
Parent-Adolescent Relationship Quality	Rezeppa, 2021	528	0.183	SMW	4-items adapted from the National Longitudinal Study of Adolescent to Adult Health. Items altered slightly for this study.
Body Esteem (Attribution - others' evaluations about one's body and appearance)	Rezeppa, 2021	528	0.027	SMW	Body Esteem Scale for Adolescents and Adults, Attribution subscale
Body Esteem (Appearance - general feelings about appearance)	Rezeppa, 2021	528	-0.347	SMW	BESAA, Appearance subscale
Unfair Treatment experiences	Rodrigues de Oliveria 2022	255	0.18	LGB	Perceived Discrimination Scale – Portuguese Adaptation, Unfair Treatment subscale
Personal Rejection experiences	Rodrigues de Oliveria 2022	255	0.215	LGB	PDS – Portuguese Adaptation, Personal Rejection subscale
Dissatisfaction with sexual identity	Rodrigues de Oliveria 2022	255	0.091	LGB	LGBIS, Identity Dissatisfaction subscale

LGBTQ+ community pressure to have an ideal body	Rodrigues de Oliveria 2022	255	0.173	LGB	1 item- "Do you feel any pressure from the LGBTQ+ community to have a certain body appearance?" - 5-point Likert scale answer from disagree strongly to agree strongly.
Impulse control difficulties	Rodrigues de Oliveria 2022	255	0.311	LGB	Difficulties in Emotion Regulation Scale, Impulse Control Difficulties subscale
Gender	Rodrigues de Oliveria 2022	255	0.019	LGB	Demographics questionnaire
Control beliefs	Serpa 2004	96	0.047	SMM	Objectified Body Consciousness Scale, Control Beliefs scale
Race/Ethnicity – Other (ref: White)	Siconolfi et al. 2009	219	-0.13	SMM	Demographics questionnaire
Need for acceptance	Siconolfi et al. 2009	219	0.26	SMM	LGBIS, Need for Acceptance scale
External motivations for working out	Siconolfi et al. 2009	219	0.22	SMM	External motivations for working out, 8-item measure
Identity confusion	Siconolfi et al. 2009	219	0.21	SMM	LGBIS, Identity Confusion scale
Negative identity	Siconolfi et al. 2009	219	0.19	SMM	LGBIS, Negative Identity scale (measured by homonegativity, need for privacy, need for acceptance, and difficult process factors)
Difficult process accepting sexuality	Siconolfi et al. 2009	219	0.16	SMM	LGBIS, Difficult Process scale
Superiority	Siconolfi et al. 2009	219	0.15	SMM	LGBIS, Superiority scale
Masculinity as Sexual Behavior	Siconolfi et al. 2009	219	-0.16	SMM	Meanings of Masculinity scale (19-items)
Masculinity as Social Behavior	Siconolfi et al. 2009	219	-0.15	SMM	Meanings of Masculinity scale (19-items)
Ineffectiveness	Taylor & Goodfriend 2008	60	0.345	SMM	Eating Disorder Inventory, Ineffectiveness subscale
Gay media consumption	Taylor & Goodfriend 2008	60	0.061	SMM	4-items, 10-point scale, asking how often they experience 1) gay oriented websites, 2) tv shows, 3) magazines. 4) average of above three.

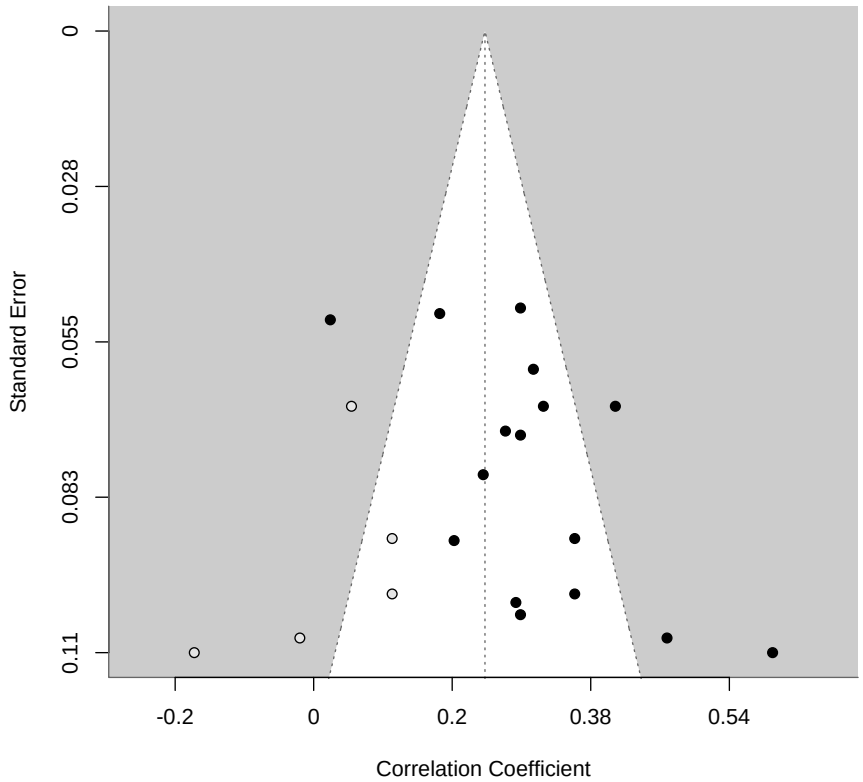
Anxiety-related trauma symptoms tied to experiences of discrimination	Urban et al. 2022	212	0.33	GM	Trauma Symptoms of Discrimination Scale
General adjustment index	Vocks et al. 2009	131	-0.181	GM	Combination of Rosenberg Self-Esteem Scale and Beck Depression Inventory
Detachment	Watson et al. 2016	353	0.33	SMW	Coping with Discrimination Scale, Detachment subscale
Sociocultural awareness of homonegativity	Williamson & Spence 2001	202	0.4	SMM	Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ) – Adapted Version
Sociocultural internalisation of homonegativity	Williamson & Spence 2001	202	0.58	SMM	Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ) – Adapted Version
Childhood harassment for gender non-conformity	Wiseman & Moradi 2010	231	0.25	SMM	Childhood Harassment for Gender Non-Conformity items

Appendix G. Trim-and-fill Funnel Plots for Publication Bias.

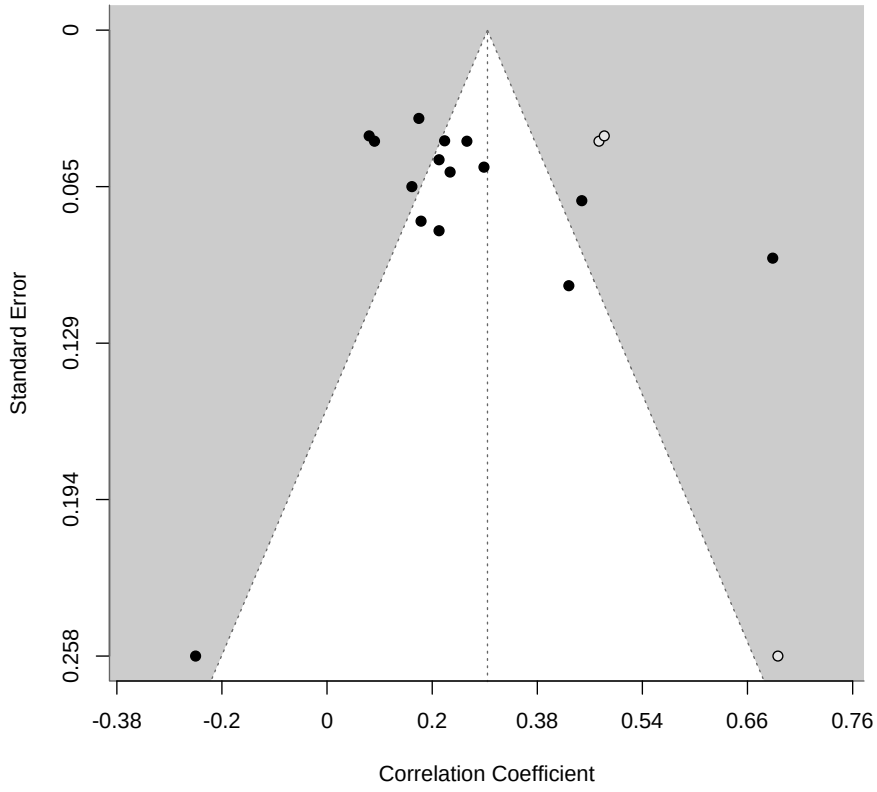
BMI Trim-and-fill funnel plot:



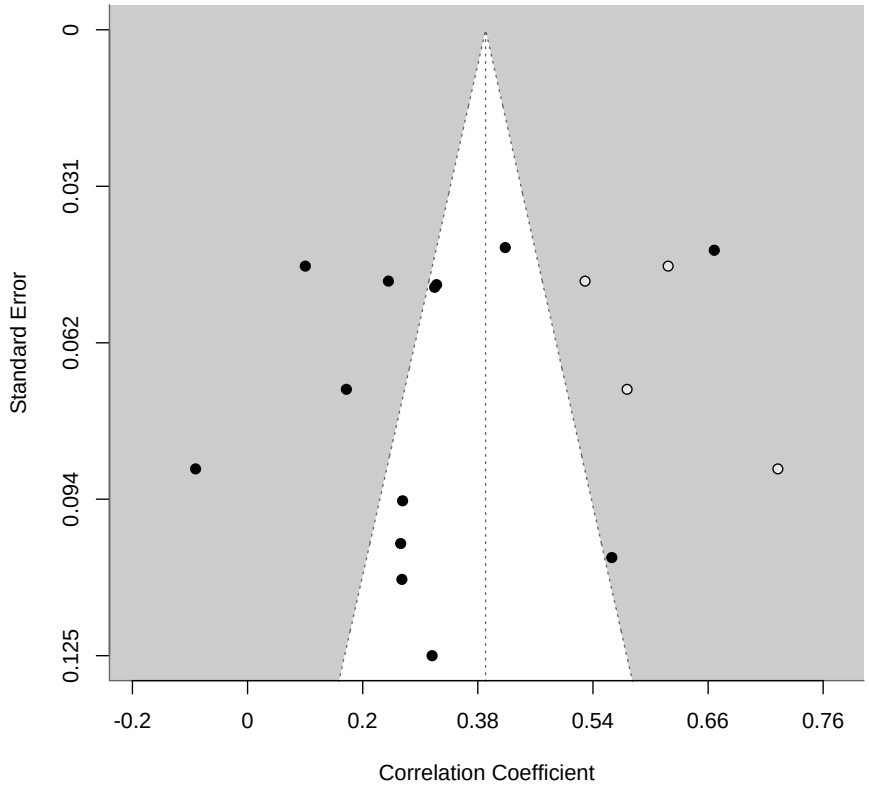
Depressive Symptoms Trim-and-fill funnel plot:



Discrimination (related to SO and/or GI) Trim-and-fill funnel plot:



Drive for Muscularity Trim-and-fill funnel plot:



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At the point of submission, you will be asked if there is a data set associated with the paper. If you reply yes, you will be asked to provide the DOI, pre-registered DOI, hyperlink, or other persistent identifier associated with the data set(s). If you have selected to provide a pre-registered DOI, please be prepared to share the reviewer URL associated with your data deposit, upon request by reviewers.
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Queries

If you have any queries, please visit our Author Services website or contact us here.
Updated 2nd February 2024

Appendix I: Demographic Information Sheet

Firstly, we would like to ask you a few questions about yourself so that we can use this information to broadly describe the people who took part in this study as a group. We are not requesting any identifying information from you.

What is your age, in years? *[free text box]*

How would you describe your race/ethnicity? *[single-select option]*
White:

- English/ Welsh/ Scottish/ Northern Irish/ British
- Irish
- Any other White background, please describe [free text box]

Mixed/ Multiple ethnic groups:

- White and Black Caribbean
- White and Black African
- White and Asian
- Any other Mixed/ Multiple ethnic background, please describe [free text box]

Asian/ Asian British:

- Indian
- Pakistani
- Bangladeshi
- Chinese
- Any other Asian background, please describe [free text box]

Black/ African/ Caribbean/ Black British

- African
- Caribbean
- Any other Black/ African/ Caribbean background, please describe [free text box]

Other ethnic group

- Arab
- Any other ethnic group, please describe [free text box]

How would you describe your sexual orientation? *[select as many as applicable to you]*

- Straight (Heterosexual)
- Gay/ Lesbian (Homosexual)
- Bisexual/ Pansexual
- Queer
- Asexual
- Another identity not listed (please specify) [free text box]
- Do not know
- Choose not to answer

How would you describe your gender identity? *[select as many as applicable to you]*

- Man
- Woman
- Non-binary (e.g., genderqueer, genderfluid, gender non-conforming)
- Agender
- Do not know
- Choose not to answer

- Another identity not listed (please specify) [free text box]

The term 'Transgender' is often used to describe people whose gender identity or expression is different, at least part of the time, from the sex assigned to them at birth. Do you consider yourself to be transgender? *[single-select option]*

- Yes
- No
- Do not know
- Choose not to answer

What was your sex assigned at birth? *[single-select option]*

- Female
- Male
- Female, but I am intersex
- Male, but I am intersex
- Do not know
- Choose not to answer

Have you ever been given a diagnosis of an eating disorder? *[single-select option]*

- *Yes (please specify) [free text box]*
- *No*

Appendix J: Eating Disorder Examination Questionnaire (EDE-Q v6.0; Fairburn & Beglin, 2008)

Page 1 out of 3

Eating Disorder examination questionnaire (EDE-Q 6.0)

Instructions: The following questions are concerned with the past four weeks (28 days) only.

Please read each question carefully. Please answer all the questions. Thank you.

Questions 1 to 12: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days) only.

	ON HOW MANY OF THE PAST 28 DAYS ...	NO DAYS	1-5 DAYS	6-12 DAYS	13-15 DAYS	16-22 DAYS	23-27 DAYS	EVERY DAY
1	Have you been deliberately **trying** to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
2	Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6
3	Have you **tried** to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4	Have you **tried** to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
5	Have you had a definite desire to have an **empty** stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6	Have you had a definite desire to have a **totally fla**t stomach?	0	1	2	3	4	5	6
7	Has thinking about **food, eating or calories** made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8	Has thinking about **shape or weight** made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
9	Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
10	Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
11	Have you felt fat?	0	1	2	3	4	5	6
12	Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

PAGE 1/3 PLEASE GO TO THE NEXT PAGE

EDE-Q 6.0

Page 2 out of 3

Eating Disorder examination questionnaire (EDE-Q 6.0)

Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to th past four weeks (28 days).

Over the past four weeks (28 days)….

13	Over the past 28 days, how many **times** have you eaten what other people would regards as an **unusually large amount of food** (given the circumstances)?	
14	… On how many of these times did you have a sense of having lost control over your eating (at the time you were eating)?	
15	Over the past 28 days, on how many **DAYS** have such episodes of overeating occurred (i.e. you have eaten an unusually large amount of food **and** have had a sense of loss of control at the time)?	
16	Over the past 28 days, how many **times** have you made yourself sick (vomit) as a means of controlling your shape or weight?	
17	Over the past 28 days, how many **times** have you taken laxatives as a means of controlling your shape or weight?	
18	Over the past 28 days, how many **times** have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat, or to burn off calories?	

Questions 19 to 21: Please circle the appropriate number. <u>Please note that for these questions the term "binge eating" means</u> eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

		NO DAYS	1-5 DAYS	6-12 DAYS	13-15 DAYS	16-22 DAYS	23-27 DAYS	EVERY DAY
19	Over the past 28 days, on how many days have you eaten in secret (ie, furtively)? … Do not count episodes of binge eating.	0	1	2	3	4	5	6
		NONE OF THE TIMES	A FEW OF THE TIMES	LESS THAN HALF	HALF OF THE TIMES	MORE THAN HALF	MOST OF THE TIME	EVERY TIME
20	On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? … Do not count episodes of binge eating.	0	1	2	3	4	5	6
			NOT AT ALL	SLIGHTLY	MODERATELY		MARKEDLY	
21	Over the past 28 days, how concerned have you been about other people seeing you eat? … Do not count episodes of binge eating.	0	1	2	3	4	5	6

PAGE 2/3 PLEASE GO TO THE NEXT PAGE

EDE-Q 6.0

Eating Disorder examination questionnaire (EDE-Q 6.0)

Questions 22 to 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

	ON HOW MANY OVER THE PAST 28 DAYS ...	NOT AT ALL	SLIGHTLY		MODERATELY		MARKEDLY	
22	Has your **weight** influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23	Has your **shape** influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24	How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25	How dissatisfied have you been with your **weight**?	0	1	2	3	4	5	6
26	How dissatisfied have you been with your **shape**?	0	1	2	3	4	5	6
27	How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	0	1	2	3	4	5	6
28	How uncomfortable have you felt about **others** seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	0	1	2	3	4	5	6

PAGE 3/3

THANK YOU

EDE-Q 6.0

Appendix K: Multidimensional Sexuality Questionnaire (MSQ; Snell et al., 1993)

INSTRUCTIONS: Listed below are several statements that concern the topic of sexual relationships. Please read each item carefully and decide to what extent it is characteristic of you. Some of the items refer to a specific sexual relationship. Whenever possible, answer the questions with your most recent partner in mind. If you have never had a sexual relationship, answer in terms of what you think your responses would most likely be. Then, for each statement fill in the response on the answer sheet that indicates how much it applies to you by using the following scale:

A = Not at all Characteristic of me
B = Slightly characteristic of me
C = Somewhat characteristic of me
D = Moderately characteristic of me
E = Very characteristic of me

	A = Not at all Characteristic of me	B = Slightly characteristic of me	C = Somewhat characteristic of me	D = Moderately characteristic of me	E = Very characteristic of me
1. I am confident about myself a sexual partner.					
2. I think about sex all the time.					
3. My sexuality is something that I am largely responsible for.					
4. I am very aware of my sexual feelings.					
5. I am very motivated to be sexually active.					
6. I feel anxious when I think about the sexual aspects of my life.					
7. I am very assertive about the sexual aspects of my life.					
8. I am depressed about the sexual aspects of my life.					
9. The sexual aspects of my life are determined mostly by chance happenings.					
10. I sometimes wonder what others think of the sexual aspects of my life.					
11. I am somewhat afraid of becoming sexually involved with another person.					
12. I am very satisfied with the way my sexual needs are currently being met.					
13. I am a pretty good sexual partner.					
14. I think about sex more than anything else.					
15. The sexual aspects of my life are determined in large part by my own behaviour.					
16. I am very aware of my sexual motivations.					

	A = Not at all Characteristic of me	B = Slightly characteristic of me	C = Somewhat characteristic of me	D = Moderately characteristic of me	E = Very characteristic of me
17. I am strongly motivated to devote time and effort to sex.					
18. I am worried about the sexual aspects of my life.					
19. I am not very direct about voicing my sexual preferences.					
20. I am disappointed about the quality of my sex life.					
2 I. Most things that affect the sexual aspects of my life happen to me by accident.					
22. I am very concerned with how others evaluate the sexual aspects of my life.					
23. I sometimes have a fear of sexual relationships.					
24. I am very satisfied with my sexual relationship.					
25. I am better at sex than most other people.					
26. I tend to be preoccupied with sex.					
27. I am in control of the sexual aspects of my life.					
28. I tend to think about my sexual feelings.					
29. I have a strong desire to be sexually active.					
30. Thinking about the sexual aspects of my life leaves me with an uneasy feeling.					
31, I am somewhat passive about expressing my sexual desires.					
32. I feel discouraged about my sex life.					
33. Luck plays a big part in influencing the sexual aspects of my life.					
34. I'm very aware of what others think of the sexual aspects of my life.					
35. I sometimes am fearful of sexual activity.					
36. My sexual relationship meets my original expectations.					
37. I would rate myself pretty favourably as a sexual partner.					
38. I'm constantly thinking about having sex.					
39. The main thing which affects the sexual aspects of my life is what I myself do.					

	A = Not at all Characteristic of me	B = Slightly characteristic of me	C = Somewhat characteristic of me	D = Moderately characteristic of me	E = Very characteristic of me
40. I'm very alert to changes in my sexual desires.					
41. It's really important to me that I involve myself in sexual activity.					
42. I usually worry about the sexual aspects of my life.					
43. I do not hesitate to ask for what I want in a sexual relationship.					
44. I feel unhappy about my sexual relationships.					
45. The sexual aspects of my life are largely a matter of (good or bad) fortune.					
46. I'm concerned about how the sexual aspect of my life appears to others.					
47. I don't have very much fear about engaging in sex.					
48. My sexual relationship is very good compared to most.					
49. I would be very confident in a sexual encounter.					
50. I think about sex the majority of the time.					
51. My sexuality is something that I myself am in charge of.					
52. I am very aware of my sexual tendencies.					
53. I strive to keep myself sexually active,					
54. I feel nervous when I think about the sexual aspects of my life.					
55. When it comes to sex, I usually ask for what I want.					
56. I feel sad when I think about my sexual experiences.					
57. The sexual aspects of my life are a matter of fate (destiny).					
58. I'm concerned about what other people think of the sexual aspects of my life.					
59. I'm not very afraid of becoming sexually active.					
60. I am very satisfied with the sexual aspects of my life.					

61. I responded to the above items based on:
    (A)A current sexual relationship
    (B) A past sexual relationship.
    (C) An imagined sexual relationship.

MSQ Subscale Definitions, as defined by Snell et al., 1993):

Sexual Esteem: A generalised tendency to positively evaluate one's capacity to relate sexually with another person.

Sexual Preoccupation: The tendency to become absorbed in, obsessed with, and engrossed with thoughts about the sexual aspects of life.

Internal Sexual Control: The belief that the sexual aspects of one's life are determined by one's own personal control.

Sexual Consciousness: The tendency to think and reflect about the nature of one's sexuality.

Sexual Motivation: The desire to be involved in a sexual relationship.

Sexual Anxiety: The tendency to feel tension, discomfort, and anxiety about the sexual aspects of one's life.

Sexual Assertiveness: The tendency to be assertive about the sexual aspects of one's life.

Sexual Depression: The tendency to feel depressed about the sexual aspect of one's life.

External Sexual Control: The belief that human sexuality is determined by influences outside of one's personal control (e.g., chance).

Sexual Monitoring: The tendency to be aware of the public impression which one's sexuality makes on others.

Fear of Sexual Relations: A fear of engaging in sexual relations with another individual.

Sexual Satisfaction: The tendency to be highly satisfied with the sexual aspects of one's life.

Appendix L: Trans-Specific Sexual Body Image Worries (T-Worries) Scale (Dharma et al., 2019)

Exhibit

Trans-Specific Sexual Body Image Worries (T-Worries) Scale

When I think about having sex, I worry …

	Not at all	Slightly	Somewhat	Moderately	Very
1. That other people think my body is unattractive.	○	○	○	○	○
2. That there are very few people who would want to have sex with me.	○	○	○	○	○
3. About feeling ashamed about my body.	○	○	○	○	○
4. That once I'm naked, people will not see me as the gender I am.	○	○	○	○	○
5. That I can't have the sex I want until I have a(nother) surgery.	○	○	○	○	○

Appendix M: Utrecht Gender Dysphoria Scale – Gender Spectrum (UGDS-GS; McGuire et al., 2019)

Exhibit

Utrecht Gender Dysphoria Scale—Gender Spectrum

For each question, select the response that best describes how much you agree with each statement. Note: Assigned sex means the sex you were assigned at birth and affirmed gender is the gender you currently identify with.

	1 Disagree completely	2 Disagree	3 Neither agree nor disagree	4 Agree	5 Agree completely
1. I prefer to behave like my affirmed gender.	○	○	○	○	○
2. Every time someone treats me like my assigned sex I feel hurt.	○	○	○	○	○
3. It feels good to live as my affirmed gender.	○	○	○	○	○
4. I always want to be treated like my affirmed gender.	○	○	○	○	○
5. A life in my affirmed gender is more attractive for me than a life in my assigned sex.	○	○	○	○	○
6. I feel unhappy when I have to behave like my assigned sex.	○	○	○	○	○
7. It is uncomfortable to be sexual in my assigned sex.	○	○	○	○	○
8. Puberty felt like a betrayal.	○	○	○	○	○
9. Physical sexual development was stressful.	○	○	○	○	○
10. I wish I had been born as my affirmed gender.	○	○	○	○	○
11. The bodily functions of my assigned sex are distressing for me (i.e. erection, menstruation).	○	○	○	○	○
12. My life would be meaningless if I would have to live as my assigned sex.	○	○	○	○	○
13. I feel hopeless if I have to stay in my assigned sex.	○	○	○	○	○
14. I feel unhappy when someone misgenders me.	○	○	○	○	○
15. I feel unhappy because I have the physical characteristics of my assigned sex.	○	○	○	○	○
16. I hate my birth assigned sex.	○	○	○	○	○
17. I feel uncomfortable behaving like my assigned sex.	○	○	○	○	○
18. It would be better not to live, than to live as my assigned sex.	○	○	○	○	○

Appendix N: ED Service Use Questionnaire (researcher developed)

1. Have you previously, or are you currently, receiving support for an eating disorder?

Yes *[participant directed to complete rest of the questionnaire]* No *[participant taken to end of survey]*

If yes, please specify whether this was in the past, is current, or both:

Past Current Both

If you have accessed care for an eating disorder more than once, please answer this questionnaire considering your most recent experience.

2. During your care, have you had a conversation with your health care professional about your sexuality/sexual functioning?

Yes No

3. During your care, have you had a conversation with your health care professional about your gender identity?

Yes No

Below are several different statements. Please read each item carefully and then rate how much you **AGREE** or **DISAGREE** with each statement by ticking in the relevant box.

	Strongly disagree	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
4. Broadly, I feel satisfied about how my **sexuality/sexual functioning** was/has been considered during my treatment *(such as during assessment, when making sense of your eating difficulties, and when developing and delivering your treatment plan)*					
5. My experience getting support for my eating disorder would have been/would be better if my healthcare provider(s) asked about the influence my eating disorder had/has on my **sexuality/sexual functioning**					
6. It would feel/have felt irrelevant for my **sexuality/sexual functioning** to be considered during my eating disorder treatment					
7. Fear of a lack of understanding was/is a barrier to speaking openly about my **sexuality/ sexual functioning** to my healthcare provider(s)					
8. I feel that my care providers are well informed about **eating disorders, sexuality, and the degree they may interact**					
9. Broadly, I feel satisfied about how my **gender identity** was/ has been considered during my treatment *(such as during assessment, when making sense of your eating difficulties, and when developing and delivering your treatment plan)*					
10. My experience getting support for my eating disorder would be/ have been better had my healthcare provider(s) asked me about the influence my **gender identity** has on my eating disorder					
11. It would feel/have felt irrelevant for my **gender identity** to be considered during my eating disorder treatment					
12. Fear of a lack of understanding was/is a barrier to speaking openly about my **gender identity** to my healthcare provider(s)					
13. I feel that my care providers are well informed about **eating disorders, gender identity and the degree they may interact**					
14. The care I received/am currently receiving is effectively addressing **my needs as a whole**					

Appendix O: Advertising Materials – Poster to Recruit Participants

University of East Anglia

RESEARCH PARTICIPANTS NEEDED!

EATING DIFFICULTIES AND SEXUALITY IN TRANSGENDER & GENDER NON-CONFORMING INDIVIDUALS

WHAT?

We would like to invite you to take part in our study looking to examine the **relationship** between **eating difficulties** and **sexuality** in **transgender** and **gender non-conforming youth and young adults**. Taking part will involve completing an anonymous **online survey** involving questions about eating, sexuality, body image and gender dysphoria.

This will take approximately 15-30 minutes to complete.

WHO?

We are looking for individuals who:

- Are **16-30 years old**,
- Are **currently living in the UK**,
- Are **currently** experiencing **eating-related difficulties** or a **diagnosed eating disorder**, and
- Self-identify as **transgender or gender non-conforming**

All the above need to apply to you, otherwise you are not eligible to take part.

HOW?

If you are considering taking part and would like some **more information** about the survey please follow this link: **https://uea.onlinesurveys.ac.uk/relationship-between-eating-difficulties-and-sexuality** or **scan the QR code** on the right.

*There will be an opportunity to enter a prize draw for the chance to **win one of five £20 Amazon vouchers**, following your participation.*

SCAN ME

Thank you for reading. Please feel free to contact me if you have any questions or queries:
Molly Cross (Trainee Clinical Psychologist & Primary Researcher), Email: Molly.Cross@uea.ac.uk.

Appendix P: Participant Information Sheet

University of East Anglia

Research study examining the relationship between eating difficulties and sexuality within the transgender and gender non-conforming community.

Version 3.0, December 2022.

Researchers: Molly Cross (Trainee Clinical Psychologist, Primary Researcher), Dr Aaron Burgess (Primary Research Supervisor), Professor Sian Coker (Secondary Research Supervisor).

We would like to invite you to take part in our study looking to examine the relationship between eating difficulties and sexuality. Thank you for dedicating your time already in getting to this page.
Taking part in this study is entirely optional and so, before you decide whether you want to take part, we will explain why this research is being carried out.

Please read the following information carefully before deciding whether you would like to be a part of this study. If you have any questions before taking part, please feel free to get in contact using our details below.

What is the purpose of the research?
We are interested in whether there might be a relationship between eating difficulties and sexuality, within those who identify as transgender and/or gender non-conforming. We define sexuality as a broad concept – including sexual thoughts, feelings, behaviours, and attractions towards other people. We are also keen to find out whether anything impacts on this relationship, such as body image and gender dysphoria. We hope that this research can help us to understand and better support transgender and gender non-conforming individuals with such difficulties.

This research is being carried out as part of a Doctorate thesis in Clinical Psychology, at the University of East Anglia (UEA).

Who is being invited to take part?
We are interested in recruiting individuals who:
• Are **16-30 years old**,
• Are **currently living in the UK**
• Are **currently** experiencing **eating-related difficulties** or have a **diagnosed eating disorder**, and
• Self-identify as **transgender** or **gender non-conforming** (including but not limited to gender fluid and non-binary).
All the above need to apply to you, otherwise you are not eligible to take part in this study.
If you are aware of anyone else who may be suitable to take part in this study, we would hugely appreciate if you could share the details of this study with them.

If you are under 18 years of age, you are eligible to take part however, we encourage you to discuss your participation with a parent/ carer/ supportive individual before consenting. It is your choice whether you do this or not, but we advise this, so you have someone aware that you are taking part and who can offer you support following this if required.

What would taking part involve?
Once agreeing to take part, you will be asked to complete an online survey which involves a small number of questionnaires. You can use your phone, tablet, or computer to complete these. You will have as much time as you need to complete these, but we predict it may take around 15-30 minutes to complete all questionnaires. You can pause and come back to the survey at any time if you'd like to complete it in smaller time periods – do this by clicking the "*Finish later*" button. Your answers will only be submitted once you finish the survey.

The questionnaires will ask you for information about yourself, your thoughts and behaviours around eating and sexuality, and your feelings towards your body and your gender identity. If applicable, you will also be asked a few questions about any experiences you might have had receiving support for an eating disorder.

There are no right or wrong answers and so we would appreciate your openness when completing the questionnaires. Once you've finished the survey, you will be given an option to provide your email address if you'd like to 1) be entered into our prize draw to win one of five £20 Amazon vouchers as a thank you for your time, and/or 2) receive a summary of the study results once findings have been written up.

Do I have to take part?
No, your participation is entirely voluntary. After you have read this information sheet, you will be asked whether you give your consent to participate in our study.

Can I stop taking part if I change my mind?
Yes. If for any reason you no longer want to continue with the survey, then you exit from the survey at any time. There will be no consequence of you doing so and you will not need to give any reason as to why. If you have completed any previous parts of the survey before deciding you no longer want to continue, then your answers will not be saved or submitted. However, once you have submitted your answers, you will not be able to withdraw these from the study.

What are the possible disadvantages or risks of taking part?
This research will ask you questions about the topics described above. It is therefore possible that these could cause you distress either during or after you have completed the survey, depending on your own thoughts, feelings, and personal experiences. If this is the case, we encourage you to consider contacting one of the organisations provided either below or on the Debrief sheet (given once you've completed the survey), for further support. If you become distressed during the study, you can also exit the study at any time.

BEAT Eating Disorders
Helpline (*open 365 days a year from 12pm-12am during weekdays, and 4pm-12am on weekends and bank holidays*):
0808 801 0677 (England), 0808 801 0432 (Scotland),
0808 801 0433 (Wales), 0808 801 0434 (Northern Ireland).
https://www.beateatingdisorders.org.uk – for resources, and support chatrooms

LGBT Foundation
Advice, Support & Information: 03453 30 30 30
https://lgbt.foundation – for information, resources, events, news etc.

Stonewall
Information Service Freephone (open 09:30-4:30, Monday to Friday): 0800 050 2020
https://www.stonewall.org.uk/help-and-advice - for information and resources

MIND – Mental Health Charity
Infoline: 0300 123 3393
https://www.mind.org.uk – for advice, resources, and general information

What are the possible benefits of taking part?
There are no 'direct' benefits to you taking part in this study, though there is opportunity to enter a prize draw as a thank you for your time. We hope that your participation will help lead to a better understanding of the research topic and as a result help to guide our current clinical services to
better support transgender and/or gender non-conforming individuals experiencing eating-related difficulties.

Will this impact my future care?
Your future care will not be impacted by taking part in this study. This research is separate to any care you may currently be receiving or may receive in the future. Your care providers will not be aware of your participation in this study, or of any of your responses.

What will happen to the information I provide?
You will not be asked any information that could personally identify you, such as your name, address, date of birth etc. All data collected from the survey will be stored on an electronic file that is password protected and

can only be accessed by the primary researcher and supervisor. It will be stored in line with the Data Protection Act (1988) and UEA Policy and will be deleted after 10 years.
If you provide your email address at the end of the study (for the prize draw and/or to receive a summary of findings), only the main researcher (Molly Cross) will have access to this information.
Your email will be stored separately to your survey responses – there will be no way of linking the two together. These will also be stored on an electronic file that is password protected and will be deleted immediately after winners have been drawn and contacted, and the summary of findings have been distributed.

What will happen to the results?
The information collected from this survey will be analysed and findings will be written up and submitted as part of a Doctoral thesis in Clinical Psychology (UEA). This anonymous data and anonymous study findings may be shared with other researchers, published in academic/research journals and/or presented at conferences. This also means that your anonymous data may be obtained from this and then used by other researchers in further research. All information is collected anonymously and as a result anything reported will not allow for personal identification of those involved in the research.

Who is organising, funding, and reviewing this study?
This study is organised and funded by the Doctoral Programme in Clinical Psychology at the UEA. The UEA Faculty of Medicine and Health Sciences Research Ethics Committee have reviewed and approved this study (ETH2223-0066, 11th January 2023).

What if I want to get in touch?
If you have any questions, queries, concerns or just generally want to let us know about something relevant to the study – please feel free to contact me using the following details:
Molly Cross (Trainee Clinical Psychologist, Primary Researcher)
Doctoral Programme in Clinical Psychology, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ. Email: Molly.Cross@uea.ac.uk

Alternatively, please feel free to contact my supervisor, and joint researcher:
Dr Aaron Burgess (Research Supervisor and Clinical Lecturer in Clinical Psychology)
Doctoral Programme in Clinical Psychology, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ. Email: Aaron.Burgess@uea.ac.uk

Or a member of course staff independent to the study:
Dr Peter Beazley (Deputy Programme Director for UEA Clinical Psychology Doctorate programme)
Doctoral Programme in Clinical Psychology, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ. Email: P.Beazley@uea.ac.uk

Please note that these email addresses are not to be used if you are seeking immediate support following survey completion for example, due to distress. It is unlikely that we will be able to respond in a timely manner and do not want you waiting for any support you might need. As a result, please do use the websites and organisations provided above for support.

Appendix Q: Consent Form

University of East Anglia

Research study examining the relationship between eating difficulties and sexuality within the transgender and gender non-conforming youth and young adults.

Researchers: Molly Cross (Trainee Clinical Psychologist, Primary Researcher), Dr Aaron Burgess (Primary Research Supervisor), Professor Sian Coker (Secondary Research Supervisor).

Please select '*I agree*' as appropriate if you agree with each of the following statements:

I confirm that I have read and understood the participant information sheet (Version 3, December 2022), for the above study, on the previous page. I have had time to think about the information, understand the advantages and disadvantages of taking part, and have been able to ask any questions I have about taking part.

☐ I agree

I understand that my participation is entirely voluntary and that I am free to withdraw at any time (before I submit my responses), without giving reason and with no consequence.

☐ I agree

I understand what will happen to the anonymous information I provide, and who will be able to access this.

☐ I agree

I understand and give my consent for the publication of this research study's findings which have been concluded using the anonymous data I have provided, and that it will not be possible for me to be identified from this. I am aware that this also means my anonymous data may be obtained from this and then used by other researchers in further research.

☐ I agree

I agree to take part in this study.

☐ I agree

If you do not agree with any of the above items, then please exit the survey now. You may return at a later date should you wish.

If you have any outstanding questions that you would like answered or wish to discuss any element of the study with the researcher, before participating, then please feel free to contact me by emailing: molly.cross@uea.ac.uk.

Appendix R: Prize Draw and Research Findings Summary – Contact Detail Request Sheet

Thanks again for taking part in this survey. We would like to show our thanks by giving you the opportunity to enter a prize draw to win one of five £20 Amazon vouchers.

We also want to give the opportunity for you to receive a copy of the study's findings, following completion of data analysis and write up.

Please note that your email address will be kept **separate** to your survey responses. There will be no way of linking the two together.

Please provide your email address in the box below, and then tick the boxes below as appropriate:

[Open text box to provide email address]

- ☐ I would like to be entered into the prize draw to win one of five £20 Amazon vouchers
- ☐ I would like to receive a copy of the study's findings upon its completion

Appendix S: Debrief Sheet

Thank you for giving your time to support this research – it is appreciated!

It is hoped that from this research, we will deepen our understanding of the relationship between eating difficulties/ disorders and sexuality, in those who identify as transgender and/or gender non-conforming. We also hope to gain insight into the influence that body image and gender dysphoria may have on this relationship. From this, we hope that we can build our understanding around why those who identify as transgender and/or gender non-conforming may develop eating difficulties, and what may influence and maintain this. This may also suggest considerations that may need to be considered in the treatment of eating difficulties and disorders within this community.

We also hope that by gaining an initial understanding around the attitudes transgender and/or gender non-conforming individuals hold regarding their experiences of receiving support from eating disorder services, whether gender identity is considered during treatment and whether this would be helpful, and potential barriers associated with discussing gender identity with healthcare providers.

Again, we **thoroughly** appreciate the time you've given to complete this survey.

If you have experienced any distress as a result of taking part in this study, then we encourage you to consider contacting one of the organisations as listed below for further support, or to reach out to a supportive friend or family member. If you feel you are experiencing significant distress, we advise for you to contact your GP.

BEAT Eating Disorders
Helpline (*open 365 days a year from 12pm-12am during weekdays, and 4pm-12am on weekends and bank holidays*):
0808 801 0677 (England),
0808 801 0432 (Scotland),
0808 801 0433 (Wales),
0808 801 0434 (Northern Ireland).
https://www.beateatingdisorders.org.uk – for resources, and support chatrooms

LGBT Foundation
Advice, Support & Information: 03453 30 30 30
https://lgbt.foundation – for information, resources, events, news etc.

Stonewall
Information Service Freephone (open 09:30-4:30, Monday to Friday): 0800 050 2020
https://www.stonewall.org.uk/help-and-advice - for information and resources

MIND – Mental Health Charity
Infoline: 0300 123 3393
https://www.mind.org.uk – for advice, resources, and general information

If you are interested in entering the prize draw for the opportunity to win one of five £20 Amazon vouchers, and/or you would like to receive a copy of the research findings once completed, please follow this link: [Insert separate survey link here]. Here you will be asked to supply your email address. We want to remind you that your email address will be securely stored, separate to your survey responses. There will be no way of linking the two together.

In the case that you would like to discuss any aspect of the study, please do not hesitate to contact:

Molly Cross (Trainee Clinical Psychologist, Primary Researcher)
Doctoral Programme in Clinical Psychology, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ. Email: Molly.Cross@uea.ac.uk

Alternatively, please feel free to contact my supervisor, and joint researcher:
Dr Aaron Burgess (Research Supervisor and Clinical Lecturer in Clinical Psychology)
Doctoral Programme in Clinical Psychology, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ. Email: Aaron.Burgess@uea.ac.uk

Or a member of course staff independent to the study:
Dr Peter Beazley (Deputy Programme Director for UEA Clinical Psychology Doctorate programme)
Doctoral Programme in Clinical Psychology, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ. Email: P.Beazley@uea.ac.uk

Appendix T: The University of East Anglia's Faculty of Medicine and Health Sciences Research Ethics Subcommittee Approval (ETH2223-0066, 11th January 2023).

University of East Anglia
Norwich Research Park
Norwich. NR4 7TJ

Email: ethicsmonitor@uea.ac.uk
Web: www.uea.ac.uk

Study title: Examining the Relationship Between Eating Difficulties and Sexuality, in Transgender and Gender Non-conforming Youth and Young Adults.

Application ID: ETH2223-0066

Dear Molly,

Your application was considered on 11th January 2023 by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee).

The decision is: **approved**.

You are therefore able to start your project subject to any other necessary approvals being given.

If your study involves NHS staff and facilities, you will require Health Research Authority (HRA) governance approval before you can start this project (even though you did not require NHS-REC ethics approval). Please consult the HRA webpage about the application required, which is submitted through the IRAS system.

This approval will expire on **29th March 2024**.

Please note that your project is granted ethics approval only for the length of time identified above. Any extension to a project must obtain ethics approval by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) before continuing.

It is a requirement of this ethics approval that you should report any adverse events which occur during your project to the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) as soon as possible. An adverse event is one which was not anticipated in the research design, and which could potentially cause risk or harm to the participants or the researcher, or which reveals potential risks in the treatment under evaluation. For research involving animals, it may be the unintended death of an animal after trapping or carrying out a procedure.

Any amendments to your submitted project in terms of design, sample, data collection, focus etc. should be notified to the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) in advance to ensure ethical compliance. If the amendments are substantial a new application may be required.

Approval by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) should not be taken as evidence that your study is compliant with the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018. If you need guidance on how to make your study UK GDPR compliant, please contact the UEA Data Protection Officer (dataprotection@uea.ac.uk).

Please can you send your report once your project is completed to the FMH S-REC (fmh.ethics@uea.ac.uk).

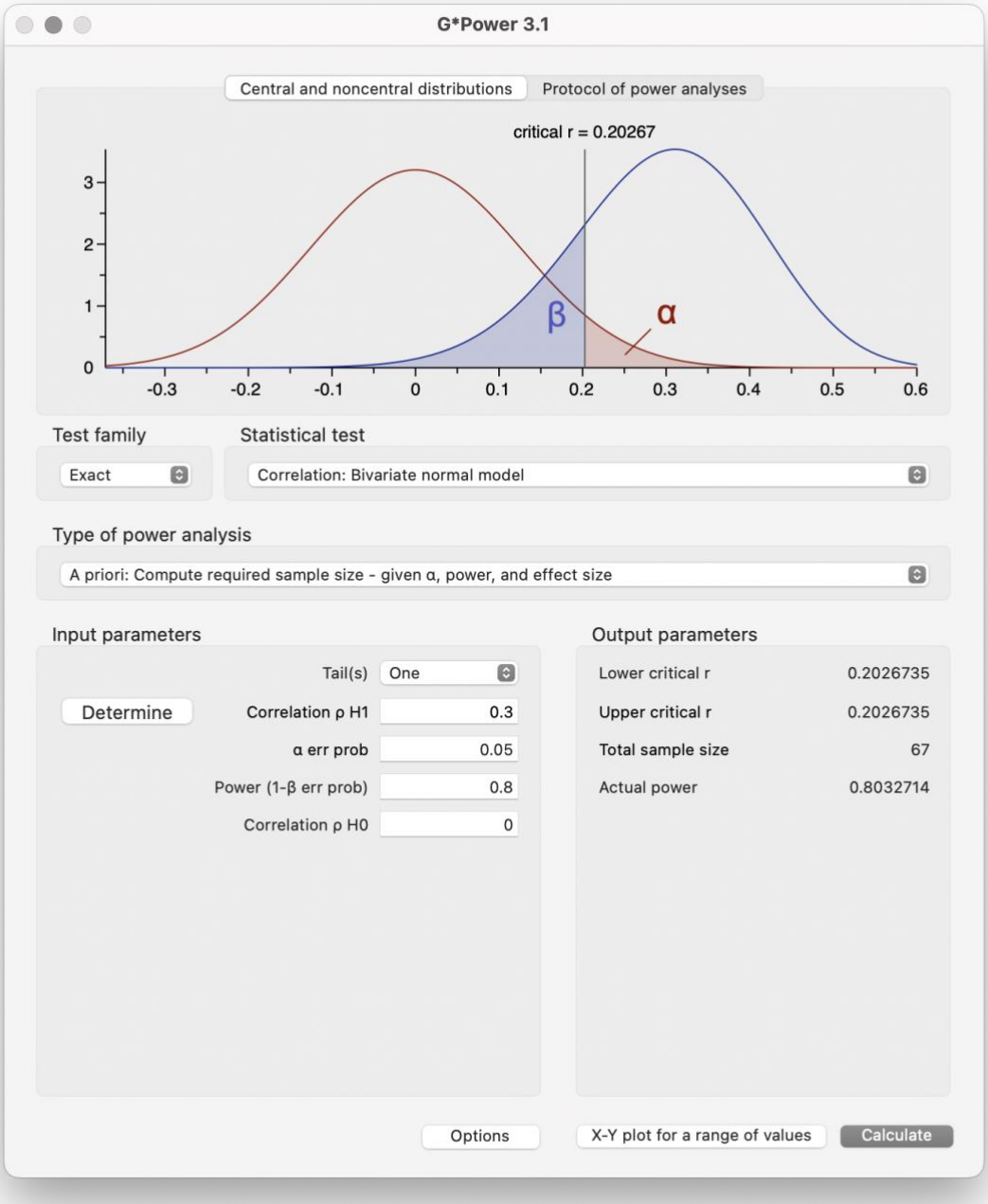
I would like to wish you every success with your project.

On behalf of the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee)

Yours sincerely,

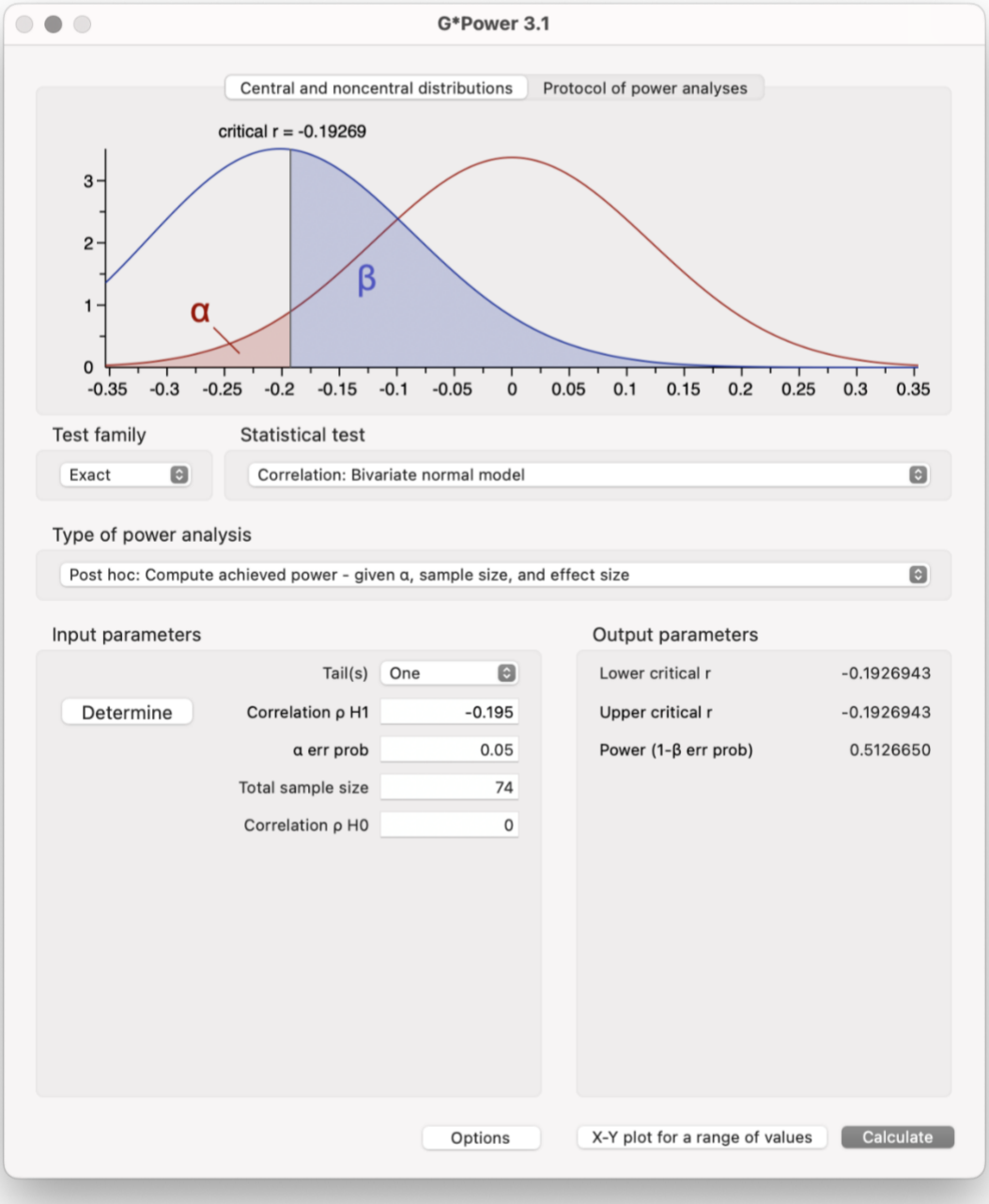
Paul Linsley

Appendix U: G*Power Screenshot – A Priori Sample Size Calculation for test of Correlation

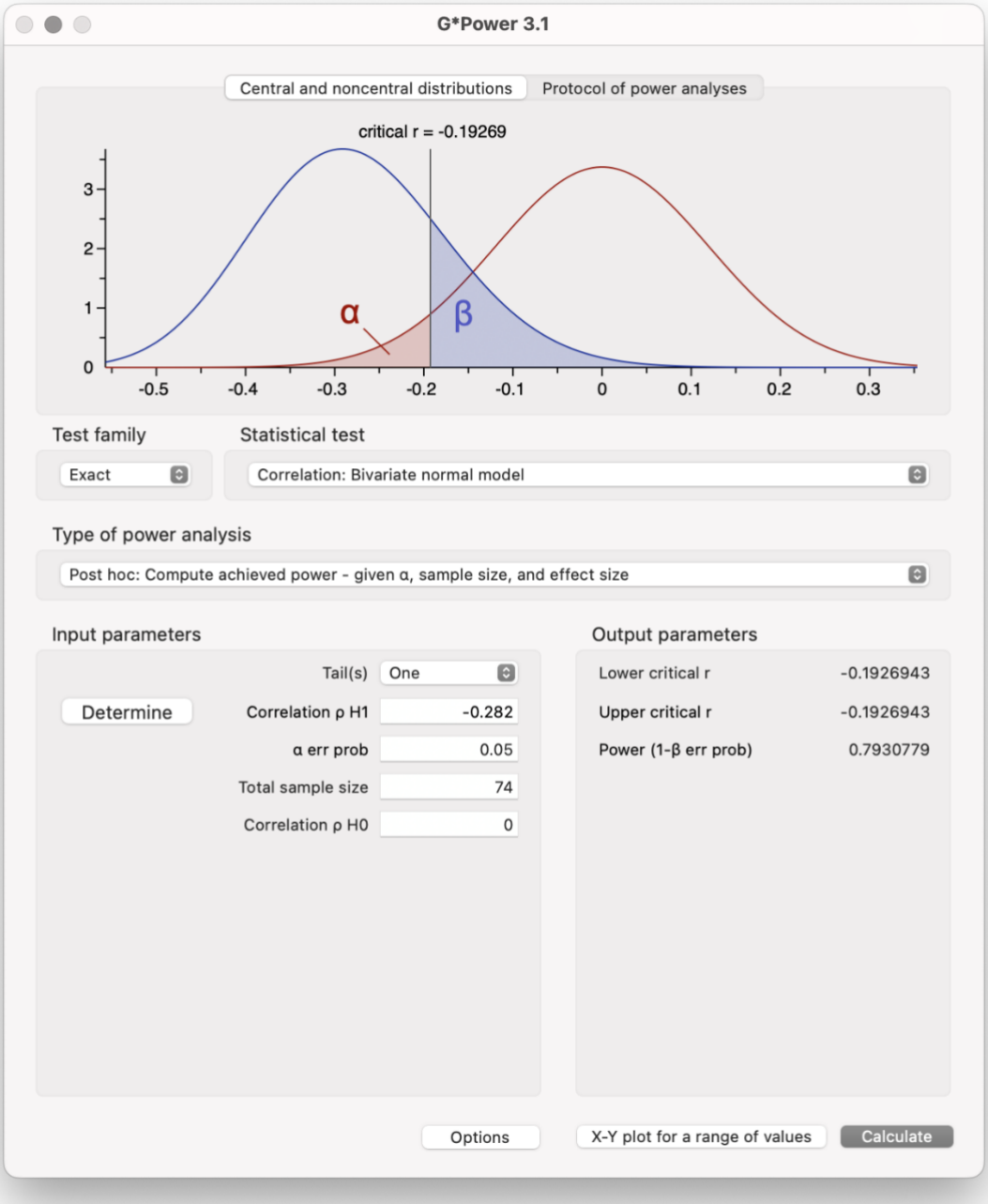


Appendix V: G*Power Screenshot – Post Hoc Power Analysis Calculation for Correlation Analysis of smallest and largest observed effect

Smallest -

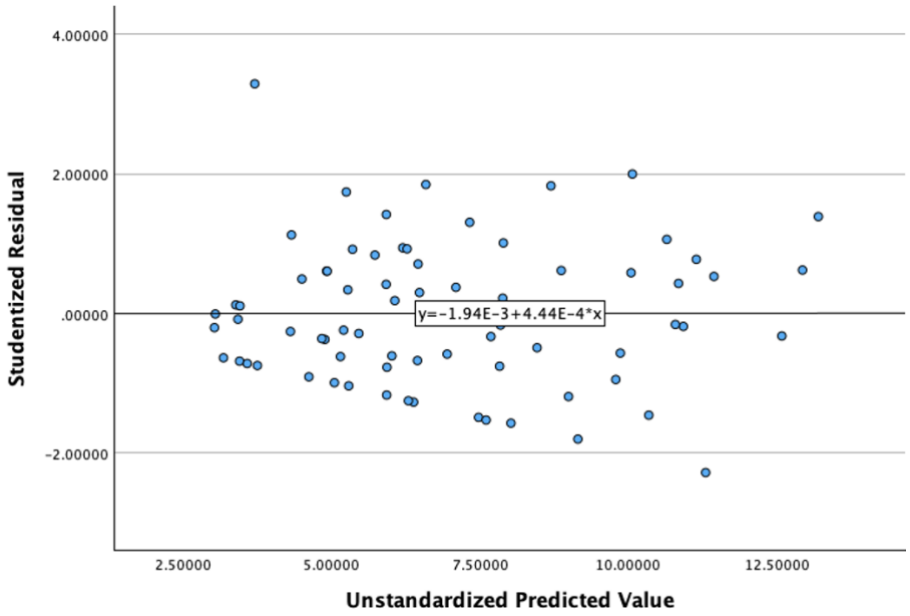


Largest –

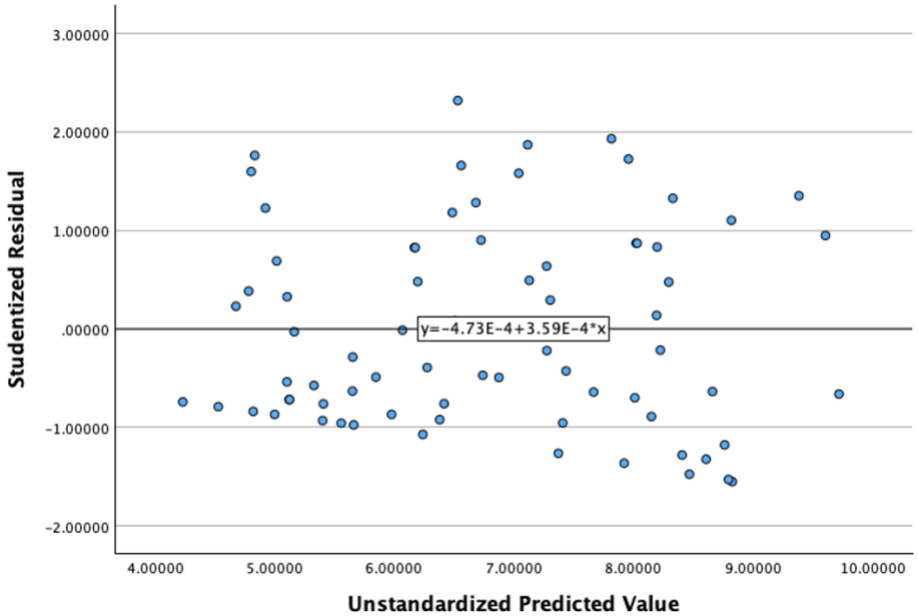

G*Power 3.1
Central and noncentral distributions
Protocol of power analyses
critical r = -0.19269
α
β
Test family
Exact
Statistical test
Correlation: Bivariate normal model
Type of power analysis
Post hoc: Compute achieved power - given α, sample size, and effect size
Input parameters
Determine
Tail(s) One
Correlation ρ H1 -0.282
α err prob 0.05
Total sample size 74
Correlation ρ H0 0
Output parameters
Lower critical r -0.1926943
Upper critical r -0.1926943
Power (1-β err prob) 0.7930779
Options
X-Y plot for a range of values
Calculate

Appendix W. Scatterplots of Residuals for Mediation Models

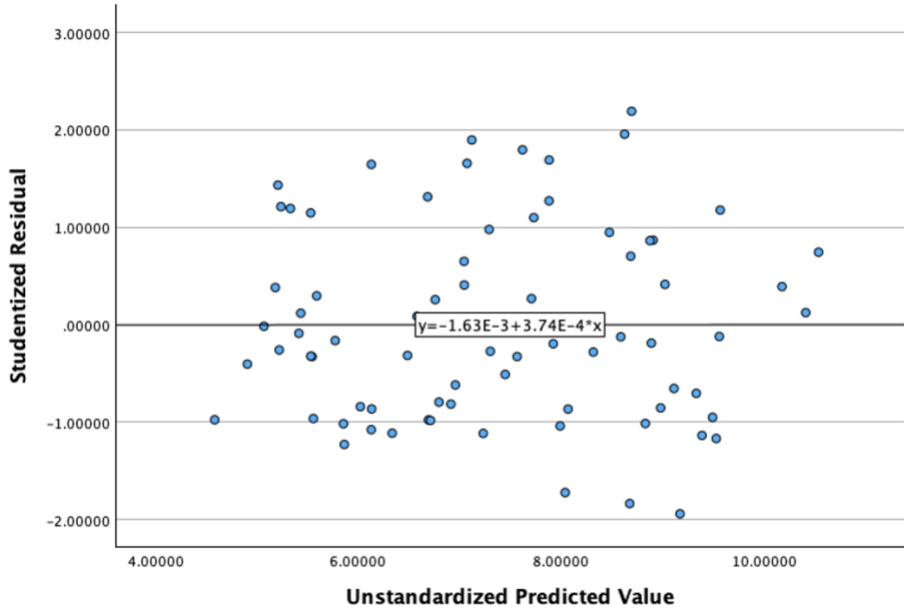
W1. *Scatterplot of Residuals for Mediation Model 1: Body Image as a Mediator of the Relationship between Eating Disorder Symptoms and Sexual Esteem.*



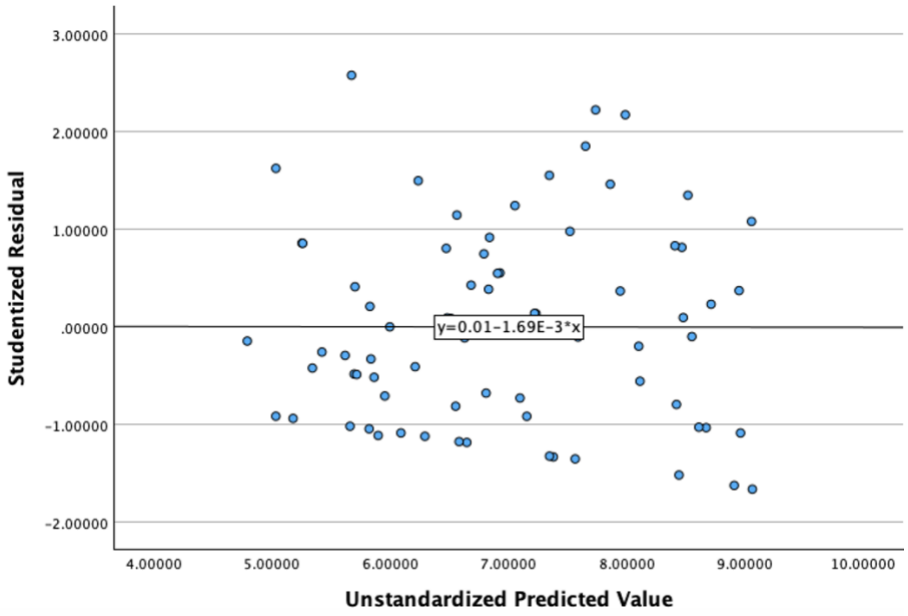
W2. *Scatterplot of Residuals for Mediation Model 2: Body Image as a Mediator of the Relationship between Eating Disorder Symptoms and Sexual Motivation.*



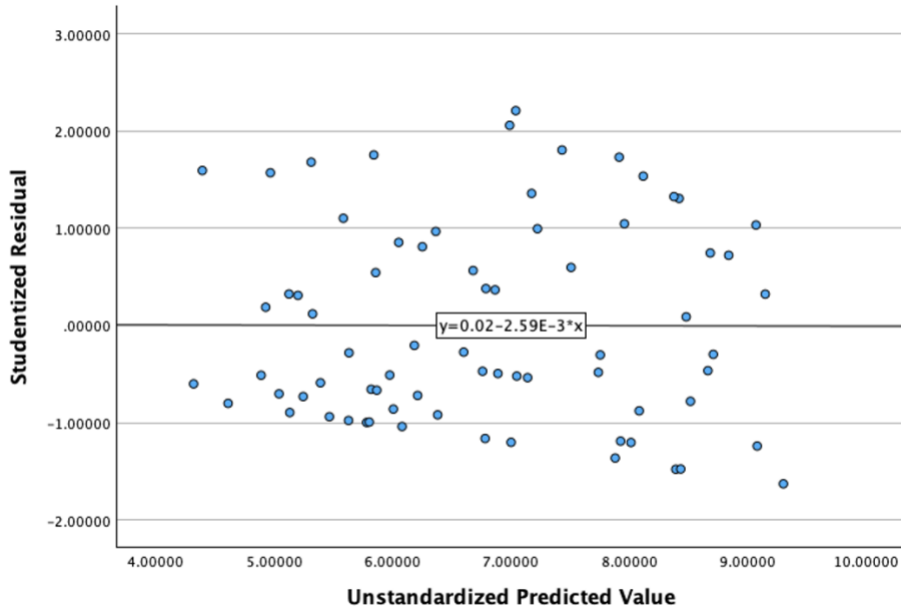
W3. *Scatterplot of Residuals for Mediation Model 3: Body Image as a Mediator of the Relationship between Eating Disorder Symptoms and Sexual Assertiveness.*



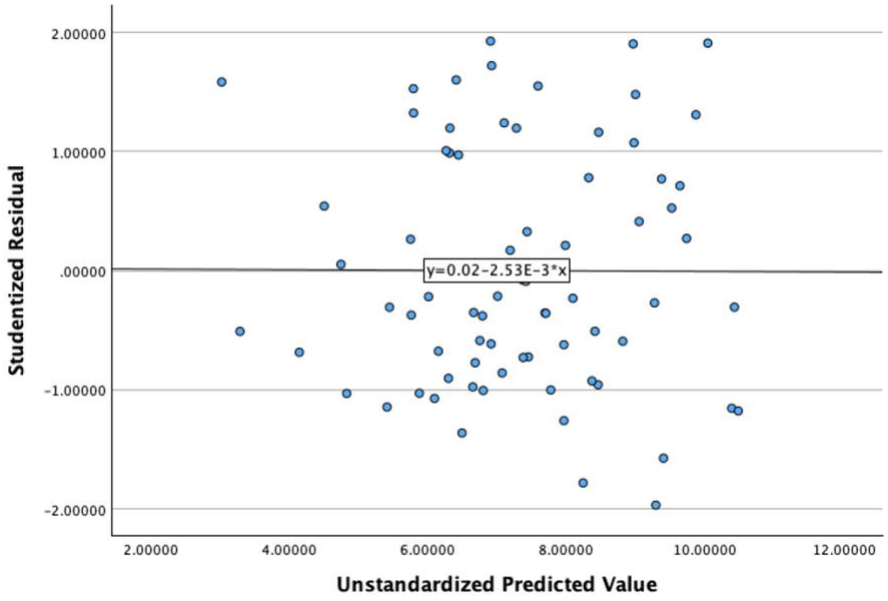
W4. *Scatterplot of Residuals for Mediation Model 4: Gender Dysphoria as a Mediator of the Relationship between Eating Disorder Symptoms and Sexual Esteem.*



W5. *Scatterplot of Residuals for Mediation Model 5: Gender Dysphoria as a Mediator of the Relationship between Eating Disorder Symptoms and Sexual Motivation.*

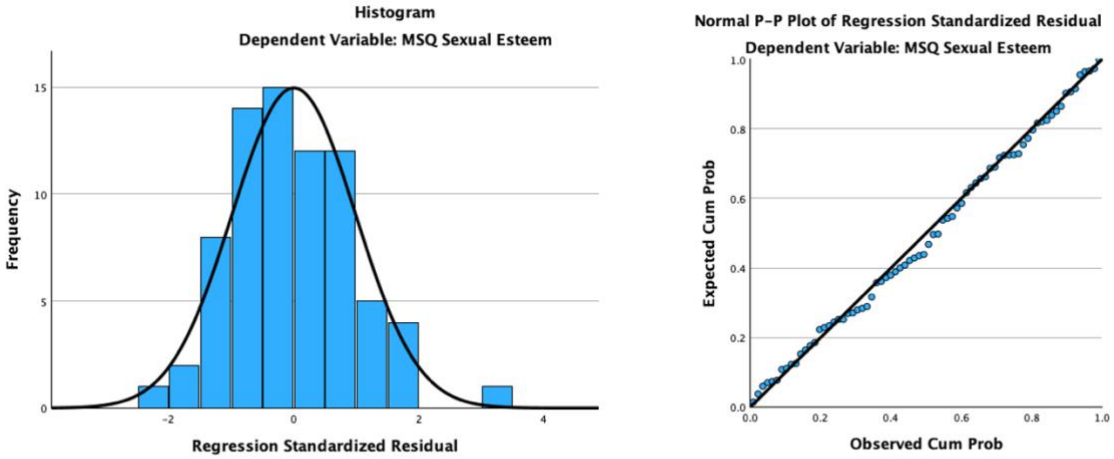


W6. *Scatterplot of Residuals for Mediation Model 6: Gender Dysphoria as a Mediator of the Relationship between Eating Disorder Symptoms and Sexual Assertiveness.*

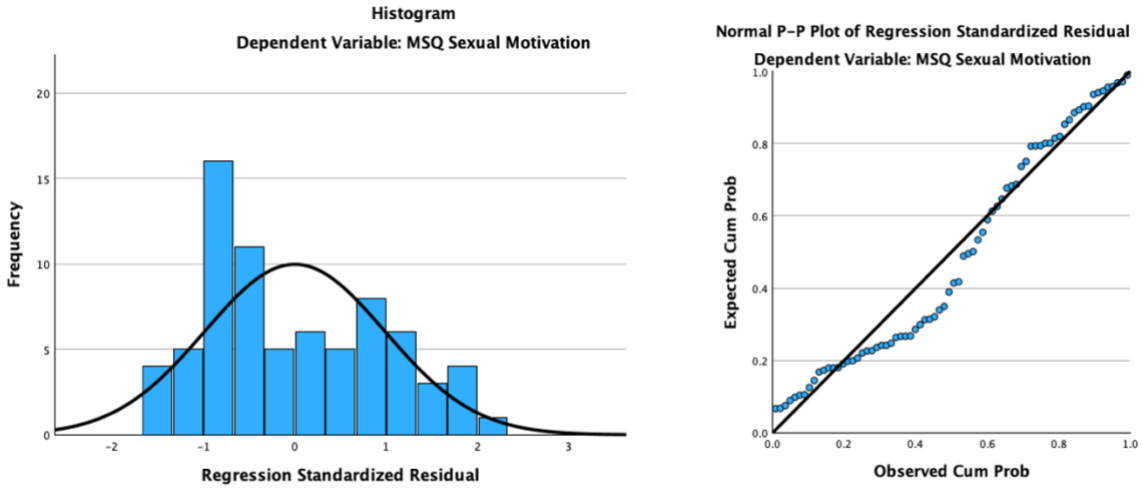


Appendix X. Histograms and P-P Plots visually inspected to test for normality in Mediation Models

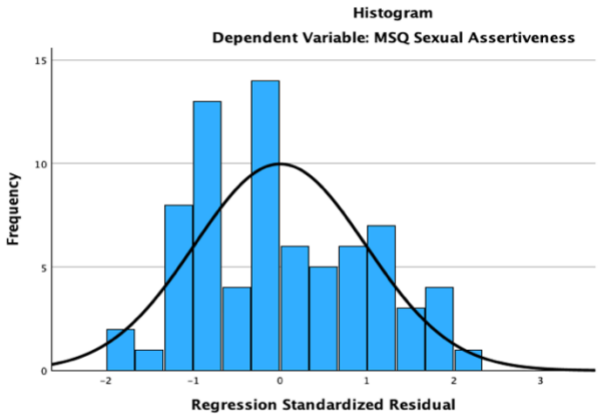
X1. *Histogram and P-P Plot for Mediation Model 1 (body image as a mediator of the relationship between ED symptoms and sexual esteem).*

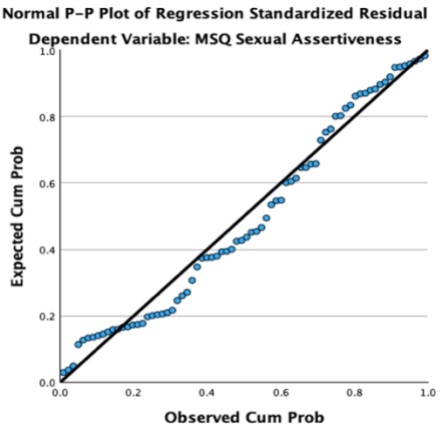


X2. *Histogram and P-P Plot for Mediation Model 2 (body image as a mediator of the relationship between ED symptoms and sexual motivation).*

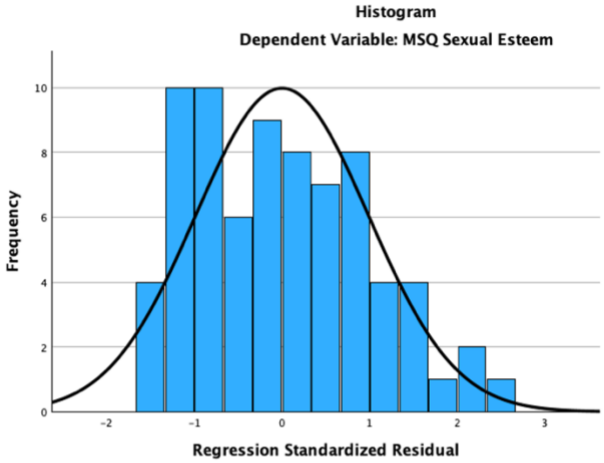


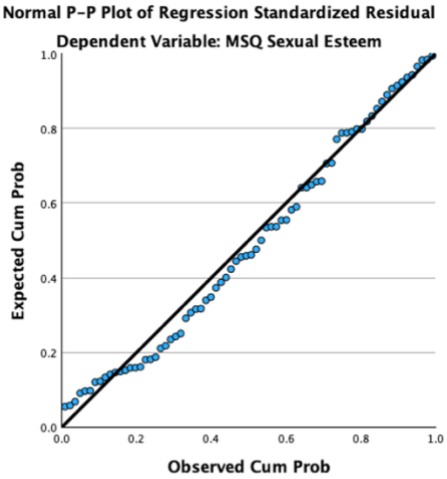
X3. *Histogram and P-P Plot for Mediation Model 3 (body image as a mediator of the relationship between ED symptoms and sexual assertiveness).*



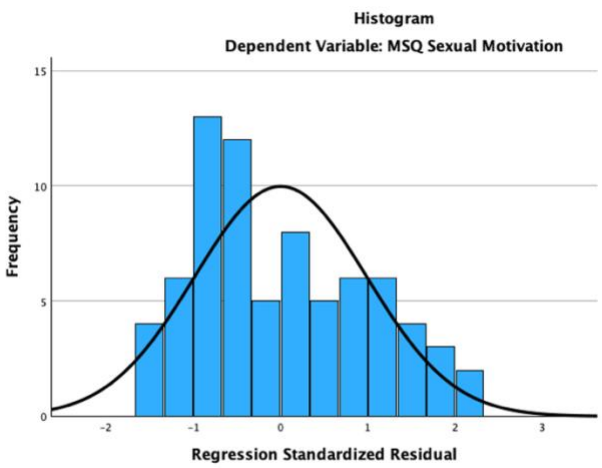


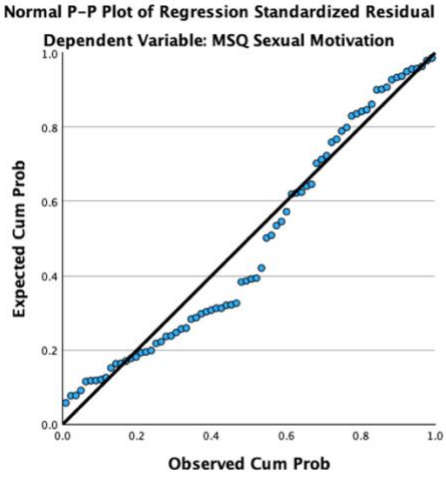
X4. *Histogram and P-P Plot for Mediation Model 4 (gender dysphoria as a mediator of the relationship between ED symptoms and sexual esteem).*





X5. *Histogram and P-P Plot for Mediation Model 5 (gender dysphoria as a mediator of the relationship between ED symptoms and sexual motivation).*





X6. *Histogram and P-P Plot for Mediation Model 6 (gender dysphoria as a mediator of the relationship between ED symptoms and sexual assertiveness).*