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University of Southampton

Faculty of Environmental and Life Sciences

School of Psychology

**Sexual and mental wellbeing of non-binary populations: individual factors
and overlapping identities.**

Fraedan Mastrantonio

ORCID ID 0000-0002-9348-5427

Thesis for the degree of Doctor of Philosophy

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Abstract

Faculty of Environmental and Life Sciences

School of Psychology

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Sexual and mental wellbeing of non-binary populations: individual factors and overlapping identities.

by

Fraedan Mastrantonio

Non-binary people's identities defies binary understandings of gender, expanding beyond the men-women dichotomy. While quantitative studies including non-binary individuals have become more common, research often still fails to fully represent non-binary people's experiences. Moreover, non-binary people are often considered as a monolith, which fails to represent the variety of individual factors and overlapping identities that might contribute to sexual and health outcomes. The present thesis explores non-binary people's sexual and mental wellbeing, while accounting for overlapping identities, particularly the overlap between being gender-diverse and autistic.

Study 1 is a systematic review of non-binary people's sexual health and wellbeing, synthesising 44 quantitative papers. Studies 2 and 3 are survey-based exploratory studies. Study 2 included 822 participants, of whom 462 were non-binary, and looked at sexual wellbeing and sexual/ relationship satisfaction. Study 3 focused on autistic non-binary identities and included 461 non-binary participants, of whom 265 (57.5%) were autistic. This study is the first to explore sexual wellbeing, mental health and camouflaging in a non-binary autistic sample. The systematic review highlights gaps within the literature, with very few papers exploring satisfaction and sexual wellbeing with non-binary participants. This study also indicates that non-binary people are often excluded or grouped with binary trans people for inferential analysis. Lastly, it shows that most studies with non-binary people fail to report information linked to other minoritised statuses or separate demographic information.

In Study 2, non-binary people were found to have similar levels of sexual satisfaction and wellbeing to binary trans people, but reported significantly lower scores compared with binary cisgender people. Many demographic factors were associated with sexual outcomes, including being autistic or asexual, which were both associated with higher sexual wellbeing among non-binary people. Overall, sexual fluidity and having a physical disability and/or chronic health condition were associated with lower wellbeing and satisfaction among the non-binary participants, while being in a relationship and having transitioned socially and/or medically were linked to better sexual outcomes. Study 3 highlights higher scores of camouflaging for non-binary autistic people compared to non-binary non-autistic participants; however, similar scores for anxiety, depression and lifetime suicidal ideation were reported. Lower depression was linked to higher sexual wellbeing and higher camouflaging. Higher camouflaging was also linked to higher anxiety levels. However, sexual wellbeing was not associated with camouflaging. This is a novel result requiring further investigation. Together, the findings highlight disparities among gender-diverse and cisgender individuals in relation to sexual outcomes, while also pointing to the resilience of gender minority individuals and their partnerships. Concurrent minoritised statuses appear to shape wellbeing in unpredictable and complex ways, indicating the importance of considering other identities and demographic factors when investigating the sexual and mental health of non-binary people.

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Research Thesis: Declaration of Authorship

Print name: Fraedan Mastrantonio

Title of thesis: Sexual and mental wellbeing of non-binary populations: individual factors and overlapping identities.

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;

2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;

3. Where I have consulted the published work of others, this is always clearly attributed;

4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;

5. I have acknowledged all main sources of help;

6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;

7. Parts of this work have been published as:

Mastrantonio, F., Griffiths, D. A., Kovshoff, H., & Armstrong, H. L. (2025). Sex Beyond the Binary: An Exploratory Analysis of Non-Binary Sexuality and Partnerships. *The Journal of Sex Research*, 1-15. <https://doi.org/10.1080/00224499.2025.2507151>

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Signature: Date:.....

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Definitions and Abbreviations

AFAB..... Assigned female at birth.

Agender A person who rejects gender categories or does not identify with any gender (LGBTQIA Resource Center Glossary, 2015)

AMAB..... Assigned male at birth.

Biological sex Biological sex is linked to biological characteristics, and is assigned at birth, normally on the basis of external genitalia presented by the individual (American Psychiatric Association, 2017). In this manuscript, I will use gender when referring to an individual's identity, and sex in the context of birth assignation.

Cisgender (cis) An individual whose gender identity aligns with their assigned-at-birth sex.

Cisgenderism..... Discriminatory assumption that all individuals are cisgender, that gender is binary and that it is possible to infer gender identity based on appearance (Ansara & Hegarty, 2014; Lindqvist et al., 2021).

Cisnormativity..... Idea that sex must be aligned with gender identity, including assumptions about body parts based on gender identification (Lindqvist et al., 2021).

Gender Social construct associated with feelings, attitudes or behaviours that are culturally linked to being assigned a specific sex at birth (Lindqvist et al., 2021).

Gender-diverse Within this thesis, gender-diverse is used to describe trans and non-binary people.

Gender dysphoria.... Strong sense of discomfort and distress experienced due to the discrepancy between the individual's current gender identity and assigned-at-birth sex (American Psychiatric Association, 2013).

Gender identity Individuals' internal sense of their gender as a man, a woman or a different gender, but also individual's awareness of existing along or outside the gender spectrum (e.g., Clarke, 2022; Matsuno & Budge, 2017; Singh & Dickey, 2017).

Neuroaffirmative Practices based on the Neurodiversity Paradigm, aimed at depathologising neurodivergent characteristics and empowering neurodivergent people (British Psychological Association, 2024)

Neurodivergent This word was initially coined by autism rights activist Kassiane Asasumasu to indicate individuals characterised by non-typical neurocognitive functioning (Walker, 2021). This term includes, but is not limited to, autistic individuals, ADHDers, and people with brain injuries, psychiatric diagnoses, and/or learning disabilities (Shew, 2024).

Neurotype..... Within the neurodiversity paradigm, a term that describes individuals' neurology, and specifically how different individuals process and understand stimuli and experience their reality (Walkers, 2021).

Neurotypical Individuals whose neurocognitive functioning is in line with cultural and societal standards and expectations (Walkers, 2021).

Pansexual A sexual orientation where the individual is attracted to other people regardless of their gender.

Queer A label reclaimed by the LGBTIQ+ community, often used as a way to disassociate from other more specific classifications of one's gender or sexual or romantic orientation (Stonewall, n.d).

Sex-assigned-at-birth (SAAB).....At birth sex designation, based on genitalia or known sex-markers (e.g., chromosomes), usually binary – either female or male (Clarke, 2022).

Transgender (trans)A person who does not identify with their assigned-at-birth-sex (American Psychological Association & National Association of School Psychologists, 2015). A transgender person may have a binary (i.e., man or woman) or non-binary gender identity.

Chapter 1 General introduction

1.1 Structure of This Thesis

In Chapter 1, I will define the word “non-binary”, I will introduce sexual and health-related constructs of interest for this thesis, and I will highlight current literature findings and gaps. Afterwards, I will discuss the relevance of overlapping identities when addressing non-binary people’s wellbeing and health, and specifically why I decided to investigate being non-binary and autistic. Lastly, I will highlight my overall aim for this PhD project, the rationale and methodological aspects of the three included studies. Chapter 2 (Study 1) contains a systematic review looking at 12-years of quantitative research looking at sexual variables in non-binary people. Chapter 3 (Study 2) includes a quantitative explorative study looking at overlapping minoritised identities, demographic factors and to non-binary people’s sexual outcomes. In this study, I also compared non-binary people’s sexual wellbeing, sexual and relationship satisfaction levels to those of binary cisgender and binary transgender people. Chapter 4 (Study 3) is the first quantitative explorative analysis of autistic non-binary people’s sexual wellbeing and mental health and camouflaging. Lastly, Chapter 5 contains the general discussion for this thesis, in which I will discuss novelty of this work, implications, strengths and limitations as well as future directions.

1.2 Topic and Rationale

Sexuality is a fundamental aspect of the human experience and is linked to a person’s wellbeing, identity, ability to experience intimacy and pleasure, and self-expression (World Health Organization [WHO], 2006; Gil-Llario et al., 2021). Sexuality is influenced by individual (i.e., biological and psychological) and societal (e.g., political,

historical, cultural, social, interpersonal and relational) factors (WHO, 2006).

Additionally, the concept of sexual health is broad and links to a state of wellbeing in relation to sexuality that encompasses the physical, emotional, mental, and social life of the individual, and their ability to engage in safe and pleasurable sexual practices that respect their sexual rights (WHO, 2006).

Regardless of these expansive and widely referred to definitions, studies on gender-diverse people have historically and predominantly focused on the presence of dysfunction or disease, at-risk behaviours, and negative health outcomes, with only a small proportion of this research being inclusive of non-binary individuals (e.g., Delgado et al., 2017; Thammapiwan et al., 2022). Investigating other sexual variables (e.g., sexual orientation, wellbeing, satisfaction, etc.) when discussing the sexuality and sexual health of non-binary and transgender people is important to develop a clearer understanding of their needs and desires (Katz-Wise, 2014). Nonetheless, there are not many studies looking at such constructs, particularly quantitative ones. Additionally, such studies may disproportionately rely on measures that might not adequately represent non-binary people's experiences (Gerymski, 2021; Özer, et al., 2023).

Centring holistic understandings of sexuality and shifting the focus to experiences of sexual wellbeing and satisfaction might help to develop a more nuanced understanding of the sexuality of gender-diverse populations. At the same time, non-binary identities are often grouped with binary trans identities within sex and health research, however conflating people with different gender identities might impact our understanding of the specific health needs of these different populations (Smalley et al., 2016). Lastly, although awareness is emerging in relation to the fact that non-binary people might have multiple marginalised identities (as proved by papers discussing how non-binary individuals are often both a gender and sexual minority, such as Burgwal et al., 2019),

research investigating how these individual factors link to health and sexual outcomes is lacking. For instance, research strongly points to overlaps between autistic and gender-diverse identities (e.g., Bölte et al., 2023; Pecora et al., 2020); however, little research looks at health and sexual-related outcomes among non-binary autistic adults specifically (e.g., White et al., 2024). Overall, researchers have noted a problematic lack of empirical data when it comes to individuals who do not fit within societal binaries (Herek, 2016). While representation within research has improved in the past 15 years, the scope of literature involving trans and non-binary people remains narrow (Matsuno & Budge, 2017). Non-binary individuals participating in quantitative studies are often not provided with appropriate response options to describe their experiences (for instance, there might not be a way to express one's gender identity as non-binary). Further literature on the sexuality and health of non-binary people, as well as research that focuses on overlapping minoritised identities (especially autistic identity) is necessary in order to give voice to the experiences of different groups of people existing within the non-binary umbrella. Through this research project, I sought to better understand and represent non-binary people's sexuality, sexual wellbeing and mental health, while giving space to the notion that non-binary individuals are not a monolith, and are often minoritised in multiple ways. More specifically, I wanted to investigate whether minoritised identities highlighted within literature, particularly autistic identity, held significance in relation to sexual and mental health outcomes through quantitative methods.

1.2.1 Defining the Word “Non-binary”

Within this thesis, the term non-binary (or nonbinary) refers to individuals whose gender identity is better represented outside the more common binary categorisation of men-women (Richards et al., 2016; Valentine 2016; Ziemińska, 2022). Overall, non-

binary people's existence challenges the very idea that every individual must fit within a binary understanding of gender. Gendered experiences for non-binary individuals vary widely, with some people identifying with being multiple genders at the same time, alternating between different genders, or with experiencing an absence of gender identity (American Psychological Association, 2015; Matsuno & Budge, 2017; Valentine 2016; Vijlbrief et al., 2020; Ziemińska, 2022). Non-binary people are a diverse group, and different non-binary individuals might use different pronouns (or no pronouns), as well as different gender identity labels, such as genderqueer, or agender (American Psychological Association, 2015; Matsuno & Budge, 2017; Twist & de Graaf, 2019).

While the existence of non-binary people in Western society can seem a recent phenomenon, other cultures have historically recognised more than two genders (Armstrong, 2021). Historically, non-binary gender identities were celebrated and incorporated within the traditional cultures in which they existed (Matsuno & Budge, 2017). Although this is not the focus of this thesis, it is important to note that through the 17th and early 18th centuries, European colonialism imposed a binary gender system and the separation of the two recognised sexes (Graaff, 2024; Lugones, 2007).

Within colonised countries (in Africa, Latin America, North America and Asia), this damaged communities and oppressed individuals that challenged conformity, including those that defied European canons of sex and gender (Graaff, 2024; Lambert, 2016; Lugones, 2007). This has created long-standing struggles for gender-diverse individuals around the world. For instance, gender-diverse individuals in India existed for centuries and were socially recognised and respected before British colonialism resulted in profound social-economic and health disparities, as well as marginalisation and criminalisation, of Hijra and Kinnar communities (Dutta et al., 2023).

1.2.1.1 Prevalence of Non-binary People Within Western Context

Considering the prevalence of non-binary people within Western contexts, estimates are varied. A fairly recent American study with a probability sample of LGBTQ (lesbian, gay, bisexual, transgender, queer or questioning) individuals, estimated that 11% of the LGBTQ adult population in the US may identify as non-binary (Wilson & Meyer, 2021). Within the UK, it has been reported that among the LGBT (lesbian, gay, bisexual, transgender) responders to a large 2019 national survey, 13% identified as transgender and of those, around 7% were non-binary (UK Government, 2019). With respect to census data, the 2021 UK census for England and Wales showed that 0.06% of the 45.4 million respondents to the gender question, or roughly 30,000, identified as non-binary¹ (Office for National Statistics, 2023), while data pertaining to the 2022 Scottish census show that 19,990 people above the age of 16 reported being trans, of which almost half (45.2% or 9,030) reported being non-binary (Wroth-Smith, 2024). Lastly, the Canadian 2021 census data show that among individuals 15 or older, 0.14% or 41,335 were non-binary (Statistics Canada, 2022). The number of non-binary individuals may be increasing over time, as supported by the Canadian 2021 census data, showing that millennials (born in the eighties and early nineties) and gen-zers (born in the late nineties and early two-thousands) were seven times more likely to identify as non-binary compared to older generations (Statistics Canada, 2022). In addition to this, the UK census data show that younger respondents (aged 16 to 24) included the highest proportion of non-binary people, and that four out of five non-binary respondents were between 16 and 34 years old (Office for National Statistics,

¹ The UK data relating to England and Wales has since been dis-accredited by to Office for National Statistics, and should be referred to as “official statistics in development” due to data indicating a link between gender identity and language proficiency (Office for Statistics Regulation, 2025)

2023). Despite this, research on the health of non-binary people, and especially sexual research that is inclusive of non-binary people, is sparse.

1.2.1.1 Gender Identity Within This Research

Researchers have noted the pervasiveness of gender within our culture and social life, while also pointing out how we constantly perform and create (or re-create) gender through interactions (Lorber, 1994). Gender is something we “do” recurrently and routinely within the social sphere; it is a social performance, and it is culturally connotated (West & Zimmerman, 1987). Gender exists at the intersection of one’s perception of gendered groups existing within the social sphere, feelings of being part or not a part of a specific gendered group (e.g., men, women, trans people, non-binary people), and internal perceptions around those feelings and experiences (Edgan & Perry, 2001; Fiani & Han, 2019). Gender is different from sex, which is assigned at birth and based on biological aspects (often genital appearance and chromosomes if known; e.g., American Psychological Association, 2015). More specifically, gender identity is often defined as an internal sense of being a man, woman or a different gender (American Psychological Association, 2015; Clarke, 2022).

The “norm-relevancy account” also describes gender identity in relation to the individual’s experiences of social norms that are associated with their gender in their specific social context, and as relevant to them specifically (Jenkins, 2018). Through this definition, Jenkins (2018) creates a “map” of gendered experiences. The author exemplified this idea through describing a space in which a man, a woman and a non-binary person all work, and highlighting how their experience of different spaces will be silently influenced by societal norms linked to their gender identity, making different spaces feel unsafe or uncomfortable (e.g., gendered toilets as the only options, where the non-binary person is unable to go), creating hostile environments, even when the

physical space is not explicitly gendered (e.g., meeting spaces where women are often talked over or belittled, communicating the message that women are not welcome; Jenkins, 2018). Gender identity maps are also intersectional, as different co-existing identities will influence experiences of social norms (Jenkins, 2018).

1.2.1.2 Non-binary People and Transgender Labels

Although people who identify as non-binary and people who identify as transgender are often grouped together for research purposes, literature has highlighted that not all non-binary individuals use the word transgender to self-describe (American Psychological Association & National Association of School Psychologists, 2015; Darwin, 2020; Wilson & Meyer; 2021). This could be for different reasons, such as perceiving a disconnect in experiences with binary trans people, or due to not feeling “trans enough”, that is, not feeling worthy of using “trans” as a self-descriptive label (Darwin, 2020). Indeed, not differentiating between binary and non-binary individuals in research could prevent us from properly addressing the specificities of these populations and their needs. For instance, when compared to binary trans people, non-binary individuals more often report concerns about obtaining desired results through “traditional” transition pathways (Galupo et al., 2021; Kennis et al., 2022a). More specifically, medical transition has the potential to change some aspects that cause distress are counterbalanced by the possibility of other issues arising (Galupo et al., 2021; Kennis et al., 2022a) i.e., taking testosterone hoping it will help with facial hair growth could have unwanted and/or dysphoria inducing side-effects for the person, such as lowering their voice. Additionally, some studies have pointed out differences in gender identity related experiences, mental health, sexual experiences and sexuality (e.g., Borgogna et al., 2019; Jones et al., 2019; Katz-Wise et al., 2016; Perez & Pepping; 2024), with non-binary people presenting distinct risk and resiliency factors (Fiani &

Han, 2019). Indeed, literature highlights that non-binary people may encounter specific challenges, such as navigating social and physical environments that do not take their existence into account and continually dismiss their identities (Matsuno & Budge, 2017), as well as feeling forced to conform to binary models while being unable (and unwilling) to perform gender as traditionally expected (Fiani & Han, 2019). Moreover, authors have pointed out how non-binary people might be affected by transnormativity and expectations about their transness, sometimes facing rejection and alienation within the wider trans community (Stone et al., 2020; Sumerau et al., 2020; Garrison, 2018).

Overall, conflating non-binary with binary trans individuals is problematic as it assumes that all gender-diverse individuals are the same or are similar enough to be grouped together, potentially erasing non-binary people's unique lived experiences (Fiani & Han, 2019).

1.2.2 Sexuality of Non-binary People

1.2.2.1 Sexual Wellbeing in Gender-diverse Populations: Main Definitions and Conceptualisations

The World Health Organization [WHO] defined Sexual Health as a fundamental aspect of the health of individuals, groups, communities and countries, requiring a positive approach to sexuality and the possibility to experience sexuality free of coercion, discrimination and violence through the access to comprehensive education, appropriate care and a supportive/affirmative environment (WHO, 2006). Sexual health is more than the lack of disease and dysfunction, describing a state of emotional, social and mental wellbeing (WHO, 2006). Lastly, sexual health is only possible when sexual rights (i.e., critical human rights such as being free from torture and inhumane

treatment, being able to access education, have privacy, make decisions about ones' body and life circumstances in relation to marriage, fertility, etc.) are respected (WHO, 2006).

Researchers have often acknowledged the revolutionary and positive impact that the WHO's definition of sexual health has had on research and practice, while also highlighting a fundamental conflation between the constructs of sexual health and sexual wellbeing that still persists within literature (Mitchell et al., 2021). Although sexual wellbeing is acknowledged in the World Health Organization sexual health definition (WHO, 2006), distinct elements of sexual wellbeing are not discussed in depth. Later, it was suggested that sexual wellbeing could be culture and context specific and be measured as "self-perceived sexual health" (Lewis et al., 2025; WHO, 2010b, p.4).

More recently, researchers have highlighted that sexual wellbeing should be conceptualised as a distinct and fundamental construct in relation to public health and a meaningful marker of overall wellbeing (Mitchell et al., 2021). Moreover, it should be seen as a fundamental aspect of sexual research and indicator of public health (Mitchell et al., 2021; 2025). Particularly, Sundgren and colleagues (2022) have highlighted the importance of applying holistic theoretical approaches to sexual wellbeing's definitions and operationalisation to capture individual and social influences on sexual wellbeing. Investigating sexual wellbeing might help to embrace approaches that do not solely focus on risk and negative sexual outcomes, but also consider positive and pleasurable aspects of sexuality (Mitchell et al., 2021).

Unfortunately, different authors have highlighted that the lack of a clearer, operational definition of sexual wellbeing creates issues with researching this construct

(Lorimer et al., 2019; Mitchell et al., 2021; Sundgren et al., 2022). Sexual wellbeing has often been conflated with sexual satisfaction, which can limit our understanding of broader aspects, beyond individual dimensions (Mitchell et al., 2025), such as the ability to freely express sexuality without being penalised and ostracised (Lorimer et al., 2019; Mitchell et al., 2025).

Measures for sexual wellbeing reflect a lack of consensus in relation to which construct dimensions should be assessed. For instance, Mitchell and colleagues (2021) observed that some measures reflect a unidimensional understanding of sexual wellbeing as an individual's overall evaluation of their sexual experiences, while other measures are multidimensional and include multiple different aspects, such as cognitive and emotional evaluations, satisfaction with one's sex life, satisfaction with function, body image, and/or sexual self-esteem. Other authors have highlighted the importance of individual aspects (e.g., psychological/biological) but also social and cultural influences on sexual wellbeing (Fitz & Zucker, 2014; Syme et al., 2019). Similarly, in their rapid review, Lorimer and colleagues (2019) highlighted a total of 59 different dimensions of sexual wellbeing existing within literature, which all fit under three main domains: 1) cognitive-affect (e.g., individual evaluations, thoughts and emotions); 2) interpersonal (e.g., relationship or sexual satisfaction, communication within a partnership); 3) sociocultural (e.g., presence of stereotypes or gender inequalities/norms impacting individuals' wellbeing).

Mitchel and colleagues (2021) developed five main principles that should guide sexual wellbeing conceptualisations: 1) sexual wellbeing should be clearly differentiated from other related concepts, such as sexual health and pleasure; 2) partnered or individual sexual activity should not be a requirement for sexual wellbeing; 3) this construct should apply to people who are unpartnered, as well as individuals

with different relationship structures; 4) conceptualisations of sexual wellbeing should be based on factors that can be improved through regulations, healthcare support, personal development; 5) focus should be on past and current individual experiences, as well as feelings about future sexual wellbeing (Mitchell et al., 2021). They went on to develop seven core domains of sexual wellbeing including: sexual respect, sexual safety and security, sexual self-esteem, resilience for past experiences, forgiveness in relation to past sexual events and feelings of comfort in relation to the individual's own sexuality (Mitchell et al., 2021). Although different individuals might give different weights to these aspects, the authors found that such domains were overall confirmed by accounts of participants' experiences (Mitchell et al., 2025), even when applied to individuals within the LGBTQ+ community, including a small number of gender minority participants (Kromojahjo et al., 2025).

Overall, Mitchell and colleagues (2021) highlighted that sexual wellbeing should encapsulate both the person's feelings and their appraisal of their sexuality and sexual experiences, as well as the broader social and cultural context. The social and cultural environment determines levels of acceptance of one's sexuality and identity and provision of support, which could influence wellbeing (Mitchell et al., 2021). This conceptualisation of sexual wellbeing would be particularly helpful in relation to marginalised individuals, as sexual wellbeing would constitute an indication of the impact that social injustices may have on the sexual outcomes of minoritised populations (Mitchell et al., 2021).

Considering gender-diverse individuals, and non-binary people more specifically, little research (especially quantitative research) is available. The existing research often medicalises trans identities by focusing excessively on sexual wellbeing in relation to medical transition or risk, missing out on the diversity of trans and non-binary

experiences (Dickenson et al., 2023). While medical transition access is vital, it is not the only factor contributing to trans and non-binary people's sexual wellbeing (Dickenson et al., 2023). Moreover, gender dysphoria has been used as a screening variable and requirement for participation in studies including trans and non-binary people, which has severely limited our understanding of gender-diverse individuals' experiences (Lindley et al., 2022). This is problematic because not all trans and non-binary people experience dysphoria in the same way or at all (Chen et al., 2020; Pulice-Farrow et al., 2020).

Although there is an overall lack of definition and of relevant measures that have been developed with gender-diverse people in mind, Gerymski (2021) has recently validated a multidimensional scale for sexual wellbeing on binary trans individuals. The author conceptualised sexual wellbeing as encompassing satisfaction with the frequency of one's sexual relations, lack of sexual distress, feelings of physical sexual gratification and pleasure, emotional fulfillment that comes from sexual activity, and the ability to express and realise one's sexual preferences within the social sphere (Gerymski, 2021).

A quantitative study focusing on sexual wellbeing in non-binary individuals (including 125 trans men, 72 trans women, 78 non-binary/genderqueer people, 98 cis men, and 107 cis women) found that non-binary people had lower scores for sexual esteem linked to body perception compared to cisgender people, but also lower levels of transgender-specific body worries compared to trans binary individuals (Kennis et al., 2022b). Lower levels of dysphoria experienced by non-binary trans people included in this sample could explain the lower scores on trans-specific body worries compared to trans binary people (Kennis et al., 2022b). A different quantitative study, including a sample of 141 trans masculine and assigned-female-at-birth non-binary adults who had

not accessed medical transition, conceptualised sexual wellbeing as the engagement and enjoyment of specific sexual acts (Lindley et al., 2022). The authors focused on the links between gender dysphoria and participation in sexual activity, finding that trans and non-binary participants were able to engage in a multitude of sexual acts (with different levels of enjoyment), and that experiences and impact of gender dysphoria on sexual wellbeing varied widely (Lindley et al., 2022).

Much literature has focused on investigating sexual wellbeing in gender minority individuals who are pursuing medical gender affirmation. For instance, in their qualitative study including 15 binary trans and non-binary adults going through medical transition, Özer and colleagues (2023) investigated individuals' perspectives of sexual wellbeing. Overall, participants highlighted the importance of feeling comfortable in their body and being able to experience intimacy with a partner, conceptualised both as finding physical and emotional connection with a sexual partner and in relation to physical pleasure and sexual exploration (Özer et al., 2023). The participants also highlighted the importance of love and support from family and partners, as well as wider societal acceptance within and outside queer spaces (Özer et al., 2023). Societal assumptions and heteronormative stereotypes in relation to gendered roles and behaviours in relation to sexuality were seen as potentially having a negative impact on trans people (Özer et al., 2023). Another qualitative study involving 21 trans and non-binary participants (only one non-binary person was included) between ages 16 and 70, at various stages of medical gender affirmation, focused on the impact of gender affirming treatment on sexuality (Ross et al., 2024). Participants highlighted that self-understanding made sexual experiences more fulfilling and discussed the impact of physical sexual function, arousal, and pleasure in relation to, but also separately from, gender affirming treatment (e.g., reduction of sexual desire for some transfeminine

people was perceived as positive and gender affirming; Ross et al., 2024). Participants pointed out that medical transition generally made physical arousal a more pleasurable and more wanted experience, in contrast with experiences of arousal prior to medical transition, when arousal was sometimes a reason for dysphoria (e.g., lubrication for trans masculine people; Ross et al., 2024). Trans people discussed the importance of positive communication with partners about sexual preferences to support pleasure and minimize dysphoria (Ross et al., 2024).

Taken together, these findings highlight a need for more research focusing on non-binary people's sexual wellbeing, expanding our focus beyond gender dysphoria or medical transition, and considering a plethora of factors and experiences – some specific to gender-diverse individuals, some more general.

1.2.2.1 Sexual Satisfaction

Sexual satisfaction is a fundamental aspect of an individual's sexual health and wellbeing (Henderson et al., 2009). Research on this construct has been mainly conducted in the context of cisgender individuals in heterosexual or same-sex relationships, finding that sexual satisfaction is linked with characteristics of sexual acts (such as frequency and duration of sex, frequency of orgasms), but also with sexual function and relationship satisfaction (Armstrong & Reissing, 2013; Byers, 2005; Henderson et al., 2009).

Qualitative research including non-binary people has highlighted some important aspects concerning sexual satisfaction and dissatisfaction for this population. Overall, studies have found a number of trans specific and non-specific factors that might influence satisfaction. For instance, a recent study involving 358 trans masculine and non-binary individuals (Lindley et al., 2020) found that difficulties in achieving

orgasm/physical pleasure, presence of trauma (e.g., past experiences of sexual assault and fear of future trauma through being fetishised), desire for different body parts or for more fluid gender expression during sex, gender dysphoria (which can impact the ability to stay present or engage in sex, a theme which was more often endorsed by binary trans people) and partner dynamics (e.g., partner not wanting to engage in sexual exploration or mismatches in desire level) were the main factors influencing sexual dissatisfaction in this non-clinical sample. In relation to partner involvement, non-binary participants reported more frequent struggles with fixed partners' ideas around gendered sexual roles and constraints imposed by sexual partners (Lindley et al., 2020). When the same sample responded to questions in relation to sexual satisfaction (Lindley et al., 2021), participants highlighted the importance of general enjoyment and of a supportive partner, not solely focusing on experiencing orgasm, but also pleasure from being touched, from sexually satisfying a partner, and from being able to experience emotional closeness, gender affirmation and openness with their partner. Some participants also found not engaging in partnered sexual activity as an important aspect of their sexual satisfaction, as well as engaging in masturbation (Lindley et al., 2021). Gender affirmation, medical transition and comfort with one's body were also relevant themes, with participants describing the importance of finding suitable sexual activities to accommodate their needs and reach satisfaction (Lindley et al., 2021). Overall, cited qualitative literature points to the importance of considering both trans-specific and universal contributors to sexual satisfaction and wellbeing.

Quantitative studies that have attempted to shed light on sexual satisfaction for non-cisgender people have done so in the context of medical transition and gender-affirming surgery results, limiting the concept of sexual satisfaction to the ability to orgasm or engage in penetrative sex after surgery (e.g., de Rooij et al. 2021; Zavlin et al.,

2018). Although a focus on genital sensitivity and orgasm ability may be appropriate in the context of post-operative care, this disproportionate focus on surgery outcomes is problematic, as it does not take into account the full scope of sexual experiences that gender-diverse people have, and tends to apply a cisnormative paradigm onto non-binary and trans people's sexuality. Additionally, studies of this kind often only focus on a specific subsection of individuals who have decided to and were able to access medical gender affirmation, and they tend to either not differentiate between non-binary and binary transgender individuals, or to only include the latter (Dyar et al., 2020). Overall, literature on sexual satisfaction is limited by medicalisation and by the assumption that gender affirming medical intervention is a prerequisite for gratification (Lindley et al., 2021). Future research should investigate differences between binary trans and non-binary individuals to better understand specific needs and potential differences (Lindley et al., 2020), while considering the experience of individuals that do not desire medical transition (Lindley et al., 2021), as well as decentring orgasm capability as the only marker of sexual satisfaction and physical pleasure (Dickenson et al., 2023).

1.2.2.2 Relationship Satisfaction

Relationship satisfaction has implications for health and wellbeing (Robles et al., 2014; Whisman & Baucom, 2012), as well as sexually-related outcomes (Witting et al., 2008). Specifically, the link between relationships and sexual satisfaction within cisgender populations has been highlighted by a rich body of research (e.g., Byers, 2005; Fallis et al., 2016), with articles highlighting a bidirectional connection between the constructs (i.e., earlier levels of sexual satisfaction predict future levels of relationship satisfaction and vice versa; McNulty et al., 2016; Quinn-Nilas et al., 2020). Overall, research looking at relationship quality within non-heterosexual and non-

cisgender individuals has not been as prominent (Perez & Pepping, 2024; Scott et al., 2025). Additionally, research that is inclusive of gender-diverse identities often focuses on binary trans individuals (Marshall et al., 2020). Consistently, a systematic review looking at romantic relationships of trans people between the years 1966 and 2020, found that there was a scarcity of quantitative studies, and that research tended to still uphold binaries which made it challenging to generalise results to the wider trans population and to individuals existing outside the binary (Marshall et al., 2020).

Literature investigating trans and non-binary people's experiences has highlighted important factors for relationship quality, some of which are trans specific (Perez & Pepping, 2024). Factors such as access to gender affirming social or medical transition as well as stigma and the impact of navigating cisnormative and heteronormative norms were found to impact relationship quality for trans people (Marshall et al., 2020). For instance, a study including 191 trans women and their cisgender partners found that perceived stigma was associated with lower perceived relationship satisfaction by trans women (Gamarel et al., 2014). Additionally, if one of the partners felt stigmatised for being in the relationship, this affected the perceived relationship quality of the other partner (Gamarel et al., 2014). A more recent study on US trans and non-binary adults highlighted that partners' support might mitigate the effects of gender stigma experienced by the trans person on relationship satisfaction (Fuller & Riggs, 2021). A study including 345 US trans adults (including 85 non-binary participants) highlighted that gender-diverse individuals reported significant difficulties in meeting intimate partners, however non-binary individuals were significantly less likely to have issues compared to transfeminine participants (Fuller & Riggs, 2021). Being fetishised within relationships and while dating has also been reported by trans people (e.g., Anzani et

al., 2021; Griffiths & Armstrong, 2023; Perez & Pepping, 2024), which could also impact the individuals' ability to find a fulfilling relationship.

In relation to trans specific factors, qualitative literature has looked more at non-binary people's needs for affirmation within a partnership, finding that being validated in relation to ones' gender identity as well as having a partner that makes an effort to avoid unwanted language, correct mistakes, is able to support the partner when feeling dysphoric where some of the affirming behaviours that non-binary people were looking for in their partner (Galupo et al., 2020). Although this type of affirmation might be specific to non-binary individuals' narratives, communication is an important factor for relationship satisfaction in all relationships (Eğeci & Gençöz, 2006; Yoo et al., 2014).

Other relevant aspects for relationship quality are not trans specific, but still relevant within gender-diverse dynamics. For instance, financial hardship was another factor that has been linked with poorer relationship satisfaction (Fuller & Riggs, 2021; Gamarel et al., 2014). More research looking at non-binary people's specific experiences through quantitative methods is especially needed in this context (Marshall et al., 2020).

1.2.2.3 Sexual Orientation and Sexual Fluidity

Sexual orientation is a multidimensional construct which includes sexual identity, behaviour, and attraction (Institute of Medicine, 2011; Katz-Wise, 2014; Rich, et al., 2018). Historically, sexual orientation has been heavily linked to partner gender in relation to individual gender, and gender (or more often, physical sexual characteristics that are associated with the idea of a male or female gender) has been considered as the most salient attribute when classifying sexual orientation (Van Anders, 2015). Although separate constructs, sexual orientation and gender identity are often

intertwined variables in sexual research (Eliason & Streed, 2017) that need to be taken into account to better understand the multiple minority group memberships (e.g., being both a sexual minority and a gender minority) of an individual, and how they impact their specific health needs.

Non-binary individuals are more likely to identify as non-heterosexual, particularly as pansexual and/or queer (e.g., Katz-Wise et al., 2016; Goldberg et al., 2020) and potentially present attraction towards other non-binary people (Boskey & Ganor, 2022). This may be especially true for younger non-binary people who seem to be moving away from standard classifications of sexual orientation and from labels that enforce a binary perception of sexual and romantic relationships (Kuper et al., 2012). Indeed, binary labels might become less meaningful for individuals who experience their gender identity as existing outside of the clear binary enforced in our society. This might create space for meaningful questioning or even deconstruction of sexual labels, and represent for some individuals, an opportunity to explore their sexuality in a new way (Dickenson et al., 2023).

Diamond (2015) described sexual fluidity as context dependent change in attractions, desires or behaviours in relation to one's sexual orientation, which could be permanent or temporary. Fluidity challenges the idea that sexual orientation is always static or binary (i.e., someone can only experience "same-sex" or "opposite-sex" orientation; Diamond, 2015). Furthermore, changes could pertain to one or more dimensions of sexual orientation, at times modifying the labels that the person uses to self-describe (Diamond, 2007; Katz-Wise, 2014). Fluidity may impact how a person experiences their sexuality as someone may experience fluidity in any component of their sexual orientation (Van Anders, 2015). In the context of trans individuals, some studies show that sexual fluidity may occur in relation to medical (i.e., hormonal therapy

and/or gender affirming surgeries) or social transition; this could be due to a shift in identity that needs to be reflected through a change in someone's sexual orientation label (Katz-Wise et al., 2016) or to a change in attraction, although results are not conclusive (e.g., Auer et al., 2014; Katz-Wise et al., 2017). Research suggests that gender-diverse people could be particularly prone to experience fluidity and changes in their sexual orientation over time, particularly when they have a non-binary gender identity (e.g., Katz-Wise et al., 2016).

Nonetheless, literature on this topic often fails to separate non-binary and binary transgender participants, impacting our ability to develop a clear understanding of this matter (Puckett et al., 2021). Further, when looking at the available research with non-binary and transgender people on the topic of sexual orientation and fluidity, it is important to understand that quantitative measures often accept cisgenderism as the norm, focus excessively on the individual's sex and sex-related physical features, and lack true inclusivity (Van Anders, 2015; Galupo et al., 2018). Available scales often confound sex-assigned-at-birth with gender, which could lead to misunderstandings and mistakes when studying gender-diverse individuals' sexual orientation (Katz-Wise et al., 2017). Indeed, not only do transgender and non-binary people often select non-normative labels (such as queer) to self-describe, they also commonly choose to self-describe their sexual orientation as "something else" if given the option (Eliason & Streed, 2017). Both of these choices could be a reflection of a legitimate desire among gender non-conforming people to not strictly label their sexual orientation, but could also be due to a lack of adequate options to capture the non-binary experience (Eliason & Streed, 2017; Katz-Wise et al., 2017; Dubin et al., 2021). There is also criticism around some of the most popular sexual orientation and fluidity measures. For instance, in a study that focused on investigating the face validity of well-recognised scales to assess

sexual orientation, transgender participants rated these measures less positively than their cisgender counterparts and indicated that such measures failed to capture their sexual orientation (Galupo et al., 2018).

Lastly, it is important to consider that sexual fluidity might be an important factor for sexual wellbeing and health, and non-binary people's experiences of fluidity might require further attention. More specifically, sexual fluidity could be conceptualised as an additional marginalised status, in which the person experiencing a shift in their orientation might lose community and support or experience ostracization within environments that were previously considered safe (Katz-Wise et al., 2017).

1.2.3 Health of Non-binary People (Other Constructs of Interest)

A recent systematic review of 11 studies focusing on aspects of non-binary individuals' health, such as sexual behaviours, mental health, life satisfaction and social support, found that results are contradictory, studies are overwhelmingly cross-sectional, and often rely on small samples (Scandurra et al., 2019). The same authors have also highlighted that most health research fails to differentiate between different subgroups of the transgender population, disregarding the specific needs of those who fall outside the gender binary (Scandurra et al., 2019). Hence, more research that focuses on non-binary people and their health is needed.

Non-binary and transgender individuals often experience poorer physical and mental health compared to cisgender people and tend to engage in higher rates of at-risk behaviours, such as drug and alcohol use (Warren et al., 2016). In sexual and gender minority individuals, health disparities have widely been attributed to marginalisation and experiences of minority stress (e.g., Dyar et al., 2020). Minority stress theory explaining how stress that is specifically linked to one's minoritised social

status (for instance being a sexual and/or gender minority) can affect health outcomes (Meyer, 2003; Testa et al., 2015). Indeed, mental health diagnoses and negative health outcomes should always be contextualised in relation to the experiences of violence and discrimination, both individually and systemically, that can come with being part of a minority group (Valentine & Shipherd, 2018).

1.2.3.1 Physical Disabilities and Chronic Health Conditions

Overall, research has shown that both mental and sexual wellbeing of trans and non-binary people could be impacted when chronic health conditions and physical disabilities are not adequately considered in relation to individuals' care needs (Lampe et al., 2021). However, literature on experiences of disability and chronic illness among gender-diverse individuals is lacking, and rates are largely unknown (Smith-Johnson, 2022). Some literature highlights that trans and non-binary people might be more likely to present chronic conditions and identify as disabled, which is why considering these aspects when discussing wellbeing and health in trans populations could be important (Smith-Johnson, 2022). More specifically, a study looking at privately insured trans individuals in the US accessing gender affirming care (and particularly those that were transmasculine or non-binary) presented elevated risk for almost all considered chronic conditions, including cardiac, neurological, thyroid-related conditions and diabetes when compared to cisgender people (Hughes et al., 2021). Similarly, research looking at seven years of US-based pooled cross-sectional data from the Behavioural Risk Factor Surveillance System, a large national sample with cisgender and transgender participants, found that after controlling for confounders, trans adults had a 27% chance to have at least one disability at 20 years old, and a 39% chance at 55 (two times the rates of their cisgender peers at both ages; Smith-Johnson, 2022). Additionally, a database search of 2009–2017 Medicare fee-for-service data on 9975 trans and non-

binary and 2961636 cisgender people's health data revealed diagnostic disparities between cisgender and gender-diverse individuals, so that trans people presented higher risks for a number of conditions, including infectious disease, arthritis, osteoporosis, dementia and kidney diseases (Hughto et al., 2023).

Conversely, when looking more specifically at disabled individuals, a recent study highlighted that trans and cis people presented similar rates of disability type, however gender-diverse people tended to be less likely to identify a mobility or physical disability as their primary disability, and would more often identify their primary disability as a developmental one, while prevalence of chronic illness appeared to be similar (Mulcahy et al., 2022). The same study pointed out that the large majority of trans and non-binary participants (90%) reported multiple disabilities, compared to only half of the cis participants (Mulcahy et al., 2022). Lastly, a cross-sectional Canadian study using health administrative data from 2085 transgender adults found that gender-diverse participants were more likely to report chronic health conditions and comorbidities such as asthma, diabetes, mental health and HIV compared to the general population within the Ontario province (Abramovich, 2020). These trans participants were also more likely to reside in low-income areas and to access health services than the general population (Abramovich, 2020).

Overall, trans and non-binary people are more likely to be uninsured in the US, which also limits their access to appropriate care, and can have consequences for their health (Hughes et al., 2021). They are also more likely to be victimised and discriminated in multiple areas, including healthcare settings (Hughto et al., 2023; Smith-Johnson, 2022). Through in-depth interviews with a sample of 15 US-based trans and non-binary people with a chronic illness and/or disability acquired in adulthood, participants reported a lack of knowledge among their care providers, with gender-

diverse patients often having to educate their provider or deal with invasive questions and “voyeuristic curiosity”, as well as with diagnostic overshadowing (or “trans broken arm syndrome”), which impacted their ability to receive adequate support (Noonan et al., 2024). Taken together, the cited studies highlight a higher rate of unmet needs for disabled gender-diverse individuals compared to disabled cisgender individuals (Mulcahy et al., 2022), as well as the role of stigma and Minority stress (Meyer, 2003), which can impact trans and non-binary people’s wellbeing in relation to healthcare (Hughto et al., 2023), especially when multiple minoritised identities (such as disability and chronic health conditions) are also present (Mulcahy et al., 2022).

1.2.3.2 Mental Health of Non-binary People

Research on mental health has generally shown a lack of scientific focus on non-binary individuals (Aparicio-García et al., 2018). It is unclear whether there are differences in mental health between non-binary people and transgender binary people, as research is also lacking in this area. Two UK studies, each including over 500 binary transgender and non-binary individuals, found that there may be no significant difference in self-harm, substance abuse, anxiety, depression or suicidality between the two populations (Rimes et al., 2019), and that non-binary people might report a similar or better quality of life than binary transgender people (Jones et al., 2019). At the same time, a large US study reported that non-binary college students experienced the highest levels of depression when compared to binary transgender and cisgender peers (Borgogna et al., 2019). This discrepancy might be linked to methodological differences in the examined studies, such as separating transgender and non-binary people based on their assigned-at-birth-sex when comparing their health.

Altogether, when compared with cisgender individuals, non-binary people report higher psychological distress, anxiety and depression, as well as more intense feelings

of isolation and suicidal ideation (Aparicio-García et al., 2018; Borgogna et al., 2019; Harrison et al., 2012; Kennis et al., 2022b).

1.2.3.3 Autism in Gender-diverse Populations

1.2.3.3.1 Neurodiversity Paradigm.

The medical model of disability conceptualises disability as an individual issue (Marks, 1997). The disabled person is seen as disadvantaged by their own impairment or condition, and the focus is on treatment (Marks, 1997). The focus is on treatment, and on making a minority of individuals (disabled people) fit into society without considering wider adaptations and ways to make systems more inclusive (Marks, 1997). On the other hand, the social model of disability originates from the Fundamental Principles of Disability (Union of the Physically Impaired Against Segregation, 1976), highlighting how people are not (or not solely) disadvantaged by impairments or differences, but by societal barriers and lack of accommodations (Oliver 1983; 2013). This model is not meant to be an all-encompassing explanation for the experiences of all disabled people, but rather a tool to further social change and improve disabled people's life (Oliver, 2013). The Neurodiversity paradigm emerged in connection to the social model of disability within online and offline advocacy spaces around the 1990s (Botha et al., 2024; Walker, 2021).

The Neurodiversity paradigm highlighting how the existence of different neurotypes and brain-types are necessary for the human species, similarly to how biodiversity (i.e., different types of plants and animals) is necessary for environments to thrive (Blume, 1998). This framework sought to explain that autistic brains, and therefore people, are not pathological and rather represent a natural occurrence and resource for the human species (on the same level as neurotypical neurotype). The

neurodiversity paradigm also opposed prevailing practice within general society to stigmatise or erase neurodivergent characteristics by pushing autistic (and other) people towards “normality” (Chapman, 2023). Initial theorisations around neurodiversity later become the inspiration for Nick Walkers’ work, in which she discussed the emergence of a “neurodivergent paradigm”, characterised by a shift within assumptions and principles relating to autism, to develop a novel frame of reference for autism research (Chapman, 2023; Walker, 2021). More specifically, while research often approaches autism through the lenses of a “pathology paradigm”, characterised by the assumption that any deviation from sociocultural normativity is undesirable and pathological (Chapman, 2023; Walker, 2012), Walker’s neurodiversity paradigm focuses on three main principles:

1- Neurodiversity is a natural occurrence, and a valuable kind of human diversity.

2- No human mind is “normal” or “right”, there is no default neurotype. Moreover, Walker argued that such concepts have no scientific validity, and that whenever we make one category of people as the standard ones in the context of human diversity (whether that is in relation to sexual orientation, race or neurotype), this creates dynamics of privilege and marginalisation (Walker, 2012).

3- Social dynamics and power relationships that are present in relation to neurodiversity are the same that exist in relation to other kinds of human diversity.

1.2.3.3.2 How is Autism Conceptualised in This Research?

This thesis embraces the neurodiversity paradigm and actively rejects the medicalisation of autistic identities and the conceptualisation of autistic ways of being as inherently disordered (Walker, 2021). On the contrary, this manuscript emphasises the notion that there is no superior neurotype and that natural variations exist within our

species' neurology (Walker, 2021). Overall, social dynamics (including dynamics of oppression) that also occur in relation to other types of human diversity, such as sexual orientation or gender (Chapman, 2023; Walker, 2012; 2021), disable and pathologize neurodivergent people.

To reflect these ideas, I will be using identity-first language (i.e., autistic person) when discussing autistic identity/autism throughout this thesis. Advocates and scholars (e.g., Natri et al., 2023) have highlighted that the roots of vague language (i.e., “person on the spectrum”) or person-first language (person with autism) within scientific and clinical discourse do not reflect the views of the autistic community. Person-first language is at best a sign of lack of understanding, and at worst is rooted in “autistophobic attitudes” (Walker, 2021) and motivated by a negative perception of autism and autistic individuals. While recognising that some autistic people might disagree with this choice, this has been informed through the author's lived experience and literature findings showing that most autistic individuals report a preference for identity-first language (Fecteau et al., 2024; Taboas et al., 2023).

1.2.3.3.3 Autistic Identity Within This Research

The concept of identity links to the social and personal spheres, representing at the same time group memberships and individual attributes (Fearon, 1999). It can be defined as the way in which individuals and groups are characterised in their relationships with other individuals and groups (Jenkins, 1996), as well as with oneself (Hall, 1989). Identities are understood within social and political structures; they are not always fixed, and are mutually constructed (Herrigel, 1993; Katzenstein 1996). Within this research, I consider different kind of identities and discuss two in particular. One is based on gender and one on disability status (and more specifically, autism).

Autistic identity is conceptualised within this thesis as a broad term that relates to both social and personal aspects of being autistic (Davies et al., 2024). Building one's identity in relation to disability can be challenging due to negative societal views and othering narratives (Anderson-Chavarria, 2022). Thinking about autism specifically, neurodivergent identity has been wrongly described as a medical condition, highlighting supposed "deficits" (Anderson-Chavarria, 2022). Being an autistic person means having to navigate a world filled with information created by non-autistic providers, where autism has traditionally been presented as undesirable (MacLeod, 2013). Being brought up in a social context where autism is framed in this manner could link to autistic people being less comfortable in seeing their autism as a core part of their identity (Davies et al., 2024). Although denying one's autistic identity might be seen as a form of self-determination if made as an informed choice (MacLeod, 2013), literature has highlighted how feelings of solidarity and community belonging that come from developing a strong autistic identity could positively influence wellbeing (e.g., Corden et al., 2021; Davies et al., 2024). Particularly, autistic pride (i.e., understanding autism as a positive difference, being able to highlight strengths that relate to being autistic and developing a positive autistic identity; Corden et al., 2021) relates to higher self-esteem in autistic people (Corden et al., 2021).

Anderson-Chavarria (2022) used the predicament model of disability (Shakespeare, 2008) to describe the heterogeneity in experience of autistic individuals, where some people perceive their autism as actively disabling, while others describe their experiences as autistic to be "just" different or not typical. Another layer of complexity in relation to autistic identity has to do with difficulties in accessing timely diagnosis, with many minority individuals (including women, ethnic minorities, gender-diverse individuals, etc.) discovering they are autistic in adulthood (Davies et al., 2024).

This creates a delay in being able to find support, community and navigate identity, with conflicting emotions accompanying the diagnostic or realisation process (Davies et al., 2024).

1.2.3.3.4 Overlap Between Being Autistic and Gender-diverse.

As discussed, autism is conceptualised within this thesis as a form of neurodivergence and a developmental neurological variant, that is characterised by differences in the way individuals process and responds to sensory (Walker, 2021) and social stimuli (as highlighted within the double empathy problem; Milton, 2012). Although all autistic individuals are different, they generally present differences in the way they communicate, use language, or socially interact, and may have a need for routine and sameness (American Psychiatric Association, 2013).

With respect to gender, research has investigated the relationship between being autistic and gender-diverse. For instance, an Australian study involving 134 autistic females and 161 non-autistic controls found that the autistic participants were 1.68 times as likely to identify as transgender/other gender than non-autistic people, and such difference was significant (Pecora et al., 2020). Other studies have found that among autistic participants, around 15% identify as trans, non-binary or another gender (Cooper et al., 2018; Dewinter et al., 2017). Consistently, other studies have shown that a conspicuous number of individuals who are non-binary or transgender might also present higher scores on questionnaires assessing autistic traits or have an autism diagnosis (Stagg & Vincent, 2019; Murphy et al., 2020), with an Australian paper identifying that 22.5% of the young gender-diverse respondents to an online survey had received a diagnosis of autism, compared to the estimated rates of 0.9% to 3.9% of the general Australian population (Strauss et al., 2021). In their recent systematic review, Bölte et al. (2023) highlighted that the overlap between gender diversity and

neurodivergent identities has been reported by multiple studies in the past ten years. While reasons for this overlap between being autistic and gender-diverse are yet to be fully understood, social theories have been identified as particularly insightful in explain the link. Specifically, a recent systematic review (Wattel et al., 2024) suggested that autistic individuals might be generally less influenced by societal pressure compared with neurotypical people. This observation aligns with the hypothesis of bottom-up processing and flattened priors in autistic individuals (i.e., the idea that autistic people’s cognitive system assigns greater significance to current experiences and new information rather than heavily relying on past knowledge when making predictions or trying to understand reality; Jackson-Perry 2020; Soulières et al. 2007). In the context of identity formation, this cognitive style may allow autistic people to explore gender and sexuality more freely, without being constrained by social norms. Consequently, autistic individuals might have a greater capacity to explore gender identity beyond cisnormative and binary frameworks (Walsh et al., 2018; Wattel et al., 2024).

Autistic advocates and autistic scholars have pointed out that being autistic in itself may shape the understanding of gender for some individuals. Examples of this are words like autigender (a term that has existed within online spaces since 2014 to describe how being autistic shapes gender experiences and understandings; Toft, 2023) or neuroqueer (Walker, 2021). The concept of neuroqueer not only describes the experience of someone who is both queer and neurodivergent, but more specifically represents the interconnection and interactions among the two identities. The act of “neuroqueering” refers to the active process of challenging neuro/heteronormativity and social norms (Walker, 2021). This can be through art or writing but could also just be a matter of expressing freely and reshaping ones’ thoughts, without conforming to what is expected in neurotypical/heteronormative society (Walker, 2021).

Overall, being autistic and gender-diverse has been linked to specific challenges and both gender-diverse and autistic people have been negatively impacted by medicalised understandings of their existence. For decades, non-cisgender people have been seen as mentally ill and deviant for challenging gender norms (Lev, 2004), while autistic people's behaviours are often still pathologized as medical symptoms (Anderson-Chavarria, 2022). A US-based qualitative study with 22 autistic gender-diverse adolescents found that participants reported a strong urgency to affirm their gender identity, but experienced challenges in self-advocating in relation to their gender-related needs (Strang et al., 2018). This difficulty in communicating and self-advocating has the potential to cause issues for autistic people to access affirmative gender-related care or request accommodations. Other authors have reported a concern that gender-diverse people could encounter barriers in trying to access health care services, which may include diagnostic services for autism (Murphy et al., 2020). Conversely, diagnostic overshadowing (Thom et al., 2022) might create a barrier for autistic individuals to access gender services or to be believed in relation to their gender identity. Due to these potential barriers, autistic gender-diverse individuals might be less likely to openly share their neurotype while accessing gender affirming care (Adams et al., 2025). This is important because autistic people might have specific communication needs or might require specific accommodations (such as adapting the environment to meet sensory needs, providing written reminders or prompts; Nicolaidis et al., 2015). Not feeling able to disclose being autistic might mean that healthcare needs are not met fully.

Moreover, when autism status is disclosed, autistic individuals might encounter delays and discrimination within gender care settings due to care providers misinterpreting autistic characteristics as signs of uncertainty, or professionals

suspecting autism and implicitly denying care (Adams et al., 2025). All considered, it is likely that we are underestimating the extent of the overlap between autistic and non-binary or trans identities. Moreover, while the incidence of poor mental health is high in autistic and gender-diverse populations individually (e.g., Borgogna et al., 2019; Lai, 2019), the co-occurrence of being autistic/ elevated autistic traits and identifying as a gender minority could potentially lead to even poorer outcomes compared to individuals who are non-binary or trans but not autistic (Adams et al., 2025; Strauss et al., 2021; Kung, 2024). This could, at least partially, be to do with the additional stigma, marginalisation or discrimination experienced (Adams et al., 2025; Strauss et al., 2021), but could also link to other factors, such as challenges in accessing appropriate transition services for autistic individuals, or autism diagnostic services for gender-diverse individuals (Adams et al., 2025; Murphy et al., 2020). Interestingly, a recent Canadian study including 460 trans autistic participants (Adams et al., 2025) found that self-identified autistic individuals were more likely to be non-binary compared to formally diagnosed, which might speak to the barriers to formal diagnosis encountered by non-binary individuals.

More research on this overlap is needed, as currently most studies that focus on gender differences in the autistic population do not include gender-diverse individuals (Bölte et al., 2023), and most available literature on autism and gender diversity tends to focus on people who present a diagnosis of gender dysphoria, excluding a relevant proportion of those that identify as non-binary or trans without experiencing dysphoria (Murphy et al., 2020).

1.2.3.3.4.1 Autism and Gender-diverse Identity: Mental Health and Camouflaging.

Camouflaging (or autistic masking) can be defined as a trauma response and as a compensatory process that unconsciously or consciously allows autistic individuals to

hide their authentic characteristics and perform neurotypicality to avoid oppression, stigma and further trauma (Cage & Troxell-Whitman, 2019; Cook et al., 2021, Hull et al., 2017; Pearson & Rose, 2021; Perry et al., 2021). An example of autistic masking could be an autistic person suppressing their stimming behaviour or scripting their social interactions (Cook et al., 2021, Hull et al., 2019). Camouflaging has been described as a response to victimization and ostracism by autistic young people (Chapman et al., 2022). Research has highlighted the existence of links between poor mental health outcomes and camouflaging within autistic populations, in both cisgender and gender-diverse people. Specifically, in cisgender people, camouflaging has been connected to exhaustion, higher levels of stress and anxiety, depression, feelings of losing ones' authenticity and one's true self, more difficulties accessing support, and higher rates of current and past mental health diagnoses (e.g., Beck et al., 2020; Hull et al., 2017; Hull et al., 2019; Hull, et al., 2021; van der Putten et al., 2024). Although research with trans and non-binary participants has been overall limited and has often relied on underpowered samples (e.g., Oshima et al., 2024), a large UK-based study including a sample of 412 gender-diverse people has demonstrated the existence of a significant link between camouflaging and stress and anxiety in this population (White et al., 2024). Although directionality of this relationship is not straightforward, masking has been described as exhausting and draining (Hull et al., 2017), and has been linked to suicidality (Mitchell et al., 2021) and feelings of isolation (Zhuang et al., 2023).

1.2.3.3.4.2 Sexuality and Camouflaging in Non-binary Autistic Populations.

Literature on the sexual health and sexuality of autistic people is lacking, and a recent systematic review and meta-analysis of socio-sexual functioning in autistic people (consisting of only 6 studies) highlighted very limited literature is in this area (Hancock et al., 2017). Nonetheless, existing research has found that autistic

individuals are more likely to identify as non-heterosexual and more likely to identify as asexual compared to non-autistic people (Weir et al., 2021). In relation to sexuality and camouflaging, recent literature looking at sexual minority individuals (including 60 gender minority participants) found that non-heterosexual individuals reported higher camouflaging, even when controlling for gender (gender minority vs. cisgender; McQuaid et al., 2025).

Considering romantic relationships and masking, another systematic review of 8 qualitative studies highlighted that research on intimate relationships and camouflaging deserves more attention (Ridgway et al., 2024). In fact, while camouflaging was described by autistic adults as an important, although often stressful and unsuccessful, strategy to initiate friendships with neurotypical people, little scientific evidence was present for intimate relationships (Ridgway et al., 2024). No papers have investigated specific links between other sexual dimensions (including sexual wellbeing) and camouflaging, particularly among gender-diverse populations.

1.2.4 Why Should we Investigate the Sexual and Mental Wellbeing of Non-binary People While Considering Overlapping Identities and Individual Factors?

Although non-binary individuals are a small minority, this label is becoming more prevalent, with millennials and gen-zers being between three and seven times more likely to identify as non-binary compared to previous generations (Statistics Canada, 2022). While historically non-binary people have been largely understudied, sex research is becoming more open to recognise and explore experiences of those who challenge gender binaries (e.g., Holt et al., 2023; Katz-Wise et al., 2016; Perez & Pepping, 2024). Although research including non-binary people is becoming more prevalent, this might not always mean that quantitative studies are able to focus on this population adequately. Projects focusing specifically on non-binary individuals are

needed to allow a deeper understanding of the sexuality of this population, as well as their connected health needs. Additionally, it is important that research recognises differences that exist within non-binary groups. Non-binary people are not a monolith, and quantitative literature needs to adequately explore differences in demographic characteristics, including overlapping marginalised identities, that non-binary people are likely to hold. Moreover, when it comes to autism, while literature has long recognised overlaps with trans and non-binary identities (Bölte et al., 2023), few quantitative studies looking at non-binary autistic people have been published. Overall, research still fails to extensively represent the experience of gender-diverse autistic adults and individuals who are not diagnosed with gender-dysphoria or outside of clinical settings (Murphy et al., 2020). As highlighted, autistic characteristics or an autism diagnosis might prevent or delay appropriate gender care for gender-diverse people (Adams et al., 2025), while autistic people might not be believed when expressing their gender identity (Strang et al., 2018). This makes neuroaffirmative research focusing on gender-diverse autistic individuals more important and urgent.

Moreover, research regarding gender-diverse individuals' sexuality and relationships through the lens of satisfaction and wellbeing is important as a way to expand current knowledge in new directions. Too often, the sexuality of gender-diverse people is considered in relation to risk-behaviours and negative health outcomes (i.e., STIs, HIV; Macdonald et al., 2022), and satisfaction becomes part of the conversation only if connected to clinical intervention (i.e., in the context of gender affirming procedures; e.g., Lindley et al., 2021). Although there is value in literature that examines these aspects, research examining wellbeing and satisfaction through non-medicalised, non-risk focused approaches is also needed. This is especially true for non-binary people, as literature has highlighted different (and potentially less

medicalised) transition pathways (e.g., Holt et al., 2023; Littman et al., 2024) and differences in experiences of dysphoria (Galupo et al., 2021). This means that existing studies might alienate a certain portion of non-binary respondents, who may not be included in existing research.

1.2.5 Overall aim

Literature that involves non-binary people is not only limited in number and scope, but often lacks focus, grouping non-binary people together with binary trans people, not allowing for the different characteristics of these populations to emerge (Smalley et al., 2016). Indeed, a comprehensive research project that considers the complexities of non-binary people's identities and characteristics, such as autism identification, sexual orientation labels, and mental and sexual wellbeing is imperative to better our understanding of the specificities of this understudied population.

The intersection of a person's gender and sexuality can shape the individual's health and sexual health needs (Zeeman et al., 2017). Whilst specific characteristics, such as a minority sexual orientation or increased sexual fluidity, may be associated with higher rates of negative outcomes, including anxiety, depression, or stress (Everett et al., 2015; Feinstein et al., 2019; Katz-Wise et al., 2017; Redcay et al., 2019), further research is needed as results are sometimes contradictory (Coulaud et al., 2024). Furthermore, being neurodivergent and specifically autistic may be associated with having a more fluid approach to sexuality and gender (George & Stokes, 2018). All considered, research has indicated the importance of recognising the individual's multiple minority group memberships when investigating their needs in regard to sexuality and mental health (Murphy et al., 2020). This could further apply to people who are both autistic and transgender/non-binary (George & Stokes, 2018; Walsh et al.,

2018), as well as to trans/non-binary people who experience sexual fluidity or identify as a sexual minority.

For these reasons, the overarching aim of my PhD project is to investigate the health and wellbeing of non-binary individuals, in an exploratory way, with a specific focus on sexuality, mental health and overlaps between being non-binary and autistic.

1.3 Methodology (and Methodological Considerations)

1.3.1 Positionality and Reflexivity

1.3.1.1 A Premise to my Statement

As someone doing quantitative research, I have struggled to understand how to coherently approach positionality and reflexivity statements within this thesis. While reflexivity and positionality statements are largely employed within qualitative research, discussions around adding explicit reflexivity statements and processes to quantitative work has been going on for many years (Ryan & Golden, 2006), without reaching clear consensus. Nonetheless, authors have argued that there can be used for reflexive practices and statements within quantitative projects. This is especially true for research that deals with complex or sensitive issues that require the researcher to engage in emotional labour (Dickson-Swift et al., 2009; Jamieson et al., 2023). Additionally, authors have challenged the objectiveness of quantitative analysis that deals with topics that are highly linked to political or ideological stances, especially when scientific results have the potential of impacting minorities in the real world (for instance, research on trans people might be used to perpetuate discrimination; Jamieson et al., 2023). It is important to notice that reflexivity processes do not weaken research validity, rather they are meant to give insight into dynamics that exist within the researcher and participants in any kind of research (Ryan & Golden, 2006). I consider

myself to be an insider within my own research, which is one of the reasons I felt compelled to give space to a positionality and reflexivity statement within my thesis. Although I recognise that there are reasons not to provide a reflexivity and positionality statement, such as issues around having to disclose vulnerabilities or sensitive information as someone who is part of one or more marginalised groups (especially as an early career researcher; Jamieson et al., 2023), I decided that my research (and I, personally) would benefit from including this section here. However, for the same reasons, such statements will not be found within my research papers, included in the next chapters (outing myself through the peer-reviewed process, as someone who has never done research before, did not feel comfortable at the time).

1.3.1.2 Positionality and Reflexivity Statement

I am a white non-binary late-diagnosed autistic person. Because of my gender expression/presentation, I am not visibly queer. And because I am a high-masking autistic person, I am not visibly disabled. Although this can be challenging in certain settings, I acknowledge the privilege of being able to navigate my environments having the choice of disclosing or not disclosing my identities. I have the privilege of not experiencing harassment and violence in my daily life because I am non-binary or autistic. This might be different to the experience of my participants, and this privileged position might have influenced my decisions around this research.

I am Italian and moved to the UK in 2018. I am the parent of a young child, and in a committed relationship with a white cisgender man. Although I come from a working class/lower middle-class background, my current socioeconomical status is higher-middle-class. I have the privilege of a comfortable lifestyle, which allowed me to pursue this PhD in the first place.

As discussed, my research exists within the understanding that being autistic means having a different neurotype and not a medical condition (i.e., neurodiversity paradigm). Equally, I conceptualise gender as a social construct, different from assigned-at-birth-sex, and as not binary in nature. My identities, as well as my theoretical beliefs around autism and gender, have shaped my research in different ways. My interest towards non-binary and non-binary autistic people, and the decisions of looking at specific variables and topics, was driven from the numerous gaps in research and understanding, but also from my personal experiences. Because of this, I might have failed to address the experiences of some community members who navigate this world with less privilege.

1.3.2 Opportunities and Challenges of Quantitative Approach With Non-binary People

I decided to use quantitative methods due to extensive research gaps within quantitative literature around non-binary people sexuality and wellbeing. Quantitative research allows the opportunity to collect a large quantity of data and generalise results to the wider population with appropriate limitations and caveats (Zyoud et al., 2024). In the case of non-binary people, the lack of focus and the lack of inferential analysis throughout the literature (which clearly emerged within my systematic review, reported in chapter 2 of this thesis) were important factors in my decisions to use quantitative methods for both subsequent studies. Of course, challenges and opportunities emerged while using this approach. Firstly, to be able to conduct adequately powered analysis, there was a need to recruit a large sample of non-binary participants. Indeed, involving socially marginalised groups in research can be challenging, and gender-diverse individuals report distrust towards the academy, and have become reluctant to engage with researchers (American Psychological Association, 2015; Staples et al., 2018). Additionally, I made the decision to open my questionnaire worldwide, sharing it

using an online platform, in the hope that this would increase my reach of participants. Lastly, I consulted with community members to construct and adjust the questionnaire content.

Nonetheless, some limitations that are linked to data collection through questionnaires and quantitative analysis of data persisted. Firstly, although I decided to use the label “non-binary” after reviewing literature and consulting with some non-binary people, some individuals whose gender still defies the binary might prefer different definitions or words to describe their experiences and might have decided not to participate. Additionally, asking to provide one gendered label and one sexual orientation label might feel restrictive for some individual (although a textbox to expand was made available to address this).

1.3.3 Study 1: Systematic Review

Study 1 is a systematic review on the sexuality and relationships of non-binary people. The reason I decided to conduct this study was to investigate the characteristics of quantitative literature including non-binary people. Initially, I intended to look at trans and non-binary people more in general, possibly comparing knowledge and understandings around experiences of binary and non-binary people within the trans umbrella, but this was later changed due to the amount of literature I was able to retrieve, as well as the fact that my interest was shifting and I wanted to focus on non-binary people exclusively. Additionally, where there are multiple systematic reviews looking at trans and non-binary people together (e.g., Pucket et al., 2021), there was a lack of systematic reviews looking at non-binary people’s sexuality people specifically. For this systematic review, I adhered to PRISMA (Page et al., 2021) guidelines. The

systematic review is presented in Chapter 2. This work has been published in the peer-reviewed journal *Archives of Sexual Behavior* (5-year Journal Impact Factor: 3.9 in 2024):

Mastrantonio, F., Kovshoff, H., & Armstrong, H. (2025). Non-binary people's sexuality, sexual health, and relationship satisfaction: a review of twelve years of quantitative research (2012-2024). *Archives of Sexual Behavior*.

<https://doi.org/10.1007/s10508-025-03224-0>

1.3.4 Study 2 & 3: Cross-sectional Analysis of Questionnaire Data

Study 2 and 3 are quantitative cross-sectional analyses of questionnaire data. Due to the lack of literature in this area, both studies are explorative. I decided to specifically focus on sexual and relationship satisfaction and sexual wellbeing in the first study, as the systematic review revealed a lack of papers covering these topics. Additionally, from a theoretical standpoint, I was interested in looking at constructs that linked to a more holistic approach to sexual and relational experiences, less focused on risk and function, more focused on individual appraisal of sexuality and partnerships. I was interested in looking at how different demographic factors or identities might relate to different experiences for non-binary participants, as the systematic review highlighted a tendency of the literature to not focus or report such aspects. For Study 2, I also wanted to include binary trans and binary cisgender people, to explore potential differences in outcomes. For Study 3, I decided to focus on my non-binary subsample and explore differences between autistic and non-autistic non-binary people.

Study 2 has been published in the peer reviewed journal *The Journal of Sex Research* (5-year Journal Impact Factor: 6.7 in 2024):

Mastrantonio, F., Griffiths, D. A., Kovshoff, H., & Armstrong, H. L. (2025). *Sex Beyond the Binary: An Exploratory Analysis of Non-Binary Sexuality and*

Partnerships. *The Journal of Sex Research*, 1-15.

<https://doi.org/10.1080/00224499.2025.2507151>

Study 3 has not yet been submitted for peer review.

Variables and scales included in the initial questionnaire, including items considered for Study 2 and 3, are reported in Appendix A. I will discuss decisions around gender identity questions and autistic identification in the next two paragraphs.

A priori power analyses were conducted to establish minimum sample sizes for both studies and are available in Appendix B.

1.3.4.1 Measuring Gender Identity

In this research project, due to methodological constraints, I made the decision to ask people about their gender identity as if it were a static attribute, although I recognise that this is a complex matter and people might change their gender categorisations as they explore their gender identity (e.g., MacKinnon et al., 2025). More specifically, I asked participants three questions about their gender identity:

1. Transgender (or trans) describes someone who identifies with a different gender than the one they were assigned at birth. Are you transgender?
2. Non-binary describes someone who identifies with a gender outside the gender binary (not man or woman). Are you non-binary?
3. Please select the gender identity label that you feel describes you best (list of 10 identities, with a text box to add more).

This choice was made in accordance with best practices around asking gender identity questions, generally advising scholars to use a “two-step approach” (sex-assigned-at-birth (SAAB) and current gender identity; e.g., Fraser, 2018; William

Institute, 2014), while also addressing the concerns of community members (including within my community consultation pool) and gender-diverse advocates, who have expressed concerns about including questions relating to SAAB (Alpert et al., 2021; Fraser, 2018) as well as a need for a more accurate reflection of gender-diverse identities and labels within research (Puckett et al., 2020). Questions on SAAB can be perceived as invasive (Tordoff et al., 2025) and might discourage gender-diverse individuals from engaging in the research. Nonetheless, most research looking at this population has either grouped individuals together or stratified them using SAAB (Tordoff et al., 2025). Additionally, by offering separate questions in relation to transgender and non-binary identification, I tried to account for the fact that not all non-binary people identify as trans (Wilson & Meyer, 2021). As discussed, although in this research gender identity was presented to participants as a static category, I want to acknowledge that gender identity can shift for some individuals (MacKinnon et al., 2025) or might not be so easily encapsulated by labels that can be provided through a survey format (although an open text box was provided to attempt mitigating this issue). Lastly, although I tried to mitigate misunderstanding by providing participants with definitions of trans and non-binary, this methodology might not have worked for those who exist outside of the gender binary but would not self-describe as non-binary.

1.3.4.2 Measuring Autism

As discussed, the matter of autistic diagnosis and identification is complex, and recognising (or being recognised) as autistic can be even more challenging for people who have non-normative identities (Ardeleanu et al., 2024; Gratton et al., 2023; Hall et al., 2020). Due to this complexity, I decided to include both self-reported formal diagnosis as well as self-identification in my questionnaire, using the following items:

1. Do you have a formal diagnosis of autism? (Yes/No/I am awaiting formal assessment)
2. Regardless of any formal diagnosis, do you self-identify as autistic? (Yes/No).

The second question was only displayed to those who did not answer “yes” to the first question. Together, while representing complexity, including both questions aligned with this project’s efforts to de-medicalise neurodivergent identities (in line with the neurodiversity paradigm) as well as with the suggestions I received during my consultations with community members.

Lastly, I included an item about neurodivergent identification (“Do you identify as being neurodivergent in any other way?”) with an open text. As overlaps among neurodivergent identities are the norm (Antshel & Russo, 2019) and as little literature exists on neurodivergent identities within the non-binary community, this item was helpful to provide a wider understanding of neurodivergent statuses within my sample.

Chapter 2 Non-binary People's Sexuality, Sexual Health, and Relationship Satisfaction: A Review of Twelve Years of Quantitative Research (2012-2024)

2.1 Abstract

Non-binary is a term used by individuals to describe their gender identity, which is better conceptualised outside the man-woman binary. In recent years, research interest in the sexuality of gender minority individuals has grown, as shown by the increasing number of publications on this topic. Accordingly, a comprehensive systematic review which synthesizes the range of sex-related variables captured in research studies with non-binary people is needed. This analysis looks at 12 years of quantitative sex research, aiming to (1) outline what is known about the sexuality, sexual health and relationship satisfaction of non-binary people; and (2) appraise measures used in this literature for the inclusivity of non-binary identities (focusing on language and terminology). Searches were conducted on PsycINFO, Web of Science, and MEDLINE for papers in Italian or English between 2012 and 2024 and 44 articles were included for synthesis. Papers covered a wide range of topics, showing that non-binary people often report non-monosexual sexual identities (e.g., queer, pansexual), more attraction to and relationships with other non-binary individuals, and similar levels of sexual and relationship satisfaction as binary transgender people. However, the language and tools employed within the research were not always expansive or inclusive enough to adequately represent non-binary people's experiences. For example, gender minority individuals were often grouped together for analysis, hiding likely within group differences. Future research should use gender-neutral language and

measures, and consider non-binary individuals separately, in order to better understand their specific sexual health, wellbeing, and relationship needs and outcomes.

Keywords: non-binary, transgender, sexuality, relationship, systematic review

2.2 Introduction

“Non-binary” is an umbrella term that describes individuals whose gender identity is outside the binary of man-woman (Richards et al., 2016). More specifically, “non-binary” refers to a group of gender identities that disturbs or questions the prevalent understanding of gender as a binary construct (Vijlbrief et al., 2020). Some of the experiences described by non-binary people include, but are not limited to, perceiving one’s gender as completely outside of man or woman, identifying as a man or a woman only some of the time, or not feeling they are any gender at all (American Psychological Association, 2015; Budge, 2017; Matsuno & Budge, 2017). Non-binary identities have been documented across various societies throughout history, although understandings, perceptions, levels of acceptance, and availability of expansive language vary widely in different cultures (Gonzalez-Salzberg & Perisanidi, 2021; Oh et al., 2024). Non-binary people may use a range of identity labels to characterize their experience of gender, such as genderfluid, agender, bigender, pangender, and genderqueer among many others (Twist & de Graaf, 2019).

Often, non-binary people are conceptualised as part of the transgender community. Transgender (or trans) is a word used to describe the identity of someone who identifies with a gender that does not match the sex they were assigned at birth (American Psychological Association & National Association of School Psychologists, 2015). Transgender is often used as an umbrella term to describe individuals who experience their gender identity as either binary (i.e., trans men or women) or non-

binary. Importantly, although non-binary people may use the term transgender to refer to themselves (e.g. (Wilson & Meyer, 2021), this population is extremely diverse, and non-binary individuals' gender expansiveness means that both people who identify as transgender and people who do not can exist within the non-binary gender spectrum. Among non-binary people, reasons for not identifying with the label trans might link to feelings of unworthiness towards claiming a trans identity (i.e., not feeling "trans enough") or perceiving relevant differences between one's own identity and experiences and those of binary transgender people (Darwin, 2020). These observations highlight the need to consider binary trans and non-binary people as different gender identity groups in sex and health studies.

Nonetheless, and although others have noted the importance of recognizing that the intersection between one's gender, self-identification, and sexuality can shape individual health needs (Zeeman et al., 2017), sex research has a long history of either ignoring the existence of non-binary people or grouping non-binary and binary transgender people. This approach masks potential differences between the groups and limits our understanding of the nuances in gender identity and health needs between these populations (Smalley et al., 2016). More recently, some authors have begun to recognize this gap in the literature and have started to compare non-binary and binary trans people on health-related variables such as gender transition (e.g., Kennis et al., 2022a), mental health (e.g., Jones et al., 2019), and sexual health and sexuality (e.g., Holt et al., 2023; Perez & Pepping, 2024), with some differences emerging on variables such as sexual fluidity (Katz-Wise et al., 2016), orientation, and attraction (Boskey & Ganor, 2022).

Although sexual health has long been recognised as a broad and multifaceted construct (e.g. Edwards & Coleman, 2004), sex research with gender-diverse

populations has historically been characterised by a narrow and medicalised focus (Anzani & Prunas, 2023). Multiple authors report that inclusive sex research with transgender and non-binary people fails to properly represent the experiences of those whose identity challenges gender binarism, possibly due to a lack of adequate methodologies and measures, as well as underpowered sample sizes (Gil-Llario et al., 2021; Lindley et al., 2022; van Anders, 2015).

As this field is evolving rapidly, a clearer understanding of the existing literature on the sexuality and sexual health of non-binary individuals is needed to better comprehend and evaluate the state of the science, how non-binary people are being identified and included in sex research, and if and how their experiences are being captured.

2.2.1 Current Systematic Review

The current systematic review synthesizes 12 years of quantitative research on the sexuality and sexual health of non-binary populations, including a wide range of sexual constructs (such as sexual orientation, fluidity, sexual wellbeing, and sexual satisfaction), to develop a broader understanding of the literature in this area and to acknowledge the multifaceted and complex nature of sexuality and sexual health. We chose to include articles published in the last 12 years to capture recent and current understandings and conceptualisations of non-binary identities. More specifically, we decided to focus on research published after 2012 for two main different reasons:

(1) From a research prospective, 2012 marks the year the US Gallup poll collected data related to sexual orientation and transgender identity for the first time (Gallup Organization, 2012). At the same time, within the UK context, the Trans Mental Health Study (McNeil et al., 2012) was published by the Scottish Transgender Alliance,

representing the first comprehensive study including a variety of health variables and healthcare related experiences for trans and non-binary people within the UK setting (Ellis et al., 2015).

(2) From a generational perspective, we wanted to include studies with millennials (individuals born between 1981 and 1996) as well as gen Z (born between 1997-2012) as participants. This is because younger individuals are more likely to identify as non-binary (Statistics Canada, 2022). Taking Canada as an example, in 2021, through the Canadian census, it was reported that 0.19% of participants over 15 were transgender and 0.14% were non-binary (Statistics Canada, 2022). 62% of these individuals reported being younger than 35, with non-binary people's mean age being especially low compared to the general Canadian sample over 15 (30 years old vs. 48 years old; Statistics Canada, 2022). Moreover, the proportion of trans and non-binary people was between three and seven times higher between gen Z and millennials compare to older generations (Statistics Canada, 2022).

This review adds to existing systematic reviews (e.g., Marshall et al., 2020, Özer et al., 2023) on sexual health and sexuality of gender-diverse individuals by focusing on psychological literature and databases, summarizing results of the examined studies, and including quantitative studies on relationship satisfaction (to highlight the interconnectedness of sexual and relationship satisfaction and the benefits of studying them concurrently). Additionally, while a recent systematic review addressed general health differences between non-binary and binary people (Scandurra et al., 2019), to our knowledge this is the first systematic review that focuses more specifically on non-binary people's sexuality. Accordingly, this review aims to enhance our understanding of what is known about sexual orientation, sexual fluidity, sexual satisfaction, sexual health and wellbeing, sexual function and dysfunction, and relationship satisfaction

within the non-binary population, while also considering differences and similarities with binary (trans and cis) people. A secondary aim is to assess which scales have been used to measure sexuality and relationships among non-binary people, and what terminology has been used to group and classify their gender identities.

More specifically, the underlying research questions of this review are:

(1) What does quantitative research tell us about sexuality, sexual health, wellbeing, and relationship satisfaction/quality among non-binary adults?

(2) How inclusive of non-binary people is quantitative sex research with respect to measurement and terminology?

2.3 Methods

For this systematic review, we adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). Before starting the systematic search of literature, preliminary searches were performed to refine keywords and to better specify the constructs of interest. The review was registered on Prospero (protocol number: CRD42021290226) on 12/11/2021. Endnote software (version 20.2) was used to manage deduplication and the screening process of the papers (The EndNote Team, 2013). Eligibility criteria are presented in Table 1. We also note that due to a larger than expected number of search results returned, inclusion criteria 8-10 were added after the initial searches had been performed to refine the focus of this paper and provide a more cohesive review.

2.3.1 Information Sources

Initial searches were conducted on the databases PsycINFO, MEDLINE, and Web of Science in September 2022. Searches were then updated in August 2024. Hand

searches were also performed by manually searching the reference lists of included papers.

2.3.2 Search Strategy

The keywords (in title or abstract) used to perform the search are reported in Supplementary Table 1. Some of the keywords referring to gender are now obsolete and were included with the aim of capturing older or more medicalised literature.

2.3.3 Selection Process

For the English papers, the initial number of retrieved articles in September 2022 was 22864, of which 5535 were identified as duplicates. For the Italian articles, 36 were initially retrieved, of which one was a duplicate. The updated searches conducted in August 2024 returned a total of 3296 additional English papers and one Italian paper that had been published between October 2022 and August 2024. Duplicates were identified through a mix of manual screening and use of the Endnote software automatic screening tool. Overall, only one Italian language paper was included past the screening phase, but it was later excluded because the full-text could not be retrieved (Figure 1 and Figure 2 show PRISMA charts for Italian and English searches combined for 2022 and 2024).

After piloting inclusion and exclusion criteria, all titles, abstract and full texts were sourced and screened by the first author (FM), while the last author (HA) screened 20% independently. Inter-rater reliability was calculated between .84 and .91 for each phase, and discrepancies were discussed until resolved. Any papers which were unclear as to their inclusion were also screened by both FM and HA and subsequently discussed.

After the initial search, 192 English language articles were identified. However, it is relevant to highlight that after screening for the inclusion of non-binary participants, 155 of these articles (80.7%) did not include any non-binary participants or did not report separate analyses for non-binary and binary transgender individuals and were therefore excluded. An additional 8 articles were excluded as they reported on samples from outside Europe, North America, Australia, and/or New Zealand. Lastly, one paper was identified through handsearching, resulting in 30 articles included after the initial search. During the search update, 97 papers were identified for possible inclusion; however, 52 of these (53.6%) were excluded as they did not separate between binary trans and non-binary participants. As such, an additional 14 papers were added following the search update, resulting in a total of 44 papers included in this review.

2.3.4 Data Extraction

Data extraction was completed primarily by FM in consultation with the other authors, following a standardized protocol based on a piloted and pre-agreed extraction table that included:

- Study date/Location/Authors
- Sample information and sampling method
- Demographics (e.g., gender identity of participants, age, ethnicity and race for whole sample and non-binary participants when available)
- Method of asking about gender identity and trans identity
- Sexual variables considered in the study (e.g., sexual orientation, sexual fluidity, etc.)
- Scales used to measure main sexuality constructs (completed by non-binary people)

- Main findings

After information was extracted, authors discussed any queries or uncertainties until consensus was reached. For extracted demographics, separate data were included for non-binary participants when available. If unavailable, only general sample characteristics were reported. For other variables, results were only reported if separate analysis for non-binary individuals were available.

2.3.5 Study Risk of Bias Assessment

To appraise the quality of all included studies, the standard quality assessment criteria for evaluating primary research papers for quantitative studies was used (Kmet et al., 2004). This tool uses 14 criteria, and the reviewer assigns a score between 2 and 0 (yes, partially, no) for each or selects “NA” if appropriate. Number of applicable responses (total possible sum) and scores obtained for each item (total sum) are then combined in a summary score (total sum/total possible sum). Papers with a summary score above 75% are classified as high quality, papers that score between 75% and 55% are classified as moderate quality, and studies that score below are 55% classified as low quality.

Two reviewers independently assessed a sample of papers (10% of total), and any disagreements were discussed until resolved. Inter-rater reliability was calculated at 0.74. After this, the first author completed the quality assessment in consultation with the second and third authors, with any doubts being discussed until consensus was reached.

2.3.6 Data Analysis

For the primary research question, studies were grouped for synthesis based on the reported sexual and relationship related variables. Information relating to study design, study and participant characteristics, and gender identity assessment and non-binary labels was synthesized in a narrative manner.

For the secondary research question, we report which scales were used to assess sexuality, sexual health, and relationship satisfaction and whether these measures were inclusive of the non-binary population (e.g., whether they used gender neutral language in terms of pronouns, body parts etc., or if they recognised the existence of genders outside of men and women – for instance when asking about sexual attraction).

2.4 Results

2.4.1 Quality Assessment

Most studies (39/44) were high quality, while five papers were classified as moderate quality. Total scores for each paper are reported in Table 2, together with study characteristics.

2.4.2 Design and Characteristics of Included Studies

All 44 included papers used a cross-sectional design. Most (34/44) used convenience and/or snowball sampling and recruited their participants online (e.g., social media ads, listservs) and via word of mouth and community LGBT organizations (e.g., Holt et al., 2023; Katz-Wise et al., 2016; Smalley et al., 2016). A large proportion (21/44) reported using data from, or subsamples of participants recruited for, larger studies (e.g., Anzani & Prunas, 2020; Dargie et al., 2014). Two papers (Kattari et al.,

2019, Kattari et al., 2021) used data from the Healthy Kids Colorado Survey (HKCS; Colorado Department of Public Health and Environment, 2024), which includes a representative sample of US high school students, and three studies (Bishop et al., 2023; Goldberg et al., 2020; Rothblum et al., 2020) analyzed data from The Generations Study (Krueger et al., 2020), a longitudinal cohort study of LGBT adults in the United States. Lastly, two studies (Koós et al., 2024; Lin et al., 2024) used data from the International Sex Survey (Bóthe et al., 2021).

2.4.3 Participant Characteristics

The number of non-binary participants included in each study varied widely, ranging from 4 (Dargie et al., 2014) to 2783 (Lin et al., 2024). Most studies (27/44) included fewer than 100 non-binary individuals (of which 10 included fewer than 50). In most, demographics such as age, race/ethnicity or education were not reported separately for non-binary participants. Where this information was available (14/44 for age, 9/44 for race/ethnicity and 11/44 for education), non-binary people were mostly from white backgrounds (e.g., Hibbert et al., 2020; Littman et al., 2024), below the age of 35 (e.g., Kennis et al., 2022a), and university or college educated (e.g., Almås et al., 2024; Kennis et al., 2022b; Mark et al., 2018). Table 3 provides full sample characteristics in relation to these variables.

2.4.4 Gender Identity Assessment

Of the papers that specified the method or items used to assess gender (30/44), 18/30 included a question assessing sex-assigned-at-birth (SAAB) and then asked participants to report their gender identity label in different formats, often through selecting one from a range of provided options (e.g., Katz-Wise et al., 2016); 20 papers explicitly stated offering an “other” option and/or a way for participants to add in their

own label if it was not already listed (e.g., Atkins et al., 2024; Jacobson & Joel, 2019). Two papers (Hibbert et al., 2020; Rutherford et al., 2021) asked participants a specific question about whether they identified as trans, without enquiring about participants' SAAB. One paper used an open response format, and answers were subsequently coded and classified by experts (identified as researchers, clinicians, and members of the trans community) in “female gender identity orientation”, “male gender identity orientation”, and “nonbinary gender identity orientation” (Almås et al., 2024). It should be noted that papers which did not specify their methodology still reported data on the gender identity of participants.

2.4.5 Non-binary Labels in Sexual Research

Overall, many studies (21/44) included one or more non-binary gender labels as options in questions on gender identity, with common options being “genderqueer” and “non-binary” (e.g., Bosse & Chiodo, 2017; Burgwal et al., 2019). As noted above, others relied on participants to select “other” and then specify their preferred label in a text box (e.g., Fisher et al., 2018). One paper presented a specific question on the perception of participants' gender as a binary or non-binary construct to differentiate between binary and non-binary participants (Anzani & Prunas, 2020). In another study (Holt et al., 2023), it was noted that if participants endorsed both a binary and non-binary gender identity, the non-binary label was given priority when classifying and grouping participants.

Even when separate non-binary labels were provided or reported, they were generally combined to form a single category/subgroup for analysis (e.g., Holt et al., 2023). In some cases, more typical non-binary labels were combined with other gender labels such as: “cross dresser” (Anzani & Prunas, 2020; Dargie et al., 2014), “woman

but only genetically-wise” (Anzani & Prunas, 2020), or “other” (Dubin et al., 2021).

Multiple papers used an ‘other’ category to capture any participants who did not neatly fit into a binary categorisation of gender (e.g., Dargie et al., 2014; Kattari et al., 2021).

2.4.6 Trans Identification

In the majority of the studies (26/44), whether non-binary participants also identified as transgender was not clear, mostly due to a lack of reporting of prompts or items used to assess gender identity (e.g., Jann et al., 2022). Of the remaining articles, twelve only included trans non-binary people (with being transgender often being one of the inclusion criteria to participate in the study; e.g., Fuller & Riggs, 2021; Kattari et al., 2019), three only included non-binary people that did not identify as trans (e.g., Rothblum et al., 2020) and three included non-binary people regardless of their trans identification (e.g., Rutherford et al., 2021). Overall, trans identity was mostly not assessed (e.g., Dubin et al., 2021; Katz-Wise et al., 2016) and this information had to be inferred by examining the inclusion criteria for participation and the gender identity items reported within the papers.

2.4.7 Scales Used to Assess Sexual Variables

2.4.7.1 Sexual Attraction and Behaviour

Twelve studies included a measure of sexual attraction. Most measured attraction using a modified Kinsey scale (Kinsey et al., 1953; 2003), for instance measuring attraction from “men/masculinity” to “women/femininity” (Anzani & Prunas, 2020). Other papers assessed attraction towards different genders, often focusing only on attraction towards men and women (Jacobson & Joel, 2019; Kennis et al., 2022b; Kennis et al., 2022a). Two studies differentiated between attraction to cisgender and transgender binary individuals using 5-point Likert scales (Goldberg et al., 2020;

Rothblum et al., 2020). In relation to attraction towards non-binary genders, one paper measured attraction towards non-binary people separately (although items to assess this were not reported in full; Boskey & Ganor, 2022), one paper gave the option to express distinct levels of attraction towards AFAB and AMAB non-binary people (Reisner et al., 2023), and one paper gave participants the option to select from a list the genders to which they were attracted, with response options: trans men, cis men, trans women, cis women, genderqueer or nonbinary people, none of the above, others (Byrne et al., 2022).

Eighteen papers included measures of sexual behaviour. Two papers mentioned specific sexual acts including vaginal/“front hole” or anal intercourse (Rosenberg et al., 2021) and “receptive (either anal or vaginal)” or “insertive (either with a penis or a strap-on)” intercourse (Goldbach et al., 2023).

Seven papers asked about gender of sexual partners. Two studies did not give an option for reporting non-binary sexual partners (Fisher et al., 2018; Reisner et al., 2023), two studies gave a non-binary partner option but the exact prompt was not reported (Boskey & Ganor, 2022; Pletta et al., 2022), and one paper gave options for non-binary or transgender partners, but for analysis, the two categories were paired together into a “transgender/genderqueer or non-binary partners” category (Goldberg et al., 2020).

2.4.7.2 Sexual Orientation Identity and Sexual Fluidity

Thirty-three papers reported on sexual orientation identity, although 16 did not report separate results for non-binary subgroups (e.g., Katz-Wise et al., 2016). While two papers provided participants with only a few alternatives in relation to labelling their sexuality, such as heterosexual (straight), gay or lesbian, bisexual, and not sure (Kattari

et al., 2019; Kattari et al., 2021), others were more inclusive, either by allowing participants to select an “other” option and enabling participants to provide their own label (e.g., Rutherford et al., 2021), or by expanding the range of options provided (i.e., pansexual, queer, asexual, and other labels), or both (e.g., Reisner et al., 2023). Some papers also allowed participants to select multiple labels (e.g., Fisher et al., 2018). One paper used the Sexuality Questionnaire (SQ; Alderson, 2012) and prompted participants to indicate how much they associated with multiple identity labels, including heterosexual, bisexual, gay or lesbian, queer, transexual, no label, or other (Dargie et al., 2014). Only two studies looked at sexual fluidity. One study (Katz-Wise et al., 2016) used a single and gender-neutral item, while a more recent study (Katz-Wise et al., 2023) used multiple gender-neutral questions that looked at attraction and identity changes.

2.4.7.3 Sexual Satisfaction

Six papers included measures of sexual satisfaction. Three papers (Kennis et al., 2022b; Kennis et al., 2022a; Mark et al., 2018) used the Global Measure of Sexual Satisfaction (GMSEX; Lawrance & Byers, 1995). One paper (Holt et al., 2023) used a single Likert scale item from the Multi-Dimensional Sexual Self-Concept Questionnaire (Snell, 2010). One paper used a modified version of the Sexual Satisfaction Scale (Fisher et al., 2015; Mark et al., 2014) removing indications on the number of partners (Perez & Pepping, 2024) and one did not report the measure used in detail (Almås et al., 2024).

2.4.7.4 Relationship Satisfaction

Six studies considered relationship or romantic satisfaction, and most measures were gender neutral. Specifically, Holt et al. (2023) used a single item (“I am satisfied with the romantic aspects of my life”, 5-point Likert scale), while Mark et al.

(2018) used the General Measure of Relationship Satisfaction (GMREL; Lawrance & Byers, 1992). The relationship satisfaction subscale of the Gay and Lesbian Relationship Satisfaction Scale (GLRSS; Belous & Wampler, 2016) was used by Fuller and Riggs (2021). Although this measure was mostly gender neutral, one of the items referenced partners using gendered pronouns (“I often tell my partner that I love him/her”). Dargie et al. (2014) and Walters et al. (2023) used Hendrick’s Relationship Assessment Scale (RAS; Hendrick, 1988). For Dargie et al. (2014), it is unclear whether the measure was completed by non-binary participants. Lastly, Perez & Pepping (2024) used the 4-items version of the Couples Satisfaction Index (CSI-4; Funk & Rogge, 2007).

2.4.7.5 Other Sexual Variables

Other sexual variables were investigated by a very limited number of papers. One study measured sexual assertiveness. McKenna et al. (2021) modified the Sexual Assertiveness Questionnaire (SAQ; Loshek & Terrell, 2015) by changing the language to be gender-neutral to make it inclusive of non-binary participants. The same study also used the Sexual Consent Scale-Revised (SCS-R; Humphreys & Brousseau, 2010) to measure sexual consent, attitudes, beliefs, and behaviours, and performed a confirmation factor analysis which found that the original structure did not fit a cisgender and non-binary sexual minority sample (McKenna et al., 2021).

One study measured sexual fantasies. Anzani and Prunas (2020) used the Italian version of the Sexual Fantasy Questionnaire (SFQ; Bogaert et al., 2015) and performed a confirmatory factor analysis which found that the proposed structure did not fit the data with a sample of non-binary and cisgender adults (and remained inappropriate, even when only cisgender participants were included). One paper looked at BDSM practices and fantasies using two measures that were created for the study (Dahl et al., 2024).

To measure sexual desire, Mark et al. (2018) used the Dyadic Subscale of the Sexual Desire Inventory (SDI-D; Spector et al., 1996). Although this tool uses gender neutral language overall, one item references biological sex (“Compared to other people of your age and sex, how would you rate your desire to behave sexually with a partner?”; Spector et al., 1996).

Koós et al. (2024) used the gender-neutral Pornography Use Motivations Scale (PUMS; Bóthe et al., 2021) and questions on frequency and duration of porn use. Fetishisation experiences were assessed through four gender-neutral items in Perez & Pepping (2024).

One study assessed sexual function. Reisner et al. (2020) developed and piloted the Transmasculine Sexual Functioning Index (TM-SFI) and conducted psychometric assessments with a sample of transmasculine patients accessing gender care in the US. The TM-SFI was adapted from the 6-item version of the Female Sexual Function Index (FSFI-6; Isidori et al., 2010) to better assess sexual function in transmasculine people who were eligible for cervical cancer screening and had not had genital surgery.

Sexual distress was measured using the Short Sexual Distress Scale (SDS-3; Pâquet et al., 2018) in Lin et al. (2024)’s study. One paper measured masturbation; however, the specific item was not reported in the article (Almás et al., 2024).

The two papers that investigated sexual self-concept discrepancies (defined as discrepancies between the actual/ideal and actual/ought sexual self; Kennis et al., 2022a), used two gender neutral items created by the researchers, as well as the Transgender-Specific Body Image Worries Scale (T-Worry; Dharma et al., 2019), a

validated measure to assess trans-specific body worries in relation to sex (Kennis et al., 2022b; Kennis et al., 2022a).

Lastly, one study examined sexual self-esteem. Kennis et al. (2022a) used four subscales of a sexual self-concept questionnaire created by Buzwell & Rosenthal (1996).

2.4.8 Review of Studies' Findings

2.4.8.1 Gender Transition

A minority of papers in our sample (8/44) examined gender transition among non-binary participants. Burgwal et al. (2019) found that 75.5% of non-binary people in their general population sample of 853 European trans and gender-diverse individuals, 16 and older, reported desiring gender affirming medical care. Kennis et al. (2022b) found that compared with binary trans participants, fewer non-binary adults in their sample (mainly recruited through social media) were seeking hormone treatment (27% vs. 81%) and gender affirming surgeries (20% vs. 51%). In a different paper, it was found that 45% of non-binary people in a sample of trans/non-binary US veterans were receiving gender-affirming care compared to 82% of binary trans people. The same authors found that a minority of non-binary participants had had gender affirming surgery compared to trans men (27% vs. 64%), while 54.4% of non-binary veterans were not taking hormones compared to 16.6% of trans women and 17.6% of trans men veterans (Littman et al., 2024).

Six papers included inferential analysis and comparison between non-binary and binary individuals in relation to gender affirming procedures. Overall, non-binary people were less likely than binary trans people to have accessed gender affirming care or to have received gender affirming treatments such as surgeries or hormones (Holt et

al., 2023; Kennis et al., 2022a; Littman et al., 2024) and were more likely to report no treatment desire (Kennis et al., 2022a).

In their US sample of treatment seeking transmasculine individuals (21 = non-binary, 146 = trans men), Boskey and Ganor (2022) reported that 95% of non-binary participants were currently seeking chest surgery while only one participant (5%) was pursuing genital surgery; this was significantly different than trans men, of whom 73% and 27% were seeking chest and genital surgery, respectively. Rutherford et al. (2021) compared non-binary individuals and cisgender non-heterosexual men having sex with men and found that non-binary participants were more likely to have been denied access to hormone therapy (13.3% vs. 0.3%) and gender affirming surgeries (9.3% vs. 0.2%).

2.4.8.2 Sexual Orientation Identity and Labels

Most papers reported that non-binary participants primarily identified as queer – between 24.9% and 71.9% (e.g., Bosse & Chiodo, 2017; Dargie et al., 2014; Fisher et al., 2018; Hibbert et al., 2020; Holt et al., 2023; Jann et al., 2022; Rutherford et al., 2021; Smalley et al., 2016). The label ‘bisexual’ was also commonly chosen by non-binary participants in some studies; however, it is unclear if this accurately reflects their orientation or rather if it is due to lack of available alternatives, as when provided, non-binary people also frequently selected “something else” or “another label”, as reported by Dubin et al. (2021) and Eliason and Streed (2017). Although it should also be noted that in the National Health Interview Survey (NHIS) used by Eliason and Streed (2017), gender identity and sexual orientation were conflated in their measure of sexual orientation.

In an US nationally representative sample of 1507 sexual minority individuals, 25% of non-binary participants identified as queer (significantly more than cis men and cis women) and one third of all queer participants endorsed a non-binary gender identity (Goldberg et al., 2020). Likewise, Fisher et al. (2018) found that nonbinary youth in their sample (aged 14-21) were significantly more likely to identify as queer compared with binary trans young people and Boskey and Ganor (2022) reported that assigned-female-at-birth (AFAB) non-binary people were significantly more likely to identify as queer compared to binary trans men.

Considering sexual minority identity status, Burgwal et al. (2019) found that non-binary participants were significantly more likely to identify as a sexual minority than binary trans participants (93.8% vs. 75.8%, $p < .001$). Similarly, Reisner et al. (2023) found that 99.4% of non-binary people in their US probability sample identified as a sexual minority, compared with 23.3% of trans women and 28.3% of trans men, a statistically significant difference.

Regarding heterosexual identity, multiple studies (e.g. Boskey and Ganor, 2022; Littman et al., 2024) reported that trans binary participants were significantly more likely to identify as heterosexual than non-binary people.

Holt et al. (2023) found that non-binary participants in their Australian study on the sexual and relationship satisfaction of trans people were more likely to identify as queer, fluid, or asexual compared to trans men and trans women, while Rutherford et al. (2021) highlighted that non-binary participants in their study of gay, bisexual, and other men who have sex with men and non-binary individuals over 15 living in Canada were significantly more likely than cisgender men to identify as queer (49.3% vs. 6.6%), pansexual (32.0% vs. 2.8%), bisexual (17.3% vs. 10.4%), asexual (4.7% vs. 0.6%), and

other (2.7% vs. 0.4%). Rothblum et al. (2020) also found that US asexual participants from the Generations Study were significantly more likely to identify as non-binary than allosexual LGB individuals. Similarly, Nimbi et al. (2024) highlighted a high percentage of non-binary people in their adult Italian asexual sample, with non-binary participants mainly identifying with the labels asexual (22.9%) and gray-asexual (21.8%).

Lastly, in terms of developmental milestones of sexual identity (e.g. realization of LGB identity, first time having sex with someone of same sex, coming out with friends and family), non-binary people appeared to generally meet the majority of these milestones before adulthood (Bishop et al., 2023).

2.4.8.3 Sexual Attraction

Attraction was mainly asked about in relation to men and women, comparing non-binary people to individuals of different binary genders. Non-binary individuals reported attraction towards both men and women (Anzani & Prunas, 2020; Goldberg et al, 2020; Reisner et al., 2023). It is unclear whether this might be a significant difference in relation to binary individuals, with some evidence pointing out that AFAB non-binary people might be more likely to report attraction to both men and women than binary cis and trans people (Jacobson & Joel, 2019) and that non-binary individuals might present higher levels of attraction to women compared to cisgender males and females (Kennis et al., 2022b). However, other studies have found no significant differences in levels of attraction towards binary genders when comparing non-binary and binary trans individuals (Boskey & Ganor, 2022; Kennis et al., 2022a). Analysis on attraction towards non-binary genders was reported by one paper (Boskey & Ganor, 2022), finding that non-binary AFAB people were significantly more likely to report attraction to other non-binary genders compared with trans men. This is supported by descriptive findings in Reisner et al. (2023) showing that the majority of the non-binary people in their US probability

sample were attracted to other non-binary people (76.1% to AFAB non-binary and 63.6% to AMAB non-binary individuals), and around 78% reported attraction to more than 3 genders.

2.4.8.4 Gender of Sexual Partners

Regarding the gender of sexual partners, both Holt et al. (2023) and Boskey and Ganor (2022) found that non-binary participants were significantly more likely than binary transgender individuals to have had non-binary partners. And, although no separated inferential analyses were conducted, Hibbert et al. (2020) found that among a sample of UK LGBT adults, 56% of non-binary participants reported having had sex with men, 77% reported sex with women, and 67% reported sex with non-binary people. Similarly, Reisner et al. (2023) found that 56.0% of non-binary participants in their US representative sample had had sex with cisgender women, 39.1% with cisgender men, 21.8% with trans women, 28.9% with trans men, and overall, 33.2% had had sex with partners of more than 3 different genders in the past 5 years. Additionally, Almås et al. (2024) found that non-binary people in their trans and gender-diverse Norwegian sample were more likely to report having had their last sex with an intersex or trans partner. Finally, in a sample of trans youth (aged 14-21), including trans non-binary youth, participants were asked about the gender of their sexual partners in the past 12 months (Fisher et al., 2018). Among 32 non-binary participants, 56.3% reported cisgender male partners, 43.8% reported transmasculine partners, 37.5% reported cis female partners, and 15.6% reported transfeminine partners; no significant differences by gender identity were found (Fisher et al., 2018).

2.4.8.5 Sexual Fantasy

Three papers reported exploring non-binary people's sexual fantasies. Although there were no significant differences in fantasies about dominance/control and partner humiliation between non-binary and cisgender participants, non-binary people reported significantly less arousal than cisgender adults in relation to some fantasies (such as kink or sexual engagement with attractive and older/more experienced partners; Anzani & Prunas, 2020). The same authors identified that non-binary adults reported to be as excited by group sex/promiscuity and submission related fantasies as cisgender women (but significantly less than cisgender men). Finally, non-binary participants appeared to be significantly less aroused by fantasizing on undressing and showing devotion towards a partner than cis women, but at a comparable level to cis men (Anzani & Prunas, 2020). In relation to BDSM fantasies, one paper found that non-binary people reported more domination fantasies than cis women ($M = 44.58$, $SD = 16.39$ vs. $M = 35.83$, $SD = 15.44$) and more submissive fantasies than cis men ($M = 43.37$, $SD = 19.14$ vs. $M = 53.42$, $SD = 17.85$; Dahl et al., 2024). The same paper also explored BDSM behaviour and found that cis women had significantly less dominant behaviour than non-binary people ($M = 30.40$, $SD = 13.63$ vs. $M = 38.28$, $SD = 15.84$; Dahl et al., 2024). Additionally, Almås et al. (2024) reported that participants with a "nonbinary gender identity orientation" reported being more aroused by the idea of perceiving themselves as trans compared to binary trans participants ("female/male gender identity orientation").

2.4.8.6 Sexual Behaviour

2.4.8.6.1 Higher Risk Behaviours

In terms of higher risk sexual behaviour, Kattari et al. (2019) reported that 42.1% of non-binary high school students in their sample used "drugs and alcohol" before last

intercourse and 61.4% did not use a condom. Similarly, Smalley et al. (2016) found that 41.4% of non-binary participants in their sample reported having unprotected sex (defined as not using condoms or dental dams) at least most of the time and 8% reported having had sex “under the influence”, which was similar as compared to participants of different genders. A study including trans people attracted to men living in New Zealand found that being non-binary AFAB and attracted to men was linked to lower perceived ability to negotiate protective barrier use compared to trans women attracted to men (Byrne et al., 2022).

Conversely, one study including Australian transgender individuals found that non-binary people were as likely as trans binary people to have had condomless intercourse in the last year, but more likely to report ever having used drugs for sex (Holt et al., 2023).

One paper looked at casual sex during Covid-19 lockdown, finding that this was not associated with gender identity (Nadarzynski et al., 2023).

Lastly, one paper found that being non-binary was not significantly associated with higher likelihood of having had sex with someone of unknown STI/HIV status in the past 12 months (Pletta et al., 2022), while a different paper focusing on transactional sex highlighted that among 65 non-binary clients accessing Alabama-based AIDS service, 60 had no history of selling sex (Atkins et al., 2024).

2.4.8.6.2 Number of Sexual Partners

Number of sexual partners in the last year and across the lifetime was similar between non-binary and binary transgender aged 14 to 21 (2.7 partners in the last 12 months and around 5 lifetime partners; Fisher et al., 2018) and between non-binary and

cisgender people over 16 (with around 9.9 lifetime sexual partners; McKenna et al., 2021).

2.4.8.6.3 Being Sexually Active and Other Sexual Behaviours

Holt et al. (2023) found that non-binary participants were more likely than binary individuals to report sex in the last year. Additionally, non-binary people of different sexual identities (queer lesbian/gay, bisexual, or “other”) were equally as likely to report being sexually active in the past 5 years (Goldberg et al., 2020). Furthermore, gender was not associated with reporting receptive or insertive sex in a sample of transfeminine and non-binary adults (Goldbach et al., 2023). In a Norwegian study of non-binary adults, the majority reported engaging in kissing and masturbation, while 42.4% reported having had oral sex in their last partnered sexual encounter (Almås et al., 2024). Lastly, the same paper discussed masturbation, finding that non-binary participants reported higher rates of masturbation compared to “female gender identity oriented” people (i.e., trans people with a feminine gender identity) but not those who were “male gender identity oriented” (i.e., trans people with a masculine gender identity; Almås et al., 2024).

2.4.8.7 Sexual Fluidity

The two papers that examined sexual fluidity both focused on the US context. The first paper (Katz-Wise et al., 2016) measured sexual fluidity in an adult American LGBT sample and found that being non-binary was associated with experiencing shifts in sexual attraction. Overall, 42% of non-binary individuals reported a change in their attractions across their lifetime, and being non-binary was significantly associated with ever experiencing a change in one’s sexual attraction for the whole sample; nonetheless, when restricting the analysis to a subset of individuals that had socially

transitioned (n = 205), individuals that experienced a change in their attraction post-transition were less likely to be non-binary (Katz-Wise et al., 2016). The second article (Katz-Wise et al., 2023) found that among a sample of youth aged 14-25 years, recruited through the survey panel provider Prodege, non-binary participants were significantly more likely to report sexual identity changes compared to cisgender individuals (73.1% vs. 17.2% cis women and 7.8% cis men). Gender identity was also linked to changes in sexual attraction, with non-binary or other identity participants reporting the highest level of change (71.3% non-binary people, 39.2% cis women, 17.7% cis men, 50% trans women, 66% trans men; Katz-Wise et al., 2023).

2.4.8.8 Sexual Satisfaction and Relationship Satisfaction

Three papers looked at both sexual and relationship satisfaction (Holt et al., 2023; Mark et al., 2018; Perez & Pepping, 2024) and found no significant differences by gender. Similar null results have been reported elsewhere for relationship satisfaction (Fuller & Riggs 2021; Walters et al., 2023) and sexual satisfaction (Kennis et al., 2022b) among binary trans people and non-binary people.

2.4.8.9 Relationship Structure

Three papers discussed monogamous and non-monogamous relationship structures in relation to non-binary individuals. Non-binary people were more likely than cisgender men (16.7% vs. 1.8%) to be in polyamorous relationships (Rutherford et al., 2021) and to have an open, “other type” of non-monogamous relationship or multiple relationships compared to trans men and women (non-binary people 29.7% vs. 16.2% trans men and 17.1% trans women; Holt et al., 2023). Lastly, on a descriptive level, non-binary adults currently living in the UK reported relationships with multiple partners

more often than binary trans and cisgender individuals (9% non-binary participants vs. 6% trans women, 4% trans men, and 2% cis participants; Hibbert et al., 2020).

2.4.8.10 Sexual Health Attendance and Negative Experiences in Health Care

Four studies looked at sexual health care attendance and discrimination experiences. In a sample of LGBT UK adults, identifying as non-binary was not associated with sexual health clinic attendance compared to other trans people (Hibbert et al., 2020). In another study with Australian trans and gender-diverse participants over the age of 16, non-binary individuals presumed AFAB were significantly more likely to access sexual health care from a general practitioner, while non-binary participants presumed AMAB were more likely to access community-based sexual health services; there was no difference for accessing hospital-based sexual health care (Rosenberg et al., 2021).

In terms of negative experiences and discrimination within sexual health care, one paper found that AFAB non-binary individuals reported the most “gender insensitivity” (i.e., experiences of transphobia and cisgenderism), and non-binary participants in general found hospitals to be the most gender insensitive providers while community-based services were the least insensitive (Rosenberg et al., 2021). Additionally, in a Canadian sample including 3083 cis men who have sex with men and 150 non-binary participants, non-binary people were significantly less likely to report never having been denied sexual health care treatment compared to cisgender participants (68% vs. 84.2%; Rutherford et al., 2021).

2.4.8.11 Other Sexual Variables: Sexual Function, Wellbeing, Self-Concept, Consent Attitudes, Porn use, Assertiveness, Pleasure, and Desire

Other sexual variables were considered in single studies only and tended to focus on whether significant differences occurred between non-binary and binary (both trans and cis) individuals. Regarding sexual desire (Mark et al., 2018) and sexual assertiveness (McKenna et al., 2021), there were no significant differences between cisgender and non-binary participants; however, non-binary people reported fewer maladaptive attitudes, beliefs, and behaviours toward sexual consent (such as believing that consent could be assumed or that there is less need for consent as relationship length increases; McKenna et al., 2021).

Non-binary people reported greater discrepancies than cisgender people (but not trans binary people) in relation to “actual/ought” sexual self-concept (their ideas of who they currently are and their self-imposed expectation on who they should be in relation to their sexuality) and “actual/ideal” sexual self-concept (their ideas of who they are compare to who they would like to be as a sexual being; Kennis et al., 2022a). The same authors looked at sexual wellbeing as a function of sexual self-esteem, satisfaction, and body-image worries, and found that trans non-binary people differed from trans binary people only on body-image worries (with binary transgender individuals being more concerned about their bodies in a sexual setting; Kennis et al., 2022a). Non-binary people differed from cisgender people only on body perception, a sub-dimension of sexual self-esteem which looks at feelings of satisfaction towards one’s body and its current development level (Kennis et al., 2022a). On a descriptive level, non-binary participants also reported more sexual distress ($M = 3.76$; $SD = 2.87$) as compared with cis men ($M = 3.41$; $SD = 2.75$) and women ($M = 3.15$; $SD = 2.66$; Lin et al., 2024). Gender identity was not significantly associated with sexual functioning in a

transmasculine sample including both binary and non-binary individuals (Reisner et al., 2020). It was also not associated with importance of sexual activity in a sample of binary transfeminine and non-binary AMAB adults (Goldbach et al., 2023). In terms of motivations for pornography use, results from an international convenience sample (42 countries) found that self-exploration was the only motivation which was more strongly endorsed by non-binary people compared to men and women (Koós et al., 2024). One paper (Almás et al., 2024) found that, as compared with non-binary people, people with a male gender identity orientation (i.e., trans men) reported higher sexual satisfaction when seducing and dominating their partners, but lower sexual satisfaction from using clothing sexually and engaging in other fetish behaviour.

Lastly, Perez and Pepping (2024) looked at sexual fetishisation in a sample of North American and European trans and gender-diverse adults. They found that trans women were significantly more likely than non-binary people to have experienced fetishisation on social media, to have been sexually objectified, and to have had sexual partners who were only interested in them because of their trans identity. No differences between non-binary people and trans men were found (Perez & Pepping, 2024).

2.5 Discussion

The current systematic review aimed to analyse the existing quantitative research on the sexuality and sexual health of non-binary people to synthesize and evaluate the literature results, appraise language inclusivity, and discuss potential gaps in knowledge. Most papers that investigated sexual orientation reported that non-binary people typically endorsed non-monosexual identities and identities that do not reference gender (e.g., queer, pansexual). This might reflect a tendency of non-binary

individuals to move away from sexual identity labels that are not reflective of their gender expansiveness (Kuper et al., 2012). Moreover, non-binary people might be more sexually fluid than binary people (Katz-Wise, 2016) and might be more likely to be attracted to and have sexual relationships with other non-binary people compared to trans binary individuals (Boskey & Ganor, 2022). Qualitative findings about the experiences of sexual fluidity in gender minority individuals have linked shifts in sexual orientation to changes in gender identity (Galupo et al., 2014), but more specific studies with non-binary individuals that recognize their unique experiences are lacking and more research is needed.

In relation to sexual health, studies found that non-binary people often experienced cisgenderism and transphobia from their care providers, which has been linked with negative health effects, such as less frequent STI testing in gender-diverse individuals (Rosenberg et al., 2021). Negative attitudes and a lack of understanding of gender minority needs might deter non-binary individuals from engaging with professional support for sexual health (as highlighted by Rutherford et al., 2021). Furthermore, even when non-binary people decide to engage with health professionals, it is important to consider how gaps in knowledge and disregard for non-binary people's identities might affect the quality of care provided (Rutherford et al., 2021). Although more research on these topics is necessary, this review found no reported significant differences between non-binary and binary people in terms of sexual and relationship satisfaction (e.g., Fuller et al., 2021; Perez & Pepping, 2024). Overall, research on other sexual variables is lacking, which greatly impacts the ability to generalize findings.

Another topic of interest for this review was the use of inclusive language in quantitative sex research with non-binary participants. Generally speaking, studies that measured sexual attraction and behaviour did so in a way that ignored genders outside

the binary, focusing on attraction towards men and woman only. Consistently, although most studies included an option to articulate one's sexual identity label using a textbox, some of the analysed papers included only a small range of default options, which might not be appropriate for non-binary people. Importantly, an understanding of sexual orientation that is rooted in a binary conceptualisation of gender might be inadequate and reductive for individuals who endorse a trans and/or non-binary identity (Galupo et al., 2014).

In relation to other sexual variables, although not all items used were reported, overall language appeared to be gender neutral, with authors sometimes changing the original scale's verbiage to improve inclusivity. In some cases, "binary" pronouns, a gendered prospective or references to biological sex (Anzani & Prunas, 2020; Fuller & Riggs, 2021; Mark et al., 2018) were maintained, which could be problematic and may alienate non-binary respondents. Additionally, questions on sexual behaviour that describe sexual acts might benefit from a more expansive definition of sexual activity that focuses less on penetration and genitals during sex (Goldbach et al., 2023).

Reviewed papers had some limitations. In relation to study characteristics, all papers were cross-sectional (or only performed cross-sectional analysis), which limits our understanding of how sexual and relationship related variables might evolve over time. Additionally, authors often did not, or were unable to, include non-binary people as a standalone group for their inferential analysis. This resulted in all individuals who did not neatly fit the gender binary being relegated to an "other-gender" category or in non-binary and binary transgender people being grouped together. Consequently, much of the information reported in this review comes from descriptive statistics, limiting our ability to generalize results to the wider non-binary population. Moreover, trans identification within the non-binary population was mostly disregarded and not

assessed which could impact our understanding of how non-binary people who identify as trans and those who do not, differ in relation to their sexuality. Gender categorisation in quantitative research should explore cisgender/transgender and binary/non-binary self-classifications and account for uncommon labels as chosen by participants (Beischel et al., 2023).

The assimilation of different gender identities in a single subgroup appeared to be due to the inability of most studies to recruit a significant number of non-binary individuals, to the point where meaningful statistics that focused on a non-binary subgroup could not be performed. Issues with recruitment may be partially explained by the fact that non-binary people are a relatively small and marginalised population (e.g., at the 2021 UK census, non-binary people represent 0.06% of people over 16 living in England and Wales; Office for National Statistics, 2023). Moreover, the recruitment of non-binary people (or even inclusion of non-binary people in some cases) was often not a specific focus of the studies, which tended to be more interested in reaching broader identity groups (e.g., transgender, LGBTQ+, or “gender minority” individuals; e.g. Rutherford et al., 2021).

We also found that measures used to assess sexual variables by the included studies were mostly created ad hoc and/or were not validated for use with non-binary or transgender populations. This reflects a more pervasive issue with research on gender-diverse individuals: a lack of validated psychometric tools for gender minority populations (Keo-Meier & Fitzgerald, 2017). To address these limitations, some of the included papers (10/44) performed psychometric testing, such as confirmatory or exploratory analysis or reliability testing (e.g., Anzani & Prunas, 2020).

From our analysis, it is apparent that this field is expanding and that literature on non-binary people is becoming more prevalent (as supported by the fact that 33/44 papers included in this review were published between 2020 and 2024). Nonetheless, research in this area is in its infancy. Notably, during the screening phase of this review, most of the research identified by the search strategy was not inclusive of non-binary people and either did not differentiate between trans and non-binary samples or did not mention non-binary people at all. Accordingly, the majority of papers retrieved via searching were not included in this review (see Supplementary Table 2). Even when the papers met inclusion criteria, non-binary people often seemed to be an afterthought, with measures lacking appropriate validation and language representing experiences outside of binarism. This is particularly true of older research included in this review. More empirically sound research, specifically focusing on the non-binary population as the main group of interest, is especially needed.

Finally, the wider societal impact of non-binary inclusive research warrants significant attention, with data showing a growing trend among younger generations to identify outside the gender binary (e.g., Gallup Organization, 2024). The prevalence of non-binary individuals is likely to continue to increase (e.g. Statistics Canada, 2022), along with increased societal recognition of those who exist beyond traditional Western gender norms. However, legal recognition of non-binary identities is progressing at a slower pace, as is healthcare providers' ability to offer evidence-based support to non-binary people concerning their health in general, and their sexual health in particular (e.g., Kinney & Cosgrove, 2022). Consequently, non-binary individuals often bear the burden of advocating for their own care and relying on social support to escape transphobia within medical settings (Seelman & Poteat, 2020). As researchers in the

field of sexuality, we have the ability and the responsibility to produce knowledge that reflects societal diversity, recognizing and fostering social change.

2.6 Recommendations for Future Research

Based on the described findings and current limitations of the field, some recommendations can be made. In general, more research of non-binary experiences on sexual topics, such as sexual wellbeing, satisfaction in sexuality and relationships, sexual fluidity, fantasy, and assertiveness is needed. Such research needs to have appropriately powered samples, and where possible, a longitudinal design to assess changes over time. Studies that explore differences between binary transgender and non-binary individuals are especially lacking and this limits our understanding of possible differences between them. It is likely that binary transgender and non-binary individuals have different sexual needs and experiences which should be accounted for. In terms of measurement, there is a need to produce, adapt and/or validate scales with non-binary people to increase confidence in the legitimacy of results. When assessing sexual identity, presenting a variety of label options, particularly plurisexual and gender-neutral options like pansexual and queer, should be the norm. Similarly, non-binary identities should be included as response options in relation to sexual attraction and behaviour related items (e.g., when assessing the gender identity of past, current, or potential partners), to allow non-binary people (and their partners) to more easily express their full range of sexual feelings and experiences. When conducting research with this population, authors also need to ensure that language is neutral and that any ambiguity (e.g., confusion between sex/gender) or unnecessary focus on sex-assigned at birth is avoided. Finally, researchers need to ensure that gender diversity is kept at

the forefront of research by involving non-binary people in studies about non-binary people from the very beginning.

2.7 Limitations of this Systematic Review

This systematic review has several limitations. Firstly, the focus on western samples and definitions of what it means to be non-binary might have created bias. However, this was an intentional choice because of variations in cultural understandings about non-binary identities. Additionally, we recognize that western categorisations of non-binary identities are also subjected to cultural influences, which can further limit our analysis. Secondly, this review focused only on quantitative research published in English and Italian, and we are therefore unable to discuss how qualitative studies might have addressed sexual variables in non-binary populations and in other languages. Selection bias might have impacted the researchers' impartiality, however this was addressed by means of detailed inclusion/exclusion criteria and two independent coders being involved in the screening process.

2.8 Conclusions

Although studies that include non-binary people are increasing, literature with a specific focus on non-binary individuals is still severely lacking. In order to fill current gaps in knowledge in a meaningful way, researchers need to establish a clearer focus on individuals that challenge and/or disrupt gender binarism by validating tools for non-binary people, using inclusive language, and enhancing community consultation practices.

Amplifying non-binary voices within academia has the potential to generate credible and impactful research that provides a more nuanced understanding of non-

binary people’s sexuality. This will directly benefit the sexual health of gender-diverse populations who have been previously marginalised both within and outside of the research literature focusing on sexual experience.

2.9 Tables for Study 1

Table 1 Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
Includes variables relating to sexuality, sexual health, or relationship satisfaction/quality (including sexual orientation, sexual fluidity, sexual satisfaction, sexual wellbeing, sexual function/dysfunction, orgasm, sexual fantasy, sexual preferences, sexual distress, and sexual behaviour).	Exclude if only data on HIV/STI prevalence, treatment, or preventive measures (e.g. PrEP) are presented, as this is the focus of previous systematic reviews (e.g. Dang et al., 2022; Van Schuylenbergh et al., 2018).
Published in peer review publications.	Grey literature, conference articles, theses, and other non-peer reviewed publications
Empirical analysis (primary research and secondary data analysis were included).	No empirical analysis.
Directly involves non-binary and/or transgender individuals as participants.	Exclude if study only reports others’ perceptions or opinions, such as family members or partners.
Presents quantitative analyses (more specifically, used a quantitative measure to assess sexuality, sexual health, or relationship related constructs). Mixed-method studies that included a quantitative approach to data relating to sexuality and relationships were also included.	Qualitatively analyses.

Mean sample age over 16 years.	Mean sample age below 16 years, focus on children.
Published in English or Italian.	Other languages were not included in this review.
Published between 2012 and 2022 (initially, later updated to 2024).	Articles published prior to 2012 were not examined.
Has separate analyses/descriptives for individuals that identify outside the gender binary (accepted labels were all labels relating to non-binary identities, such as "non-binary", "genderqueer", "agender", or labels that group multiple identities outside of men and women together, such as "other").	Papers that did not differentiate non-binary and binary trans or cis people were not included.
Includes samples from Europe, North America, and/or Australia and New Zealand	Due to cultural differences in the understanding and categorisations of non-binary genders, papers referring to non-western samples were not included

Table 2 Studies' Characteristics and Quality Assessment Summary Scores

Citation	Location samples	Sampling method	Main independent variables	Main outcome variables considered	Scales or items used for main sexuality constructs (completed by non-binary people)	Main findings	Quality assessment
Almås et al. (2024)	Norway	Convenience sampling	Gender identity	Sexual behaviour, Sexual arousal, Sexual satisfaction, Masturbation	Questionnaire adapted French, used in previous studies	Sexual behaviour: Non-binary people reported a mean age of 12.8 (4.0) of first sex with oneself and of 17.8 (3.4) for first sex with others. Non-binary people were more likely to having had last sex with a trans or intersex person. Sexual arousal: Non-binary people reported being more aroused by the idea of perceiving themselves as trans.	0.55

						<p>Sexual satisfaction: male oriented people reported higher sexual satisfaction in terms of seducing and dominating their partners, but lower in relation to using clothing and other fetishes compared to non-binary oriented people.</p> <p>Masturbation: non-binary people reported higher rate in the past 12 months compared to female oriented people but not male oriented people. Sexual practices: majority of non-binary oriented people had engaged in kissing, masturbation and 42.4% had engaged in oral sex in their last encounter with a sexual partner.</p>	
Anzani & Prunas (2020)	Not specified (possibly Italy as questionnaire in Italian)	Convenience sampling	Gender identity	Sexual fantasy	<p>Sexual fantasies: Sexual Fantasy Questionnaire (SFQ) - Italian version. Confirmatory factor analysis performed, proposed structure did not fit the data (even when including cisgender participants). Principal axis analysis performed, 5 items were removed. Authors highlight this is a gendered scale, made for cisgender people and used due to lack of inclusive tools.</p> <p>Sexual attraction: Kinsey scale (Erotic attraction from "Exclusively to men/masculinity Predominantly to men/masculinity, only incidentally to women/femininity" to "Predominantly to women/ femininity, only incidentally to</p>	<p>Sexual fantasy: no significant difference in scores for factors "Dominance and control" and "Forcing/humiliating the partner" across genders (cis men, cis women and nonbinary people). Nonbinary people reported less arousal for factors "Kink and non-normative sexual interests", "Attractive/irresistible partner", "Older, more experienced partners" than cisgender groups, and less arousal on factors "Group sex, multiple sexual partners, promiscuity" and "Passivity and submission" compared to cis men (no significant difference with cis women). Non-binary participants had less arousal for "Undressing, showing-of" and "Devotion/being devoted to partner" than cis women (no significant difference with cis men). Sexual attraction: 40% of non-binary people were "Equally attracted to men/masculinity and women/femininity" followed by 18.2% "Predominantly attracted to women/ femininity, only incidentally to men/masculinity".</p>	0.91

					men/masculinity Exclusively to women" + "Attracted to neither men/masculinity nor women/femininity").		
Atkins et al. (2024)	USA	Convenience (Clients accessing Alabama-based AIDS Service)	Transactional sex	STIs diagnosis	Transactional sex history: "In the past five years, have you exchanged sex for money, drugs or something of need?"	Transactional sex: of the 65 non-binary or other participants, 60 had no history of transactional sex.	0.91
Bishop et al. (2023)	USA	Data from baseline of The Generations Study	Gender identity, race/ethnicity, gender non-conformity, cohort (age)	Sexual identity development milestones/profiles	Sexual identity development milestones: six questions assessing age at which milestones occurred (e.g. "At what age were you first sexually attracted to someone of the same sex as you?"). Participants responded with their age at each event or "never"/ "do not know/cannot recall" (missing). Participants were classified in one of four profiles: early adolescence (EA), middle adolescence (MA), late adolescence (LA) or adulthood (AH) profile. Sexual identity: options were gay or lesbian, bisexual, or other (i.e., same-gender-loving, pansexual, queer, asexual, and anti-label).	Sexual identity development milestones: Nonbinary/genderqueer had the largest proportion of people in the middle adolescence (MA) profile (44%) and the fewest (9%) in the adulthood profile (AH) profile. Women and nonbinary/genderqueer participants were more likely to be in the EA or MA profiles than the late adolescence (LA) profile compared to men.	0.95

Boskey & Ganor (2022)	USA	Convenience sampling (patients of Center for Gender Surgery in USA)	Binary/non-binary gender identity	Sexual orientation (identity, behaviour, attraction)	Specific questions not reported in article	Sexual orientation - attraction: Non-binary participants were significantly more likely to have attraction towards non-binary genders (nonbinary, gender queer, and agender, $p < 0.01$ for all) than binary participants. No differences in attraction to binary individuals. Sexual orientation - behaviour: non-binary people had more non-binary sexual partners ($p < 0.01$). Sexual orientation - identity: non-binary people were more likely to identify as queer compared to binary trans men. Binary trans men were more likely to be heterosexual.	0.86
Bosse & Chiodo (2017)	USA	Convenience sampling (community organizations and Internet groups)	Sex-assigned-at-birth, "Congruent/incongruent" gender identity	Sexual orientation identity, "Congruent/incongruent" gender identity	Demographic questionnaire on gender identity, sex-assigned-at-birth, sexual orientation (options asexual, bisexual, gay, lesbian, pansexual, queer, heterosexual and other).	No separate analysis for non-binary subsample aside from Sexual orientation (no inferential analysis on subgroups)	0.68
Burgwal et al. (2019)	Georgia, Poland, Serbia, Spain, Sweden	Convenience sampling (snowball)	Gender identity and demographics, gender affirming medical interventions	Minority status, self-reported health, general wellbeing	Belonging to different minority groups (sexual minority status is the only relevant for this review): Participants indicated whether they felt they belonged to minority groups ("No, I don't belong to this group," "Yes, but it is not important at all to me," "Yes, but it's only slightly important to me," and "Yes, and it's very important to me" – recoded into yes/no for each group). Minority	Sexual minority status: Non-binary participants were more often identifying as a sexual minority (93.8% vs. 75.8%, $p < .001$).	0.91

					groups listed were: ethnic minority, religious minority, sexual minority (gay, lesbian, bisexual, queer, asexual, etc.), disability).		
Byrne et al. (2022)	New Zealand and	Convenience sampling (online and community-based organizations and networks)	Gender identity, Sexual attraction, Ability to negotiate barrier use	PrEP awareness	Sexual attraction: "Who are you sexually attracted to? Mark all that apply." (trans men, cis men, trans women, cis women, genderqueer or nonbinary people, none of the above, others.). Ability to negotiate protective barrier use with sexual partners: T-Barrier Scale (Dharma et al., 2019).	Sexual attraction: Non-binary AFAB attracted to men 164 (23.3); Non-binary AFAB not attracted to men 52 (7.5); Non-binary AMAB attracted to men 53 (7.6); Non-binary AMAB not attracted to men 19 (2.7). Ability to negotiate barrier use: In both bivariate and multivariate analysis, being non-binary AFAB and attracted to men linked to lower T-Barrier scale scores compared to trans women attracted to men. Significant gender differences are also reported in relation to proportions of participants reporting being "Somewhat certain" and "Completely certain" in response to specific T-Barrier items.	0.95
Dahl et al., 2024	USA	Archival data	Demographics, belonging to The National Coalition for Sexual Freedom (NCSF), BDSM involvement	BDSM identity, fantasy, and behaviour; coping and mental health	BDSM fantasy and behaviour: BDSM-Fantasy (BDSM-F) Scale and BDSM-Activity (BDSM-A) Scale (created for this study, based on previous literature and consultation with NCSF)	BDSM fantasy: gender minority individuals (M = 44.58, SD = 16.39, Cohen's d = .55) had statistically significantly higher Dominant Fantasy scores compared to cis women (M = 35.83, SD = 15.44), and similar scores to cis men. Submissive Fantasy scores were lower for cis men (M = 43.37, SD = 19.14) compared to other gender minority (M = 53.42, SD = 17.85, Cohen's d = -.54), no differences reported between non-binary and cis women or trans binary people. BDSM behaviour: Cis women (M = 30.40, SD = 13.63) reported significantly lower Dominant Behaviour scores compared to other gender minority individuals (M = 38.28, SD = 15.84, Cohen's d = -.53), no differences reported with trans binary and cis men. No significant differences reported	1.00

						between other gender minority people and other genders for Submissive Behaviour.	
Dargie et al. (2014)	Not specified	Convenience sampling (various methods online and offline, snowball)	Gender identity	Social support, relationship quality, physical and mental health	Sexual attraction and behaviour: Kinsey Scale (Kinsey et al., 1953; 2003). Sexual identity: Sexuality Questionnaire (SQ; Alderson, 2012) to rate level of identification (low-high) with identity labels. Relationship satisfaction: Hendrick's Relationship Assessment Scale (RAS; Hendrick, 1988).	Attraction/Behaviour: 0% of "other" gender identity group identified as "Exclusively Heterosexual" or "Homosexual", while all the other options were chosen by 25% of this sub-sample. Authors reported similar patterns between "other" gender and trans men, but no inferential analysis were performed. Other sexual variables: No separate analysis for non-binary subsample aside from Sexual orientation (no inferential analysis on this). Relationship satisfaction: no results reported for non-binary people.	0.86
Dubin et al. (2021)	USA	De-identified EHR chart review study of patients (NYU Langone Health)	Gender identity	Sexual orientation identity	Sexual orientation prompt: "What is your current sexual orientation" (bisexual, choose not to disclose, don't know, heterosexual/straight, homosexual/ gay, lesbian, and something else - text input not visible for this study).	No inferential findings.	0.68
Eliason & Streed (2017)	USA	Convenience sample (professional social media networks and listservs)	Gender identity	Sexual orientation identity responses to NHIS question	Sexual orientation identity: National Health Interview Survey (NHIS) two-part question: "Which of the following best represents how you think of yourself?" (lesbian or gay; straight; bisexual; something else; I don't know the answer). Second part (if person	NA	0.91

					<p>responds “something else”) was “If you answered something else, what do you mean by something else?” (options: you are not straight, but identify with another label such as queer, trisexual, omnisexual, or pansexual; you are transgender, transsexual, or gender variant; you have not figured out or are in the process of figuring out your sexuality; you do not think of yourself as having sexuality; you do not use labels to identify yourself; you mean something else).</p>		
Fisher et al. (2018)	USA	Convenience sampling (online advertisement)	Gender identity	<p>Perceptions of patient/provider communications, gender and sexual minority (GSM) stigma, confidentiality concerns, GSM-sexual health information, sexual orientation (behaviour and identity)</p>	<p>Ad-hoc questionnaire (questions developed after community consultation and piloting). Sexual orientation - attraction and behaviour: items on gender of people participants are attracted to, number (lifetime and last 12 months) and gender of sexual partners (last 12 months). Response options were: cisgender male, cisgender female, trans masculine and trans feminine partners.</p>	<p>Sexual orientation identity: nonbinary youth was significantly more likely to identify as queer. Sexual Behaviour - Number sexual partner in lifetime/last 12 months: no significant differences by gender identity. Non-binary people had a mean of 2.72 partners in the last 12 months and 4.94 partners in lifetime. Sexual behaviour - Gender of sexual partners: no significant differences by gender identity are reported, the majority of nonbinary participants had cisgender male partners, followed by transmasculine partners.</p>	0.86

					Sexual orientation - identity: Both open ended and multiple choice (could select more than one) item for label [full questions not reported].		
Fuller & Riggs (2021)	USA	Convenience sampling (community organizations and online)	Gender identity	Partners, partners gender, relate to perceiving support, satisfaction, and hopefulness about future relationships, as well as psychological distress	Relationship satisfaction: Relationship satisfaction subscale of the gay and lesbian relationship satisfaction scale (GLRSS; Belous & Wampler, 2016).	Relationship satisfaction: Non-significant findings for gender differences for relationship satisfaction.	0.77
Galupo et al. (2018)	USA	Convenience sampling (Online announcements, snowball)	Gender identity and sexual orientation (monosexual vs. plurisexual)	Scale ratings (face validity for Kinsey scale (Kinsey et al., 1953; 2003), Klein Sexual Orientation Grid (KSOG; Klein et al., 1985), The Sexual-Romantic Scale (Galupo et al., 2014) and The Gender Inclusive Scale (designed for current study)	Sexual orientation identity: question not explicitly stated. Face validity for sexual orientation scales: "This scale accurately reflects my sexuality" using a five-point Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree").	In terms of gender, face-validity analysis only compared cis and trans group, as trans subgroups were too small.	0.95
Goldbach et al. (2023)	Most participants from North	Convenience sampling (online)	Demographic variables (i.e. age, sexual orientation, education)	Sexual experiences outcomes (i.e. receptive/insertive penetration, importance of sex, sexual	Sexual orientation/ Gender of current partner: question not specified. Sexual Activity Importance, Engagement, and Pleasure: questions were part of survey	Importance of sexual activity: hierarchical linear regression performed, in first step of model, identifying as agender (p < .05) was one of the significant predictors, but it was not significant in final model. Engagement in Receptive/Insertive Sexual Activity:	0.91

	America and Western Europe		n level, gender identity), contextual variables (i.e. body satisfaction, social dysphoria, fetishisation), medical transition (i.e. hormone therapy)	pleasure, sexual intimacy)	created for the larger project. Insertive/Receptive sex: “Did you have receptive (either anal or vaginal) sexual intercourse?”/ “Did you have insertive (either with a penis or a strap-on) sexual intercourse (either anal or vaginal)?”(yes /no). Global sexual experiences: “Overall, I do perceive sexual activity as pleasurable”/“Overall, I do perceive sexual intimacy as pleasurable”; and “Overall, sexual activity is an important part of my life.” (5-point Likert)	gender was not a significant predictor. Pleasure from Sexual Activity and Intimacy: gender identity was not a significant predictor. No other separate analysis.	
Goldberg et al. (2020)	USA	Data from The Generations study	Sexual identity	Sexual attraction, sexual partnering, romantic relationships	Sexual identity: Phase 2 Generations baseline survey self-report with options: straight/heterosexual, lesbian, gay, bisexual, queer, same gender-loving, or other (write-in). Results categorized in queer, bisexual, lesbian/gay and other (included same-gender loving, queer, asexual, pansexual, and anti-label). Sexual attraction: “How sexually attracted are you to the following types of people: Women, non-transgender;	Sexual Identity: 25% of genderqueer/non-binary participants were queer (significantly more than cis men and cis women) and 33% of queer participants were genderqueer/non-binary. Sexual Attraction: Most non-binary people reported some attraction. 78% of non-binary people was attracted to both women and men. Sexual partners: no differences in the percentage of GQNB people who were sexually active in the last year. Among those who were sexually active, 50.6% of queer respondents had had both women and men as partners. Romantic relationship: No significant differences based on sexual identity in terms of being in relationship or gender of partner.	1.00

					men, non-transgender; transgender women/male-to-female; transgender men/female-to male?" (5-point Likert) with creation of four variables based on different levels of attraction. Sexual partnering: "In the last 5 years, who did you have sex with? By sex, we mean any activity you personally define as sexual activity" (could select multiple answers and categories were created similarly to attraction). Current partner gender: options cisgender woman (CW), cisgender man (CM), and transgender, genderqueer/non-binary (GQNB).		
Hibbert et al. (2020)	UK	Convenience sample (online advertisement)	Gender, demographic variables, psychosocial factors, condomless intercourse, drug use, loneliness, self-stigma, body dissatisfaction, life satisfaction	Sexual health clinic attendance, reporting ever having an HIV test	Sexual health clinic attendance: question on attendance of a sexual health/genitourinary medicine clinic in the past 12 months. Sexual behaviour: gender identity of sexual partners.	Sexual health clinic attendance: 29% of non-binary people had attended a clinic in last 12 months (descriptive result). Being non-binary was not associated with sexual health clinic attendance in the past year. Sexual behaviour: 56% of non-binary people had sex with men, 77% with women and 67% with non-binary people. Inferential analyses were done grouping trans people and comparing with cis people.	0.91

			on, sexual contact without consent etc.				
Holt et al. (2023)	Australia	Convenience sampling (online advertisement and through trans organization)	Gender identity	Sexual satisfaction, romantic satisfaction	Sexual satisfaction: "I am satisfied with the sexual aspects of my life" (5-point Likert) - derived from the Multi-Dimensional Sexual Self-Concept Questionnaire (Snell, 2010). Romantic satisfaction: "I am satisfied with the romantic aspects of my life" (5-point Likert) - also from Snell (2010). Sexual experience/Sexual behaviours: exact items not reported. For behaviours, questions covered condomless sex and drug use in relation to sex.	Sexual orientation: non-binary people were more likely to identify as fluid, queer or asexual compared to men and women. Sexual experience: Non-binary participants were more likely than binary participants to have been recently sexually active. Binary participants reported fear about one's sex life more than non-binary participants. Non-binary participants were the most likely to have had non-binary partners. Sexual and romantic satisfaction: neither was independently related to gender. Sexual Behaviour: non-binary people and trans binary people did not differ in terms of condomless intercourse in the last year. Non-binary participants were more likely to report drug use in relation to sexual activity.	0.86
Jacobson & Joel (2019)	Majority : USA (70.2%), United Kingdom (14.1%), Canada (10.7%)	Convenience sampling (Online recruitment, LGBT organizations/groups)	Gender identity, sex-assigned-at-birth	Attraction to men/women, sexual fantasies, sexual behaviour, relationships	Sexual orientation (excluding identity): Eight questions on sexual fantasies, sexual attraction, sexual behaviour, and romantic relationships (each question repeated twice, once towards women, once towards men (e.g., "How would you rate the level of your sexual attraction to men?") and "How would you rate the level of your sexual	Attraction to men/women: significantly negatively correlated in whole sample, AFAB gender-diverse group had lowest correlation levels ($r = -.06, p = .18$). In AMAB gender-diverse individuals, the correlations between attraction to men and to women was not significantly different.	0.95

					attraction to women?") Sexual Identity: options were Exclusively heterosexual, Mostly heterosexual, Bisexual, Mostly homosexual, Exclusively homosexual, Pansexual, Asexual or Other). This was not used due to some people referring to their SAAB (sex-assigned-at-birth) and other to their current GI (gender identity) while responding.		
Jann et al. (2022)	USA	Data from database from primary care health centre	Gender identity (cisgender vs. TGNC), age, race/ethnicity, homelessness	Hepatitis A vaccinations, hepatitis B vaccinations, cancer screenings, HPV vaccination	Exact prompts not specified	Sexual Health variables: no inferential analysis separating binary/non-binary people (trans/non-binary people grouped together and compared to cis people).	0.91
Kattari et al. (2021)	USA	Healthy Kids Colorado Survey (HKCS) representative high school sample	Sexual orientation, gender identity, bullying and mental health	Sexual behaviour	Sexual orientation: "Which of the following best describes you?" heterosexual (straight), gay or lesbian, bisexual, and not sure). Sexual orientation was combined with GI (nine categories). Sexual behaviour: "Have you ever had sexual intercourse? (yes/no)"; "During your life, with how many people have you had sexual intercourse? (I have	Sex ever: 0.63% of those who had sex identified as "transgender other". Of non-binary people 51 out of 81 had had sex. Non-binary people were grouped together with other trans people for inferential analysis.	0.91

					never had sexual intercourse, 1 person, 2 people, 3 people, 4 people, 5 people, 6 or more people)” and “How old were you when you had sexual intercourse for the first time? (I have never had sexual intercourse, 11 years old or younger, 12 years old, 13 years old, 14 years old, 15 years old, 16 years old, 17 years old or older).”		
Kattari et al. (2019)	USA	Healthy Kids Colorado Survey (HKCS) representative high school sample	Gender identity and sexual orientation (controlling for bullying and mental health)	Sexual risk (drugs or condom use during sex)	Sexual Orientation: "Which of the following best describes you?" (heterosexual (straight), gay or lesbian, bisexual, and not sure) - responses for sexual orientation and gender identity were (nine categories). Sexual risk - alcohol or drugs use: "Did you drink alcohol or use drugs before you had sexual intercourse the last time? (yes/no)". Sexual risk – condom use: "The last time you had sexual intercourse did you or your partner use a condom? (yes/no)"	Sexual risk: 42.11% of "Transgender Other" participants used drugs and alcohol before last intercourse and 61.40% did not use a condom. Only descriptive statistics available, as inferential analysis were conducted using GI*SO groups (transgender identity collapsed and divided in subgroups based on sexual orientation).	0.95
Katz-Wise et al. (2023)	USA	Sampling through Prodege panel	Demographics	Sexual Fluidity	Sexual fluidity: two items: 1) Sexual orientation identity change: "Have you ever experienced a	Sexual fluidity: Nonbinary individuals (73.1%) were more likely to report identity change compared to cisgender individuals. Gender identity was associated	0.77

				<p>change in your sexual orientation identity? Yes/No; 2)</p> <p>Attraction change: “Have you ever experienced a change in your attractions to others over time? Yes/No.</p> <p>Sexual orientation identity: “‘Sexual orientation’ describes who you are attracted to and how you identify yourself based on those attractions. Sexual orientation may change over the course of people’s lives. Which of the following best describes your current sexual orientation?” (straight/heterosexual, bisexual, gay or lesbian, pansexual, queer, asexual, not sure, another identity/identities - write in).</p> <p>Participants could pick one. Sexual orientation attraction: “‘Attraction’ describes sexual or romantic feelings toward another person. Attractions may change over the course of people’s lives. Who are you currently attracted to?”, with the following response options: girls/women, boys/men,</p>	<p>with changes in attraction ($p < .01$), with non-binary people or another identity (71.3%) reporting highest attraction change compared to other genders.</p>
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					<p>nonbinary people (e.g., genderqueer, gender non-conforming, another nonbinary identity), people of another gender identity: (write-in). Participants could choose all that apply.</p>		
<p>Katz-Wise et al. (2016)</p>	<p>USA</p>	<p>Convenience sampling (online and in-person)</p>	<p>Gender identity, Social gender transition</p>	<p>Sexual fluidity in attraction</p>	<p>Sexual orientation identity - "How do you currently identify your sexual orientation?" (straight/heterosexual, gay/lesbian/same-gender attracted, bisexual, queer, questioning, I do not label my sexual orientation, unsure, asexual, other, recoded as straight, gay/lesbian, bisexual, queer, and other/non-binary). Sexual fluidity in attractions - two items: "Have you ever experienced a change in attractions to others? (For example, feeling only attracted to women, then feeling attracted to both women and men)" (yes/no). If yes to first item, "Did you experience a change in attractions to others after recognizing you were transgender and/or gender nonconforming?"</p>	<p>Sexual Fluidity: 42% of non-binary participants experienced a change in attraction in their lifetime. Individuals who experienced change in attraction were more likely to be non-binary. When only considering those who socially transitioned (Adjusted model on 205 participants), 26.1% of those that changed their attractions post-transition were non-binary (p =.30). Those who did experience a change were less likely to be non-binary.</p>	<p>0.77</p>

					(For example, feeling only attracted to women before transition, then feeling attracted to both women and men after transition)" (yes/no).		
Kennis et al. (2022b)	Most participants Net herl and s (54.4%), USA (18.8%), Belg ium (12.9%).	Convenience sample (mainly online social media for trans people and broader universit y and sex researc h commu nity for cis people, snowbal l)	Gender identity	Attraction to men/women, sexual wellbeing, sexual body worries specific to trans people, sexual self-concept discrepancies	Sexual wellbeing - multiple scales were used: Sexual Esteem measure taken from larger questionnaire on sexual self-concept (Buzwell & Rosenthal, 1996; adapted by Deutsch et al., 2014). Four subscales included (Behaviour, Body Perception, Attractiveness). Trans-specific body image worries during sex: T-WORRY (Dharma et al., 2019). Sexual satisfaction: Global Measure of Sexual Satisfaction (GMSEX; Lawrance & Byers, 1995). Sexual self-concept discrepancies: sliding scale 0 to 100, higher scores indicating a higher SSC discrepancy. Sexual orientation: two sliding scales (one for men, one for women) indicating levels of attraction to these genders (0 to 100, lower scores indicating lower attraction)	Attraction to men/women: cisgender group scored lower than binary trans and NBGQ group for attraction to women (both $p < .001$), but no significant differences for attraction to men. Sexual wellbeing: comparisons on the four sexual self-esteem components, T-WORRY, and sexual satisfaction. The only significant difference between non-binary (NBGQ) and trans binary (TB) participants was for T-WORRY (TB higher score), while only a "trend towards difference" was found for sexual satisfaction ($p = .066$, non-binary had higher score). Non-binary people had lower score on all variables compared to cisgender people, but only significant difference was for Sexual esteem body perception. Sexual self-concept discrepancies: NBGQ scored significantly higher than cisgender group ($p < .001$), but not different from the binary transgender group.	0.86

<p>Kennis et al. (2022a)</p>	<p>mainly The Netherlands, Belgium, USA</p>	<p>Convenience sampling (mainly online, snowball)</p>	<p>Gender identity (binary vs. non-binary), desire for treatment (Fulfilled/Unfulfilled)</p>	<p>Undergone GAMT, GAMT desire/motives, gender dysphoria, satisfaction with life, anxiety and depression, sexual satisfaction, transgender-specific body image worries, and sexual self-concept discrepancies.</p>	<p>Sexual orientation: 2 sliding scales (one for men, one for women) to indicate level of attraction (0 to 100, with lower scores indicating lower attraction). Sexual satisfaction: Global Measure of Sexual Satisfaction (GMSEX; Lawrance & Byers, 1995). Sexual Self-Concept Discrepancies: two items - "Think about your actual sexual self-concept, and your ideal (item 1)/ought (item 2) sexual self-concept. Your actual self-concept entails all the ideas and feelings you have about who you currently are as a sexual person. Your ideal sexual self-concept entails all the ideas and feelings you have about who you ideally would want to be (item 1)/ who you should be (item 2) as a sexual person. How far away is your actual sexual self-concept from your ideal (item 1)/ ought (item2) sexual self-concept?" (0 = 'Entirely overlapping' to 100 = 'Very far away,' with higher scores indicating a higher SSC discrepancy).</p>	<p>Sexual Orientation: Binary and non-binary transgender groups did not differ in terms of attraction to men/women. Other sexual constructs: inferential analysis done by separating in Unfulfilled desire/Fulfilled desire for GAMT (gender affirming medical treatment) and not based on binary/non-binary identity.</p>	<p>0.91</p>
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					Transgender-specific body image worries (in relation to sex): T-WORRY.		
Koós et al. (2024)	42 countries	Convenience sampling (online, through local research networks)	Demographics	Pornography use/motivation (PUMS scale validation)	Pornography use: Pornography Use Motivations Scale (PUMS; Bóthe et al., 2021). Pornography and sexuality questions: past-year frequency of their Porn use and masturbation (0 – 10) & the average duration of their Porn use.	Pornography use motivations: non-binary people had lower latent means than men for most motivations. Non-binary people scored higher than women on all motivations. For self-exploration, latent mean of non-binary people was higher than both men and women. All differences were significant ($p < .01$).	1.00
Lin et al. (2024)	42 countries	Convenience sampling (online, through local research networks)	Demographics	Sexual Distress	Sexual Distress: Short Sexual Distress Scale (SDS-3; Pâquet et al., 2018)	Sexual Distress: Study focuses on scale validation. On a descriptive level, observed mean reported for gender-diverse individuals ($M = 3.76$; $SD = 2.87$) is higher than the observer mean for men ($M = 3.41$; $SD = 2.75$) and women ($M = 3.15$; $SD = 2.66$).	1.00
Littman et al. (2024)	USA	Convenience (out of 1462 veterans identified as trans/non-binary, 14000 were randomly selected to contact)	Demographic variables	Gender affirming medical procedures	Sexual orientation: not specified in paper	Sexual orientation: trans men were more likely than non-binary people to identify as heterosexual/straight.	0.91
Mark et al. (2018)	Not specified,	Convenience sampling (online	Attachment style	Relationship satisfaction, sexual satisfaction,	Sexual satisfaction: General Measure of Sexual Satisfaction Scale (GMSEX;	Sexual and relationship satisfaction: in bivariate analysis no significant differences between gender categories (men, women,	1.00

	possibly North America	and print advertisements)		and sexual desire	Lawrance & Byers, 1995). Relationship satisfaction: General Measure of Relationship Satisfaction (GMREL; Lawrance & Byers, 1992). Sexual desire: Dyadic Subscale of the Sexual Desire Inventory (SDI-D; Spector et al., 1996).	genderqueer, $p > .05$). Sexual desire: significant main effect of gender in sexual desire, but difference in post hoc was only between men and women and not genderqueer participants. Other analyses were not conducted separating gender and sexual orientation categories, as preliminary analysis did not support the examinations of each category separately (no significant effect of gender, sexual orientation or gender x sexual orientation).	
McKenna et al. (2021)	USA	Convenience (online and offline e.g. LGBTQ + organizations	Non-binary status, traditional gender self-concept, sexual assertiveness	Sexual consent attitudes	Sexual Assertiveness: Sexual Assertiveness Questionnaire (SAQ; Loshek & Terrell, 2015). Gender neutral pronouns were added to make more inclusive. Sexual consent attitudes, beliefs and behaviours: The Sexual Consent Scale-Revised (SCS-R; Humphreys & Brousseau, 2010). Confirmation factor performed, original structure not adequate fit (single factor with Principal component analysis, four items removed), internal consistency calculated for sample.	Sexual assertiveness: no significant differences between cisgender and non-binary participants. In non-binary participants, sexual assertiveness was significantly correlated with number of partners ($r = .29$, $p < .05$). Sexual consent attitudes: non-binary participants had significantly less maladaptive consent attitudes, beliefs and behaviours than cis people ($p < 0.001$). Identifying as non-binary was also significantly negatively correlated with age ($p < .05$) and with sexual consent ($p < .01$). For non-binary participants, being older and having had more partners was associated with more adaptive consent attitudes, beliefs and behaviours. Being non-binary predicted less maladaptive consent attitudes, beliefs and behaviours. Number of sexual partners: non-binary people had penetrative sex with a mean of 9.90 partners in their life (no significant differences with cis participants).	0.88
Nadarzynski et al. (2023)	UK	Convenience sampling/snowball (online)	Demographics	Casual sex	Casual sex: questions around engagement in casual sex with one or more people after lockdown started; how long they were	Casual sex in lockdown: 28% of non-binary people engaged in casual sex. Gender was not associated with casual sex engagement during lockdown.	0.91

					able to abstain from casual sex, if they re-engaged with sexual partners in lockdown, reasons for meeting sexual partners during lockdown.		
Nimbi et al. (2024)	Italy	Convenience (online and through local asexual organizations)	Demographics, sexual orientation – asexual spectrum	Sexual desire	Sexual desire: The Sexual Desire Inventory-2 (SDI-2; Spector et al., 1996); The Sexual Desire and Erotic Fantasies questionnaire (SDEF; Nimbi et al., 2023;2025)	No further results to report.	0.86
Perez & Pepping (2024)	Europe and North America	Convenience sampling	Gender identity	Sexual fetishisation, victimization, sexual and relationship satisfaction	Sexual Fetishisation: “In your experience have you ever felt fetishised?” yes/no (from Anzani et al., 2021) with follow up questions about where fetishisation was experienced (e.g. social media, dating apps) and following four questions: (1) “I am seen as a sexual object because I am TNB”; (2) “Dating partners are only interested in me because I am TNB”; (3) “Sexual partners are only interested in me because I am TNB”; (4) “I have felt objectified or fetishised because I am TNB” with response on 1-5 Likert. Relationship Satisfaction: four-item version of the Couples Satisfaction Index	Sexual fetishisation: Women were significantly more likely to have experienced fetishisation on social media, having been seen as a sexual object, having felt objectified and fetishised, and having partners interested in them only due to being trans compared to non-binary people. No differences between non-binary people and men. Sexual and relationship satisfaction: No differences in relation to gender identity.	0.95

					(CSI-4; Funk & Rogge, 2007). Sexual Satisfaction: modified Sexual Satisfaction Scale (Fisher et al., 2015; Mark et al., 2014) removing references to number of partners.	
Pletta et al. (2022)	USA	Convenience sampling (patients of Community Health Center in Boston, Massachusetts.)	Demographic characteristics and reported relationships characteristics (age, racial identity, gender identity, number of partners, GI of partners etc.)	Sexual behaviour with a partner of unknown STI/HIV status in the past 12 months	Sexual behaviour - other: number of sexual partners in the past year/engagement in casual sex. Sexual behaviour - partner HIV status: engagement in sexual behaviour with a partner of unknown STI/HIV status in the past 12 months (yes/no). Sexual partners' gender identities: coded as: cisgender female; cisgender male; transfeminine (transgender female/male-to-female/MtF, or nonbinary/genderqueer and assigned-male-at-birth/AMAB); or transmasculine (transgender male/female-to-male/FtM, or nonbinary/genderqueer and assigned-female-at-birth/AFAB).	Sexual behaviour - partner HIV status: being non-binary was not significantly associated with probability of sexual behaviour with a partner of unknown STI/HIV status in the past year. Other information: not presented divided by gender identity.
						1.00

Reisner et al., 2023	USA	Data from TransPop (U.S. national probability sample of transgender adults)	Gender identity	Sexual Orientation	<p>Sexual identity: "Which of the following best describes your current sexual orientation?" (straight/heterosexual, lesbian, gay, bisexual, queer, same gender loving, and other). Sexual behaviour: Sexual partners in last 5 years (women, non-transgender; men, non-transgender; transgender women, transgender men, and "I have not had sex with anyone in the last 5 years.")</p> <p>Multiple response options were allowed). Sexual attraction: How sexually attracted participants were to the following types of people (women, non-transgender; men, non-transgender; transgender women; transgender men; females at birth, genderqueer (AFAB nonbinary); males at birth, genderqueer (AMAB nonbinary). Multiple response options were allowed. Response options were on a Likert from "not at all" to "very attracted" and included "not sure").</p>	<p>Sexual identity: 99.4% of non-binary people identified as a sexual minority, difference with trans men and women was significant (23.3% of trans women, 28.3% of trans men and only 0.6% of non-binary people identifies as straight/heterosexual). Sexual behaviour: In the past 5 years, 30% did not have sex; 56.0% had sex with cisgender women, 39.1% with cisgender men, 21.8% with trans women, 28.9% with trans men. 37.0% of non-binary people had one sexual partner gender and 33.2% reported more than 3 sexual partner genders. Sexual attraction: 78% of non-binary people was sexually attracted to cis women, 52.4% to cis men, 72.3% to trans women, 69.4% to trans men, 76.1% to AFAB non-binary and 63.6% to AMAB non-binary. 77.8% of non-binary participants reported attraction to more than 3 genders.</p>	0.82
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<p>Reisner et al. (2020)</p>	<p>USA</p>	<p>Convenience sampling (patients accessing cervical cancer screening)</p>	<p>Access to gender-affirming medical care, participant characteristics (including gender identity, and sexual orientation), sexual partner characteristics (currently have a sexual partner, number and gender of sexual partners in the past 12 months), protective barrier use during high-risk sexual acts in the past 12 months, psychosocial context (psychological conditions, lifetime history of sexual</p>	<p>Sexual functioning</p>	<p>Sexual functioning: Transmasculine Sexual Functioning Index (TM-SFI) - adaptation Female Sexual Function Index (FSFI), which was piloted and for which exploratory factor analysis, reliability analysis was performed.</p>	<p>Sexual functioning: Gender identity was not a significant predictor.</p>	<p>0.86</p>
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			abuse/assault, and substance use, tobacco use)				
Rosenberg et al. (2021)	Australia	Sample was part of Australian Trans & Gender-diverse Sexual Health Survey study (recruitment through online and offline approaches)	Experiences in sexual health	HIV/STI testing	Sexual behaviour in past 12 months: questions on number of sexual partners, participation in group sex, engaging in sex work or exchange sex, inconsistent condom use with casual partners for vaginal/front hole or anal sex. Sexual health access: general practitioner, clinics, community-based services, hospital-based. Gender insensitivity of Sexual health care settings: Within each health setting, responses to each item (no previous experience or some previous experience) were summed, accounting for reverse-coded items.	Sexual health care access: AFAB non-binary people were more likely to have accessed sexual health care through a GP (91.0%; p < 0.001). AMAB non-binary participants were more likely to have used community-based services (28.9%; p = 0.003). No differences in access to hospital-based sexual health care was reported (p = 0.585). AFAB non-binary participants reported highest scores of gender insensitivity in sexual health care (M = 2.28, SD = 1.20), both AMAB and AFAB non-binary people found hospitals to be most gender insensitive, followed by GPs. Sexual behaviour: not divided by gender identity.	0.91
Rothblum et al. (2020)	USA	Participants of larger longitudinal study (Generations study).	Asexual identity	Gender identity, sexual attraction and behaviour, openness to others, felt stigma, and everyday discrimination, experience of LGBT community	Sexual identity: "Do you consider yourself to be..." (lesbian, gay, bisexual, queer, same-gender loving). Sexual Orientation: Which of the following best describes your current sexual orientation" with	Asexual sexual orientation and gender identity (GI): Nearly three quarters (72.26%) of asexual participants identified as non-binary compared to 6.35% of non-asexual participants. Other sexual variables: No separated analysis for gender identity, as focus was asexual identity.	0.95

					<p>choices of straight/heterosexual, lesbian, gay, bisexual, queer, same-gender loving, or other (write-in). Sexual behaviour: "In the last 5 years, who did you have sex with? By sex, we mean any activity you personally define as sexual activity. Please mark all that apply. " (cisgender women, cisgender men, transgender women, and/or transgender men, or not at all - yes/no for each). Sexual attraction: question on sexual attraction to non-trans women, non-trans men, trans women, and/or trans men (somewhat or very, not at all, not very, or not sure).</p>		
Rutherford et al. (2021)	Canada	Data from Sex Now 2018 survey - Convenience sample (community organizations led in-person recruitment at Pride festivals and	Gender identity	Mental health and substance use, body image, health resources/ have gone to health professional, sexual Health (STI prevalence, testing, HIV testing, PrEP, vaccination), Healthcare access	<p>Sexual Orientation identity: able to select more than one sexual identity (i.e., selections were not mutually exclusive). Sexual health: not specified, but link to full questionnaire is available in article.</p>	<p>Sexual orientation identity: Non-binary people were less likely to identify as gay (32.7% vs. 85.2%), but significantly more likely to identify as queer (49.3% vs. 6.6%), pansexual (32.0% vs. 2.8%), bisexual (17.3% vs. 10.4%), asexual (4.7% vs. 0.6%), and other (2.7% vs. 0.4%) compared to cis people and as likely to identify as straight (0.7% and 0.6%). Sexual Health related variables: Being denied access – Even after controlling for confounders, trans and non-binary people were more likely to have been denied health services compared to cisgender participants (68.0% of non-binary</p>	0.95

		related events across 15 Canadian cities, online promotion prior to events)				participants and 84.2% of cisgender participants).	
Smalley et al. (2016)	USA	Convenience sampling (online, snowball)	Gender identity, Sexual orientation	Health risk behaviours - the only relevant one for this review is sexual risk (Have unprotected sex, Have sex under the influence)	Health risks (including sexual health risks - Have unprotected sex, Have sex under the influence) - Health Risk Questionnaire (HRQ)	Have unprotected sex: 41.4% of non-binary people reported having had unprotected sex. There was no significant difference between non-binary people and other genders. Having sex under the influence: 8.0.% of non-binary participants reported sex under the influence. No significant difference with other genders.	0.73
Walters et al. (2023)	USA	Convenience sampling through universities)	Changes in sexual behaviour due to covid, social support from partner, cohabitation, demographics, depression	Relationship satisfaction	Relationship Assessment Scale (RAS; Hendrick, 1988)	Relationship satisfaction: Gender identity was not significantly associated with relationship satisfaction.	0.91
Winer et al. (2024)	USA, Canada, UK	Convenience/snowball sampling (quantitative data from the online 2018 Asexual	Demographics	Patterns of identity in the asexual community	Not specified in paper	Patterns of identity among asexual people: asexual participants that had a history of identifying as bisexual or pansexual were more likely to be non-binary.	0.73

		Community Survey – ACS)					
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Table 3 Participants/Samples Characteristics

Citation	N total sample (N non-binary participants)	Mean age sample (Mean age non-binary participants)	Race/ethnicity total sample (race/ethnicity non-binary participants)	Non-binary people Socioeconomic status	Non-binary people education	Gender identity labels	Trans identity of the non-binary sample	Sexual orientation identity (descriptive statistics for non-binary participants)
Almås et al. (2024)	334 (93)	62.7% was under 30 (62.5% was below 40)	Not reported (Not reported)	Not reported	60.3% completed higher education	“Female gender identity orientation” (FGIO) 93; “male gender identity orientation” (MGIO) 148; “nonbinary gender identity orientation” (NBGIO) 93	Not specified	NA
Anzani & Prunas (2020)	296 (55)	26.88 (Not reported, but not significantly different from cis participants)	Not reported (Not reported)	Not reported	Not reported	Cisgender men 85; Cisgender women 156; “Viewed gender as a nonbinary construct” (most common labels reported were non-binary and genderqueer) 55	Participants whose gender assigned at birth was not aligned with their experienced or expressed gender and who adhered to a nonbinary view of gender were assigned to the	NA

							nonbinary group. No trans binary people in the study.	
Atkins et al. (2024)	14687 (65)	No history of transactional sex: 31.5; Transactional sex in last 5 years: 32.6 (Not reported)	52% Black; 47% White (Not reported)	Not reported	Not reported	Cisgender woman 6726; Cisgender man 7690; Transgender woman 41; Transgender man 72; Gender nonconforming or other 65	Not specified	NA
Bishop et al. (2023)	1492 (94)	No mean reported. 62% between 18 – 25 (not reported)	62% White, 21% Latino, 16% Black (Not reported)	Not reported	Not reported	Woman 737; Man 661; Nonbinary/genderqueer 94	Screening question "Do you, personally, identify as lesbian, gay, bisexual, or transgender?" (if yes to transgender, signposted to participate to sibling study. Non-binary people were still included).	No separate data
Boskey & Ganor (2022)	167 (21)	No mean reported. Majority of participants were	Not reported, no significant difference between binary and non-binary participants	Not reported	Not reported	Binary trans men 146; Nonbinary transmasculine 21 (Nonbinary 76%, Gender queer 14%, Other 10%)	Participants are "transmasculine" group of patients (treatments seeking).	Heterosexual 0%; Homosexual 24%; Bisexual 5%; Pansexual 19%; Queer 29%; Asexual 10%; Demisexual 10%; Other 0%; Choose not to answer 5%.

		15-18, followed by 18-21 at the time of first consultation (Majority between 18-21, followed by 21-24)	ts (81% White non-binary sample/ 95% non-Hispanic)					
Bosse & Chiodo (2017)	175 (34)	21.1 (Not reported)	Caucasian (81.1% (Not reported))	Not reported	Not reported	(cis) men 21.7%; (cis) woman 41,1%; Transgender 1.3%; FTM/ Transmasculine 11.4%; MTF/ Transfeminine; 1.1% Genderqueer 13.7%; Nonbinary gender 1.7%; Agender/Do not Use Label 4.0%; Questioning 0.6%; Other 2.3%	No specific question on trans identity for non-binary people.	AFAB individuals that identified as Genderqueer (n= 21) were asexual (9.5%), bisexual (19%), lesbian (9.5%), pansexual (23.8%) and queer (38.1%). Agender (n = 5) were asexual (40%), gay (20%), Pansexual (40%). Nonbinary (n= 3) were asexual (33.3%), bisexual (33.3%), queer (33.3%). AMAB individuals that identified as genderqueer (n= 3) were asexual (33.3%), bisexual (33.3%), pansexual (33.3%).
Burgwal et al. (2019)	853 (230)	Age binary trans people 27.1 (24.7, significant difference with	Not reported, no significant difference between binary and non-binary participants (11.2%	Non-binary people reported significantly lower economic stress compared to trans	Most people had a "middle" level of education	Trans women 254 (29.8%); Trans men 369 (43.2%), Non-binary people (Nonbinary/ Genderqueer / Gender nonconformi	No specific question.	93.8% GQNB reported being a sexual minority

		binary participants, p = .004)	of GQNB were ethnic minority)	binary people		ng or other with non-binary label) 230 (26%)		
Byrne et al. (2022)	704 (290)	32.5 (Not reported)	78.0% Pakeha/New Zealand European (White) (Not reported)	Not reported	Not reported	Trans men 185; Trans women 227, nonbinary AMAB 72, nonbinary AFAB 218	No specific questions reported. Non-binary and trans people are both included.	NA
Dahl et al., 2024	1036 (69)	38.51 (Not reported)	87.9% White (Not reported)	Not reported	Not reported	Cisgender Man 404 (39.0%); Cisgender Woman 560 (54.1%); Transgender Woman 16 (1.5%); Transgender Man 20 (1.9%); Agender 4 (0.4%); Genderfluid 10 (1%); Gender Queer 9 (0.9%); Multiple 6 (0.6%); Gender Queer Woman 2 (0.2%); Other (did not specify) 5 (0.5%). Non-binary identities were combined and labelled "Other gender minority	No question specified.	No separate data

						(Agender; Genderfluid; Gender Queer; Multiple; Gender Queer Woman; Other)”		
Dargie et al. (2014)	Descriptive analysis: 64 (4); Inferential analysis: 36 trans people and 689 cisgender people as control	32.77 (Not reported) for descriptive analysis sample	Not reported (Not reported)	Not reported	Not reported	Trans women 27; Trans men 32; Other (genderqueer or cross-dresser) 4; Declined response 1	No question specified.	No one in the "other" group identified with heterosexual, half had low identification (did not identify) with using no label (the other half did not respond) and around 80% highly identified with the label queer.
Dubin et al. (2021)	821 (62)	No mean reported. 55.73% of sample between 18-34 (Not reported)	58.20% White, 16.40% Other race (Not reported)	Not reported	Not reported	Male identified (trans male and male) 292; Female identified (trans female and female) 212; Nonbinary and other (referred to it as “non-binary”) 62; Choose not to disclose 249	No specific question on trans identity.	nonbinary and other : 62.33% input a response for SO. AFAB - Most common response was Something Else 41.67%, followed by Lesbian (input) 19.44%, Don't know 13.89%, Homosexual/gay 13.89%, Bisexual 11.11% while Choose not to disclose and Heterosexual/straight were 0%. AMAB - Homosexual/gay 100%

Eliason & Streed (2017)	277 (15)	37.8 (Not reported)	White 80% (Not reported)	Not reported	Not reported	(cis) Female 103; (cis) Male 85; Genderqueer /gender variant 15; Transgender 8	No specific question.	47% of genderqueer/gender variant participants indicated that their sexual identity was "something else" on the first part of the NHIS question. 7% of genderqueer/gender variant identified as Bisexual and 46% as gay/lesbian. For part 2 of the question Genderqueer/gender variant that responded "something else" in the first part responded "Use other labels" (43%) or "Something else" (57%). Transgender and genderqueer/gender variant individuals accounted for the majority of those who chose to report their sexual identity as "something else" (and they often reported "something else" on both parts of the questions).
Fisher et al. (2018)	228 (32)	17.86 (17.25)	White 87.7% (Not reported)	No differences reported between trans binary and non-	No differences reported between trans binary and non-binary youth	Trans masculine 103; Trans feminine 93; and Gender non-binary 32	All non-binary people were also trans as they identified as "transgender	Pansexual 21 (65.6%); Queer 23 (71.9%); Bisexual 8 (25.0%); Gay 10 (31.3%); Asexual 6 (18.8%); Questioning/unsure 3 (9.4%); Lesbian 6 (18.8%);

				binary youth		All non-binary labels come from open-ended question. Examples given are: gender nonbinary, agender, bigender, and gender fluid	in another way"	Heterosexual 1 (3.1%); Do not wish to answer 0 (0.0%)
Fuller & Riggs (2021)	345 (87)	27 (Not reported)	White, not of Hispanic origin 75.7% (Not reported)	Not reported	Not reported	Male 109; Female 85; non-binary 87; another gender (non-cis) 45; agender 19.	Inclusion criteria was to be transgender.	No separate data
Galupo et al. (2018)	363 (51)	26.5 (Not reported)	White/Caucasian 77.7% (Not reported)	Not reported	Not reported	Cisgender people 278; Trans people 85 (of which 51 non-binary people)	Non-binary labels/people appear to be coming out of transgender group.	Lesbian/gay 13 (61% of total transgender people identifying as lesbian); Bisexual 5 (62.5% of total transgender people identifying as bisexual); Pansexual/queer 33 (58.9% of total transgender people identifying as pansexual/queer)
Goldbach et al. (2023)	169 (66)	Mean not reported. Majority under 34 (Not reported)	79.3% White (Not reported)	Not reported	Not reported	Trans-feminine identity 60.9% (103), Nonbinary (some examples: genderqueer, two spirits) 31.4% (n = 53); Agender 7.7% (n = 13)	Not directly assessed.	No separate data

Goldberg et al. (2020)	1,507 (94)	No total reported, divided by sexual identity. Queer participants 26.1 (0.8) were significantly younger than the rest of sample (Lesbian/gay: 35.4 (0.6); Bisexual 26.8 (0.5); Other 27.8 (1.2)).	Majority from all sexual identity sample was white, e.g. 55.3% for queer and 65.1% for bisexual (Not reported)	Not reported	Not reported	Cisgender men 672; Genderqueer / nonbinary 94; Cisgender women 741	Screening question on LGBT identity, with binary trans people then reassigned to sister study Trans pop. No direct question on trans identity reported.	Queer 24.9%; Gay 14.9%; Bisexual 19.5%; Other 39.8%.
Hibbert et al. (2020)	3507 (244)	27.1 (No mean reported, most common age band was 18-24 (50%) or 24-34 (34%))	95% White for total trans sample (93% White non-binary sample)	Majority were in full-time employment (33%) or a student (29%)	50% had a university level education or higher	Trans men 147; Trans women 88; Non-binary 244; In another way 21; Cisgender 3007	Follow-up question on trans identification, used to separate binary people in trans and cis. No specific information reported on trans identification for non-binary subgroup.	Gay/lesbian/homosexual 23%; Bisexual 16%; Straight/heterosexual 2%; Queer 33%; Asexual 8%; In another way 18% (inferential analysis were done grouping trans people and comparing with cis).
Holt et al. (2023)	1613 (863)	No mean reported	Aboriginal or Torres Strait	68.8% annual income	51.8% university educated	Trans men 353 (21.9%); Trans women	Inclusion criteria was to have	Asexual 87 (10.1%); Bisexual 179 (20.7%); Fluid

		d. Median age 27 (No mean reported. Median age 26)	Islander 4.4% of total sample (Aboriginal or Torres Strait Islander 3.8% of non-binary people)	below 40k		397 (24.6%); Non-binary (e.g. agender, genderqueer) 863 (53.5%).	gender identity different than assigned at birth, non-binary identity was given priority if both binary and non-binary identities expressed. No further questions on trans identity for non-binary people.	197 (22.8%); Heterosexual 12 (1.4%); Homosexual 117 (13.6%); Queer 264 (30.6%)
Jacobson & Joel (2019)	6104 (744)	Not reported (Not reported)	Not reported (Not reported)	Not reported	Not reported	Transgender (people that identified as transgender, transman, transwoman) 406, gender-diverse (people that identified as genderqueer or other) 744 and cisgender 4954.	Separation between genderqueer /non-binary and trans people.	NA
Jann et al. (2022)	14372 (232)	Mean not reported. More than half over 30, but 64.4% of TGNC under 30 (Mean not	39.5% white, 30.7% Hispanic/Latinx (Not reported)	8.6% reported being homeless, which was similar to trans men, less than trans women (around 19%) and	NA	Cisgender gay/homosexual men 57.5%; Straight/heterosexual men 8.9%; Straight/heterosexual women 5.2%; Bisexual women 3.5%; TGNC	Specific information not reported.	Gay/homosexual 47(20.3%); Lesbian 3 (1.3%); Bisexual 22 (9.5%); Heterosexual 2(0.9%); Other 29(12.5%); Pansexual 30(12.9%); Queer 69(29.7%); Questioning 4(1.7%); Unknown/unreported/declined

		reported. Majority 29 or below)		more than cisgender people (around 2-3%) [not statistically tested, only trans vs. cis]		people 3.2% (Genderqueer/ nonbinary 50.7%; Transgender women/trans feminine 38.2%; Transgender men/trans masculine 11.1%).		26(11.2%)
Kattari et al. (2021)	4,729 (81)	Students were 14+, mean not reported (middle and high school students), mean not calculated but above 16 (Not reported)	57.31% White (Not reported)	Not reported	Not reported	Not transgender 12467; Do not Know transgender 175; Transgender girl/woman 57; Transgender boy/man 110; Transgender other 81	All non-binary people were also trans as they identified as "transgender in another way".	No separate data
Kattari et al. (2019)	4834 (57)	16.2 (Not reported)	53.8% White; Latino/Hispanic 26.75% (Not reported)	Not reported	Not reported	Do not Know 69; Not Transgender 4611; Transgender Female 42; Transgender Male 56; Transgender Other 57	All non-binary people were also trans as they identified as "transgender in another way".	No separate data
Katz-Wise et al. (2023)	4087 (167)	89.7% of sample was between 18 and 25 (Not reported)	47.8% White; Other ethnicities; 16.5%	Not reported	Not reported	Cisgender girl/woman 2,370 (58%); Cisgender boy/man 1,497 (36.6%);	No specific question reported	No separate data

		reported	Black (Not reported)			Transgender girl/women 6 (0.2%) ; Transgender boy/man 47 (2.2%); Nonbinary person 167 (4.1%)		
Katz-Wise et al. (2016)	452 (185)	32.6 (Not reported)	White Non-Hispanic 79.4% (Not reported)	Not reported	Not reported	Trans Feminine 36.9%; Trans Masculine 63.1% (of whom non-binary 40.9%). Some of the non-binary label used were: genderqueer, gender variant, gender nonconforming, other	No explicit question to check if non-binary people are also trans. Study was open to trans and gender-diverse individuals.	No separate data
Kennis et al. (2022b)	480 (78)	30.21 (30.55)	Not reported (Not reported)	Majority was employed (43.59%) or a student (35.9%), nonetheless non-binary people were more likely to be unemployed when compared to	Majority had college/university education (74.36%). No significant difference with binary trans and cis participants.	Transgender men 125; Transgender women 72; Non-Binary individuals 78; Cisgender men 98; Cisgender women 107. Non-Binary selected this label or used the text-box response option that indicating a non-binary	Specific separate question on trans identity (79.5% of non-binary participants indicated having a transgender identity)	NA

				cisgender people (20.51% vs. 9.8%), with more similar scores to binary trans people (18.78%)		identity (e.g. "non-binary transmen")		
Kennis et al. (2022a)	259 (62)	30.4 (28.32)	Not reported (Not reported)	no difference between binary and non-binary trans people in relation to housing	no difference between binary and non-binary trans people in relation to education (majority were highly educated)	Transgender men 125; Transgender women 72; Non-binary transgender 62	Specific separate question on trans identity (of the non-binary and/or other identity group, 18 participants did not identify as transgender, and they were excluded from sample.)	NA
Koós et al. (2024)	75117 (2612)	32.07 (Not reported)	Not reported (Not reported)	Not reported	Not reported	Men 31,454 (41.9%); Women 41,016 (54.6%); Genderdiverse 2612 (3.5%)	Unclear. From supplemental table S1 looks like non-binary people might be both trans and not trans.	No separate data
Lin et al. (2024)	82243 (2783)	32.39 (Not reported)	Not reported (Not reported)	Not reported	Not reported	Men 32,549 (39.6%); Women 46,874 (57.0%); Non-binary individuals 2315 (2.8%);	No specific information about trans identification.	No separate data

						Individuals with other gender identities 468 (0.6%)		
Littman et al. (2024)	6653 (1013)	Trans men: majority below 39; Trans women: Majority below 49 (Majority was below 39)	Trans men: 59.2% White, 18.4% Black; Trans women: 77.6% White, 7.5% Black (66.5% White; 10.1% Black)	Majority ≤ 50,000	Majority had completed "Some college or technical school" or below	Trans men 25%; Trans women 59%; Nonbinary 16%.	Unclear, no specific question reported, but participants were screened for participation based to the following questions: 1) "Are you transgender, trans, nonbinary or gender-diverse?" (yes/no) 2) "Is your current gender identity different than the sex on your original birth certificate?" (yes/no)	No separate data
Mark et al. (2018)	955 (57)	33 (33)	White 87.4% (White 87.7%)		Majority had completed college/university (28.1%) or had completed some college (22.8%)	Cisgender women 605 (63.4%); cisgender men 293 (30.7%); genderqueer 57 (6.0%)	No specific information about trans identification.	Straight 7 (12.3%); Gay 9 (15.8%); Lesbian 0 (0%); Bisexual 20 (35.1%)
McKen et al.	251 (61)	24.0 (23.33)	White	Not reported	Not reported	Cisgender women	Non-binary people are	NA

al. (2021)			(68.9% White)			39.4% (99); Cisgender men 36.3% (91); Nonbinary 24.3% (61).	included in this study, but binary transgender people are not, which could mean non-binary people in this study were not trans, but could also mean that binary trans people were excluded while non- binary people's trans identity was not assessed.	
Nadarz ynski et al. (2023)	1429 (28)	36.6 (Not reporte d)	85% White (Not reported)	Not reported	Not reported	Male (including trans male) 1386 (97%); Female (including trans female) 6 (< 1%); Non-binary 28 (2%); Other 9 (< 1%)	No specific question reported.	NA
Nimbi et al. (2024)	1041 (153)	25.25 (Not reporte d)	Not reported (Not reported)	Not reported	Not reported	Female 718 (68.97%); Male 81 (7.78%); Questioning 89 (8.54%); Non-binary 153 (14.69%)	No specific question reported.	Authors highlight high percentage of non-binary people in the sample. Non-binary people in the sample mainly identified as asexual (22.89%) or gray-asexual (21.77%).
Pletta et al. (2022)	141 (27)	27.4 (Not reporte d)	75.2% White/ 88.7% non-	Not reported	Not reported	Transmasculi ne spectrum: Non-binary gender (e.g.	Paper is on "transmascu line" group of patients	NA

			Hispanic (Not reported)			non-binary bigender, genderqueer identity (no 114, yes 27)	(treatments seeking).	
Perez & Peppin (2024)	316 (239)	26.84 (Not reported)	80% White (Not reported)	Not reported	Not reported	Men 39 (12.3%); Women 38 (12%); Non-binary and/or gender-diverse 239 (75.6%)	No specific question reported.	No separate data
Reisner et al., 2023	274 trans binary and 1162 cis participants (76)	34.2 trans binary sample; 48.5 cis sample (30.4)	Trans binary sample: 56.5% White and 43.5% People of colour; Cis sample: 72.3% White and 27.7% People of colour (54.2% White; 21.7 Latinx)	Not reported	58.7% had completed at least some college	274 Trans people (Trans man 30.9%, trans woman 30.8%, trans non-binary 31.3%) and 1162 Cisgender people	All non-binary participants were also trans (follow up question on gender identity - see method of asking about gender identity)	Queer 35%; Pansexual 15%; Lesbian 13.2%; Bisexual 12.9%; Asexual 11.9%
Reisner et al. (2020)	150 (30)	27.5 (Not reported)	74.7% White (Not reported)	Not reported	Not reported	Transgender men (FtM) 50.4%; Man/male 28.7%; Genderqueer / non-binary 20.0%; Another gender 3.3%.	Paper is on "transmasculine" group of patients of cervical screening.	No separate data
Rosenberg et al. (2021)	1613 (1067)	30.7 (Not reported)	4.3% Aboriginal and/or Torres Strait Islander (Not reported)	Not reported	Not reported	Man/trans man 258 (16.0%); Woman/trans women 288 (17.9%); Non-binary, presumed	Participants could be trans and/or gender-diverse (no other item to assess trans identity)	NA

						<p>male at birth 340 (21.1%); Non-binary, presumed female at birth 727 (45.0%)</p> <p>Participants reported 58 different gender labels, which were re-coded as trans men/men, trans women/women, gender non-binary (AFAB/AMAB)</p> <p>Those who reported both binary and non-binary gender labels were categorized as non-binary.</p>		
Rothblum et al. (2020)	19 asexual people compared with 1504 non-asexual LGB people (72.26% of asexual subsample)	No mean reported. Of asexual respondents (91.19%, SE = 5.47) were 18–27 (Not reported)	80.46% White for asexual subsample (Not reported)	Not reported	Not reported	<p>Asexual people were: Women 27.74%; men 0%; Genderqueer and non-binary (GQNB) 72.6%.</p> <p>Non-asexual (LGB sample) were:</p>	<p>Stated in discussion that this study is about asexual individuals who are LGB or GQNB sexual minorities but do not identify as trans or straight</p>	No separate data

						Women 54.92%; Men38.74%; Genderqueer and non- binary (GQNB) 6.35%		
Rutherford et al. (2021)	3,423 (150)	No mean reported. Majority below 29 (No mean reported. 40.7% were below 25 (66.0% of non-binary responders were below 30). Both trans and non-binary groups were younger than the cisgender group.)	73.6% White (70.0% White)	Majority reported having enough to make ends meet with no extra (35%) or with extra money to spend (20.7%), however 20.7% reports being unable to make ends meet. Non-binary people were overall twice as likely to reporting having to cut back and four times as likely to report not making ends meet than	Non-binary participants were less likely to have a Bachelor's degree (24.0% vs. 32.2%) or above a Bachelor's degree (8.0% vs. 22.1%), completing post-secondary school (28.7% vs. 25.1%) compared to cis people, but this was not significant after adjusting for confounders.	Cisgender participants 3083; Trans participants 296, Non-binary participants 150 (106 people in both trans and non-binary subsample as they identified as both) People that gave alternative label selecting option "neither. I prefer to self-describe as: _____." to gender question (any non-binary label included., e.g. "enby" or "genderqueer")	Specific separate question on trans identity/experiences. Trans and non-binary group are not mutually exclusive (non-binary group only has non-binary participants, with or without trans identity, while the trans group is mix of trans non-binary and binary people. 106 participants identified both as non-binary and as trans).	Gay 32.7%; Asexual 4.7%; Straight 0.7%; Bisexual 17.3%; Pansexual 32.0%; Queer 49.3%; Heteroflexible 1.3%; Other 2.7%

				cisgender people.				
Smalley et al. (2016)	3279 (117)	29.8 (Not reported)	Caucasian 68.9% (Not reported)	Not reported	Not reported	Female 2,038 ; Male 916; Transgender female 82; Transgender male 126; Genderqueer , nonbinary, or other 117	No specific question.	Most genderqueer or nonbinary participants identified as queer or pansexual – omnisexual (50.0% and 24.1%). 10.7% was Bisexual.
Walters et al. (2023)	175 (18%)	20.5 (Not reported)	63% White; 21% Hispanic/Latinx (Not reported)	Not reported	Not reported	Women 53%; Men 14%; Non-binary 18%; Transgender men 5%; Transgender women 4%; Genderqueer 1%; Other 5%	No specific question.	No separate data
Winer et al. (2024)	7568 (1926)	24.5 (Not reported)	78.9% White (Not reported)	Not reported	Not reported	Women 4687 (62%); Men 955 (13%); Neither men nor women 1926 (26%)	Transgender identity for whole sample was assessed (transgender identifying (18%); Unsure (8%)), however no specific data reported for non-binary people.	No separate data

2.10 Figures for study 1

Figure 1 Prisma chart for English searches

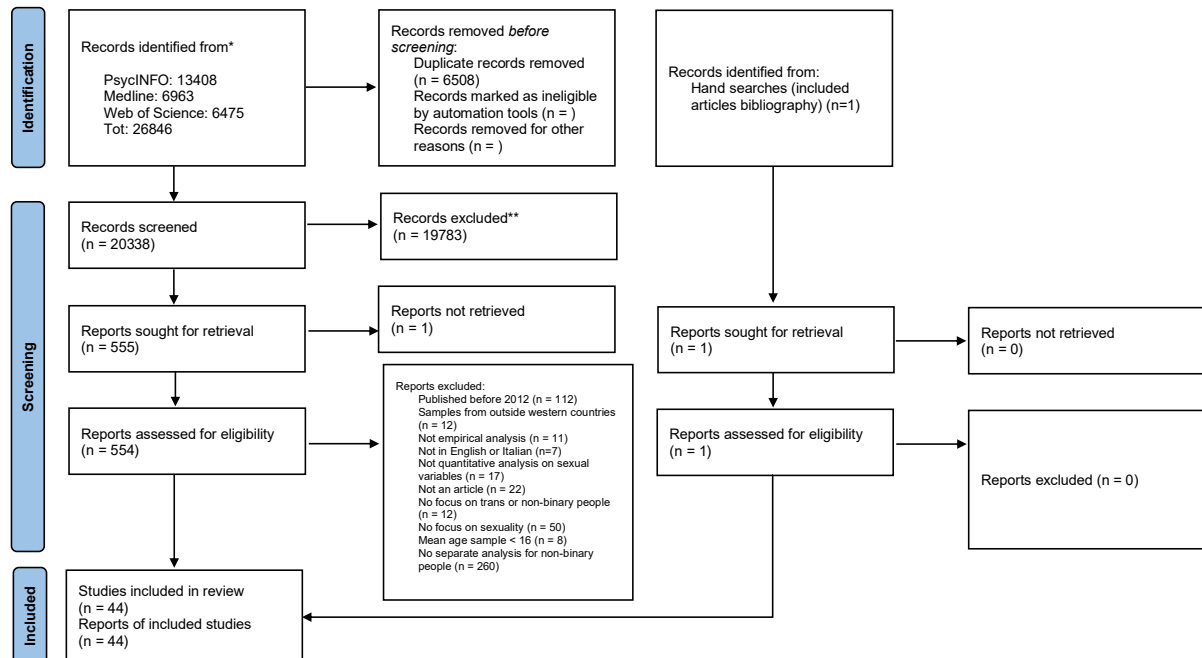


Figure 1 reports PRISMA chart (Page et al., 2021) for searches in English language.

Figure 2 Prisma chart for Italian searches

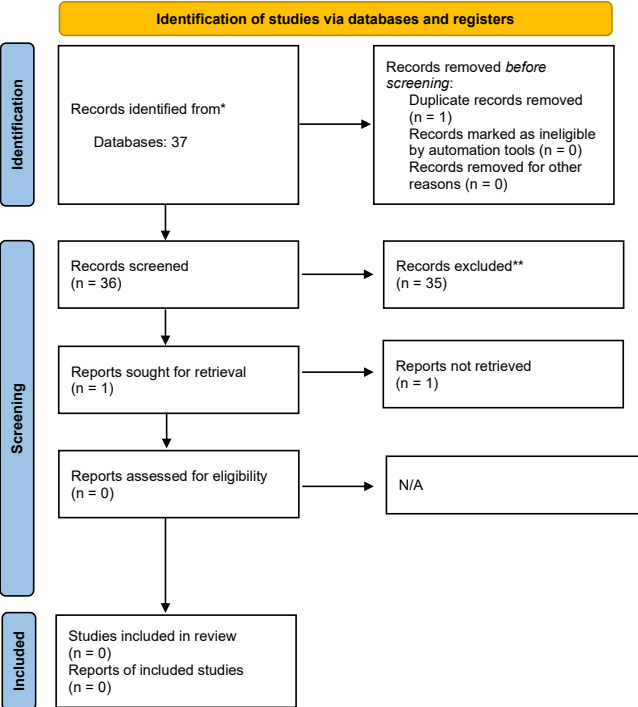


Figure 2 reports PRISMA chart (Page et al., 2021) for searches in Italian language.

Chapter 3 Sex beyond the binary: An exploratory analysis on Non-binary Sexuality and Partnerships.

3.1 Abstract

Non-binary identities are often overlooked by quantitative sex research. This explorative study focuses on the sexuality and partnerships of non-binary people. The analysis addresses three primary questions: the characteristics of non-binary people's sexual experiences, demographic factors linked to sexual wellbeing and relationship satisfaction, and differences between non-binary and binary trans/cisgender individuals. 822 participants (462 non-binary, 129 binary trans and 231 cisgender individuals) took part. 60% of non-binary individuals identified as autistic and 40% reported chronic health conditions or physical disabilities. Regression analysis was performed with sexual wellbeing, sexual and relationship satisfaction as dependent variables and demographics, transition status and minoritised identities as independent variables. Among the non-binary subsample, being autistic and being asexual, being in a relationship and transition status were associated with higher sexual wellbeing, while sexual fluidity and health conditions were linked to lower sexual wellbeing. Sexual fluidity linked to lower sexual and relationship satisfaction. Non-binary and binary trans individuals reported lower sexual satisfaction and wellbeing than cisgender individuals. Results highlight the importance of examining overlapping minoritised identities in non-binary populations and call for further investigation into the connections between sexual fluidity, autism, asexuality, and sexual outcomes to improve understanding of non-binary people's sexual experiences.

The study is completed and currently under review for publication.

3.2 Introduction

Sexuality and sexual health are integral and fundamental aspects of the human experience (Mendelsohn et al., 2022; World Health Organization, 2010a). Nonetheless, the sexuality of gender-diverse individuals has historically been regulated by society and neglected by researchers (Dyar et al., 2020; Puckett et al., 2023), with especially sparse literature focusing on the sexual experiences and partnerships of individuals who exist outside Western conceptualisations of the gender binary. The term “non-binary” describes identities that challenge the idea that every person must identify as either a woman or a man (American Psychological Association, 2015; Richards et al., 2016).

Overall, there is a dearth of empirical evidence addressing the experiences and needs of non-binary populations (Herek, 2016). While recent qualitative literature has more readily sought to explore and understand the experiences of non-binary individuals (e.g. Anzani et al., 2021; Lindley et al., 2021), quantitative research still largely excludes this population. A recent systematic review on the sexuality and sexual health of non-binary people (Mastrantonio et al., 2025b) found that, although the body of quantitative sex research with gender-diverse individuals is increasing, non-binary individuals are often still disregarded. Specifically, it highlighted how psychometric tools are often inappropriate with respect to the reality of non-binary people’s sexuality and partnerships, that samples tend to be underpowered for the analyses, and that there is an overall need for more research on sexual and relationship-related constructs within this population (Mastrantonio et al., 2025b). The scarcity of quantitative data is concerning, as these reports are often used to inform health policies (Wronski et al., 2021). Without adequate non-binary representation in quantitative research, decisions may fail to accurately consider this population. Additionally, further quantitative research in this area could deepen our understanding of non-binary people’s sexuality

and needs, potentially contributing to improved resource provision and sexual health care access for this population.

Overall, gender minorities have previously been compared to cisgender individuals (i.e. those whose sex-assigned-at-birth overlaps with their current gender identity) often pointing to worse sexual and health outcomes (e.g., Goldenberg et al., 2024). Importantly, quantitative research has repeatedly failed to account for differences within gender-diverse groups of individuals and has largely focused on risk behaviour (e.g. Andrzejewski et al., 2020), disregarding satisfaction and sexual wellbeing. More specifically, non-binary people and binary transgender (trans) people (i.e. individuals who do not identify with their assigned at birth sex but who do identify as men or women; American Psychological Association & National Association of School Psychologists, 2015) have repeatedly been grouped together and treated as the same population (Mastrantonio et al., 2025b). This is despite findings suggesting that while some non-binary people might identify as trans, not all do (Darwin, 2020; Wilson & Meyer, 2021), and that trans people do not necessarily perceive their gender as outside the binary. This approach prevents a deeper understanding of non-binary and binary trans people's sexuality by focusing on gender minority populations as a homogeneous group, with identical life experiences and struggles. Conversely, the expansiveness of non-binary people's experience of gender, and their existence outside the men-women gender dichotomy (Vijlbrief et al., 2020), has the potential to expose them to specific forms of societal and legal discrimination that can impact their overall wellbeing and health (e.g., Lefevor et al., 2019).

Differences in the sexuality of binary trans and non-binary people have been consistently reported. For instance, when compared to binary individuals, non-binary people were found to be less likely to identify as heterosexual and more likely to identify

as queer or pansexual (e.g., Goldberg et al., 2020; Holt et al., 2023; Katz-Wise et al., 2016). They also report more sexual attraction to other non-binary people (Boskey & Ganor, 2022) and have more non-binary partners (Holt et al., 2023). Moreover, non-binary people might express different levels of desire for gender-affirming medical procedures and might desire different transition paths (e.g., Galupo et al., 2021; Kennis et al., 2022a). These factors may influence an individual's sexual and romantic connections and highlight a need for more research exploring non-binary and binary gender-diverse individuals' experiences separately.

Quantitative research on sexuality and relationship quality among non-binary people, and research that considers gender differences within gender minority populations, are both still in their infancy (Perez & Pepping, 2024). Moreover, existing quantitative research on the sexual satisfaction of trans and non-binary populations has often been highly medicalised in focus, relying on the assumption that medical intervention is required to reach satisfaction, while often excluding those who do not medically transition (Lindley et al., 2021). Recently, qualitative findings including non-binary individuals have highlighted how both universal aspects (such as general enjoyment from sexual activity and connection with partners) and trans-specific aspects (e.g. partners that affirm gender identity, sex as a way to connect to one's body) were highlighted in a large sample of non-binary and trans masculine individuals (Lindley et al., 2021). At the same time, research has highlighted how trans and non-binary people's reports often centre around joyful and pleasurable experiences when discussing their sexuality (Hall et al., 2024). These results indicate how the medicalisation of gender-diverse individuals' sexual experiences is problematic and encourages the need to widen our scope and focus on experiences of satisfaction, relationships, and wellbeing.

In relation to findings on sexual and relationship satisfaction, a few recent studies point to similarities across gender identities (e.g. Holt et al., 2023; Kennis et al., 2022b; Perez & Pepping, 2024); however, more research is necessary. Additionally, non-binary individuals may likely be in non-monogamous and polyamorous relationships (e.g., Holt et al., 2023; Rutherford et al., 2021). Relationship structure has been linked to different levels of sexual satisfaction in trans and non-binary samples (Holt et al., 2023), although conflicting results have also been found. Specifically, Perez and Pepping (2024) found no association between relationship structure and sexual and relationship satisfaction for trans and non-binary individuals. Lastly, it is relevant to highlight that constructs like sexual wellbeing have remained largely unstudied in non-binary and trans populations. This may be partially due to a lack of conceptual clarity and a scarcity of validated measures to assess sexual wellbeing in gender-diverse samples in the past (Gerymski, 2021). For a more comprehensive review of quantitative sex literature including non-binary people, see Mastrantonio et al. (2025b).

A further element of complexity for understanding the sexuality and sexual wellbeing of non-binary people is that gender-diverse individuals can often be characterised by multiple overlapping minoritised identities. For instance, research has suggested a possible overlap between gender-diverse and autistic identity (e.g., Cooper et al., 2018; Dewinter et al., 2017; Pecora et al., 2020), and has highlighted that non-binary individuals might be more likely to identify as a sexual minority (e.g. Goldberg et al., 2020; Katz-Wise et al., 2016) and to experience sexual fluidity (Katz-Wise et al., 2016). Nonetheless, quantitative sexual research has not fully investigated how the presence of multiple minoritised identities within non-binary groups contribute to shaping their sexual and romantic experiences.

3.2.1 Current study

To summarize, in the past non-binary individuals have often been ignored in quantitative sex research, which has resulted in a problematic lack of literature about their sexuality and relationships. Moreover, existing research has often failed to account for other coexisting identities and characteristics beyond gender identity, all of which could contribute to shaping experiences of sex and partnerships. As such, further research investigating non-binary people's sexuality and relationships while considering other minoritised identities, and that strives to identify potential differences between nonbinary people and other people's experiences, is needed.

3.2.1.1 Research questions

The overarching aim of this analysis was to explore the sexuality and relationships of non-binary individuals, while also assessing possible differences and commonalities between non-binary and binary (transgender and cisgender) populations, by comparing sexual and relationship outcomes.

We focused on three main research questions: (1) What are the characteristics of non-binary individuals' sexual experiences and partnerships? (2) Which demographic factors are associated with sexual wellbeing, and sexual and relationship satisfaction among non-binary people? (3) Are there any differences in relationship satisfaction, sexual satisfaction, and sexual wellbeing between non-binary and other people?

Due to the exploratory nature of this study, no specific hypotheses were formulated.

3.3 Method

The present study was a quantitative cross-sectional analysis of baseline data (collected between August and December 2023) from a larger longitudinal study looking at sexual and mental health in non-binary individuals. Non-binary, trans, and/or autistic experts-by-experience were consulted in the development phase, and modifications to the initial version of the questionnaire reflected feedback received. The study was approved by the Ethics Board of the University of Southampton (ERGO: 82588).

3.3.1 Participants

Participants were recruited through convenience and snowball sampling, focusing on social media advertising (e.g., Facebook, Reddit, Instagram), webpages, and charities working with nonbinary and trans people. Additionally, the survey was published and advertised to University of Southampton psychology students through the research participation pool (SONA). Participants could choose to enter a lottery for three £25 Amazon vouchers after completing the baseline questionnaire. Students participating through SONA were also awarded 6 university participation credits. There were no restrictions in terms of geographical location. The only criteria for participation were to be over 18 and able to complete the questionnaire in English.

The questionnaire was completed 1331 times. After initial screening, 449 responses were deleted due to lack of completion, inappropriate responding to control questions and/or inappropriate response timings (e.g. questionnaire completed too quickly). 17 duplicate responses were deleted as were 8 responses that did not sufficiently answer the necessary gender-related items. Finally, 35 responses were deleted because of further data quality concerns (such as extreme or contradictory

responses to questionnaire items). Pairwise deletion was used during analysis to handle other missing data. The final sample included 822 participants.

3.3.2 Measures

3.3.2.1 Demographics

Demographic questions included age, country, racial background, education and income levels, relationship status (monogamous, polyamorous, or single), neurotype, physical disability or chronic health condition, gender identity, and sexual and romantic orientations. Sex-assigned-at-birth was not asked as consultation with experts-by-experience during questionnaire development indicated that questions on biological sex could be triggering or inappropriate for gender-diverse individuals.

Neurotype was assessed by asking if participants had an autism diagnosis (yes/no) and if they self-identified as autistic (yes/no). Experts-by-experience from the autistic community suggested that self-identification is less stigmatizing than autistic traits measures. Assessing autistic identity is important as studies have shown associations between gender diversity and autism (e.g., Bölte et al., 2023; Stagg & Vincent, 2019) and being autistic may influence how individuals characterize and experience their sexuality (e.g., Beato et al., 2024; Gray et al., 2021).

Gender identity status was collected through a series of three items. The first question asked about transgender identity (yes/no), the second assessed non-binary identity (yes/no), and the third asked participants to pick their primary gender label from a list or add another label through a text box. The first two questions were used to divide participants into three subgroups for analysis: people who responded “yes” to transgender and “no” to non-binary identity items were classified as “binary transgender” and people who responded “no” to both questions were classified as

“binary cisgender.” People who responded “yes” to non-binary were classified as “nonbinary” regardless of their transgender status.

Sexual and romantic orientation were assessed separately, as previous research has highlighted that gender-diverse participants may be especially likely to report a distinction between their sexual and romantic attractions (Galupo et al., 2016). For sexual identity and romantic identity, participants selected their current primary label from a list (with an optional textbox if needed). Sexual attraction and romantic attraction were measured separately by asking the participants’ level of attraction (0–10) for (1) men (including trans men), (2) women (including trans women), and (3) non-binary people. Lastly, participants were asked about the genders of people they had had sex with in the past year.

3.3.2.2 Sexual Fluidity

A brief explanation of sexual fluidity was provided (“Some individuals could experience spontaneous changes in their sexual orientation over the course of their life. These changes can be temporary or permanent. This is called sexual fluidity”). Participants were then asked if they had ever experienced a change in their sexual orientation (yes/no).

3.3.2.3 Transition-Related Variables

Trans and non-binary participants were asked if they had chosen to affirm their gender by social and/or medical transition using three items. A dichotomous “social/medical transition” variable categorized individuals who had medically and/ or socially transitioned in at least some capacity (yes) or not at all (no). A second dichotomous “transition intention” variable categorized those with “no intention to

further transition” and those with “some intention to further transition or who were unsure.”

3.3.2.4 Sexual Satisfaction

The New Sexual Satisfaction Scale (NSSS; Štulhofer et al., 2010) has been used in different cultures as a gender-neutral measure of sexual satisfaction and demonstrates good psychometric properties (Brouillard et al., 2019; Štulhofer et al., 2010). The scale includes 20 questions using a 5-point Likert scale (“Not at all satisfied” to “Extremely satisfied”) and is characterised by an Ego-Centred subscale and a Partner and Activity-Centred subscale. It has also been previously used with gender-diverse participants (Martin, 2020.; Yan, 2023). For this analysis, the scale had excellent reliability (Cronbach’s alpha = .94). The scale was also easily adaptable for people with multiple partners (wording was changed from “partner” to “partners” where relevant). Only individuals who reported sex with a partner in the past year were included in analyses with this measure. 9/ 822 (1.09%) individuals were excluded from analyses including this scale due to having at least one missing item on the NSSS.

3.3.2.5 Relationship Satisfaction

The Relationship Assessment Scale (RAS; Hendrick, 1988) was used to evaluate relationship satisfaction as it includes gender neutral language and has previously been used with transgender and non-binary samples (e.g., Dargie et al., 2014). Wording and instructions were slightly modified to include non-monogamous and polyamorous participants (similar to Garner et al., 2019). The scale is composed of 7 items using a 5-point Likert scale (“Low” to “High”). Reliability for this study was good (Cronbach’s alpha = .88). 4/822 (0.49%) individuals were excluded from analyses including this scale due to having at least one missing item on the RAS.

3.3.2.6 Sexual Wellbeing

The Short Sexual Wellbeing Scale (SSWBS; Gerymski, 2021) was used to measure sexual wellbeing as it has been previously validated with transgender people, but not with non-binary samples (Gerymski, 2021). This scale uses a holistic conceptualisation of sexual wellbeing encompassing satisfaction with the frequency of one's sexual relations, sexual distress, feelings of physical sexual gratification and pleasure, emotional fulfilment that comes from sexual activity, and the ability to express and realise one's sexual preferences within the social sphere. This scale includes 5 items, and we opted for a 7-point Likert response scale (as recommended by the author; Gerymski, 2021). The SSWBS had good reliability (Cronbach's alpha = .80) for the current sample. 11/822 (1.34%) individuals were excluded from analyses including this scale due to having at least one missing item on the SSWBS.

3.3.3 Data Analysis

For Research Question 1, descriptive statistics were used to describe non-binary people's sexual and romantic orientation labels, partners in the last year, sexual fluidity, relationship status, and type of relationship.

To assess factors associated with sexual wellbeing and sexual and relationship satisfaction among non-binary participants (Research Question 2) univariable and multivariable regression analyses were run. Univariable linear regressions were performed with demographic factors as independent variables and sexual wellbeing, sexual satisfaction, and relationship satisfaction as dependent variables. Demographic factors with $p < .20$ in univariable analyses were retained for each of the multivariable models. For the relationship satisfaction multivariable model, we used Wild

bootstrapping (with Biascorrected and accelerated 95% confidence intervals and 2000 samples) to address heteroscedasticity in the data.

Additionally, as the sample sizes varied for sexual wellbeing (whole sample), sexual satisfaction (only sexually active participants) and relationship satisfaction (only partnered participants), three sensitivity analyses including only non-binary participants who were partnered and sexually active were conducted. As before, dependent variables were sexual satisfaction, romantic satisfaction, and sexual wellbeing. However, in these regression analyses, we also included sexual satisfaction, romantic satisfaction, and sexual wellbeing as independent variables, depending on the model (e.g., the sexual satisfaction model included sexual wellbeing and relationship satisfaction as independent variables), while controlling for other demographic variables. Wild bootstrapping (with Biascorrected and accelerated 95% confidence intervals and 2000 samples) was used due to heteroscedasticity for these analyses.

Similarly, to answer the question about gender differences in relation to the mentioned sexual constructs (Research Question 3), three regression analyses were performed with gender identity as the independent variable, and sexual wellbeing, sexual satisfaction, and relationship satisfaction as dependent variables. Demographic variables that were associated with the dependent variable of interest in univariable analyses ($p < .20$) were controlled for in the final multivariable models.

For all analyses, most demographic variables were dichotomously recoded, including age (<24 vs. 25+), education (up to a high school diploma vs. any post-secondary schooling), income (<£20,000 vs. £20,000+), sex in the past year (yes/no), chronic health condition and/or physical disability (yes/no), and autism (yes/no). Lastly, sexual orientation was recoded as monosexual (gay/straight), non-monosexual

(bi/pan/queer), asexual spectrum, or other/questioning, while romantic orientation was recoded as monoromantic, non-monoromantic, aromantic spectrum, or other/questioning.

3.4 Results

Among 822 participants, 129 (15.7%) were binary transgender, 231 (28.1%) were binary cisgender, and 462 (56.2%) were nonbinary. Among the non-binary participants, 380 (82.3%) also identified as transgender while 81 (17.5%) did not; 1 (0.2%) did not respond. Most participants (50.5%) were between 18 and 24 years old, white (86.9%) and had completed at least some university (77.7%). Nearly half (47.4%) were from the United Kingdom, 12.3% were from the United States, and 10.8% were from Italy. 371 (45.1%) were in a relationship with one partner, 82 (10%) were in a non-monogamous/polyamorous relationship, and 369 (44.9%) were single. Lastly, 354 (43.1%) individuals in our sample were either formally diagnosed or self-identified as autistic and 309 (37.6%) reported having a physical disability, a chronic health condition, or both. Table 4 reports full demographics by gender identity group.

3.4.1 Characteristics of Non-binary Individuals' Sexual Experiences and Partnerships

Participants who reported a non-binary identity also reported using a variety of primary gender identity labels, including non-binary (37%), agender (16.5%), transmasculine (11.5%), and genderqueer (10.2%). Other self-defined labels, included “non-binary woman,” “transmasc non-binary,” and “genderless.” Most were in relationships, either monogamous (45%) or non-monogamous/polyamorous (14.3%). Most non-binary individuals (n = 311) were sexually active in the past year (67.3%), and of these 34.1% only had sex with men, 26.7% only had sex with women, 25.4% had sex

with partners of multiple gender identities, and 13.8% only had sex with other non-binary people. 88 (19%) non-binary participants reported never having had sex.

Among non-binary participants, the most common sexual identity label was queer (30.1%), followed by pansexual (18.4%), bisexual (15.8%), and asexual (15.4%). Other self-reported identity labels included those from the asexual spectrum ($n = 13$, e.g., “grayasexual” i.e., an umbrella term for identities falling between asexuality and allosexuality, often including demisexuality; Rainbowpedia, n.d.-a, “demisexual,” “grey bisexual”), and other non-monosexual labels ($n = 6$, e.g., “polysexual” i.e., a person who is attracted to more than one gender; LGBTQIA+ Wiki, n. d.-b, “omnisexual” i.e., a person who is attracted to all genders, but for whom gender plays a role in their attraction; LGBTQIA+ Wiki, n.d.-a). Three participants specified genders they were or were not attracted to (i.e. “agender 4 agender,” “anything but men”), three were gynosexual or sapphic, three were questioning, and two were unlabeled. 258 (55.8%) had experienced sexual fluidity in their lifetime.

3.4.2 Factors Associated with Sexual Satisfaction, Relationship Satisfaction, and Sexual Wellbeing Among Non-binary People

Factors considered included age, trans identification, education, income, relationship status, sexual fluidity, having had sex in the past year, living with a chronic health condition/ physical disability, being autistic, having socially or medically transitioned in some capacity, transition intentions, sexual orientation, and romantic orientation.

3.4.2.1 Sexual Satisfaction

Among 305 non-binary individuals who had been sexually active in the past 12 months, having a chronic health condition/physical disability ($B = -3.593$; 95%CI =

-7.064, -.121) was associated with lower sexual satisfaction, while being in a polyamorous ($B = 11.888$; 95%CI = 6.601, 17.176) or monogamous ($B = 9.413$; 95%CI = 5.107, 13.719) relationship (vs. being single), and having socially or medically transitioned in at least some capacity ($B = 5.839$; 95% CI = .589, 11.089) were associated with higher sexual satisfaction in univariable analyses (Table 5). The multivariable regression model was significant ($F(6, 298) = 7.168$, $p < .001$) and explained 11% of the variance. Having a chronic health condition/physical disability ($B = -4.955$; 95%CI = -8.303, -1.607) was significantly associated with lower sexual satisfaction. Having socially and/or medically transitioned ($B = 5.421$; 95%CI = .250, 10.592) in some capacity and being in a polyamorous ($B = 11.942$; 95%CI = 6.704, 17.179) or monogamous ($B = 10.026$; 95%CI = 5.780, 14.273) relationship (compared to being single) was associated with higher sexual satisfaction.

3.4.2.2 Relationship Satisfaction

Among 272 non-binary participants in relationships, having been sexually active in the past year ($B = 2.476$; 95% CI = .668, 4.285) was linked to higher levels of relationship satisfaction, while experience of sexual fluidity was associated with lower relationship satisfaction ($B = -1.635$; 95%CI = -2.781, -.488) in univariable analysis (Table 6). The multivariable model was significant ($F(6, 265) = 3868$, $p < .001$) and predicted 6% of the variance. Only sexual fluidity was associated with relationship satisfaction, with people who had experienced fluidity reporting less satisfaction ($B = -1.833$, bootstrapped 95%CI = -2.894, -.689).

3.4.2.3 Sexual Wellbeing

Among non-binary participants ($n = 449$), having had sex in the past year ($B = 2.935$; 95%CI = 1.628, 4.243), being in a polyamorous ($B = 4.559$; 95%CI = 2.716, 6.403)

or monogamous relationship ($B = 3.693$; 95%CI = 2.398,4.988) vs. being single, having transitioned in some capacity ($B = 2.315$; 95% CI=.539,4.090), and having no further transition intentions ($B = 1.569$; 95%CI=.105,3.033) were associated with higher sexual wellbeing, while having experienced sexual fluidity ($B = -1.468$; 95%CI = $-2.714, -.223$) was associated with lower sexual wellbeing at the univariable level (Table 7). The multivariable regression model was significant ($F(12, 436) = 7.553$, $p < .001$) and explained 15% of the overall variance. Having a chronic health condition/physical disability ($B = -2.252$; 95% CI = $-3.431, -1.072$) and having experienced sexual fluidity ($B = -1.442$; 95%CI = $-2.645, -.240$) were significantly associated with lower sexual wellbeing. Additionally, compared to asexual participants, those who were monosexual ($B = -3.243$; 95% CI = $-5.486, -1.000$), non-monosexual ($B = -2.817$; 95%CI = $-4.566, -1.068$), or other/questioning ($B = -4.571$; 95%CI = $-8.426, -.715$) reported lower sexual wellbeing. Sexual activity in the past year ($B = 1.710$; 95%CI=.067, 3.353), being in a polyamorous ($B = 4.191$; 95%CI = 2.180,6.202) or monogamous ($B = 3.507$; 95%CI = 1.998,5.016) relationship (vs. single), having transitioned socially or medically in some capacity ($B = 1.795$; 95%CI=.060,3.530), and being autistic ($B = 1.278$; 95%CI=.080, 2.476), were each independently associated with higher sexual wellbeing.

3.4.2.4 Sensitivity Analysis

To better understand factors associated with sexual satisfaction, a second multivariable regression analysis was conducted which included all variables in the previous model, as well as relationship satisfaction and sexual wellbeing. Among 237 non-binary participants who were in a relationship and sexually active, only relationship satisfaction ($B = .627$, bootstrapped 95%CI=.301945) and sexual wellbeing ($B = 1.614$, bootstrapped 95%CI = 1.382,1.852) were significantly associated with sexual

satisfaction. The overall multivariable regression model was significant ($F(6, 231) = 82.156, p < .001$) and explained 67% of the overall variance (Table 8).

Likewise, for relationship satisfaction, sexual satisfaction and sexual wellbeing were added to a multivariable regression analysis which also included all variables in the previous model. Higher levels of sexual satisfaction ($B = .130$; bootstrapped 95%CI=.062199) were associated with higher relationship satisfaction, while having experienced sexual fluidity was significantly associated with lower relationship satisfaction ($B = -1.603$; bootstrapped 95%CI = $-2.522, -.773$]). The regression model was significant ($F(7, 230) = 15.034, p < .001$) and explained 29% of the overall variance; no other factors were associated.

Finally, a multivariable regression analysis for sexual wellbeing was conducted which included all variables in the previous model, as well as sexual and relationship satisfaction. Sexual satisfaction was the only factor significantly associated with sexual wellbeing, with higher levels of sexual satisfaction linked with higher levels of wellbeing ($B = 1.614$; bootstrapped 95%CI = $1.382, 1.852$). The regression model was significant ($F(12, 225) = 39.444, p < .001$) and explained 66% of the overall variance.

3.4.2.5 Differences in Relationship Satisfaction, Sexual Satisfaction, and Sexual Wellbeing Among Non-Binary, Trans Binary, and Cisgender Individuals

Among 531 sexually active participants, being cisgender as compared to non-binary ($B = 3.053$; 95%CI=.027,6.079) and being in a monogamous ($B = 10.75$; 95%CI = $7.78, 13.730$) or polyamorous ($B = 11.849$; 95%CI = $7.627, 16.071$) relationship (vs. being single) were associated with higher sexual satisfaction, while having a physical disability and/or chronic illness ($B = -3.927$; 95CI = $-6.622, -1.232$) was significantly associated with lower sexual satisfaction in univariable analyses (Table 9).

The multivariable regression model was significant ($F(6, 524) = 13.346; p < .001$) and explained 12.3% of the variance. Gender identity was significantly associated with sexual satisfaction, with binary cis people reporting higher sexual satisfaction than non-binary people ($B = 3.381; 95\%CI = .261, 6.501$); no differences were found between non-binary and binary trans people. Additionally, being in a monogamous ($B = 11.262; 95\%CI = 8.306, 14.218$) or polyamorous ($B = 14.203; 95\%CI = 9.898, 18.507$) relationship was significantly associated with better sexual satisfaction (compared to single people) and having a chronic health condition/physical disability was associated with lower levels of sexual satisfaction ($B = -4.212; 95\%CI = -6.872, -1.552$).

Among 448 people in relationships, there was no significant association between relationship satisfaction and gender identity in univariable analysis; hence, no further analysis was performed.

Among 809 participants, gender identity was significantly associated with sexual wellbeing in univariable analysis, with binary cisgender people having better sexual wellbeing than non-binary people ($B = .468; 95\%CI = .398, 2.538$). Having experienced sexual fluidity ($B = -1.447; 95\%CI = -2.380, -.515$) and having a chronic illness and/or a physical disability ($B = -1.102; 95\%CI = -2.066, -.137$) were associated with lower sexual wellbeing, while being in a monogamous ($B = 4.839; 95\%CI = 3.912, 5.766$) or polyamorous relationship ($B = 4.357; 95\%CI = 2.818, 5.897$) (vs. being single), having had sex in the past year ($B = 4.169; 95\%CI = 3.218, 5.119$), and having completed at least some university ($B = 1.155; 95\%CI = .025, 2.285$) were associated with higher sexual wellbeing (Table 10). The multivariable model was significant ($F(8, 800) = 21.557, p < .001$) and accounted for 17% of the overall variance. Binary cisgender people had significantly higher sexual wellbeing compared with non-binary people ($B = 1.476; 95\%CI = .418, 2.535$); there was no difference between non-binary and binary trans

people. Additionally, being in a monogamous ($B = 4.101$; 95% CI = 3.035,5.167) or polyamorous ($B = 4.290$; 95%CI = 2.630,5.950) relationship (compared to being single) and being sexually active ($B = 1.869$; 95%CI=.780,2.958) were associated with higher sexual wellbeing. Having experienced sexual fluidity ($B = -1.155$; 95%CI = -2.042,-.269) and living with a chronic health condition/physical disability ($B = -1.329$; 95%CI = -2.247,-.412) were associated with lower sexual wellbeing.

3.5 Discussion

In this study, we investigated non-binary people's sexuality and partnerships, focusing on overlapping identities and associations with sexual satisfaction, relationship satisfaction, and sexual wellbeing. We also compared non-binary people to binary cisgender and binary transgender individuals to identify potential differences in sexual outcomes.

Overall, non-binary participants in our sample were characterised by multiple co-existing minoritised statuses. More specifically, almost 60% of our non-binary sample reported being autistic (self-identified or formally diagnosed), while around 40% had a physical disability and/or chronic health condition. Due to the use of a convenience sample, these findings cannot be generalized to the wider non-binary population; however, they still point to the importance of investigating overlapping identities in gender minority populations when addressing issues of sexuality and sexual health. Additionally, we found that about 20% of non-binary participants did not identify with the label transgender. As studies on gender-diverse populations often exclude individuals who do not identify as trans (as reported in Mastrantonio et al., 2025b), it is important to reflect on whether non-binary people who do not adopt this label are being under-represented in existing literature.

In relation to sexual orientation, our study is in line with previous studies which found that non-binary individuals mostly use non-monosexual labels that do not focus on gender identity, such as queer, pansexual, bisexual, and also asexual (e.g. Holt et al., 2021; Rutherford et al., 2021). Additionally, more than half of non-binary participants reported having experienced sexual fluidity in their lifetime. This result is similar to a recent finding in which 56% of participants in a sample of trans and non-binary people reported a shift in sexual orientation over 1.5 years (Katz-Wise et al., 2024). Importantly, sexual fluidity was linked to worse sexual satisfaction, relationship satisfaction and sexual wellbeing in our study. Previous research with both gender-diverse and cisgender populations has linked sexual fluidity to worse health outcomes (e.g., Katz-Wise et al., 2017). Moreover, research with trans individuals has highlighted that gender-affirming transition can be associated with changes in sexual orientation (e.g., Auer et al., 2014); however, there is little research focusing on nonbinary people. Recently, Katz-Wise et al. (2024) have highlighted how shifts in sexual orientation among trans and non-binary people could represent a shift toward plurisexual labels, linking this to individuals acquiring further sexual/romantic experience (e.g., experiencing attraction toward people with different identities), as well as learning about new labels that are a better fit for them (Katz-Wise et al., 2024). The same authors also noted that some of their non-binary and trans participants reported shifts in their gender identity; this could also play a role (Katz-Wise et al., 2024). Further studies should continue to investigate potential links between sexual fluidity and sexual outcomes in non-binary and gender-diverse people using a longitudinal design and they should also attempt to clarify which aspects (e.g., attraction, behaviour, identity label) might be shifting over time and why.

Interestingly, we found that both autism and asexuality were independently linked to higher levels of sexual wellbeing among the non-binary participants in our study. This

could be due to the ability of many autistic and asexual people to find accepting communities and partners that allow for individuals to freely express and actualize their sexual preferences. Research on gender minorities has highlighted the importance of affirming partners (Galupo et al., 2019), and how communities can provide a space to feel sexually free for non-binary people (Björklund & Lindroth, 2024). This could be true for non-binary autistic and asexual individuals as well. Alternatively, this finding could also be partially explained by external and unrelated factors (for instance, asexual and autistic people who have high levels of sexual wellbeing may have been more likely to participate and/or complete our questionnaire in full). Nonetheless, these findings are worth further investigation, and future research should seek to better understand if and in what capacity asexual and autistic identity are relevant to non-binary people's sexuality and wellbeing. Contrary to what Holt et al. (2023) highlighted, asexuality was not independently associated with sexual satisfaction within our non-binary sample. More specifically, Holt et al. (2023) concluded that asexual people in their sample were less likely to have had partnered sex in the last year and were more likely to report no previous or no regular sexual experiences. As such, this discrepancy could be due to our analysis on sexual satisfaction only including individuals who had been sexually active within the past year.

Our study also supports existing findings that being in a relationship (either monogamous or non-monogamous) is associated with better sexual satisfaction in gender-diverse samples (similar to Perez & Pepping, 2024). In contrast to what was found by Holt et al. (2023), we did not find that being in a monogamous relationship was linked with better outcomes compared to other relationship structures. This difference in findings could be due to a difference in definitions (open/other type of relationship in Holt et al.'s study vs. polyamorous/consensually nonmonogamous in our study), or may

relate to the measures used to assess satisfaction, as suggested by Perez and Pepping (2024). Thinking about the tools employed to measure satisfaction, it is also important to consider that factors describing relationship quality in monogamous vs. non-monogamous relationships might be different for trans and non-binary people (as pointed out by Holt et al., 2023). For these reasons, further research relating to relationship dynamics and their associations with satisfaction within trans and non-binary populations is necessary.

In relation to gender-affirming transition, we did not find an association between transition intention and any of the considered sexual outcomes. However, having transitioned socially or medically in some capacity was associated with higher levels of sexual satisfaction and sexual wellbeing in non-binary individuals. This finding speaks to the importance of being able to access gender-affirming care and social transition, as this may help improve sexual outcomes. This finding also adds to the growing body of literature that establishes a link between transitioning and higher wellbeing among gender minority people (e.g. Allen et al., 2019; Lindley et al., 2020).

Lastly, considering differences between non-binary and binary trans/cis populations, our results partially support previous research showing no differences in sexual and relationship satisfaction between gender identities, and specifically, no differences between non-binary and binary trans individuals (e.g., Fuller & Riggs, 2021; Kennis et al., 2022a; Mark et al., 2018; Perez & Pepping, 2024). However, we found that trans binary and non-binary people reported lower sexual satisfaction and lower sexual wellbeing than binary cis individuals. While future research is needed, we suggest that this could be related to experiences of gender minority stress (Testa et al., 2015), known to affect gender-diverse individuals' sexual health and general wellbeing (e.g. Hunter et al., 2021; McLemore, 2018; Mezza et al., 2024; Tan et al., 2020). More specifically, our

society often ostracizes and invalidates those who do not align with ideas of cisnormativity and binarism (e.g., Katz-Wise et al., 2024), creating barriers for non-binary people.

3.6 Limitations & Future Directions

This study had several limitations. Firstly, our sample was predominantly white and mostly from Europe (UK and Italy) and the US. Consequently, we were unable to perform analyses exploring the intersection of gender and ethnicity/race. Additionally, the sample was also young, with the majority of participants between 18 and 34 years old and this may also have influenced our findings and created bias. Additionally, as we used a convenience sample, we have to be cautious in generalising results. This analysis was also cross-sectional, which limits our understanding of how variables may interact over time and prevents us from making causal interpretations of the data. Moreover, we chose to group all non-binary identities together, and we did not allow participants to select more than one gender identity or sexual identity label. This could be seen as a simplification of the expansiveness of how gender-diverse participants conceptualize their gender and sexuality (see Galupo et al., 2016). Adding to this point, we also acknowledge that some people who do not identify with the label or our definition of “non-binary,” but who still exist outside of the binary western understanding of gender, might have decided to not participate in our study. Overall, our decision to look at social and medical transition together limits our ability to understand how different aspects of transition may impact an individual’s sexual experiences. In addition, the decision to avoid collecting data on assigned sex at birth limits our understanding of potential differences in the experiences of assigned male at birth (AMAB) and assigned female at birth (AFAB) non-binary participants, which could

impact sexual wellbeing. This is particularly relevant as literature has highlighted that gender minority AMAB individuals are often subjected to increased experiences of fetishisation, violence and stigma (e.g. Chavanduka et al., 2021; Kidd et al., 2021; Murchison et al., 2023; Newcomb et al., 2020). The decision to avoid collecting information on SAAB was made in an effort to make our non-binary participants feel at ease through data collection and was strongly endorsed by our community experts.

Lastly, by focusing on demographics and identity-related factors, this study did not directly address the impacts that experiences of oppression might have on the sexuality and relationships of non-binary individuals, especially those with multiple marginalised identities. An intersectional approach to this research could be achieved by focusing on how minoritised identities are interrelated in shaping individual experiences of stigma (Cooper, 2015; Lindley et al., 2021) and would constitute an important next step to better contextualize our findings.

Nonetheless, our study meaningfully adds to the existing literature on the sexuality of gender-diverse individuals. Nonbinary people remain a severely understudied group, and future studies should continue to address the complexity of their gender, sexuality, and relationships. Future research may also wish to consider the role of gender euphoria, as opposed to dysphoria, among non-binary people as this may also impact sex and relationships (Beischel et al., 2022; Griffiths et al., 2025). Finally, research should continue to investigate the importance of concurrent minoritised identities in the context of non-binary people's sexual wellbeing, such as the intersections between gender, ethnicity/race, asexuality/demisexuality, having experienced sexual fluidity, and being autistic.

3.7 Conclusions

This research explored the sexuality and relationships of nonbinary people through a large cross-sectional analysis. We also wanted to understand how individual factors and multiple overlapping identities might be associated with sexual and relationship outcomes in non-binary populations. Our results show that non-binary individuals should not be considered as a monolith in sex research, and that other marginalised identities might be important to consider to better understand the sexual wellbeing of non-binary and gender-diverse populations.

3.8 Tables for Study 2

Table 4 Sample Descriptives by Gender Identity

		Binary Trans		Non-binary		Cis Binary		Total Sample	
		N	%	N	%	N	%	N	%
Age	18-24 years old	54	41.9%	175	37.9%	186	80.5%	415	50.5%
	25-34 years old	41	31.8%	205	44.4%	34	14.7%	280	34.1%
	35-44 years old	19	14.7%	59	12.8%	9	3.9%	87	10.6%
	45-54 years old	10	7.8%	16	3.5%	1	0.4%	27	3.3%
	55-64 years old	4	3.1%	7	1.5%	1	0.4%	12	1.5%
	65+ years old	1	0.8%	0	0.0%	0	0.0%	1	0.1%
Ethnicity	Asian	3	2.3%	9	1.9%	30	13.0%	42	5.1%
	White	117	90.7%	419	90.7%	178	77.1%	714	86.9%
	Black or Caribbean	4	3.1%	5	1.1%	11	4.8%	20	2.4%
	Mixed or multiple ethnic background	4	3.1%	26	5.6%	12	5.2%	42	5.1%
	Other ethnic group	1	0.8%	3	0.6%	0	0.0%	4	0.5%
Education	Did not complete high school	4	3.1%	15	3.2%	1	0.4%	20	2.4%
	High School diploma	27	20.9%	54	11.7%	37	16.0%	118	14.4%
	Vocational qualification	12	9.3%	30	6.5%	3	1.3%	45	5.5%
	Some University	26	20.2%	92	19.9%	73	31.6%	191	23.2%
	Undergraduate	38	29.5%	143	31.0%	89	38.5%	270	32.8%

	Master's Degree or PhD	22	17%	128	27.7%	28	12.1%	178	21.7%
Income	Less than £20,000	71	55.0%	254	55.3%	188	81.4%	513	62.6%
	£20,000 to £49,999	39	30.2%	164	35.7%	38	16.5%	241	29.4%
	£50,000 +	19	14.7%	41	8.9%	5	2.1%	65	8%
Relationship status	In a relationship with one partner	55	42.6%	212	45.9%	104	45.0%	371	45.1%
	In a relationship with more than one partner	15	11.6%	66	14.3%	1	0.4%	82	10.0%
	Single	59	45.7%	184	39.8%	126	54.5%	369	44.9%
Primary gender identity label	Man	23	17.8%	2	0.4%	41	17.7%	66	8.0%
	Woman	23	17.8%	1	0.2%	190	82.3%	214	26.1%
	Transmasculine	9	7.0%	53	11.5%	0	0.0%	62	7.6%
	Trans man	39	30.2%	6	1.3%	0	0.0%	45	5.5%
	Transfeminine	2	1.6%	25	5.4%	0	0.0%	27	3.3%
	Trans woman	28	21.7%	4	0.9%	0	0.0%	32	3.9%
	Non-binary	0	0.0%	171	37.1%	0	0.0%	171	20.8%
	Genderqueer	0	0.0%	47	10.2%	0	0.0%	47	5.7%
	Agender	0	0.0%	76	16.5%	0	0.0%	76	9.3%
	Genderfluid	3	2.3%	35	7.6%	0	0.0%	38	4.6%
Other	2	1.6%	41	8.9%	0	0.0%	43	5.2%	
Primary sexual orientation label	Heterosexual/straight	13	10.1%	11	2.4%	149	64.5%	173	21.0%
	Gay	11	8.5%	17	3.7%	4	1.7%	32	3.9%
	Lesbian	15	11.6%	29	6.3%	8	3.5%	52	6.3%
	Bisexual	31	24.0%	73	15.8%	39	16.9%	143	17.4%
	Pansexual	21	16.3%	85	18.4%	13	5.6%	119	14.5%
	Queer	17	13.2%	139	30.1%	6	2.6%	162	19.7%
	Asexual	15	11.6%	71	15.4%	6	2.6%	92	11.2%
	Other	6	4.7%	37	8.0%	6	2.6%	49	6.0%
Sexual fluidity	Yes	84	65.1%	258	56.0%	77	33.5%	419	51.1%
	No	45	34.9%	203	44.0%	153	66.5%	401	48.9%
Sexual attraction to non-binary people	M 5.67	SD 2.85	M 6.40	SD 3.18	M 3.39	SD 2.95	M 5.44	SD 3.33	
Romantic attraction to non-binary people	M 5.83	SD 2.92	M 6.91	SD 3.04	M 3.14	SD 3.05	M 5.68	SD 3.44	
Primary romantic orientation label	Heteroromantic	18	14.0%	22	4.8%	153	66.2%	193	23.5%

	Homoromantic	33	25.6%	45	9.8%	14	6.1%	92	11.2%
	Biromantic	25	19.4%	114	24.8%	32	13.9%	171	20.9%
	Panromantic	42	32.6%	161	35.0%	18	7.8%	221	27.0%
	Aromantic	8	6.2%	52	11.3%	9	3.9%	69	8.4%
	Other	3	2.3%	66	14.3%	5	2.2%	74	9.0%
Health Conditions	Chronic health condition	29	22.5%	156	33.8%	37	16.0%	222	27.0%
	Physical disability	1	0.8%	17	3.7%	3	1.3%	21	2.6%
	Both	12	9.3%	49	10.6%	5	2.2%	66	8.0%
	None	87	67.4%	240	51.9%	186	80.5%	513	62.4%
Autistic	Self-diagnosed	32	24.8%	164	35.6%	24	10.4%	220	26.8%
	Formally diagnosed	21	16.3%	101	21.9%	12	5.2%	134	16.3%
	No	76	58.9%	196	42.5%	195	84.4%	467	56.9%

Table 5 Sexual Satisfaction Univariates and Multivariate Analyses: Regressions of Associations Between Demographic Variables and Sexual Satisfaction in the Non-binary Subsample; n=305

Variable	Univariable				Multivariable			
	Standardized B	B	p	95% CI	Standardized B	B	p	95% CI
Age	≤24							
			Ref.					
	.022	.734	.696	[-2.960; 4.428]				
Autism	No							
			Ref.					
	-.025	-.785	.661	[-4.302; 2.733]				
Physical disability/chronic condition	No							
			Ref.					
	-.116	-3.593	.043*	[-7.064; -.121]	-.160	-4.955	.004*	[-8.303; -1.607]
Education	Highschool or below							
			Ref.					
	.029	1.124	.617	[-3.298; 5.546]				
Sexual fluidity	No							
			Ref.					
	-.069	-2.177	.228	[-5.722; 1.367]				
Income	20000 or below							
			Ref.					

	20000 or above	-.056	-1.731	.330	[-5.220; 1.759]				
Relationship status	Single					Ref.			
	Polyamorous relationship	.308	11.888	<.001**	[6.601; 17.176]	.309	11.942	<.001*	[6.704; 17.179]
	Monogamous relationship	.299	9.413	<.001**	[5.107; 13.719]	.319	10.026	<.001*	[5.780; 14.273]
Romantic orientation	Monoromantic					Ref.			
	Non-monoromantic	-.035	-1.210	.603	[-5.780; 3.360]				
	Aromantic spectrum	.006	.415	.921	[-7.857; 8.687]				
	Other/Questioning	.057	4.904	.358	[-5.577; 15.385]				
Sexual orientation	Monosexual					Ref.			
	Non-monosexual	.036	1.324	.615	[-3.843; 6.490]				
	Asexual spectrum	-.002	-.117	.978	[-8.594; 8.360]				
	Other/Questioning	.073	7.021	.243	[-4.784; 18.827]				
Trans identity	No					Ref.			
	Yes	.007	.263	.908	[-4.195; 4.721]				
Intentions to transition	Further intentions to transition					Ref.			
	No further intentions to transition	.093	3.269	.106	[-.703; 7.240]	.074	2.608	.182	[-1.230; 6.447]
At least some transition	No					Ref.			
	Yes	.125	5.839	.029*	[.589; 11.089]	.116	5.421	.040*	[.250; 10.592]

Note. CI = Confidence intervals

* = p-value <.05

** = p-value <.001

Table 6 Relationship Satisfaction Univariate and Multivariate Analyses: Regressions of Associations Between Demographic Variables and Relationship Satisfaction in the Non-binary Subsample; n=272

Variable		Univariable				Multivariable			
		Standardized B	B	p	95% CI	Standardized B	B	p	95% CI
Age	<24								
	>25	.001	.008	.990	[-1.231; 1.247]				
Autism	No								
	Yes	-.087	-.855	.152	[-2.026; .316]	-.046	-.450	.450	[-1.619; .590]
Physical disability and/or chronic illness	No								
	Yes	-.093	-.909	.123	[-2.066; .247]	-.108	-1.041	.073	[-2.202; .262]
Education	Highschool or below								
	At least some university	.086	1.063	.157	[-.412; 2.537]	.039	.474	.561	[-1.040; 1.949]
Sexual fluidity	No								
	Yes	-.168	-1.635	.005*	[-2.781; -.488]	-.189	-1.833	<.001**	[-2.894; -.689]

Income	20000 or below		Ref.						
	20000 or above	-.010	-.096	.868					[-1.224; 1.033]
Relationship status	Monogamous relationship		Ref.						
	Polyamorous relationship	-.066	-.755	.279					[-2.124; .614]
Romantic orientation	Monoromantic		Ref.						
	Non-monoromantic	.002	.018	.982					[-1.544; 1.580]
	Aromantic spectrum	.037	.695	.601					[-1.920; 3.311]
	Other/Questioning	-.025	-.636	.709					[-3.986; 2.714]
Having had sex the last year	No		Ref.						
	Yes	.161	2.476	.007*		.127	1.986	.052	[-.116; 4.139]
Sexual orientation	Monosexual		Ref.						
	Non-monosexual	.028	.316	.713					[-1.369; 2.000]
	Asexual spectrum	.044	.731	.556					[-1.709; 3.170]
	Other/Questioning	.027	.885	.681					[-3.341; 5.110]
Trans identity	No		Ref.						
	Yes	-.036	-.457	.550					[-1.961; 1.047]
Transition intentions	Further intentions to transition		Ref.						
	No further intentions to transition	.050	.555	.407					[-.762; 1.872]
At least some transition	No		Ref.						
	Yes	.097	1.445	.110		.136	2.043	.057	[-.111; 4.215]

Note. CI = Confidence intervals

* = p-value < .01

** = * = p-value < .001

Table 7 Sexual Wellbeing Univariate and Multivariate Analyses: Regressions of Associations Between Demographic Variables and Sexual Wellbeing in the Non-binary Subsample; n=449

Variable	Univariable				Multivariable			
	Standardized B	B	p	95% CI	Standardized B	B	p	95% CI
Age				Ref.				
	≤24							
	25+	-.018	-.248	<.704				[-1.531; 1.035]
Autism	No			Ref.				
	Yes	.078	1.056	.099		.094	1.278	.037*
Physical disability and/or chronic illness	No			Ref.				
	Yes	-.091	-1.223	.053		-.168	-2.252	<.001**

Education	Highschool or below	Ref.							
	At least some university	.044	.725	.350	[-.798; 2.248]				
Sexual fluidity	No	Ref.							
	Yes	-.108	-1.468	.021*	[-2.714; -.223]	-.107	-1.442	.019*	[-2.645; -.240]
Income	20000 or below	Ref.							
	20000 or above	.062	.842	.188	[-.414; 2.098]	.007	.098	.871	[-1.087; 1.282]
Relationship status	Single	Ref.							
	Monogamous relationship	.274	3.693	<.001**	[2.398; 4.988]	.260	3.507	<.001**	[1.998; 5.016]
	Polyamorous relationship	.237	4.559	<.001**	[2.716; 6.403]	.220	4.191	<.001**	[2.180; 6.202]
Romantic orientation	Monoromantic	Ref.							
	Non-monoromantic	.031	.434	.621	[-1.291; 2.160]				
	Aromantic spectrum	.064	1.221	.287	[-1.030; 3.473]				
	Other/Questioning	-.007	-.224	.887	[-3.335; 2.887]				
Having had sex the last year	No	Ref.							
	Yes	.203	2.935	<.001**	[1.628; 4.243]	.118	1.710	.041*	[.067; 3.353]
Sexual orientation	Asexual spectrum	Ref.							
	Non-monosexual	-.075	-1.073	.209	[.209; -2.751]	-.197	-2.817	.002*	[-4.566; -1.068]
	Monosexual	-.093	-1.871	.109	[-4.164; .421]	-.161	-3.243	.005*	[-5.486; -1.000]
	Other/Questioning	-.088	-3.673	.079	[-7.774; .428]	-.110	-4.571	.020*	[-8.426; -.715]
Trans identity	No	Ref.							
	Yes	-.034	-.605	.468	[-2.242; 1.031]				
Intentions to transition	Further intentions to transition	Ref.							
	No further intentions to transition	.099	1.569	.036*	[.105; 3.033]	.056	.884	.214	[-.513; 2.281]
At least some transition	No	Ref.							
	Yes	.120	2.315	.011*	[.539; 4.090]	.092	1.795	.043*	[.060; 3.530]

Note. CI = Confidence intervals

* = p-value <.05

** = p-value <.001

Table 8 Sensitivity Analysis: Regressions of Associations Between Sexual Satisfaction, Relationship Satisfaction and Sexual Wellbeing Controlling for Demographic Variables with a Subsample of Sexually Active Non-binary People in Relationships; n=237

Variable	Sexual satisfaction				Relationship satisfaction				Sexual wellbeing				
	Standardized B	B	p	95% CI	Standardized B	B	p	95% CI	Standardized B	B	p	95% CI	
Physical disability and/or chronic illness	No	Ref.											
	Yes	-.032	-.988	.409	[-3.390; 1.412]	.028	.261	.623	[-.668; 1.130]	-.077	-1.020	.055	[-2.014; -.002]
Relationship status	Monogamous	Ref.											
	Polyamorous	.062	2.186	.071	[-.221; 4.767]					-.043	-.657	.284	[-1.720; .401]
Transition intentions	Further intentions to transition	Ref.											
	No further intentions to transition	.003	.110	.932	[-2.436; 2.846]					.045	.692	.233	[-.789; 2.442]
At least some transition	No	Ref.											
	Yes	.021	.983	.620	[-2.796; 4.585]	.036	.524	.575	[-1.300; 2.418]	.042	.855	.289	[-.789; 2.442]
Education	Highschool or below	Ref.											
	At least some university					-.004	-.044	.946	[-1.341; 1.230]				
Income	20000 or below	Ref.											
	20000 or above									.037	.493	.307	[-.409; 1.405]
Autism	No	Ref.											
	Yes					-.067	-.636	.247	[-1.659; .273]	.077	1.032	.058	[.049; 2.021]
Sexual fluidity	No	Ref.											
	Yes					-.169	-1.603	.002*	[-2.522; -.773]	-.048	-.642	.234	[-1.693; .360]
Sexual Orientation	Asexual spectrum	Ref.											
	Monosexual									-.086	-1.627	.129	[-3.659; .428]
	Non-monosexual									-.021	-.334	.738	[-2.168; 1.451]
	Questioning/other									-.099	-4.595	.249	[-10.944; 1.616]
Sexual satisfaction					.418	.130	<.001*	[.062; .199]	.753	.329	<.001*	[.287; .371]	
Relationship satisfaction	.194	.627	<.001*	[.301; .945]					.060	.085	.190	[-.034; .203]	
Sexual wellbeing	.704	1.614	<.001*	[1.382; 1.852]	.123	.087	.217	[-.042; .219]					

Note. CI = Confidence intervals

** = p-value <.001

Table 9 Sexual Satisfaction Univariates and Multivariate Analyses: Regressions of Associations Sexual Satisfaction and Demographic Variables in Overall Sample by Gender Identity; n=531

Variable	Univariable				Multivariable				
	Standardized B	B	p	95% CI	Standardized B	B	p	95% CI	
Gender identity	Non-binary Ref.								
		.089	3.053	.048*	[.027; 6.079]	.098	3.381	.034*	[.261; 6.501]
		.036	1.594	.426	[-2.334; 5.522]	.054	2.413	.204	[-1.310 ; 6.137]
Age	<24 Ref.								
		-.019	-.598	.659	[-3.253; 2.058]				
Autism	No Ref.								
		-.035	-1.087	.425	[-3.761; 1.588]				
Physical disability and/or chronic illness	No Ref.								
		-.123	-3.927	.004*	[-6.622; -1.232]	-.132	-4.212	.002*	[-6.872 ; -1.552]
Education	Highschool or less Ref.								
		.052	2.023	.234	[-1.314; 5.359]				
Sexual fluidity	No Ref.								
		-.085	-2.651	.050	[-5.304; .001]	-.053	-1.644	.216	[-4.248; .960]
Income	20000 or below Ref.								
		-.053	-1.664	.225	[-4.357; 1.028]				
Relationship status	Single Ref.								
		.338	10.755	<.001**	[7.78; 13.730]	.354	11.262	<.001**	[8.306; 14.218]
		.263	11.849	<.001**	[7.627; 16.071]	.315	14.203	<.001**	[9.898; 18.507]

Note. CI = Confidence intervals

* = p-value <.05

** = p-value <.001

Table 10 Sexual Wellbeing Univariate and Multivariate Analyses: Regressions of Associations Sexual Wellbeing and Demographic Variables in Overall Sample; n=809

Variable	Univariable				Multivariable				
	Standardized B	B	p	95% CI	Standardized B	B	p	95% CI	
Gender identity	Non-binary Ref.								
		.098	1.468	.007*	[.398; 2.538]	.098	1.476	.006*	[.418; 2.535]
		-.071	-1.324	.052	[-2.657; .009]	-.057	-1.061	.094	[-2.302 ; .181]
Age	<24 Ref.								
		-.031	-.426	.373	[-1.363; .511]				
Autism	No Ref.								
		.034	.462	.338	[-.484; 1.408]				
Physical disability and/or chronic illness	No Ref.								
		-.079	-1.102	.025*	[-2.066; -.137]	-.095	-1.329	.005*	[-2.247; -.412]
Education	Highschool or less Ref.								

	At least some university	.070	1.155	.045*	[-.025; 2.285]	.010	.158	.767	[-.889; 1.205]
Sexual fluidity	No		Ref.						
	Yes	-.107	-1.447	.002*	[-2.380; -.515]	-.085	-1.155	.011*	[-2.042; -.269]
Income	20000 or below		Ref.						
	20000 or above	.002	.027	.956	[-.945; 1.000]				
Sex in the past year	No		Ref.						
	Yes	.290	4.169	<.001**	[3.218; 5.119]	.130	1.869	<.001**	[.780; 2.958]
Relationship status	Single		Ref.						
	Monogamous relationship	.355	4.839	<.001**	[3.912; 5.766]	.301	4.101	<.001**	[3.035; 5.167]
	Polyamorous relationship	.192	4.357	<.001**	[2.818; 5.897]	.190	4.290	<.001**	[2.630; 5.950]

Note. CI = Confidence intervals

* = p-value <.05

** = p-value <.001

Chapter 4 Non-Binary and Autistic: Sexual Wellbeing, Mental Health, and the Impact of Camouflaging

4.1 Abstract

This explorative quantitative study investigates camouflaging, mental health and sexual wellbeing outcomes in self-reported non-binary autistic participants. Autism research has often disregarded non-binary individuals, although overlaps exist between being gender-diverse and autistic. While camouflaging has been linked to different health outcomes within cisgender individuals, research with non-binary people lacks. No literature has looked at sexual wellbeing and camouflaging together in this population. 461 non-binary individuals (57.5% formally or self-identifying autistic) completed the anonymous online questionnaire. Initially, a sensitivity analysis was performed to compare formally and self-identifying participants. Non-binary autistic participants had higher camouflaging scores, but similar levels of anxiety and depression compared to non-binary non-autistic people. In autistic non-binary participants, higher camouflaging

linked with higher anxiety and depression. Higher depression was associated with lower sexual wellbeing; higher relationship satisfaction linked with enhanced sexual wellbeing. No relationship was found between sexual wellbeing and camouflaging. Findings increase the understanding of camouflaging and its association with health outcomes in non-binary people. The lack of association between sexual wellbeing and camouflaging is a novel result and calls for further investigation.

Key words: non-binary; autistic; camouflaging; sexual wellbeing; mental health

4.2 Introduction

Autism is a neurological variant characterised by cognitive, sensory, and communicational differences (Heasman et al., 2024). Although there is much heterogeneity in the way autistic people think, perceive, and behave (Walker, 2021), autistic minds tend to be monotropic (i.e., have the ability to deeply focus on, process, and respond to one matter at time, often to the detriment of other inputs; Murray, 2021). The Neurodiversity Paradigm asserts that autistic ways of being represent a variation of human neurocognitive functioning and are not pathologic (Walker, 2021). However, certain autistic characteristics might be disabling due to non-accommodating environments (Beardon, 2022), especially with expectations that relate to social interaction (Walker, 2021) and navigating social norms that are better suited for the non-autistic majority.

Non-binary people exist outside of societal understandings of gender as a binary construct (American Psychological Association, 2015; Richards et al., 2016). Non-binary individuals have multifaceted and complex experiences of gender (i.e., experiencing multiple genders at once, oscillating or not experiencing gender identity at all; Ali, 2023; Vijlbrief et al., 2020).

Research has highlighted possible overlap being autistic people and non-binary or transgender (i.e., individuals whose gender does not match their assigned sex at birth; American Psychological Association & National Association of School Psychologists, 2015), although reasons for this remain unclear (Bölte et al., 2023; Sala et al., 2020). Moreover, there are undeniable commonalities in the experiences of non-binary and autistic people when it comes to disrupting societal norms and not fitting societal expectations and rules (Voltaire et al., 2024). People who are both autistic and non-binary are a severely understudied population, with quantitative literature that focuses on autism often only including small samples of non-binary individuals or none at all (e.g. Hull et al., 2019). Additionally, while quantitative literature focusing on non-binary people and their experiences is rapidly expanding, several studies group non-binary and binary trans people together when performing inferential analysis, which might hide inter-group differences as well as perpetuating the idea that all gender-diverse people are all the same (Mastrantonio et al., 2025b). As some studies have highlighted differences between non-binary and trans people in relation their health needs and outcomes (Boskey & Ganor, 2022; Holt et al., 2023; Jones et al., 2019; Littman et al., 2024; Rimes et al., 2020), literature focusing on non-binary populations specifically is needed. Studies have also highlighted how barriers may impact accessibility of autism assessment for LGBTQIA+ individuals, including trans and non-binary people (Ardeleanu et al., 2024).

4.2.1 Mental Health and Camouflaging in Autistic Adults

There is strong evidence of mental health disparities between autistic and non-autistic individuals. Frequent co-occurrence between autism and psychiatric disorders includes, but is not limited to, anxiety, depression, suicidality, and eating disorders (e.g., Hollocks et al., 2019; Hossain et al., 2020; Lai et al., 2019; Lugo-Marin et al., 2019).

Camouflaging (i.e. autistic masking) is a compensatory process through which autistic individuals consciously or unconsciously hide their authentic autistic selves by modifying their behaviours, hiding their sensory experiences, and altering the way they spontaneously interact socially (Milton, 2016). Camouflaging may be a coping response or a safety mechanism by which autistic people suppress their natural responses and present a more socially acceptable self that keeps them safe from discrimination after previous negative (and possibly traumatic) experiences (Hull et al., 2017; Pearson & Rose, 2021; Rose, n.d.). Some ways autistic people might camouflage include creating scripts or planning social interactions in advance, maintaining eye contact even when uncomfortable, or stopping one's stims (self-regulatory behaviours; Hull et al., 2017; Parish-Morris et al., 2017). A recent systematic review highlighted how autistic people might camouflage to gain acceptance among peers and develop relationships; however, such relationships might feel inauthentic and superficial, ultimately leading the autistic individual to feel more isolated (Zhuang et al., 2023).

Researchers suggest that individuals with higher levels of autistic traits may engage in camouflaging more frequently (Hull et al., 2019). Age-related and gender-related differences may also play a role (e.g., Hull et al., 2017) as social expectations and demands shift over time and can differ for different genders. A systematic review (Cook et al., 2021) highlighted that people who are assigned female at birth or who identify as women are more likely to camouflage than those assigned male at birth or who identify as men. Conversely, Pearson and Rose (2021) suggested that perpetuating the idea of a “female phenotype” of autism could negatively impact individuals who exist outside the gender binary, creating further obstacles to accessing diagnosis and support.

Overall, research on camouflaging has largely focused on identifying differences between male and female cisgender individuals, and studies that are inclusive of non-binary people are sparse and rely on small samples, limiting the ability to draw clear conclusions (Cook et al., 2021). One study found no difference in camouflaging levels between non-binary people with a formal diagnosis of autism and non-binary people without a diagnosis, but highlighted that this finding could be due to an underpowered sample (Hull et al., 2020). It has been hypothesised that camouflaging may emerge as a consequence of double empathy (i.e., reciprocal inability to establish understanding between autistic and non-autistic people; Milton, 2012) and the subsequent lack of positive social experiences on the part of the autistic person (Mitchell et al., 2021b). Camouflaging might mediate the relationship between lack of social favourability and feelings of social disconnect. The feelings of isolation and rejection could then lead to mental health struggles and suicidality (Mitchell et al., 2021b).

Consistently, there is evidence of a link between camouflaging and poor mental health in autistic populations (e.g., Cook et al., 2021). Reports from autistic adults have linked camouflaging to exhaustion, stress and elevated anxiety, feelings of losing one's authentic identity, and difficulties in accessing support (Hull et al., 2017). Quantitative research has found that higher levels of camouflaging correlate with higher distress, anxiety, and depression (Beck et al., 2020; Hull et al., 2019; Hull, et al., 2021). Masking is also associated with a higher presence of current and past mental health conditions (van der Putten et al., 2024). Evidence is limited considering the effects of camouflaging on the mental health of gender minority individuals, and existing studies often rely on small samples (e.g., Oshima et al., 2024); however, a recent UK-based study including 412 trans and/or non-binary individuals found that camouflaging was significantly associated with anxiety and stress (White et al., 2024).

4.2.2 Mental Health in Non-binary Adults

Mental health research with non-binary deserves further attention (Aparicio-García et al., 2018). Literature highlighted that non-binary people tend to experience higher levels of psychological distress, lower general life satisfaction, higher anxiety and depression, and more intense feelings of isolation and suicidal ideation compared with cisgender individuals (Aparicio-García et al., 2018; Borgogna et al., 2019; Harrison et al., 2012; Kennis et al., 2022b). Although most studies indicate that non-binary individuals experience similar or better levels of anxiety, depression, or suicidality and quality of life compared with binary trans people (Jones et al., 2019; Rimes et al., 2020), one study identified that non-binary individuals reported poorer health outcomes, including higher levels of depression and stress, than both cisgender and binary transgender participants (Lefevor et al., 2019).

Moreover, a recent systematic review and meta-analysis focusing on non-binary individuals between the ages of 11 and 25 found that non-binary individuals presented higher levels of depression, anxiety, and suicidal ideation compared to cisgender individuals, and overall poorer mental health than both binary cisgender and binary transgender people (Klinger et al., 2024). Reasons for health disparities could be linked to legal and social barriers to gender recognition for non-binary people's identities within binary societies (Jones et al., 2019; Lefevor et al., 2019), including barriers to accessing health care for individuals that exist outside the binary (Rosenberg et al., 2021; Rutherford et al., 2021).

4.2.3 Sexual Wellbeing of Autistic and Non-binary People

Sexual wellbeing takes a holistic approach to sexuality. The concept of sexual wellbeing is important in gender minority (and neurodivergent) research, as sexual

studies within these populations have often overlooked the importance of intimacy and pleasure, focusing on risk-based approaches (e.g. Dickenson et al., 2023). Moreover, although sexual wellbeing is a meaningful measure of overall wellbeing and a fundamental public health indicator (Mitchell et al., 2021; 2025), it is rarely accounted for in research with autistic individuals. In the current study, sexual wellbeing is conceptualised as a distinct multidimensional construct, including aspects of physical and emotional fulfilment in relation to sexual acts, lack of sexual distress, satisfaction with the frequency of sexual behaviour, and the social sphere in which the individual is able (or unable) to freely express and realise their sexuality (Gerymski, 2021). Sexual wellbeing is applicable to all individuals, not just those who engage in partnered sex, and it exists as a distinct but linked construct to sexual health (Mitchell et al., 2021a).

Definitions and operationalisations of sexual wellbeing have varied and different measures have been used (Mitchell et al., 2021a), often with a lack of explicit definition within articles (Lorimer et al., 2019). This makes appraising and summarising research on sexual wellbeing in general a difficult task (Mitchell et al., 2021a), which is further compounded by insufficient research on sexual wellbeing among non-binary and autistic individuals specifically.

Considering the sexual wellbeing of non-binary people, the few available studies suggest that non-binary and binary trans people may report similar levels of wellbeing (Kennis et al., 2022b; Mastrantonio et al., 2025a), but that non-binary people report lower sexual wellbeing compared to binary cisgender individuals (Mastrantonio et al., 2025a).

Likewise, research on sexual wellbeing of autistic people is lacking (Maggio et al., 2022). In one study of autistic individuals, higher levels of sexual wellbeing

(conceptualised as higher sexual satisfaction, sexual assertiveness, sexual arousability, desire for partner sexual activity, frequency of sexual activity, sexual self-esteem, and lower sexual anxiety and reported sexual problems; Byers et al., 2013) were reported by men, those who scored lower on the Autism Quotient Scale (Baron-Cohen et al., 2001), and those in a relationship. Other papers have examined factors associated with sexual wellbeing such as autistic people's experiences of positive and negative sexual cognitions (including sexual thoughts, fantasies and images; García-Barba et al., 2024). Sexual wellbeing was also found to be positively associated with sexual satisfaction for autistic individuals who were not in a relationship, but not for those who were; however sexual wellbeing was associated with better quality of life among autistic people, regardless of their relationship status (Pearlman-Avni et al., 2017). In terms of relationship and sexual satisfaction, a recent paper (including 9 autistic vs. 2 non-autistic non-binary and 2 autistic vs. 2 non-autistic trans people) found that autistic participants had shorter relationships, but reported higher sexual and relationship satisfaction, compared to non-autistic people (Yew et al., 2023). No studies have specifically looked at sexual wellbeing among autistic, non-binary adults.

Finally, the association between sexual wellbeing and mental health has been studied primarily in cisgender non-autistic participants and research suggests that more negative mental health outcomes are associated with lower sexual wellbeing. For instance, depression has been associated with lower sexual wellbeing among middle-aged women (Castillo-Hernández et al., 2023). Similarly, in a predominantly cisgender sample of men and women, higher anxiety sensitivity, anxiety, and depression were all associated with poorer sexual wellbeing (Olthuis et al., 2023). Qualitative research has looked at autistic experiences of camouflaging and relationships. A recent systematic review of eight qualitative studies focusing on friendship and intimate relationships

found that overall, autistic people report masking to create relationships (mainly with non-autistic people), but that camouflaging did not allow for deeper connection with others, leading to increased feelings of loneliness, anxiety, and depression (Ridgway et al., 2024). Overall, the review noted that very little research considers intimate relationships among autistic people and called for more attention to be given to this area (Ridgway et al., 2024).

4.2.4 Current Study

The present explorative study wants to investigate possible links between sexual wellbeing, mental health outcomes and camouflaging, among a large sample of non-binary autistic individuals. This population has been severely understudied in autism research, as well as sex research, therefore little is known about non-binary autistic people's health and sexual outcomes, as well as their experiences with camouflaging. Camouflaging is an important variable in relation to health outcomes among autistic cisgender individuals, however there is a fundamental lack of research including large samples of non-binary individuals. Additionally, including sexual wellbeing allows exploration of the potential associations between camouflaging, intimacy, and sexuality for non-binary autistic people, something that has been overlooked in previous studies. Although no hypothesis can be made due to the exploratory nature of this research, camouflaging has been found to influence other health-related aspects, such as mental health, which are known to be associated with sexual wellbeing (e.g., Cook et al., 2021; Mitchell et al., 2021), as well as relationships (Ridgway et al., 2024) and general wellbeing (Alaghband-Rad et al., 2023). Considering autistic non-binary people's mental and sexual wellbeing, it is possible that existing as both a gender-diverse and neurodivergent individual in a society that does not cater for either might come with additional health-related challenges (Peachey & Crane, 2024; Voltaire et al., 2024). As

such, the overall aim of this research was to investigate the health and wellbeing of non-binary autistic people. More specifically, we explored the sexuality, sexual wellbeing, mental health (anxiety, depression), and camouflaging of non-binary autistic people, as compared with a sample of non-autistic non-binary people. The following research questions were considered:

1) Are there differences in anxiety, depression and suicidal ideation for autistic non-binary people vs. non-autistic non-binary people?

2) Are there differences in self-reported camouflaging (masking, compensation, assimilation) between autistic and non-autistic non-binary adults? Is self-reported camouflaging associated with mental health outcomes (anxiety, depression) among autistic non-binary individuals?

3) Are there any distinctions in the sexual wellbeing of autistic vs. with non-autistic non-binary adults? Are camouflaging and mental health outcomes associated with sexual wellbeing for autistic non-binary people?

4.3 Methods

This study is an exploratory cross-sectional quantitative analysis of the baseline data for an ongoing longitudinal project on the health and wellbeing of non-binary people. Before beginning data collection, we engaged in thorough PPI work consulting with a group of 11 non-binary, trans, and autistic experts-by-experience. The experts provided 1:1 feedback to all individual items and measures included in the questionnaire through a video call or a voice call (following their preference). The initial questionnaire was modified based on their feedback. Data for this analysis includes only non-binary participants from the larger sample, collected between August and

December 2023. The study was approved by the University of Southampton's Ethics Board (ERGO: 82588).

4.3.1 Participants

This study is part of a larger project including non-binary, binary trans and cisgender adults. Adults were recruited through social media advertisement (e.g., Facebook groups, reddit, Instagram) and word of mouth (convenience and snowball sampling). Participants could enter a lottery to win one of three £25 Amazon vouchers. There were no restrictions in terms of neurotype or geographical region and participants needed to be over 18 and able to complete a questionnaire in English.

The initial 1331 questionnaire responses were screened accurately, through a mix of built-in questionnaire tools (e.g. re-Captcha scores) and additional checks (i.e. control and open questions, checking for contradictory responses given to different items), following main recommendations from Griffin and colleagues (2022).

449 responses were deleted due to non-completion, inappropriate responses to control items, inappropriate response times or clear quality issues (for instance, if the questionnaire had been completed too rapidly). 8 individuals did not respond to the gender identity questions and were removed. 17 responses were duplicated. In the last phase, questions about sex in the past year which was checked against a different item looking at sex in the lifetime (e.g., if a person had said they never had sex, but then reported sex in the last year they were excluded). Additionally, questions about drug use were checked against a chemsex item (e.g., if the person reported no drug use, but then reported having engaged in chemsex in the last year, they were excluded). Lastly, questionnaires were screened for repetitive responses (i.e., person selecting the same

response or patterns of responses). 35 entries met criteria for such quality concerns and were screened out (e.g. contradictory or extreme responses).

Considering the cross-sectional nature of the analysis, the non-representative nature of the sample, and given the absence of strong evidence against the missing completely at random/missing at random (MCAR/MAR) assumption, we proceeded on the basis that the data may reasonably be treated as MCAR/MAR. For this reason, pairwise deletion was used during analysis to handle other missing data.

While the larger final sample (n=822) also included cisgender and binary transgender participants, for the current analysis, we focused on our non-binary subgroup (n=462). One non-binary person was deleted from this analysis as their autistic identity was not clearly stated, and they were not formally diagnosed. As such, our analytic sample includes 461 non-binary individuals, of whom 196 (42.5%) were non-autistic and 265 (57.5%) were autistic participants.

4.3.2 Measures

Demographics: Participants were asked about their ethnicity and racial background, education and income, age, presence of physical disability or chronic health condition, neurotype/autism, relationship status (monogamous, polyamorous/non-monogamous or no relationship), lifetime experience of sexual fluidity (yes/no), partnered sexual activity in the past year (yes/no), gender identity, and sexual orientation. We decided not to assess sex-assigned-at-birth after consulting non-binary experts-by-experience.

Autistic identification and diagnosis were assessed by asking about formal autism diagnosis (yes/no/awaiting assessment). People who responded “no” or “awaiting assessment” were asked a follow-up question about autistic identification

("Regardless of any formal diagnosis, do you identify as autistic", yes/no). Overall, research has highlighted that autism diagnosis is often inaccessible (Huang et al., 2020), especially for marginalised groups including LGBTQI+ and trans/non-binary people and emphasises the importance of including self-identifying autistic individuals in research samples (Ardeleanu et al., 2024). Diagnostic overshadowing might also be limiting access to appropriate care for individuals who are both autistic and a gender minority (e.g., Overton et al., 2024). In this study, the autistic subsample includes people who either self-reported a professional diagnosis or who self-identified as autistic. We will refer to this group as "autistic non-binary participants". Those who did not report a formal diagnosis or a self-identification will be referred to as "non-autistic non-binary participants" throughout this research. Our choices were also informed by the feedback we received from our autistic experts-by-experience, who noted that self-identification is less stigmatising than including questionnaires on autistic traits. We performed a sensitivity analysis with people reporting a formal diagnosis only, as reported within the results, which further validated our decision.

Neurotype was further investigated by asking about other neurodivergent identities (yes/no). If participants responded "yes" they were able to specify their other neurodivergent identities through a text box.

Sexual orientation was assessed by asking participants to select their main identity label from a list (heterosexual/straight, gay, lesbian, bisexual, pansexual, queer, asexual, something else - with text box to specify).

Gender identity was assessed through three items. The first asked about transgender identity (yes/no), the second about non-binary identity (yes/no), and the third provided participants with a selection of gender identity labels for them to select

the one they primarily used (e.g., man, woman, non-binary, agender, genderqueer, genderfluid, transmasculine, etc). Participants could also indicate “something else” and enter their own identity label into a text box. Participants included in this analysis are those who selected “yes” to the non-binary identity question.

Participants were also asked whether they had affirmed their gender through social and/or medical transition using three separate items (“Some individuals might decide to socially transition in relation to their gender transition - e.g. changing name, changing pronouns, come out to relevant people, modify gender expression through clothing or aesthetic treatments such as laser treatment, etc. Have you socially transitioned?”; “Some individuals might decide to take gender affirming hormones in relation to their gender transition - e.g., antiandrogens, oestrogens, testosterone, hormone blockers, etc. Have you ever taken gender affirming hormones?”; “Some individuals might decide to have gender affirming surgeries to achieve some of their transition goals - e.g., top surgery/ chest reconstruction/ breast augmentation surgery, phalloplasty or metoidioplasty, vaginoplasty, any facial surgery that you would consider gender affirming, etc. Have you ever had gender affirming surgeries?”). Two dichotomous variables were then created to assess whether people had transitioned in any capacity (“At least some transition”: yes/no) and whether they desired any further medically or socially transition (“Intentions to transition”: Further intentions to transition/No further intentions to transition).

Relationship satisfaction: The Relationship Assessment Scale (RAS; Hendrick, 1988) was used to measure relationship satisfaction. This scale is characterised by seven items, a 5-point Likert scale (“Low” to “High”), and gender-neutral language. The scale was also modified to be inclusive of non-monogamous and polyamorous

individuals (similar to Garner et al., 2019). Reliability for this study was good (Cronbach's alpha = .87).

Autistic masking/Camouflaging: Participants completed the Camouflaging Autistic Traits Questionnaire (CAT-Q; Hull et al., 2019). This 25-item questionnaire was developed using qualitative accounts of autistic individuals' experiences of camouflaging (Hull et al., 2019). The measure does not focus on observed behaviour, but on individuals' internal experiences, thus being able to account for unsuccessful masking. Scores range from 25-175, with higher scores indicating greater camouflaging. This scale also includes 3 dimensions: "masking" (i.e., attempts to hide autistic responses and characteristics, such as stimming, in order to put on a more neurotypical mask); "compensation" (i.e., use of learned neurotypical body language such as maintaining eye contact); "assimilation" (i.e., hiding anxiety and discomfort to blend in or avoid social situations where discomfort might be experienced). A recent study has confirmed construct validity for this scale (McKinnon et al., 2024) and it has also been used previously with non-binary people (e.g., Perry et al., 2022; White et al., 2024). Reliability for this study was excellent (Cronbach's alpha = .92).

Anxiety and Depression: Anxiety and depression were measured using the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). This scale was chosen as it has been used with transgender and gender non-conforming individuals, showing good reliability (e.g., Thorne et al., 2019). It has also been used with autistic adults with good reliability for the anxiety subscale and acceptable reliability for the depression subscale (Uljarević et al., 2018). Clinical cut-offs for HADS-A is 8 (Olsson et al., 2005), while for HADS-D a cut-off of 7 or 8 is generally preferred (Olsson et al., 2005; Wu et al., 2021). For the current study, reliability was good (Cronbach's alpha = .87) for HADS-A and acceptable (Cronbach's alpha = .74) for HADS-D.

Lifetime suicidal ideation: Lifetime suicidal ideation was assessed with the question “Have you ever thought about ending your life?” (similar to Treharne et al., 2020) with answers “yes”, “no”, and “prefer not to say”. This last option was added based on feedback from our experts-by-experience. People who selected “prefer not to say” were excluded from analyses with this variable.

Sexual wellbeing: We used the Short Sexual Wellbeing Scale (SSWBS; Gerymski, 2021) to assess sexual wellbeing. This scale is composed of five items and response options are on a 7-point Likert scale. It has previously been validated with trans binary people (Gerymski, 2021) but not non-binary individuals. The scale is based on a broad definition of sexual wellbeing, conceptualised as satisfaction with the frequency of one’s sexual engagement, sexual distress, physical pleasure, emotional fulfilment, and being able to realise and express sexual preferences within one’s social environment. Reliability for our study was acceptable (Cronbach’s alpha = .78).

4.3.3 Data Analysis

Before focusing on our main analysis, we performed a sensitivity analysis only including non-binary autistic people who reported a formal diagnosis. This was done in an effort to ensure our results with the larger self-identified and reporting a formal diagnosis group was appropriate.

To explore differences in the mental health of autistic as compared with non-autistic non-binary individuals (Research Question 1), two separate t-tests with autism status (yes/no) as the independent variable and anxiety and depression scores as the response variables were conducted. A chi-square was used to test differences between autistic and non-autistic people regarding their lifetime suicide ideation.

To evaluate mean differences in camouflaging between autistic and non-autistic non-binary individuals (Research Question 2), multiple t-tests were conducted with autism status as the independent variable and CAT-Q total score and subscale scores (masking, compensation, assimilation) as the dependent variables. For the assimilation subscale score, Kruskal-Wallis H was used due to heteroscedasticity in the data. Among autistic participants, two separate multiple regressions were conducted to test the relationship between camouflaging and mental health outcomes (anxiety and depression), while controlling for demographic factors (age, sex in the last year, education, physical disability/ chronic condition, having experienced sexual fluidity, income level, relationship status, trans identity (i.e., whether the non-binary person identified as trans), intention to transition, and having transitioned in at least some capacity).

To explore if there were differences in sexual wellbeing between autistic and non-autistic people, a t-test was conducted (Research Question 3). Among autistic participants, multiple regression analysis was then conducted to further understand the relationships between anxiety, depression, and camouflaging with sexual wellbeing, while controlling for demographic variables (same as previous analysis). A sensitivity analysis was run with a subsample of autistic non-binary people in relationships to evaluate the impact of relationship satisfaction on sexual wellbeing (as only those in relationships completed the relationship satisfaction measure). For all multivariable models, independent variables were included if $p < 0.20$ in univariable analyses (similar to Barnett et al., 2013; Nabarrett et al., 2021).

4.4 Results

Among 461 non-binary participants, 265 (57.5%) were autistic: 101 (21.9%) reported a formal diagnosis and 164 (35.6%) self-identified as autistic without a formal diagnosis; 73 participants (16.3%) reported that they were waiting to be assessed for autism.

The majority (82.5%) of our sample was between the ages of 18 and 34. The sample was mostly white (90.7%), highly educated (78.5% with at least some university), and located in the United Kingdom (38%), North America (17.4% United States; 3.5% Canada) or Europe (11.9% Italy, 8.7% Germany). Most (79%) had an annual income of £34,999 or less and 60.1% were in a relationship (45.8% monogamous, 14.3% non-monogamous). Most participants reported a minority sexual identity label including queer (30.2%), pansexual (18.4%), bisexual (15.8%), or asexual (15.4%), and many (56%) reported having experienced shifts in their sexual orientation (sexual fluidity). Lastly, almost half of our sample (48.2%) reported living with a chronic health condition (33.8%), a physical disability (3.7%), or both (10.6%). Demographic information divided by neurotype is reported in Table 11.

4.4.1 Neurotype of Non-binary People

Among the whole sample, 337/461 (73.1%) reported neurodivergence outside of autism. Most autistic participants (203/265, 76.6%) reported other neurodivergent identifications, including 132 who were diagnosed with or self-identified as having or suspecting ADHD. Participants often reported multiple neurodivergent labels in addition to their autistic identity (e.g., “ADHD, Autism and schizoaffective disorder”; “ADHD, Epilepsy, Dyspraxia”).

Among non-autistic participants, 134/196 (68.4%) reported neurodivergence. Of those who disclosed their neurodivergent labels (106 participants), most (75 people) reported ADHD (either self-identified, formally diagnosed, or suspected). Some participants gave more than one label (e.g., “ADHD, dyspraxia, dyslexic”). Other examples of labels include PTSD, Tourette syndrome, “unsure”, “neuro-atypical”, and “I self-identify as neurodivergent”. Two participants mentioned potentially having “autistic traits” but not being sure/not to the level of self or formal diagnosis.

4.4.2 Camouflaging in Non-binary Autistic and Non-autistic Participants

Autistic non-binary participants scored significantly higher on total camouflaging as compared with non-autistic non-binary people (Autistic: $M=125.6$, $SD=22.0$ vs. Non-Autistic: $M=104.4$, $SD=24.1$; $t(456) = 9.77$, $p<.001$). Similar results were observed with the camouflaging subscales. Autistic participants scored significantly higher on masking (Autistic: $M=40.6$, $SD=8.10$ vs. Non-Autistic: $M=36.6$, $SD=8.62$; $t(458) = 5.07$, $p<.001$), compensation (Autistic: $M=44.16$, $SD=10.70$ vs. Non-Autistic: $M=32.72$, $SD=11.03$; $t(458) = 11.18$, $p<.001$) and assimilation masking (Autistic: $M=40.78$, $SD=8.16$ vs. Non-Autistic: $M=34.94$, $SD=9.59$; $H(1) = 41.29$, $p<.001$).

4.4.3 Anxiety and Depression in Non-binary Autistic and Non-autistic People

No significant differences were found between autistic and non-autistic non-binary participants for anxiety ($t(458)=1.916$, $p=.056$) or depression ($t(457)=.992$, $p=.322$). In general, both autistic and non-autistic non-binary people reported scores above the clinically relevant cut-offs with higher levels of anxiety (Autistic: $M=11.44$, $SD=4.82$; Non-autistic: $M=10.59$; $SD=4.44$) and relatively lower levels of depression (Autistic: $M=7.90$, $SD=3.94$; Non-autistic: $M=7.53$, $SD=4.02$). More non-binary autistic

people reported having thought about ending their life (83.4% vs. 77.0%) but this difference was not statistically significant ($X^2(1, N = 438) = .547, p > .499$).

4.4.4 Mental and Sexual Health of Non-binary Autistic Individuals

4.4.4.1 Sensitivity Analysis With Participants Reporting Formal Diagnosis

Sensitivity analyses constraint to participants with a formal autism diagnosis (n=101) found similar results with very few differences (see Supplementary tables 3 – 5 in Appendix D). We therefore decided to combine participants reporting a formal diagnosis and self-identified participants into one group. As discussed, including both groups is important to our study for theoretical reasons. Additionally, it allows us to increase the power of our analyses, which makes for more reliable results.

4.4.4.2 Camouflaging and Mental Health Outcomes

Among 258 non-binary autistic people, higher camouflaging ($B = .045$; 95%CI = .201, 5.645) and living with a chronic health condition and/or physical disability ($B = 1.302$; 95%CI = .355, 2.250) were associated with higher depression, while having completed at least some university, as compared to only high school ($B = -1.628$; 95%CI = -2.737, -.519), and having an annual income greater than £20,000 ($B = -1.277$; 95%CI = -2.222, -.333) were associated with lower levels of depression in univariable analysis. The subsequent multivariable regression model was significant ($F(5, 254) = 6.347$; $p < .001$) and explained 8.8% of the variance. Education ($B = -1.367$; 95%CI = -2.452, -.282), living with a chronic health condition and/or physical disability ($B = 1.169$; 95%CI = .254, 2.083), income ($B = -1.117$; 95%CI = -2.038, -.195), and camouflaging ($B = .035$; 95%CI = .014, .055) maintained their significant associations with depression (Table 12).

Likewise, among 259 non-binary autistic participants, higher camouflaging ($B=.89$; $95\%CI=.065,.114$) was associated with higher levels of anxiety, while having completed at least some university ($B=-2.103$; $95\%CI=-3.459,-.746$) and having an annual income greater than £20,000 ($B=-1.188$; $95\%CI=-2.353,-.023$) were associated with lower anxiety in univariable analysis. The final multivariable model was significant ($F(5, 254)=12.710$; $p<.001$), explaining 18.4% of the overall variance. In this model, education level ($B=-1.957$; $95\%CI=-3.220,-.694$) and camouflaging ($B=.087$; $95\%CI=.063;.111$) were the only significant factors associated with anxiety (Table 12).

4.4.4.3 Sexual Wellbeing, Camouflaging and Mental Health

At the univariable level, among 256 non-binary autistic people, higher levels of anxiety ($B=-.243$; $95\%CI=-.407,-.078$) and depression ($B=-.553$; $95\%CI=-.746,-.360$) were associated with lower levels of sexual wellbeing. Being in a polyamorous ($B=3.278$; $95\%CI=.918,5.637$) or monogamous ($B=3.798$; $95\%CI=2.108,5.488$) relationship vs. being single, and having had sex in the past year ($B=2.710$; $95\%CI=1.041,4.380$) were associated with higher sexual wellbeing. Camouflaging was not associated with sexual wellbeing and so was not included in the multivariable regression model.

The multivariable model was significant ($F(6, 250)=9.697$; $p<.001$) and explained 16.9% of the overall variance. Being in a monogamous relationship vs. being single ($B=3.410$; $95\%CI=1.441,5.379$) was associated with higher sexual wellbeing, while higher depression scores ($B=-.570$; $95\%CI=-.803,-.336$) were associated with lower sexual wellbeing (Table 13).

4.4.4.4 Sensitivity Analysis (Participants in a Relationship)

Among 156 autistic non-binary people in relationships, higher relationship satisfaction ($B=.683$; $95\%CI=.497,.869$) was associated with higher sexual wellbeing

while higher depression ($B=-.661$; 95%CI $=-.908,-.413$) and anxiety scores ($B=-.253$; 95%CI $=-.462,-.044$) were associated with lower sexual wellbeing in univariable analyses. The final multivariable regression model was significant ($F(7, 149)=10.908$; $p<.001$) and explained 30.8% of the variance. Depression ($B=-.479$; 95%CI $=-.763,-.179$) and relationship satisfaction ($B=.532$; 95%CI $=.341,.730$) remained the only factors significantly associated with sexual wellbeing (Table 14).

4.5 Discussion

This is the first quantitative study focusing on mental health, sexual wellbeing and camouflaging with an exclusively non-binary (autistic and non-autistic) sample. Overall, we found that camouflaging was linked to mental health outcomes; however, no relationship with sexual wellbeing emerged in our autistic group. Our results also highlight how non-binary autistic people present higher levels of reported camouflaging compared to non-autistic non-binary individuals. The sensitivity analysis indicates the importance of relationship quality for the sexual wellbeing of non-binary autistic people who are in monogamous or polyamorous partnerships. Interestingly, we found that a large majority of our participants (73.10%) had other neurodivergent identities outside of autism, consistent with previous literature that has highlighted overlap between trans/non-binary and other neurodivergent identities, such as ADHD (Warrier et al., 2020).

Considering differences in camouflaging, our results align with existing findings that autistic people present higher levels of masking compared to non-autistic people, but are in contrast to a previous study that found no difference in level of camouflaging between autistic non-binary people and non-autistic non-binary people (Hull et al., 2020). This discrepancy could be linked to an underpowered sample (only 43 non-binary

people) in the previous study, as highlighted by the authors themselves (Hull et al., 2020), or could relate to a difference in sampling (i.e., our decision to include self-identifying participants). Overall, the mean camouflaging score of autistic non-binary people in our sample was comparable to that found by White et al. (2024) with their gender-diverse participants, including 302 non-binary/genderqueer individuals (M=130.56, SD=21.54) and Hull et al. (2020; M=122.00; SD=17.12). Interestingly, we found that non-binary non-autistic participants presented a higher overall mean for total camouflaging (M=104.4, SD=24.1) when compared to non-autistic cisgender participants in previous studies (e.g. M=87.0; Hull et al., 2020). This could be because non-binary people may be more likely to avoid showing some aspects of their personality, or to closely monitor their social responses avoid discrimination or negative consequences within a society that prioritises cisnormativity. Additionally, although a recent study including 60 gender minority individuals (binary trans and non-binary people together) found that there might be a link between identifying as a sexual minority and experiences of camouflaging while controlling for gender identity (McQuaid et al., 2025), we were not able to assess this due to the very low percentage of non-binary people identifying as heterosexual in our sample. Overall, literature has highlighted that non-binary people are more likely to identify as a sexual minority and as not heterosexual (Mastrantonio et al., 2025b).

Within our non-binary sample, autistic and non-autistic people had similar levels of anxiety, depression and suicidal ideation. This appears to partially contradict existing research which found mental health differences in autistic vs. non-autistic populations (e.g. Lai et al., 2019). This could be due to several factors, such as the presence of other neurodivergent identities within our non-autistic sample as well as poorer mental health among non-binary individuals in general (Klinger et al., 2024). Literature has highlighted

how non-autistic neurodivergent individuals are more likely to experience anxiety and mood disorders, such as depression (e.g. Choi et al., 2022; Fayyad et al., 2017; Piedad et al., 2016). Another reason for the similarity between autistic and non-autistic non-binary participants in our sample could be that the overlap of autism and non-binary identity does not significantly increase negative mental health outcomes for non-binary individuals. In our sample, both autistic and non-autistic non-binary people scored above the clinical cut-off for anxiety and depression (Olsson et al., 2005; Wu et al., 2021), suggesting significant levels of depression and anxiety regardless of reported autistic status.

Among the autistic non-binary participants in our sample, we found a significant relationship between higher levels of camouflaging and higher depression and anxiety scores, similar to previous research (e.g. Cook et al., 2021). This is consistent with additional recent findings highlighting camouflaging as one of the factors associated with poorer mental health outcomes within a large trans and non-binary sample (White et al., 2024).

Concerning sexual wellbeing, we found that depression was also significantly associated with lower sexual wellbeing in our sample. This aligns with past research which demonstrates an association between depressive symptoms and lower sexual health and satisfaction (e.g. Field et al., 2016). However, we did not find an association between anxiety and sexual wellbeing. While some studies have reported negative associations between anxiety and sexual outcomes (e.g., Xiao et al., 2023), research is inconclusive. For instance, a recent systematic review indicates that anxiety might not necessarily inhibit sexual arousal or cause dysfunction (Kane et al., 2019), which may partially explain our results. Moreover, camouflaging was not related to sexual wellbeing among our participants. Autistic individuals often partner with other autistic

individuals (e.g., Nordsletten et al., 2016) and the need to mask might be more pronounced when having to interact with neurotypical people, while interactions with fellow autistic partners might look different and require less camouflaging (as supported by the double empathy theory; Milton, 2012). The sensitivity analysis in our study highlights the importance of relationship quality for sexual wellbeing among autistic non-binary people in romantic relationships. Unfortunately, we did not ask about the neurotype of sexual partners and are therefore unable to draw any specific conclusions from our data, so this remains an important consideration for future research. Additionally, as external acceptance and the ability to express sexuality within one's social sphere are contributing factors to sexual wellbeing (Gerymski, 2021), future research should also consider how community support may contribute to better understand this result. This links with recent findings highlighting how accepting social environments can enable autistic people to feel less of a need to mask and more ability to present authentically (Cook et al., 2024). Alternatively, autistic people in our sample might perceive sexual wellbeing as not connected to partnered sexual encounters, which could also explain the lack of association between sexual wellbeing and masking. Finally, as the tool we used to measure camouflaging focuses on unspecified/general day-to-day interactions, rather than specifically on communication or interactions with intimate partners, our null finding may be due to measurement error and more valid questions, specific to sexual and romantic partners, may find different results. Overall, further studies are needed to better contextualise these findings.

4.6 Limitations & Future Directions

This study should be considered within its limitations and exploratory nature. Firstly, as these data are cross-sectional, we are unable to comment on variable

associations as time progresses or the causal pathways of any reported results.

Secondly, our convenience sample was mostly white, European or North American, and highly educated, limiting our ability to generalise to individuals with different backgrounds as well as the wider non-binary autistic population. Third, although we consulted with experts-by-experience and tried to minimise any potential discomfort, our research encompasses personal and sensitive topics so it is possible that some individuals may have chosen not to participate, even though they would have otherwise been eligible.

Although the decision to not differentiate between self-identifying and formally diagnosed autistic people was made in an effort to depathologise neurodivergent identities and was supported by our experts-by-experience consultation, we do recognise that formally diagnosed and self-identified individuals might have different life experiences (such as differences in ability to access diagnostic services or to receive support), which could have influenced our results. For similar reasons, we decided not to measure autistic traits, which may also have limited our understanding of differences in camouflaging experiences (e.g. Hull et al., 2019). Nonetheless, we believe that these decisions made our study more suitable for our population of interest, and helped us to reach a large and diverse sample of non-binary people who self-identify or report a formal diagnosis of autism. Conducting the sensitivity analysis also helped to inform and validate our decision. Lastly, we decided not to measure sex-assigned-at-birth, following experts-by-experience feedback. Regardless, it is important to acknowledge that assigned-female-at birth-individuals have been found to mask more than those that were assigned-male-at-birth (e.g., Wood-Downie et al., 2021), and this might apply to non-binary people. However, not enough research exist to affirm this

definitively, and more studies could take sex-assigned-at-birth into account while investigating non-binary experiences of masking.

Overall, this explorative study still contributes to the understanding of sexual and mental health and wellbeing among non-binary autistic people, who are an understudied population. Our large sample (as far as we know, the largest non-binary sample to have been involved within autism research) allowed us to explore this topic with more nuance, something previous studies with very limited numbers of non-binary participants have been unable to do. Further research should continue to investigate the experiences of non-binary autistic individuals, including those from minoritised ethnic backgrounds and with less access to education. Future studies need to focus on exploring links between autistic masking and wellbeing, including sexual aspects, with the goals of understanding needs, depathologising lived experiences and offering appropriate support.

4.7 Conclusions

This study focused on the mental health, sexual wellbeing and camouflaging experiences of autistic non-binary people – a population often overlooked in research. Overall, a large percentage of our non-binary sample identified as autistic or otherwise neurodivergent, which points to the need of more inclusivity within autism research. We also found a connection between camouflaging and mental health, as well as a relationship between depression and sexual wellbeing in this population. However, the lack of relationship between camouflaging and sexual wellbeing highlights the necessity for additional research. Our findings emphasise the need to further investigate the role of camouflaging in shaping lived experiences, including sexual and health outcomes in gender-diverse autistic individuals.

4.8 Tables for study 3

Table 11 Sample Descriptives by Neurotype

		Autistic		Non-autistic		Total Sample	
		N	%	N	%	N	%
Age	18-24 years old	119	44.9%	56	28.6%	175	38.0%
	25-34 years old	110	41.5%	95	48.5%	205	44.5%
	35-44 years old	28	10.6%	31	15.8%	59	12.8%
	45-54 years old	8	3.0%	8	4.1%	16	3.5%
	55-64 years old	0	0%	6	3.1%	6	1.3%
	65+ years old	0	0.0%	0	0.0%	0	0%
Ethnicity	Asian	3	2.3%	3	1.5%	9	2.0%
	White	242	91.3%	176	89.8%	418	90.7%
	Black or Caribbean	4	1.5%	1	0.5%	5	1.1%
	Mixed or multiple ethnic background	13	4.9%	13	6.6%	26	5.6%
	Other ethnic group	0	0%	3	1.5%	3	0.7%
Education	Did not complete high school	10	3.8%	5	2.6%	15	3.3%
	High School diploma	32	12.1%	22	11.2%	54	11.7%
	Vocational qualification	20	7.5%	10	5.1%	30	6.5%
	Some University	62	23.4%	30	15.3%	92	20%
	Undergraduate	82	30.9%	61	31.1%	143	31%
	Master's Degree or PhD	59	22.2%	68	34.7%	127	27.6%
Income	Less than £20,000	150	57.3%	103	52.6%	253	55.2%
	£20,000 to £49,999	91	34.8%	73	37.3%	164	35.8%
	£50,000 +	21	8%	20	10.2%	41	8.9%
Relationship status	In a relationship with one partner	121	45.7%	90	45.9%	211	45.8%
	In a relationship with more than one partner	40	15.1%	26	13.3%	66	14.3%
	Single	104	39.2%	80	40.8%	184	39.9%
Primary sexual orientation label	Heterosexual/straight	4	1.5%	7	3.6%	11	2.4%
	Gay	13	4.9%	4	2%	17	3.7%
	Lesbian	18	6.8%	11	5.6%	29	6.3%

	Bisexual	37	14%	36	18.4%	73	15.8%
	Pansexual	40	15.1%	45	23.0%	85	18.4%
	Queer	84	31.7%	55	28.1%	139	30.2%
	Asexual	48	18.1%	23	11.7%	71	15.4%
	Other	21	7.9%	15	7.7%	36	7.8%
Sexual fluidity	Yes	154	58.3%	104	53.1%	258	56.1%
	No	110	41.7%	92	46.9%	202	43.9%
Health Conditions	Chronic health condition	90	34.0%	66	33.7%	156	33.8%
	Physical disability	14	5.3%	3	1.5%	17	3.7%
	Both	44	16.6%	5	2.6%	49	10.6%
	None	117	44.2%	122	62.2%	239	51.8%
Formal diagnosis of autism	Yes	101	38.1%	0	0%	101	21.9%
	No	102	38.5%	183	93.4%	285	61.8%
	Awaiting formal diagnosis	62	23.4%	13	6.6%	75	16.3%
Autism self-identification (among participants with no formal diagnosis)	Yes	164	100%	0	0%	164	45.6%
	No	0	0%	196	100%	196	54.4%
Suicide ideation (lifetime)	Yes	221	83.4%	151	77.0	372	80.6%
	No	36	13.6	30	15.3	66	14.3%
	Prefer not to say	8	3.0	15	7.7	24	5.2%
Other neurodivergent identities (do you identify as being neurodivergent in any other way?)	Yes	203	76.6%	134	68.4%	337	73.1%
	No	62	23.4%	62	31.6%	124	26.9%

Table 12 Depression and Anxiety Univariate and Multivariate Analyses: Regressions of Associations Between Demographics, Camouflaging and Depression in the Non-binary Autistic Subsample.

Variable	B	p	95% CI	Depression			Anxiety					
				Univariable		Multivariable	Univariable		Multivariable			
				B	p	95% CI	B	p	95% CI	B	p	95% CI
Age ≤34	.750	.289	[-.639; 2.139]				1.182	.172	[-.518; 2.881]	.639	.424	[-.934; 2.212]

	35+	Ref.						Ref.				
Sex in the past year	No	Ref.						Ref.				
	Yes	-.456	.371	[-1.456; .545]				-.129	.837	[-1.356; 1.099]		
Physical disability/chronic condition	No	Ref.						Ref.				
	Yes	1.302	.007*	[.355; 2.250]	1.169	.012*	[.254; 2.083]	.753	.207	[-.420; 1.926]	.532	.330 [-.542; 1.606]
Education	High school or below	Ref.						Ref.				
	At least some university	-1.628	.004*	[-2.737; -.519]	-1.367	.014*	[-2.452; -.282]	-2.103	.003*	[-3.459; -.746]	-1.957	.003* [-3.220; -.694]
Sexual fluidity	No	Ref.						Ref.				
	Yes	.351	.477	[-.619; 1.320]				.536	.374	[-.649; 1.722]		
Income	20000 or below	Ref.						Ref.				
	20000 or above	-1.277	.008*	[-2.222; -.333]	-1.117	.018*	[-2.038; -.195]	-1.188	.046*	[-2.353; -.023]	-.835	.127 [-1.908; .239]
Relationship status	Single	Ref.						Ref.				
	Polyamorous relationship	-.610	.407	[-2.055; .836]				.371	.680	[-1.401; 2.144]		
	Monogamous relationship	-.316	.549	[-1.355; .722]				-.048	.940	[-1.322; 1.225]		
Camouflaging		.045	<.001**	[.201; .645]	.035	<.001**	[.014; .055]	.089	<.001**	[.065; .114]	.087	<.001** [0.063; .111]
Trans identity	No	Ref.						Ref.				
	Yes	.260	.723	[-1.179; 1.699]				-.873	.373	[-2.802; 1.055]		
Intentions to transition	Further intentions to transition	Ref.						Ref.				
	No further intentions to transition	.154	.786	[-.966; 1.275]				-.137	.844	[-1.510; 1.236]		
At least some transition	No	Ref.						Ref.				
	Yes	-1.103	.168	[-2.674; .468]	-.721	.359	[-2.266; .823]	-.873	.373	[-2.802; 1.055]		

Table 13 Sexual Wellbeing Univariable and Multivariable Analyses: Regressions of Associations Between Demographics, Camouflaging, Anxiety, Depression and Sexual Wellbeing in the Non-binary autistic Subsample

Variable	Univariable			Multivariable			
	B	p	95% CI	B	p	95% CI	
Age	≤34	1.167	.325	[-1.161; 3.494]			
	35+	Ref.					
Sex in the past year	No	Ref.					
	Yes	2.710	.002*	[1.041; 4.380]	.679	.499	[-1.297; 2.655]
Physical disability/chronic condition	No	Ref.					
	Yes	-.600	.467	[-2.222; 1.021]			
Education	Highschool or below	Ref.					
	At least some university	.028	.977	[-1.883; 1.940]			
Sexual fluidity	No	Ref.					
	Yes	-.063	.939	[-1.693; 1.566]			
Income	20000 or below	Ref.					
	20000 or above	1.430	.086	[-.203; 3.063]	-.136	.864	[-1.697; 1.425]
Relationship status	Single	Ref.					
	Polyamorous relationship	3.278	.007*	[.918; 5.637]	2.535	.054	[-.040; 5.109]
	Monogamous relationship	3.798	<.001**	[2.108; 5.488]	3.410	<.001**	[1.441; 5.379]
Camouflaging		-.003	.881	[-.039; .034]			
Anxiety		-.243	.004*	[-.407; -.078]	.019	.847	[-.171; .208]
Depression		-.553	<.001**	[-.746; -.360]	-.570	<.001**	[-.803; -.336]
Trans identity	No	Ref.					
	Yes	-1.272	.305	[-3.708; 1.164]			
Intentions to transition	Further intentions to transition	Ref.					
	No further intentions to transition	.890	.354	[-.997; 2.777]			
At least some transition	No	Ref.					
	Yes	1.514	.259	[-1.119; 4.148]			

Note. CI = Confidence intervals

* = p-value <.05

** = p-value <.001

Table 14 Sensitivity Analysis: Regressions of Associations Between Demographics, Camouflaging, Anxiety, Depression, Relationship Satisfaction and Sexual Wellbeing Among Non-binary autistic People in a Relationship

Variable		Univariable			Multivariable		
		B	p	95% CI	B	p	95% CI
Age	≤34	2.315	.099	[-.439; 5.068]	2.217	.067	[-.161; 4.596]
	35+	Ref.					
Sex in the past year	No	Ref.					
	Yes	2.553	.130	[-.761; 5.868]	.558	.662	[-2.261 ; 3.546]
Physical disability/chronic condition	No	Ref.					
	Yes	-2.000	.071	[-4.175; .175]	-.805	.422	[-2.734; 1.151]
Education	Highschool or below	Ref.					
	At least some university	.375	.772	[-2.177; 2.928]			
Sexual fluidity	No	Ref.					
	Yes	.253	.815	[-1.870; 2.376]			
Income	20000 or below	Ref.					
	20000 or above	.461	.668	[-1.660; 2.581]			
Relationship status	Polyamorous relationship	Ref.					
	Monogamous relationship	.520	.677	[-1.938; 2.977]			
Camouflaging		-.014	.552	[-.062; .033]			
Anxiety		-.253	.018*	[-.462; -.044]	.039	.791	[-.190; .248]
Depression		-.661	<.001**	[-.908; -.413]	-.479	.002*	[-.763; -.179]
Relationship satisfaction		.683	<.001**	[.497; .869]	.532	<.001**	[.341; .730]
Trans identity	No	Ref.					
	Yes	-1.147	.467	[-4.252; 1.959]			
Intentions to transition	Further intentions to transition	Ref.					
	No further intentions to transition	1.518	.211	[-.870; 3.905]			
At least some transition	No	Ref.					
	Yes	2.633	.177	[-1.205; 6.472]	2.244	.234	[-1.321; 5.359]

Note. CI = Confidence intervals

* = p-value <.05

** = p-value <.001

Chapter 5 - General Discussion

5.1 Summary of Findings

The overall aim of this thesis was to better understand non-binary people's sexual wellbeing and mental health and included a novel focus on non-binary autistic individuals. This aim was achieved across three interrelated studies; a systematic review summarised quantitative sexual research with non-binary participants and highlighted current understandings of non-binary people sexuality, as well a lack of focus on nonbinary populations specifically within datasets. In Studies 2 and 3, overlapping identities such as autism, physical disability and/or chronic health conditions, and sexual orientation were shown to shape individuals' sexual and mental health outcomes in complex ways.

5.2 Contributions and Novelty

The key contributions of this thesis are summarised below and divided into four main categories. First, I will argue that my findings have contributed to deepening the quantitative understanding of non-binary people's sexuality. Second, I will discuss the thesis' contribution in relation to non-binary (and autistic) mental health. Third, I will highlight the importance of making space for complexity in quantitative research including enabling participants to self-select gender-diverse and neurodivergent labels and identities in survey-based studies. Lastly, I will discuss how this work reflects the imperative of accounting for multiple minoritised identities within quantitative research with non-binary people to better understand experience and outcomes.

5.2.1 Non-binary People's Sexual Outcomes

Overall, non-binary people's committed romantic relationships were associated with higher levels of sexual wellbeing (Study 2 and 3) and satisfaction (Study 2), constituting a positive and potentially protective factor for participants. This was consistent in both polyamorous (Study 2) and monogamous (Study 2 and 3) relationships, pointing to the role of other relationship aspects. For instance, affirming communication and supportive language have been shown to be important for non-binary people (Galupo et al., 2020). Additionally, relationship satisfaction was associated with higher levels of sexual wellbeing in autistic non-binary people who were in committed relationships (Study 3). Moreover, sexual satisfaction appeared to be the most important factor in relation to both sexual wellbeing and relationship satisfaction, for non-binary people who were both in a relationship and sexually active (Study 2). This might suggest that intimacy and sexual fulfilment is a critical factor for non-binary people's sexual wellbeing, and would be in line with previous literature describing sexual satisfaction as a core component of sexual wellbeing (Sundgren et al., 2024) as well as strongly linked to relationship quality (McNulty et al., 2016; Quinn-Nilas et al., 2020).

Beyond relationships, sexual fluidity also emerged as an important variable within this research. While a lack of research on this construct emerged within Study 1, Study 2 indicated that having experienced sexual fluidity in one's lifetime was associated with poorer sexual and relationship outcomes. In the past, literature has linked sexual fluidity (especially from heterosexual to non-heterosexual orientations) to poorer health outcomes (Everett, 2015; Katz-Wise et al., 2017). A change in sexual orientation might be difficult for an individual to navigate or might be associated with a loss of community

and support, or even increased societal stigma, which might impact relationships, sexual outcomes or wellbeing (Everett, 2015).

In Study 3 however, sexual fluidity was not associated with sexual wellbeing or mental health outcomes within the autistic non-binary subsample. Autistic people within our sample might have been particularly open and resilient to experiencing sexual orientation changes. Indeed, there is evidence to suggest that autistic individuals might be less susceptible to social conditioning compared to non-autistic people (Walsh et al., 2018). The Bayesian decision theory (connected to the idea that autistic cognition is based on bottom-up processing, meaning that situational details may hold more weight than overarching constructs or ideas; Jackson-Perry 2020; Soulières et al. 2007) suggests that for autistic people, past experience may hold less weight and be less generalisable to future situations compared to non-autistic people. This idea has been applied to gender exploration, describing how autistic people might not be held back by binaristic ideas of sex/gender when exploring their identity (Walsh et al., 2018; Wattel et al., 2024). Applying this theory to sexual fluidity, we could theorise that bottom-up cognition might facilitate the acceptance of new sexual feelings or spontaneous identity shifts for autistic individuals, resulting in fewer negative sexual and mental health outcomes.

Lastly, wanted medical and/or social transition was generally linked to non-binary people's sexual wellbeing (Study 2 and 3). . Indeed, barriers for social acceptance and health care access are still present for non-binary people (Lefevor et al., 2019). This is consistent with the wider literature among gender-diverse individuals (Allen et al., 2019; Lindley et al., 2020a), and points to a need for inclusive social and health environments.

5.2.2 Non-binary (and Autistic) People's Mental Health

This thesis is consistent with past research that indicates, regardless of gender identity, camouflaging should be considered when investigating autistic people's outcomes and experiences (e.g., Cook et al., 2021; White et al., 2024). The null finding in relation to camouflaging and sexual wellbeing is novel. As autistic people might have a preference to form friendships and relationships with other autistic people (Chen et al., 2021; Nordsletten et al., 2016), this could point to the role of the double empathy problem (Milton, 2012). More specifically, finding community and intimate relationships with other autistic people, might mean less of a need for masking behaviours, which might contribute to enhanced sexual wellbeing (Study 2). This could also explain the lack of link between sexual wellbeing and camouflaging (Study 3).

Interestingly, the lack of significant differences between autistic and non-autistic people for the considered mental health variables is in contrast to previous findings showing poorer mental health outcomes for autistic vs. non-autistic cisgender individuals (Lai et al., 2019). Additionally, both our autistic and non-autistic non-binary participants presented above-clinical-cut-offs scores for both depression and anxiety (Olsson et al., 2005; Wu et al., 2021) and reported a high proportion of lifetime suicidal ideation. This suggests that non-binary people overall are at heightened risk for poorer mental health, regardless of their autistic identification.

5.2.3 Making Space: Self-identification & Labels Matter

This thesis advances quantitative research with non-binary and non-binary autistic people by centring self-identification and expansive labels. Recent literature has highlighted the importance of conducting sensitive research with gender minority individuals, and the risks of identity invalidation and microaggressions (i.e., pervasive

but subtle acts of discrimination; Staples et al., 2018) experienced by gender minority individuals participating in quantitative studies (Staples et al., 2018). Indeed, historically researchers have relied on limited and oftentimes inappropriate language and items that have not been able to capture gender minority people's experiences (Staples et al., 2018). As such, trans and non-binary people have expressed fear of their research findings being misinterpreted, which can further deter them from participation (American Psychological Association, 2015; Staples et al., 2018). For non-binary people (and autistic non-binary people), microaggressions and lack of trust in research could also be linked to experiences of erasure and the use of binary-focused language and tools (as highlighted within Study 1).

Throughout this thesis, I used quantitative tools and methodologies that reflect the experiences of non-binary people and autistic non-binary people. I did so through engaging with the existing literature, including elements of community consultation, and utilising my lived experience. Some of the methodological consequences of this approach included: 1. focusing on providing expansive options for sexual orientation and gender identity (avoiding a focus on sex-assigned-at-birth, but including questions on trans and non-binary identity); 2. relying on self-identification to challenge medicalised views of autism and gender-diversity (for autism, that meant deciding against measuring autistic traits to avoid perpetrating a deficit-based view of neurodivergent identities); and 3. making sure that the language used was clear (i.e., avoiding conflation between gender identity and sex-assigned-at-birth), gender neutral, and true to non-binary people's experiences (e.g., not imposing binaries when measuring sexual attraction or behaviour).

While Study 1 identified limitations in the existing research and criticised a lack of attention to non-binary people's lived experience within some studies, Study 2 and 3

showed the importance of allowing for expansive categorisations and self-identification. When given the options, participants shared a range of labels in relation to their relationships, attractions, gender, sexual and romantic identities, as well as their neurodivergent identification(s).

5.2.4 Allowing for Complexity: Overlapping Marginalised Identities

This thesis highlights the multifaceted experiences of non-binary individuals with multiple minoritised identities, contributing to a more complex understanding of sexual and health outcomes. Overall, studies on gender minority individuals lack focus when it comes to the experiences of individuals with multiple marginalised identities (Tan et al., 2020). While we are unable to make inferences based on our sample's demographics (due to recruitment strategies), findings from Study 2 and 3 highlight that many non-binary people are characterised by multiple minoritised identities, and moreover that some of these identities are relevant for health outcomes. As such, overlapping minoritised statuses should not be minimised or overlooked by quantitative researchers. Indeed, asking a non-binary person to fit a “non-binary-identity-only” mould might not be much different than pressuring them to adapt to any other arbitrary binary, which (as established) might not work very well.

5.3 Implications

This project carries implications for research, healthcare practice, and policy making. First, further focus on neurodivergent and non-binary identities within sexual research is needed. While quantitative data is important for policy making and to inform professional and stakeholder decisions within health care settings, we are currently under-researching non-binary people (systematic review, Study 1). At the same time, while literature looking at the sexuality of autistic gender minority individuals is still

sparse, research has highlighted that sexuality and intimacy are desired and important topics for most autistic individuals and deserve attention (Sala et al., 2020). This thesis highlights the need for a wellbeing-focused approach to gender-diverse and neurodivergent health, to depathologise autistic and non-binary identities, sexualities and experiences.

Second, researchers should reflect on the appropriateness and inclusivity of their approach when collecting information about sexuality and gender with non-binary people, making sure that labels and options offered are expansive, and that information that is likely to discourage engagement (i.e., sex-assigned-at-birth) is not collected unless strictly necessary (Study 1). Specifically, a two-step approach including a question on sex-assigned-at-birth has been often used to assess gender identity with trans and non-binary individuals and has been seen as best practice for a time (Puckett et al., 2020). However, these kinds of questions might not be as helpful as initially believed, as they are not a good proxy to collect information about individual characteristics (i.e., anatomy, physiology, gender identity; Alpert et al., 2021).

Moreover, researchers need to make space for complexity, considering subgroups within non-binary populations, and focusing on specific demographics or overlapping identities. This is important to avoid being too broad when generalising quantitative findings, as well as to ensure that we are providing enough space for non-binary people to share other important factors that could shape their lived experiences.

The importance of the appropriateness of questions, as well as the need for more inclusive approaches to gender and neurotype also expands to health-related settings. Starting from service access, intake forms should accommodate non-binary individuals' experiences and identities. Additionally, leaflets distributed within services,

informational materials, and sex education curricula need to cover diverse lived experiences, including those outside of the binary, discussing a plethora of labels, practices and identities.

In relation to health-care accessibility for multiply minoritised individuals, recent findings have further highlighted specific difficulties for autistic individuals wanting gender affirming interventions. Indeed, a portion of autistic participants to a recent Canadian study reported not sharing their autism with providers for fear of being declined treatment (Adams et al., 2025). That autistic people feel they need to hide their neurotype to access appropriate care is concerning, and points to a need for further training for health care professionals caring for gender-diverse adults. As has been discussed throughout this thesis, appropriate training should explore multiple minoritised statuses and provide professionals with gender- and neuro-affirming working frameworks to empower diversity, rather than enforcing inappropriate binaries.

The erasure of non-binary people through binary language, and the medicalised focus within literature including autistic people is problematic. Overall, healthcare systems need to make space within their policies and procedures for those whose existence challenges societal definitions of normality or binaries, especially if they do so in multiple ways.

5.4 Strengths and Limitations

This thesis has important strengths. Firstly, it represents an in-depth quantitative exploration into the sexuality and mental health of non-binary people, including a comprehensive systematic review and the first quantitative Study looking at associations between sexual wellbeing, mental health and camouflaging in a completely non-binary sample. This focus on non-binary autistic people is especially

novel within quantitative sex research. Indeed, this is also an important step towards fairer gender representation within autism research. In fact, while literature has long suggested an overlap between gender-diversity and neurodivergence (Bölte et al., 2023), researchers have often failed to adequately focus on this in relation to sexuality and wellbeing.

Secondly, the quantitative analyses were performed with a large sample of non-binary individuals, which allowed for more robust findings. Indeed, previous quantitative studies were often unable to recruit a high number of non-binary participants, sometimes having to exclude this group from inferential analysis (Study 1).

Thirdly, the inclusion of binary trans and binary cisgender people allowed for the assessment of similarities and differences in sexual outcomes. This is particularly important as previous studies have not always assessed trans identification within non-binary samples, sometimes grouping binary trans and non-binary people together (Study 1). Lastly, to correctly capture the experiences of different individuals within the non-binary umbrella, I used my insider understanding and consulted with community members (non-binary, autistic and trans people) to improve the survey.

However, this thesis also has limitations that should be acknowledged. Firstly, the thesis uses a western conceptualisation of non-binary identities. The systematic review only included western samples and Studies 2 and 3, while open to participants of any country, included mostly white European and North American participants. This might also mean that individuals who identify outside the binary might have found the presented definitions of trans or non-binary too restrictive or otherwise unsuitable, deciding against participating.

Secondly, the non-binary sample was young, with most non-binary participants being under 35 years. This is often the case with studies involving non-binary individuals and may be because younger generations are much more likely to identify as gender-diverse compared to previous generations (Statistics Canada, 2022). Additionally, the primary recruitment strategy was advertisement through social media channels, which might be more frequented by younger people. This creates limitations for the generalization of the results and caution should be used.

Thirdly, while the decision behind not asking about sex-assigned-at-birth was prompted by experts-by-experience and might have helped in our recruitment, it limits our ability to understand possible differences within the experiences of individuals based on their assigned-at-birth-sex. This is especially relevant as gender-diverse assigned-male-at-birth [AMAB] people often experience increased victimization, fetishisation, and violence (Chavanduka et al., 2021; Kidd et al., 2021; Murchison et al. 2023; Newcomb et al., 2020). Furthermore, while this thesis provides helpful data to better understand non-binary people's experiences, it did not separate between gender identities existing within the non-binary umbrella, and did not fully represent individuals that exist outside of the binary/non-binary dichotomy. A possible way forward would be to integrate the Gender/Sex 3x3 framework (Beischel et al., 2023) which describes gendered experiences through two intersecting dimension called "binary relation" (which looks at how a person conceptualises their gender/sex in relation to the gender binary) and "gender trajectory" (which looks at the relationship between sex-assigned-at-birth and individuals' current gender/sex). This frameworks allows the participant to freely express how they would like to be described (which could include information on sex-assigned-at-birth for some people), while avoiding direct questions on SAAB and remaining inclusive and flexible. Moreover, this approach is inclusive of people that

have identities outside of strictly transgender vs. cisgender (“allogender”) and binary vs. non-binary (“allobinary”) categories, providing more nuance and reducing the risk of misrepresenting identities (e.g. assuming that everyone who is not non-binary is binary, Beischel et al., 2023).

Fourth, as variables relating to social and medical transition were combined for analysis, this thesis is limited in its ability to describe how different aspects of gender affirmation might relate to differences in sexual outcomes. This approach limits our understanding on how specific gender-affirming experiences might contribute to sexual wellbeing or satisfaction. Additionally, the empirical findings presented were obtained through cross-sectional analysis, hence it is only possible to describe associations between variables, not to speculate on causation.

Lastly, within the systematic review, I was unable to examine country-level differences for sexual outcomes. This was due to the fact that the majority of included papers primarily focused on North American participants. In addition, research groups operating in different regions tended to investigate different aspects of gender-diverse people’s sexuality, often examining similar topics within the same populations rather than across multiple geographical areas. While this prevented any meaningful country related comparison within the systematic review, it is important to point out that country specific factors might powerfully influence non-binary (and trans) people’s health and sexual outcomes. First of all, there are wide variations concerning legal and political recognition of LGBTQAI+ identities. While the presence of a protective legal infrastructure might support individuals’ wellbeing within different settings (Ceatha et al., 2021; Wight et al., 2013), structural stigma might link create hostile environments and barriers for safety (e.g., Perales & Todd, 2018). Another important consideration relates to access to healthcare. Starting with gender-affirming care, countries regulate

access to medical transition differently. Ease of access to lifesaving gender care can profoundly impact non-binary and trans people's wellbeing, as literature highlights more negative mental health and suicidal ideation/attempts when people are unable to access wanted medical transition (Tordoff et al., 2022; Turban et al., 2022). Health might also be impacted by health professionals' levels of education around trans and non-binary people, and their ability to understand and treat them when necessary without invasive questioning, dismissal of concerns (i.e., potentially due to diagnostic overshadowing; Thom et al., 2022), microaggressions or outwardly discriminatory conduct towards gender-diverse patients (Drabish & Theeke, 2022; Hobster & McLuskey, 2020; Miller et al., 2023).

These limitations highlight a need for further research in the field.

5.5 Future Directions

5.5.1 Theoretical Framework

A variety of theories were considered within this project, as highlighted within the introduction. Below, I bring attention to other theoretical frameworks that could be used in future studies to deepen understandings of non-binary people's sexuality and wellbeing.

Intersectionality theory (Crenshaw, 1991) explains how multiple minoritised identities shape the way someone may experience oppression and privilege (e.g., a Black woman will experience a specific kind of oppression that results from both racism and misogyny; Crenshaw, 1991; Nagoshi et al., 2023; Van Schuylenbergh et al., 2018). Intersectionality has been used to describe how the health inequalities experienced by trans people may be explained by the existence of structures of domination (e.g.,

hetero-cisgenderism), reinforced by institutional systems (e.g., healthcare) and maintained through practices (e.g., pathologizing of trans identities; Wesp et al., 2019).

While this thesis does not explore how structural inequalities might interact and contribute to different experiences and sexual/mental health outcomes, further research could utilise this theory to better capture the experience of multiply minoritised individuals, bringing in the wider societal and political context.

Alternatively, the Gender Minority Stress Model (Testa et al., 2015) which is derived from the Minority Stress Model (Meyer, 2003), conceptualises how individuals from minority groups (especially LGBTQ+ individuals) experience internal (i.e., internalised heterosexism, identity concealment) and external (i.e., stigma, unjust policies) stressors due to their minority status (Frost & Meyer, 2023; Meyer, 2003). Such additional stressors are not experienced by dominant groups and have been linked to negative health outcomes in marginalised populations (McLemore et al., 2018).

Expanding upon this, the Gender Minority Stress Model (Testa et al., 2015) describes how gender-diverse individuals experience internal (i.e., internalised transphobia) and external (i.e., stigma, unjust policies, inability to access adequate care, nonaffirmation of gender identity, societal enforcement of gender binarism) stressors due to their gender minority status (Frost & Meyer, 2023; Mezza et al., 2024; Puckett et al., 2023; Testa et al., 2015), leading to poorer health compared to cisgender people (Hunter et al., 2021; McLemore et al., 2018; Mezza et al., 2024; Tan et al., 2020). The Gender Minority Stress Model may offer valuable insight to understand potential discrepancies in the sexual outcomes of non-binary, binary trans, and cisgender people, while also providing space to account for mitigating and resiliency factors, such as the role of community connectedness and trans/non-binary pride (Testa et al., 2015). Recent papers including gender-diverse samples have used this model (e.g. Perez & Pepping,

2024) to explore sexual and relationship outcomes and mental health (e.g., Borgogna, 2019). An approach with this framework could help explain how specific stressors and resiliency factors shape sexual wellbeing outcomes for non-binary and non-binary autistic people, and could also help identify specific resiliency and stress factors for these populations.

Moving beyond the concept of resilience and “coping”, recent literature is also focusing on positive and pleasurable aspects of queer and gender-diverse individuals’ experiences. Examples of this are the constructs gender euphoria and minority joy. More specifically, gender euphoria has been defined as positive and joyful emotions and a feeling of “rightness” linked with one’s gender/sex (Beischel et al., 2022), which can be felt through a wide range of internal or psychological (e.g., self-discovery or self-reflection related experiences), external or physical (e.g., clothes/haircuts, chest binding or shapewear, medical transition related changes), or social factors (e.g., validation from social environment, people being affirming; Beischel et al., 2022). In a recent paper, gender euphoria was described by non-binary and trans participants as either a more intense feeling of joy or a more “quiet contentment” in relation to their gender identity (Griffiths et al., 2025), and participants described links between gender euphoria and their sexual experiences, behaviours and sexual wellbeing. Likewise, minority joy has been conceptualised as pleasurable experiences and positive feelings connected to being trans and non-binary (Wurm et al., 2024). Participants within the Study (Wurm et al., 2024) described experiencing minority joy in relation to experiences of gender euphoria, community connectedness (i.e., feelings of belonging, experiencing joy and love within minoritised communities) and gender freedom/playfulness (i.e., joy that comes from experimenting and erasing gender boundaries).

Future studies could benefit from using these theories to construct a more affirming and strength-based framework. While resilience and coping are linked to negative experiences, minority joy and gender euphoria directly relate to positive events, thoughts or feelings, and represents a fundamental theoretical shift in the way in which research approaches minoritised individuals' narratives, which might ultimately benefit participants and involved communities.

5.5.2 Methodological and Topic-related Directions

5.5.2.1 Increasing Understanding of Sexual and Relationship Related Variables

Future research might benefit from developing a deeper understanding of the importance of partner characteristics. For instance, I did not focus on partner's gender identity nor on partner's neurotype. Overall, gender-diverse people might find other gender-diverse partners to be more supportive (Fuller & Riggs, 2021) as well as more affirming towards their own gender identity (Scott et al., 2025). Having a trans partner has also been linked to lower levels of psychological distress among trans and non-binary people (Fuller & Riggs, 2021). Additionally, partner social support has been linked with higher relationship satisfaction (Fuller & Riggs, 2021). Monogamous relationships in which the partners are gender-diverse (Trans for Trans [T4T]) have been reported to have higher relationship satisfaction compared to those where one of the partners is cisgender (Scott et al., 2025). This may be more associated with the ability of a trans partner to communicate and affirm the other person's gender, rather than with the gender identity of the partners themselves (Scott et al., 2025). There is an overall lack of research on intimate partnerships between neurodivergent people and the effect of neurotype on sexual dynamics. Nonetheless, further research is necessary to identify if

partners' gender identity or neurotype may be associated with non-binary people's sexual and relationship outcomes.

5.5.2.2 Disability and Neurodivergence Within Gender Minority Research

As previously highlighted, although the sample for this thesis was recruited through convenience and snowballing methodologies, a large proportion of the sample self-reported being autistic, neurodivergent or physically disabled/chronically ill and this deserves further attention. A recent review looking at how management of trans and non-binary people's chronic conditions linked with their sexual and reproductive health and gender affirming care found significant gaps within services, with a lack of attention to the specific needs of physically disabled and chronically ill individuals accessing these health-care environments (Lampe et al., 2021). Research on the sexuality of autistic and neurodivergent people is also often neglected (Maggio et al., 2022), with little space given to explore minoritised gender identities, and often focusing on problematic sexual behaviours. Promisingly, recent literature has looked at autistic people and kink, centring autistic people's sexuality in a more positive light (Pearson & Hodgetts, 2024). Future research with gender-diverse individuals could explore disability as it relates to sexual experiences and outcomes.

5.5.2.3 Other Overlapping Identities

Sex research is often biased towards including Western, Educated, Industrialised, Rich, and Democratic (WEIRD) samples (Klein et al., 2022). While this thesis explored different minoritised statuses, the sample was still largely white and western, and the majority of non-binary people were below the age of 35 (Study 2 and 3). Additionally, the systematic review focused on western definitions of non-binary identities (Study 1). Future studies could also focus more deeply on race and ethnicity, looking at sexual

wellbeing for people who are a racial or ethnic minority as well as non-binary (and possibly autistic), as this was not possible due to sample composition. Overall, Black trans individuals may experience poorer health outcomes compared to both Black cisgender people and white gender minority individuals (Lett et al., 2020), with higher burden for transfeminine individuals (Hughes et al., 2021). Unfortunately, there is a lack of quantitative research in relation to Black, autistic and non-binary people's health and wellbeing. Further research focusing on people with racial/ethnic, gender and neuro-minority identities is needed.

Finally, additional research could explore other demographic variables and their associations with sexual, relationship and mental health outcomes within non-binary populations. Interestingly, while my non-binary sample was mainly highly educated, over 50% reported low income levels (Study 2 and 3). Moreover, higher education and income were linked to better mental health outcomes for autistic non-binary people (Study 3). Overall, literature highlighted difficulties for gender-diverse people to find suitable work, as they are likely to experience work related stigma and harassment in the workplace because of their identity (Enogieru et al., 2024; Mejías Nihlén et al., 2025; Rosati et al., 2025). Within literature, gender minority individuals have consistently reported experiencing being fired, denied promotions or not hired due to being trans (Baugher et al., 2024; James et al., 2016; Sears et al., 2024). Lastly, a recent report from the European Union Agency for Fundamental Rights including LGBTI individuals over 15, highlighted how trans and non-binary respondents were more likely to be unemployed, less likely to be in paid work or to be a student compared to all LGBTI participants (Russell et al., 2023). This was especially true for trans and non-binary people reporting disability (Russell et al., 2023). Considering autistic identity, research has long highlighted that school settings can be stressful or unsuitable for neurodivergent

learners (Horgan et al., 2023; Lynam et al., 2024), sometimes leading to non-attendance or dropout (Cage & McManemy, 2022; Nordin et al., 2024; Totsika et al., 2020), and potentially lower levels of qualifications. Moreover, in the UK, autistic people are more likely to face unemployment than non-autistic individuals and report difficulties in maintaining a job long-term due to lack of accommodation and inaccessible environments (Department of Work and Pensions, 2024).

Exploring sexuality and relationships while considering demographic characteristics or other marginalised statuses as described above could reveal specific needs, but also patterns of resilience and could help create a more varied and fair representation of the non-binary and autistic community.

5.6 Conclusion

This thesis explored non-binary people's health and sexuality, with a novel focus on minoritised overlapping identities. This project highlights the importance of using appropriate labels and language in research to correctly represent and amplify non-binary and autistic people's experiences. Moreover, this work stresses that self-identification is an important tool in allowing participants to authentically characterise their experiences beyond medicalised narratives.

Lastly (and most importantly), this project highlights that minoritised overlapping identities matter, and are associated with multiple sexual and health-related outcomes for non-binary people (often in unpredictable ways). While quantitative sex research with non-binary people is becoming more prevalent and inclusive, further focus on minorities within non-binary groups is still needed. I hope that this exploratory work might inspire further quantitative sex researchers to investigate similar topics, as well as positively impact real-world outcomes for non-binary (and autistic) individuals.

As researchers, we have the power to advance and disseminate knowledge that embodies social diversity and social change. As people who are part of multiple marginalised groups, representing our experience means to sometimes take detours, challenge preconceptions, be creative, embrace mistakes, and allow for complexity.

Our collective voices need to be heard.

We deserve to take up space.

We have always been here.

We belong.

Appendix A Complete questionnaire items (Study 2-3)

Variable	Scale or Items
Age	“How old are you?” (drop down menu)
Country	“Please select your country” (selection from list)
Racial background	“Please select your ethnicity/ racial background” (multiple choice, based on UK Census categories)
Education and income levels	“Which category best describes your education?” and “Which category best describes your income level?” (multiple choice)
Gender identity	<p>1) “Transgender (or trans) describes someone who identifies with a different gender than the one they were assigned at birth. Are you transgender?” (yes/no)</p> <p>2) “Non-binary describes someone who identifies with a gender outside the gender binary (not man or woman). Are you non-binary?” (yes/no)</p> <p>3) “Please select the gender identity label that you feel describes you best:” (multiple choice, with option to select “other” and add text)</p>

<p>Neurotype</p>	<p>1) “Do you have a formal diagnosis of autism?” (yes/no/I am awaiting formal diagnosis)</p> <p>2) If yes not selected to previous question: “Regardless of any formal diagnosis, do you self-identify as autistic?” (yes/no)</p> <p>3) “Do you identify as being neurodivergent in any other way?” (yes/no). If yes selected, people could specify their neurodivergent status using a textbox</p>
<p>Relationship status</p>	<p>“Do you currently have one or more partners that you feel committed to in a romantic way?” (Yes, I am in a relationship with one partner/ Yes, I am in a relationship with more than one partner/ No, I am single)</p>
<p>Transition status</p>	<p>For Trans and non-binary participants:</p> <p>1) “Some individuals might decide to socially transition in relation to their gender transition (e.g., changing name, changing pronouns, come out to relevant people, modify gender expression through clothing or aesthetic treatments such as laser treatment...). Have you socially transitioned?” (Yes, I completed all the steps I wanted to/ Partially, I still have steps that I want to complete/ No, but would like to in the future/ No, and I don’t want to in the future/ No, and I am unsure about whether I would like to socially transition)</p> <p>2) “Some individuals might decide to take gender affirming hormones in relation to their gender transition (e.g., antiandrogens, oestrogens, testosterone, hormone blockers...). Have you ever taken gender affirming hormones?” (yes, still currently taking them/ Yes, I did in the past but not anymore/ No, but would like to in the future/ No, and I</p>

	<p>don't want to in the future/ No, and I am unsure about whether I would like them in the future)</p> <p>3) Some individuals might decide to have gender affirming surgeries to achieve some of their transition goals (e.g., top surgery/ chest reconstruction/ breast augmentation surgery, phalloplasty or metoidioplasty, vaginoplasty, any facial surgery that you would consider gender affirming etc). Have you ever had gender affirming surgeries? (yes, and I would like to have more/ yes, and I do not want any more/ no, but would like to in the future/ no, and I don't want any in the future/ no, and I am unsure about whether I would like them in the future)</p>
<p>Sexual Orientation</p>	<p>1) "Which of the following labels best describes your current sexual orientation (please pick you primary label)?" (straight/ gay/ lesbian/ bisexual/ pansexual/ queer/ asexual/ Other with option to add text)</p> <p>2) "Thinking about your past, what was the first sexual orientation label that you used to describe yourself?" (same range of response options)</p> <p>3) "Please indicate how sexually attracted you are to the following types of people: Men (including trans men), Women (including trans women), Non-binary people (with Likert from not at all attracted (0) to extremely attracted (10) for each category)</p> <p>4) "Thinking about your lifetime, how would you describe the genders of your sexual partners?" (I have only had sex with men (including trans men)/ I have only had sex with women (including trans women)/ I have only had sex with non-binary people/ I have had sex with partner of multiple genders/ I never had sex)</p> <p>5) "How would you describe the genders of your sexual partners in the last year?" (same response options to previous question, aside from last option being "I did not have any sexual partners in the last year"</p>

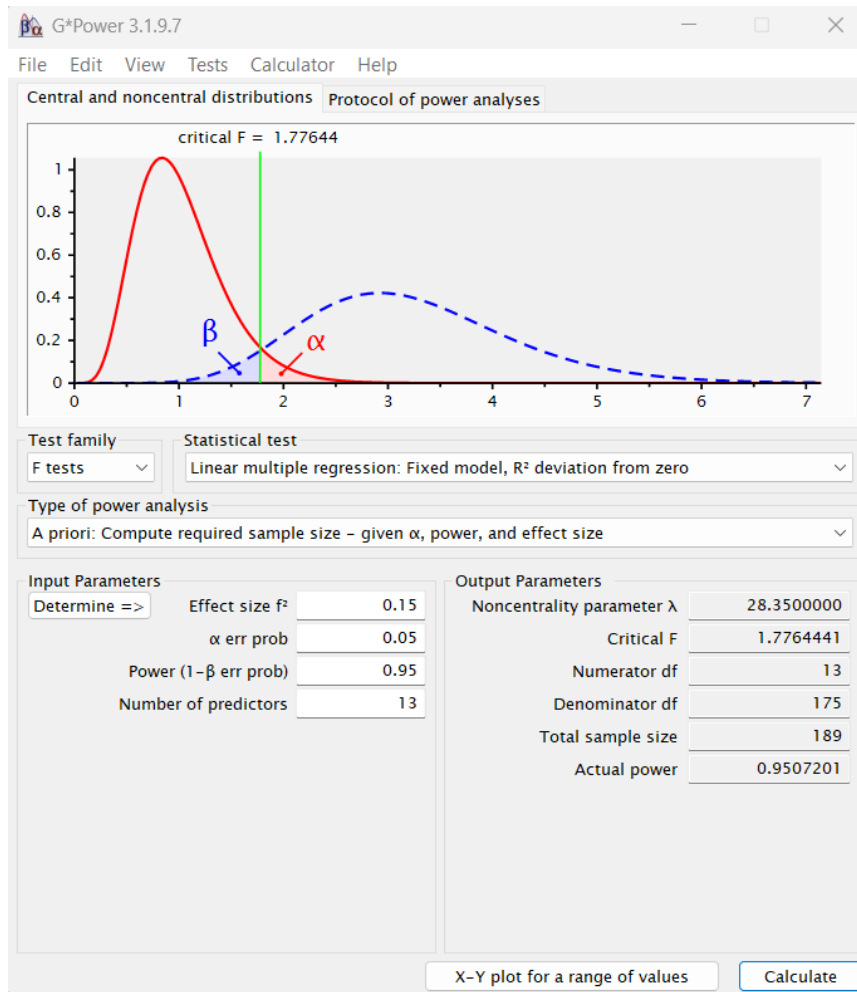
<p>Sexual fluidity</p>	<p>The concept of sexual fluidity was briefly explained before questions were asked.</p> <p>1) “Has your sexual orientation ever changed in your lifetime?” (yes/no)</p> <p>2) For trans and non-binary people only “Do you feel like a change in your sexual orientation was linked to your transition?” (yes/no). If person responded yes, they were given the option to explain more through textbox.</p>
<p>Romantic orientation/ attraction</p>	<p>1) “For some individuals, romantic orientation is separate from sexual orientation. Which word better describes your romantic orientation?” (Heteroromantic/ Homoromantic/ Biromantic/ Panromantic/ Aromantic/ Other with textbox) – each option was accompanied by brief explanation of terminology.</p> <p>2) “For some individuals, romantic attraction is separate from sexual attraction. Please indicate how romantically attracted you are to the following types of people: Men (including trans men), Women (including trans women), Non-binary people (with Likert from not at all attracted (0) to extremely attracted (10) for each category”</p>
<p>Sexual wellbeing</p>	<p>The Short Sexual Wellbeing Scale (SSWBS; Gerymski, 2021)</p>
<p>Sexual satisfaction</p>	<p>The New Sexual Satisfaction scale (Štulhofer et al., 2010) – adapted for people with multiple partners (changing “partner” to “partner(s)”) – Items that mentioned partnered sex were not visible for those that did not report having had sex in the past year.</p>
<p>Relationship satisfaction</p>	<p>The Relationship Assessment Scale (RAS) (Hendrick, 1988) – modified to be inclusive of people in non-monogamous relationships (similar to Garner et al., 2019 and following community feedback). – This scale was only visible to those that reported not being single.</p>

Anxiety and depression	Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983)
Alcohol abuse	AUDIT-C (Bush, et al., 1998)
Substance abuse and Chemsex	<p>1) Which of the following drugs have you used in the past 12 months? Please select all that apply: (list of substances with option to add using textbox and to respond “none”. People could select more than one option).</p> <p>2) (if any selected) How often have you used these drugs? (monthly or less/ weekly/ daily or almost daily)</p> <p>3) (if selected any drugs from first item) DAST-10 (Skinner, 1982). It was decided to change the language of item 2 and 3 (“Do you abuse more than one drug at a time?”; “Are you unable to stop abusing drugs when you want to?”) substituting the word “abuse” with the word “use”, following McCabe et al., 2006). Language was also updated (partner(s) instead of spouse to reflect community feedback.</p> <p>4) “Chemsex or Party and Play (PnP) is defined as the act of using drugs (normally stimulants) to enhance sexual activity. Do you participate in Chemsex or PnP?” (yes, I have in the past year/ yes, but not in the past year/ no)</p>
Suicide ideation in lifetime	“Have you ever thought about ending your life?” (yes/no/ prefer not to say). “prefer not to say” option was added to reflect community feedback and prevent missing data.
Smoking	“Do you currently smoke tobacco or vape?” (yes/no)
Camouflaging	CAT-Q (Hull et al., 2019)
Physical disability and physical health	1) “How is your health in general?” (5-point Likert from Very good to Very bad). This question was taken from the UK Census.

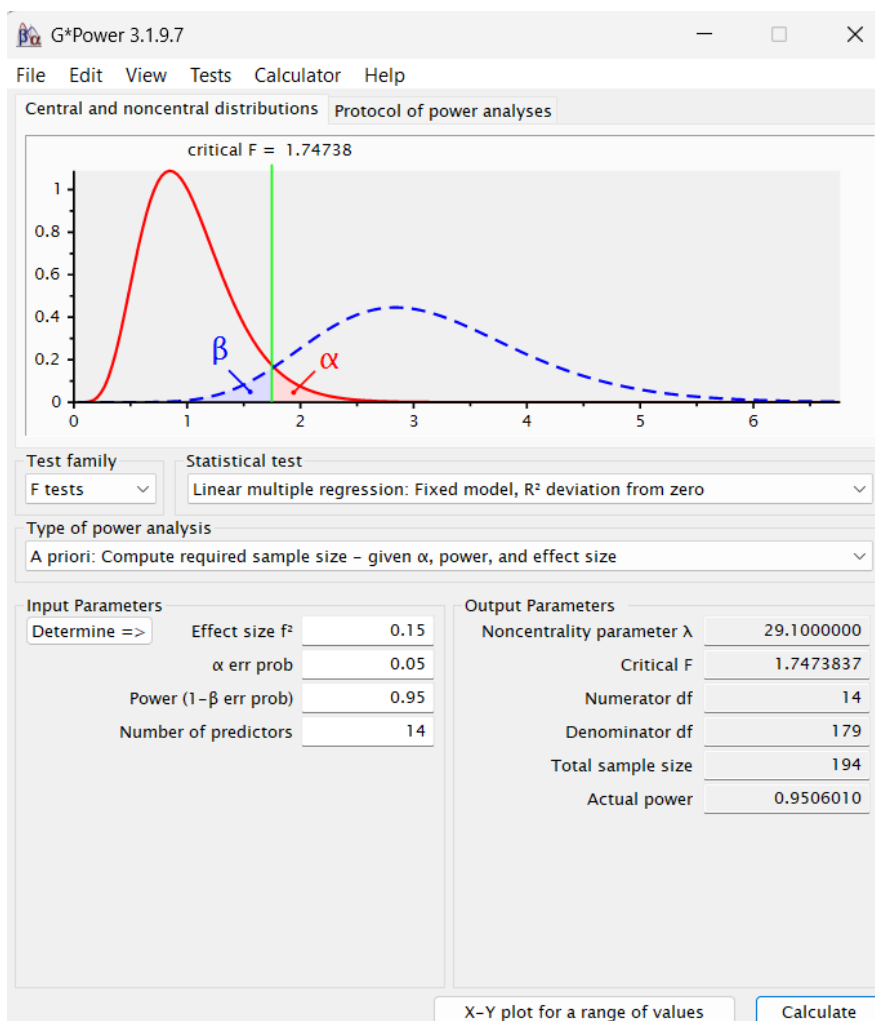
	<p>2) “Do you have a chronic health condition or a physical disability?” (yes, I have a chronic health condition/ yes, I have a physical disability/ yes, I have both/ no)</p>
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Appendix B Sample size and Power Estimates for Paper 2 & 3

Paper 2: A priori calculation using GPower (13 predictors)



Paper 3: A priori calculation using GPower (14 predictors)



Appendix C Supplemental materials Paper 1

Supplementary Table 1 Search Strategy/Keywords and Subject/Mesh Headings

	English
Sexuality, sexual health, relationships	Sexuality OR “Sexual Orientation*” OR “Sexual Fluidity” OR “Sexual satisfaction” OR “Sexual pleasure*” OR “Sexual Well*” OR “Sexual Health” OR “Sexual Function*” OR “Sexual Dysfunction*” OR “Sexual* dissatisf*” OR “Relationship Satisfaction” OR “Relationship quality” OR Orgasm OR “Sexual Fantas*” OR “Sexual Preference*” OR “Sexual* Distress*” Or “Sexual experience” OR “Romantic Relationship”
	Italian
	Sessual* OR “Orientamento sessuale” OR “Fluidità sessuale” OR “Salute sessuale” OR “Piacere sessuale” OR “Benessere sessuale” OR “Funzion* sessuale” OR “Disfunzion* sessuale” OR “Soddisfazione relazion*” OR

	<p>“Benessere di coppia” OR “Relazione di coppia” OR Orgasmo</p>
Gender identity	English
	<p>“Non-binary” OR nonbinary OR genderqueer OR “gender queer” OR “gender creative” OR “gender minority” OR “gender-diverse” OR “gender non-conforming” OR “gender nonconforming” OR “LGBT*”OR Transgender OR Trans OR Transmasc* OR Transfem* OR Transwom* OR Transm* OR FTM OR MTF OR AFAB OR AMAB OR “Female to male” OR “Male to Female” OR Transsexual</p>
	Italian
	<p>Non-binari* OR “Identità di genere” OR “LGBT*”OR Transgender OR Trans OR Transmasc* OR Transfem* OR “donn* transgender” OR “uom* transgender” OR FTM OR MTF OR Gender OR Genere OR Transessual*</p>
	PsycINFO
Subject headings and Mesh headings	<p>•DE "Gender Reassignment" OR DE "Gender Identity" OR DE "Gender Nonbinary" OR DE "Gender Nonconforming" OR DE "LGBTQ" OR DE "Transsexualism" OR DE "Transgender" OR DE "Transvestitism"</p> <p>•DE "Sexuality" OR DE "Sexual Arousal" OR DE "Female Sexual Dysfunction" OR DE "Sexual Minority Groups" OR DE "Sexual Health" OR DE "Sexual Satisfaction" OR DE "Sexual Fantasy" OR DE "Sexual Attraction" OR DE "Orgasm" OR DE "Sexual Orientation" OR DE "Same sex intercourse" OR DE "Sexual function disturbances" OR DE "Sexual disorders" OR DE "Relationship Quality" OR DE "Relationship Satisfaction" OR DE "Same Sex Couples"</p>
	MEDLINE
	<p>•(MH "Sexuality") OR (MH "Sexual Dysfunction, Physiological") OR (MH "Sexual Health") OR (MH "Sexual Dysfunctions, Psychological") OR (MH "Orgasm") OR (MH "Erectile Dysfunction") OR (MH "Marriage")</p> <p>•(MH "Gender Identity") OR (MH "Transgender Persons") OR (MH "Transsexualism")</p>

Supplementary Table 2 Excluded Papers

Reasons for exclusion	Study
Samples from outside western countries	Barrientos Delgado, J., Saiz, J. L., Guzmán-González, M., Bahamondes, J., Gómez, F., Castro, M. C., Espinoza-Tapia, R., Saavedra, L. L., & Giami, A. J. (2021). Sociodemographic characteristics, gender

	<p>identification, and gender affirmation pathways in transgender people: A survey study in Chile. <i>Archives of Sexual Behavior</i>, 50(8), 3505-3516. https://doi.org/10.1007/s10508-021-01939-4</p> <p>Chakrapani, V., Newman, P. A., Shunmugam, M., Logie, C. H., & Samuel, M. (2017). Syndemics of depression, alcohol use, and victimisation, and their association with HIV-related sexual risk among men who have sex with men and transgender women in India. <i>Global Public Health: An International Journal for Research, Policy and Practice</i>, 12(2), 250-265. https://doi.org/10.1080/17441692.2015.1091024</p> <p>Chakrapani, V., Shunmugam, M., Newman, P. A., Kershaw, T., & Dubrow, R. (2015). HIV status disclosure and condom use among HIV-positive men who have sex with men and Hijras (male-to-female transgender people) in India: Implications for prevention. <i>Journal of HIV/AIDS & Social Services</i>, 14(1), 26-44. https://doi.org/10.1080/15381501.2013.859113</p> <p>Champutiz-Quintana, K. A., Olmos, J. C. C., Lucas-Matheu, M., & Bastidas-Champutiz, S. B. (2024). Assessment of sexual satisfaction in the LGBTIQ population of Ecuador. <i>UNIVERSITAS-REVISTA DE CIENCIAS SOCIALES Y HUMANAS</i>(40), 187-208. https://doi.org/10.17163/uni.n40.2024.08</p> <p>Haase, S., Müller, A., & Zweigenthal, V. (2022). Sexual health behaviour, health status, and knowledge among queer womxn and trans men in Kenya: An online cross-sectional study. <i>PloS one</i>, 17(6). https://doi.org/10.1371/journal.pone.0268298</p> <p>Lee, Y. G., Zhakupova, G., Vinogradov, V., Paine, E. A., Laughney, C. I., Reeder, K., Davis, A., Hunt, T., Mergenova, G., Primbetova, S., Terlikbayeva, A., & Wu, E. (2022). Polydrug use, sexual risk, and HIV testing among cisgender gay, bisexual, and other men and transgender and nonbinary individuals who have sex with men in Kazakhstan. <i>AIDS Education and Prevention</i>, 34(5), 413-426. https://doi.org/10.1521/aeap.2022.34.5.413</p> <p>Nugroho, A., Erasmus, V., Coulter, R. W. S., Koirala, S., Nampaisan, O., Pamungkas, W., & Richardus, J. H. (2018). Driving factors of retention in care among HIV-positive MSM and transwomen in Indonesia: A cross-sectional study. <i>PloS one</i>, 13(1). https://doi.org/10.1371/journal.pone.0191255</p> <p>Petterson, L. J., Dixon, B. J., Little, A. C., & Vasey, P. L. (2018). Viewing time and self-report measures of sexual attraction in Samoan cisgender and transgender androphilic males. <i>Archives of Sexual Behavior</i>, 47(8), 2427-2434. https://doi.org/10.1007/s10508-018-1267-7</p> <p>Smith, A. D., Kimani, J., Kabuti, R., Weatherburn, P., Fearon, E., & Bourne, A. (2021). HIV burden and correlates of infection among transfeminine people and cisgender men who have sex with men in Nairobi, Kenya: an observational study. <i>The lancet. HIV</i>, 8(5), e274-e283. https://doi.org/10.1016/S2352-3018(20)30310-6</p> <p>Stief, M. (2017). The sexual orientation and gender presentation of hijra, kothi, and panthi in Mumbai, India. <i>Archives of Sexual Behavior</i>, 46(1), 73-85. https://doi.org/10.1007/s10508-016-0886-0</p> <p>Su, Y., & Zheng, L. (2023). Stability and Change in Asexuality: Relationship Between Sexual/Romantic Attraction and Sexual Desire. <i>Journal of Sex Research</i>, 60(2), 231-241. https://doi.org/10.1080/00224499.2022.2045889</p> <p>Wainipitapong, S., Oon-arom, A., Wiwattarangkul, T., Vadhanavikkit, P., Wiwattanaworaset, P., Srifuengfung, M., & Chiddaycha, M. (2023). Sexual Behaviours Among Lesbian, Gay, Bisexual, Transgender, and Other Sexual and Gender-diverse Medical Students: A National Study of Thai Medical Schools. <i>International Journal of Sexual Health</i>, 35(3), 352-362. https://doi.org/10.1080/19317611.2023.2214801</p>
Not empirical analysis	<p>Agwu, A. (2020). Sexuality, Sexual Health, and Sexually Transmitted Infections in Adolescents and Young Adults. <i>Topics in antiviral medicine</i>, 28(2), 459-462. https://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=32886466&site=ehost-live https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7482983/pdf/tam-28-459.pdf</p>

	<p>Bauer, G. R., & Hammond, R. (2015). Toward a broader conceptualisation of trans women's sexual health. <i>Canadian Journal of Human Sexuality</i>, 24(1), 1-11. https://doi.org/10.3138/cjhs.24.1-CO1</p> <p>Berenbaum, S. A., & Meyer-Bahlburg, H. F. L. (2015). Gender development and sexuality in disorders of sex development. <i>Hormone and metabolic research = Hormon- und Stoffwechselforschung = Hormones et metabolisme</i>, 47(5), 361-366. https://doi.org/10.1055/s-0035-1548792</p> <p>Carr, N., Serisier, T., & McAlister, S. (2020). Sexual deviance in prison: Queering identity and intimacy in prison research. <i>Criminology & Criminal Justice: An International Journal</i>, 20(5), 551-563. https://doi.org/10.1177/1748895820937401</p> <p>da Silva, R. U. M., Abreu, F. J. d. S., da Silva, G. M. V., Dos Santos, J. V. Q. V., Batezini, N. S. d. S., Silva, B. N., & Rosito, T. E. (2018). Step by step male to female transsexual surgery. <i>International braz j urol : official journal of the Brazilian Society of Urology</i>, 44(2), 407-408. https://doi.org/10.1590/S1677-5538.IBJU.2017.0044</p> <p>Dowshen, N., Matone, M., Luan, X., Lee, S., Belzer, M., Fernandez, M. I., & Rubin, D. (2016). Behavioural and health outcomes for HIV+ young transgender women (YTW) linked to and engaged in medical care. <i>LGBT Health</i>, 3(2), 162-167. https://doi.org/10.1089/lgbt.2014.0062</p> <p>Elyaguov, J., Schardein, J. N., Sterling, J., & Nikolavsky, D. (2022). Gender Affirmation Surgery, Transfeminine. <i>The Urologic clinics of North America</i>, 49(3), 437-451. https://doi.org/10.1016/j.ucl.2022.05.001</p> <p>Jaspal, R., Nambiar, K. Z., Delpech, V., & Tariq, S. (2018). HIV and trans and non-binary people in the UK. <i>Sexually transmitted infections</i>, 94(5), 318-319. https://doi.org/10.1136/sextrans-2018-053570</p> <p>Salvador, J., Massuda, R., Andrezza, T., Koff, W. J., Silveira, E., Kreische, F., de Souza, L., de Oliveira, M. H., Rosito, T., Fernandes, B. S., & Lobato, M. I. R. (2012). Minimum 2-year follow up of sex reassignment surgery in Brazilian male-to-female transsexuals. <i>Psychiatry and Clinical Neurosciences</i>, 66(4), 371-372. https://doi.org/10.1111/j.1440-1819.2012.02342.x</p> <p>Wright, J., & Greenberg, E. (2024). Non-binary youth and binary sexual consent education: unintelligibility, disruption and possibility. <i>SEX EDUCATION-SEXUALITY SOCIETY AND LEARNING</i>, 24(4), 445-459. https://doi.org/10.1080/14681811.2023.2217748</p> <p>Yeung, H., Luk, K. M., Chen, S. C., Ginsberg, B. A., & Katz, K. A. (2019). Dermatologic care for lesbian, gay, bisexual, and transgender persons: Epidemiology, screening, and disease prevention. <i>Journal of the American Academy of Dermatology</i>, 80(3), 591-602. https://doi.org/10.1016/j.jaad.2018.02.045</p>
No full text	<p>Ansermet, F. (2014). Scegliere il proprio sesso: Usi contemporanei della differenza sessuale = Choose your gender: Current suggestions on gender differences. <i>Rivista Sperimentale di Freniatria: La Rivista della Salute Mentale</i>, 138(2), 11-22. https://doi.org/10.3280/RSF2014-002002</p> <p>Romano, G., Bouaoud, J., Schmidt, M., Rausky, J., Stivala, A., Atlan, M., & Cristofari, S. (2023). Improvements in Transgender Masculinizing Chest Surgery: A Pilot Study of a Tailored Approach with a Life Satisfaction Assessment. <i>Transgender Health</i>. https://doi.org/10.1089/trgh.2021.0212</p>
Not in English or Italian	<p>Alavi, K., Nodushan, A. H. J., & Eftekhar, M. (2014). Sexual orientation in patients with gender identity disorder. <i>Iranian Journal of Psychiatry and Clinical Psychology</i>, 20(1), 43-49. https://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2014-36513-005&site=ehost-livemehrdad.eftekhar@gmail.com</p> <p>Bergero, T., Ballester, R., Gornemann, I., Cano, G., & Asiain, S. (2012). Desarrollo y validación de un instrumento para la evaluación del comportamiento sexual de los transexuales: EL CSTM = Development and validation of an instrument for evaluating transgender sexual behaviour: The CSTM. <i>Revista de Psicopatología y Psicología Clínica</i>, 17(1), 11-30. https://doi.org/10.5944/rppc.vol.17.num.1.2012.10366</p>

	<p>Cerwenka, S., Nieder, T. O., & Richter-Appelt, H. (2012). [Sexual orientation and partner-choice of transsexual women and men before gender-confirming interventions]. <i>Psychotherapie, Psychosomatik, medizinische Psychologie</i>, 62(6), 214-222. https://doi.org/10.1055/s-0032-1309030</p> <p>Cerwenka, S., Nieder, T. O., & Richter-Appelt, H. (2012). Sexuelle Orientierung und Partnerwahl transsexueller Frauen und Männer vor körpermedizinischen geschlechtsanpassenden Maßnahmen = Sexual orientation and partner-choice of transsexual women and men before gender-confirming interventions. <i>PPmP: Psychotherapie Psychosomatik Medizinische Psychologie</i>, 62(6), 214-222. https://doi.org/10.1055/s-0032-1309030</p> <p>Heß, J., Sohn, M., Küntscher, M., & Bohr, J. (2020). [Gender reassignment surgery from male to female]. <i>Der Urologe. Ausg. A</i>, 59(11), 1348-1355. https://doi.org/10.1007/s00120-020-01337-z</p> <p>Isaev, D. D. (2016). Deconstruction of Heteronormative Matrix. <i>Psychology-Journal of the Higher School of Economics</i>, 13(1), 9-26. <Go to ISI>://WOS:000382813100002</p> <p>Karpel, L., Gardel, B., Revol, M., Brémont-Weil, C., Ayoubi, J.-M., & Cordier, B. (2015). Bien-être psychosocial postopératoire de 207 transsexuels = Psychological and sexual well being of 207 transsexuals after sex reassignment in France. <i>Annales Médico-Psychologiques</i>, 173(6), 511-519. https://doi.org/10.1016/j.amp.2012.01.021</p>
Not quantitative analysis of sexual variables	<p>Anzani, A., Ruscio, E., Peverato, I., & Prunas, A. (2024). The use of sex toys in trans and nonbinary individuals' sexuality. <i>Sexual and Relationship Therapy</i>. https://doi.org/10.1080/14681994.2024.2306311</p> <p>Chadwick, S. B., Francisco, M., & van Anders, S. M. (2019). When orgasms do not equal pleasure: Accounts of 'bad' orgasm experiences during consensual sexual encounters. <i>Archives of Sexual Behavior</i>, 48(8), 2435-2459. https://doi.org/10.1007/s10508-019-01527-7</p> <p>Davis, S. A., & Meier, S. C. (2014). Effects of testosterone treatment and chest reconstruction surgery on mental health and sexuality in female-to-male transgender people. <i>International Journal of Sexual Health</i>, 26(2), 113-128. https://doi.org/10.1080/19317611.2013.833152</p> <p>Galupo, M. P., Lomash, E., & Mitchell, R. C. (2017). 'All of my lovers fit into this scale': Sexual minority individuals' responses to two novel measures of sexual orientation. <i>Journal of Homosexuality</i>, 64(2), 145-165. https://doi.org/10.1080/00918369.2016.1174027</p> <p>Galupo, M. P., Pulice-Farrow, L., Clements, Z. A., & Morris, E. R. (2019). 'I love you as both and I love you as neither': Romantic partners' affirmations of nonbinary trans individuals. <i>International Journal of Transgenderism</i>, 20(2-3), 315-327. https://doi.org/10.1080/15532739.2018.1496867</p> <p>Hoskin, R. A., Blair, K. L., & Jenson, K. E. (2016). Dignity versus diagnosis: Sexual orientation and gender identity differences in reports of one's greatest concern about receiving a sexual health exam. <i>Psychology & Sexuality</i>, 7(4), 279-293. https://doi.org/10.1080/19419899.2016.1236745</p> <p>Hwahng, S. J., & Nuttbrock, L. (2014). Adolescent gender-related abuse, androphilia, and HIV risk among transfeminine people of color in New York City. <i>Journal of Homosexuality</i>, 61(5), 691-713. https://doi.org/10.1080/00918369.2014.870439</p> <p>Rossiter, H. (2016). She's always a woman: Butch lesbian trans women in the lesbian community. <i>Journal of Lesbian Studies</i>, 20(1), 87-96. https://doi.org/10.1080/10894160.2015.1076236</p> <p>Scott, S. B., Pulice-Farrow, L., Do, Q. A., Garibay, B., & Balsam, K. F. (2023). 'The sense of falling in love again': Transgender and nonbinary individuals' positive experiences in romantic relationships during gender transitions. <i>the Behaviour Therapist</i>, 46(3), 113-122. https://soton.idm.oclc.org/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2024-33131-003&site=ehost-live</p> <p>Thomann, M., Grosso, A., Wilson, P. A., & Chiasson, M. A. (2020). 'The only safe way to find a partner': rethinking sex and risk online in Abidjan, Cote d'Ivoire. <i>Critical Public Health</i>, 30(1), 53-67. https://doi.org/10.1080/09581596.2018.1527017</p>

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Appendix D Supplementary Tables for Study 3

Supplementary Table 3 Depression and Anxiety Multivariate Analyses: Regressions of Associations Between Demographics, Camouflaging and Depression in the Non-binary Formally Diagnosed Autistic Subsample

Depression

Anxiety

$F(5,95)=3.399$; $Adj R^2=.17.5$; $p<.001$

$F(5,95)=3.399$; $Adj R^2=.107$;
 $p=.007$

Variable		B	p	95% CI	B	p	95% CI
Age	≤34				.405	.739	[-2.000; 2.810]
	35+						
Physical disability/chronic condition	No						
	Yes	1.596	.038*	[.093; 3.099]	.636	.475	[-.1.125; 2.398]
Education	Highschool or below						
	At least some university	-1.754	.030*	[-3.337; -.170]	-1.733	.070	[-3.610; .144]
Income	20000 or below						
	20000 or above	-1.049	.177	[-2.580; .483]	-1.003	.263	[-2.769; .764]
Camouflaging		.033	.043*	[.001; .065]	.084	<.001*	[.047; .122]
At least some transition	No						
	Yes	.146	.896	[-2.074; 2.366]			

Note. CI = Confidence intervals

* = p-value < .05

** = p-value < .001

Supplementary Table 4 Sexual Wellbeing Multivariable Analyses: Regressions of Associations Between Demographics, Camouflaging, Anxiety, Depression and Sexual Wellbeing in the Non-binary Formally Diagnosed Autistic Subsample

$F(6,92)=6.277$; $Adj R^2=.244$; $p<.001$

Variable	Multivariable			
	B	p	95% CI	
Age	≤34			
	35+			
Sex in the past year	No			
	Yes	2.275	.219	[-1.376; 5.926]
Income	20000 or below			
	20000 or above	1.510	.275	[-1.223; 4.243]
Relationship status	Single			
	Polyamorous relationship	1.026	.632	[-3.218; 5.271]
	Monogamous relationship	-.740	.692	[-4.447; 2.966]

Camouflaging			
Anxiety	-.101	.537	[-.427; .224]
Depression	-.764	<.001**	[-.1.163; -.365]

Note. CI = Confidence intervals

* = p-value <.05

** = p-value <.001

Supplementary Table 5 Sensitivity Analysis: Regressions of Associations Between Demographics, Camouflaging, Anxiety, Depression, Relationship Satisfaction and Sexual Wellbeing Among Non-binary Formally Diagnosed Autistic People in a Relationship

<i>Variable</i>		<i>Multivariable</i>		
		<i>B</i>	<i>p</i>	<i>95% CI</i>
Age	≤34	2.022	.293	[-1.796; 5.840]
	35+			
Sex in the past year	No			
	Yes	1.645	.552	[-3.870; 7.160]
Physical disability/chronic condition	No			
	Yes	-1.798	.254	[-4.924; 1.329]
Camouflaging				
Anxiety		.042	.814	[-.312; .396]
Depression		-.666	.011*	[-1.175 -.156]
Relationship satisfaction		.792	<.001**	[.479; 1.106]
Trans identity	No			
	Yes			
At least some transition	No			
	Yes	.893	.709	[-3.878; 5.664]

Note. CI = Confidence intervals

* = p-value <.05

** = p-value <.001

Appendix E Participants Information Sheets, Debriefing Form and Advertising materials

Participant Information Sheet

Study Title: Non-binary people’s health: Exploring the health and well-being of non-binary and other people

Researcher: Fraedan Mastrantonio

ERGO number: 82588

You are being invited to take part in the above research study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. You may like to discuss it with others but it is up to you to decide whether or not to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

This research is part of my PhD project, funded by the South Coast Doctoral Training Programme. This study focuses on the health and wellbeing of non-binary people, although people of all genders are invited to take part. As a non-binary and autistic person, I am particularly interested in understanding more about mental health, sexual health, and the overlap between being gender-diverse and neurodiverse (and

more specifically autistic). The rationale behind this project is that existing research on non-binary people is sparse and information is often collected using inappropriate tools or questions that do not take into account gender diverse individuals.

My aim is to make research more inclusive of non-binary people and also to help inform professionals about non-binary people's needs and characteristics.

If you decide to complete this questionnaire, you will be asked questions about your gender identity, your sexual orientation, wellbeing and satisfaction, your mental health and neurotype. You will also be asked other demographic questions such as your age.

As this study is longitudinal (i.e. we will ask you to complete a similar questionnaire 6 months from now, as well as one year from now), you will also be asked to generate an ID number and to type in your email address, so that we can contact you with the next survey link. We will only use this information for the purpose of sending you the next survey and so that we know which survey has been completed by which participant; it will not be used for any other purpose.

Why have I been asked to participate?

You have been asked to participate because you are 18 years of age or older. Although this study focuses on non-binary people, all people 18 years of age or older are welcome to participate, regardless of gender, location, or neurotype.

What will happen to me if I take part?

This study is longitudinal and involves completing three questionnaires about your health and wellbeing at three different time points (baseline, after 6 months and after

one year). You will be recontacted via the email that you will provide us in your first questionnaire to be reminded to complete the next two.

The questionnaires can be completed from anywhere, as long as you have an internet connection. You can expect each questionnaire to take between 20 to 30 minutes to complete (the second and third questionnaires are shorter and should take you less time).

Are there any benefits in my taking part?

Your participation will help our understanding of non-binary people's health and wellbeing. This is very important, as research is not very inclusive of gender-minority individuals and a lot more scientific-based information is needed to make sure that non-binary individuals are correctly represented and that health professionals can be given relevant information to meet non-binary people's needs, if and when required.

Additionally, you will be able to enter a lottery to win a £25 Amazon voucher (if you would like to).

To participate in the lottery you will have to check a box at the end of the questionnaire. The draw for 3 Amazon vouchers (9 in total) will happen at the end of each data collection point (after all participants have responded to the first, the second and the third questionnaire).

Are there any risks involved?

You will be asked questions about your health and wellbeing, your gender identity, sexuality, sexual health, mental health, and neurotype. Some individuals may find such questions difficult to answer or distressing.

If taking part in this study has caused you discomfort or distress, you can contact the following organisations for support:

From the UK:

- Steps2wellbeing: <https://www.steps2wellbeing.co.uk/>
- Mind UK: <https://www.mind.org.uk/need-urgent-help/using-this-tool/>
- Samaritans: <https://www.samaritans.org/>
- Frank (Drug use): <https://www.talktofrank.com/>
- Find help for your mental health through the NHS website:
<https://www.nhs.uk/nhs-services/mental-health-services/how-to-find-local-mental-health-services/>

If you are transgender, non-binary, questioning or are looking for LGBTQ+ specific services:

- Beyond reflection (trans/ non-binary/ questioning support): <https://beyond-reflections.org.uk/contact/>
- MindLine Trans+ (phone line): <https://bristolmind.org.uk/help-and-support/mindline-transplus/>
- Switchboard (support for LGBTQ+ people): <https://switchboard.lgbt/>
- Galop (support for LGBTQ+ people that have experienced abuse or violence):
<https://galop.org.uk/>

If you are in a crisis, please contact 999.

You can also contact your GP or phone 111 for advice.

Outside the UK:

Please contact your doctor if you need advice.

If you need urgent help or are in a crisis, please call your local emergency services.

Other international resources:

The Trevor project: <https://www.thetrevorproject.org/>

What data will be collected?

In this questionnaire you will find questions about your gender identity, sexual and romantic orientation, sexual behaviour and sexual wellbeing. You will also be asked questions about your sexual and relationship satisfaction and information about your relationship status, your race and ethnicity, your income and your education category, whether you have a chronic health condition, a physical disability, and whether you have been diagnosed or identify as being autistic. Questions will also be asked about your mental health (anxiety, depression, suicide ideation in your lifetime) and alcohol/drug use. If you are transgender or non-binary, we will also ask you a few questions about transitioning.

Please be aware that you can skip any of the questions while completing this questionnaire.

Data will be collected through Qualtrics and will be saved and stored in password protected documents on secure University of Southampton drives. It will also be backed up on password protected hard drives.

Due to the longitudinal nature of this research, we will ask you for your email address and to create an ID code following instructions (the ID code will be formed using your initials and DOB).

This information will be used only to contact you with the links to complete the other questionnaires (one in six months and the other one year from now), and so that the researcher knows that the same participant has completed each questionnaires.

Original ID codes and emails will be kept for the duration of the study and then destroyed once all questionnaires have been completed and data from the three questionnaires has been linked together.

Data will only be analysed as aggregated (which means that we are not interested and will not be looking at one individual's specific responses). It will not be possible to identify individual responses in any reports or publication.

Will my participation be confidential?

Your participation and the information we collect about you will be kept strictly confidential.

Only members of the research team and responsible members of the University of Southampton may be given access to data about you for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your data. All of these people have a duty to keep your information, as a research participant, strictly confidential.

Any information that you share will be kept in password protected files on the University's secure drive system. Any backup copy of this data will be password protected and encrypted.

Do I have to take part?

No, it is entirely up to you to decide whether or not to take part. If you decide you want to take part, you will need to give your consent by ticking the appropriate box at the end of this form.

What happens if I change my mind?

You have the right to change your mind and withdraw simply by closing your browser window at any time, without giving a reason and without your participant rights being affected. If you wish to withdraw from the study after you have submitted your answers, please contact Fraedan Mastrantonio at f.mastrantonio@soton.ac.uk.

Please note that there is a time limit of roughly 13 months from first questionnaire completion, for withdrawing your data. This is due to data anonymisation.

What will happen to the results of the research?

Your personal details will remain strictly confidential. Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent. This data will be used as part of my PhD thesis, and potentially be used for publication in relevant scientific journals.

Anonymised data will be deposited in the University of Southampton's repository in the form of survey databases.

Where can I get more information?

If you have any question you can contact the main researcher using the following email address: f.mastrantonio@soton.ac.uk.

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researchers who will do their best to answer your questions.

You can contact the main researcher: f.mastrantonio@soton.ac.uk

Or someone in the supervisory team: h.armstrong@soton.ac.uk or
h.kovshoff@soton.ac.uk

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (<https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page>).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you.

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at

<http://www.southampton.ac.uk/assets/sharepoint/intranet/ls/Public/Research%20and%20Integrity%20Privacy%20Notice/Privacy%20Notice%20for%20Research%20Participants.pdf>

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you until the study has finished after which time any link between you and your information will be removed (your email address and ID will be delete). Anonymised data will be retained for at least 10 years, following the University data management policy.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (<https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page>) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you for reading this information sheet and considering taking part in this research.

Please tick (check) this box to indicate that you have read and understood information on this form, are aged 18 or over and agree to take part in this survey.

Debriefing Form

Study Title: Non-binary people's health: Exploring the health and well-being of non-binary and other people.

Ethics/ERGO number: 82588

Researcher(s): Fraedan Mastrantonio, Heather Armstrong, Hanna Kovshoff

University email(s): f.mastrantonio@soton.ac.uk; h.armstrong@soton.ac.uk; h.kovshoff@soton.ac.uk

Version and date: VERSION 1 14.06.23

Thank you for taking part in our research project. Your contribution is very valuable and greatly appreciated.

Purpose of the study

The aim of this research was to better understand the health and wellbeing of non-binary people by looking at mental health, sexual health, sexuality and neurotype. This study was open to people of different genders, to be able to compare them to non-binary people on the variables of interest.

There are no set hypothesis for this study, as it is exploratory. However, your data will help our understanding of differences in mental health (e.g. levels of anxiety, depression, substance use) and sexuality (e.g. sexual orientation, sexual wellbeing), and contribute to better our understanding on the overlap between being gender-diverse and being diagnosed or self-identifying as autistic.

Confidentiality

Results of this study will not include your name or any other identifying characteristics.

Study results

If you would like to receive a copy of the research when it is completed, please let us know by using the contact details provided on this form.

Further support

If taking part in this study has caused you discomfort or distress, you can contact the following organisations for support:

From the UK:

- Steps2wellbeing: <https://www.steps2wellbeing.co.uk/>
- Mind UK: <https://www.mind.org.uk/need-urgent-help/using-this-tool/>
- Samaritans: <https://www.samaritans.org/>
- Frank (Drug use): <https://www.talktofrank.com/>
- Find help for your mental health through the NHS website:
<https://www.nhs.uk/nhs-services/mental-health-services/how-to-find-local-mental-health-services/>

If you are transgender, non-binary, questioning or are looking for LGBTQ+ specific services:

- Beyond reflection (trans/ non-binary/ questioning support): <https://beyond-reflections.org.uk/contact/>
- MindLine Trans+ (phone line): <https://bristolmind.org.uk/help-and-support/mindline-transplus/>
- Switchboard (support for LGBTQ+ people): <https://switchboard.lgbt/>
- Galop (support for LGBTQ+ people that have experienced abuse or violence): <https://galop.org.uk/>

If you are in a crisis, please contact 999.

You can also contact your GP or phone 111 for advice.

Outside the UK:

Please contact your doctor if you need advice.

If you need urgent help or are in a crisis, please call your local emergency services.

Other international resources:

The Trevor project: <https://www.thetrevorproject.org/>

Further reading

If you would like to learn more about this area of research, you can refer to the following resources:

Katz-Wise, S. L., Reisner, S. L., Hughto, J. W., & Keo-Meier, C. L. (2016). Differences in sexual orientation diversity and sexual fluidity in attractions among gender minority adults in Massachusetts. *Journal of sex research*, 53(1), 74-84. <https://doi.org/10.1080/00224499.2014.1003028>

Rimes, K. A., Goodship, N., Ussher, G., Baker, D., & West, E. (2019). Non-binary and binary transgender youth: Comparison of mental health, self-harm, suicidality, substance use and victimization experiences. *International Journal of Transgenderism*, 20(2-3), 230-240.

<https://www.tandfonline.com/doi/pdf/10.1080/15532739.2017.1370627>

Further information

If you have any concerns or questions about this study, please contact Fraedan Mastrantonio at f.mastrantonio@soton.ac.uk who will do their best to help.

If you remain unhappy or would like to make a formal complaint, please contact the Head of Research Integrity and Governance, University of Southampton, by emailing: rgoinfo@soton.ac.uk, or calling: + 44 2380 595058. Please quote the Ethics/ERGO number which can be found at the top of this form. Please note that if you participated in an anonymous survey, by making a complaint, you might be no longer anonymous. Thank you again for your participation in this research.

Text for social media ads:

TEXT 1:

“PARTICIPANTS NEEDED!

The University of Southampton is conducting a longitudinal study on the health and wellbeing of non-binary and trans people.

The study’s lead researcher is non-binary and the questionnaire has been reviewed by members of the non-binary, trans and autistic community.

All genders and neurotypes welcome!

18+ only.

Please take part in our study and help us making research more inclusive by clicking on this link: <link will be inserted when available>

Or scanning the QR code below.

<QR code will be added when available>

Share with anyone who might be interested.”

TEXT 2:

“PARTICIPANTS NEEDED!

The University of Southampton is conducting a longitudinal study on health, wellbeing and of non-binary.

The study’s lead researcher is non-binary and the questionnaire has been reviewed by members of the non-binary, trans and autistic community.

All genders and neurotypes welcome!

18+ only.

Please take part in our study and help us making research more inclusive by clicking on this link: <link will be inserted when available>

Or scanning the QR code below.

<QR code will be added when available>

Please, share with anyone who might be interested.”

TEXT 3:

“PARTICIPANTS NEEDED!

The University of Southampton is conducting a longitudinal study on sexual health, mental health and gender identity.

All genders and neurotypes welcome!

18+ only.

Please take part in our study and help us making research more inclusive by clicking on this link: <link will be inserted when available>

Or scanning the QR code below.

<QR code will be added when available>

Please, share with anyone who might be interested.”

Pictures for social media ads:

SC.DTP. South Coast Doctoral Training Partnership **University of Southampton**

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PARTICIPANTS NEEDED!!

FOR STUDY ON SEXUALITY, MENTAL HEALTH AND GENDER

PEOPLE ACROSS ALL GENDERS AND NEUROTYPES WELCOME!

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ERGO NUMBER: 82588/ VERSION: XXXX/ DATE:XXXXX

Hashtags for social media ads:

Relevant hashtags such as: #NonBinary #LGBTQ #Genderfluid #Genderqueer #Agender etc.

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