

A gender identity sensitive study of students' mental health

Module 12

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Abstract

Transgender and gender non-conforming (TGNC) persons and students are reportedly high risk for poor mental health (Budge et al., 2013; Eisenberg et al., 2007; Hunt & Eisenberg, 2010). However, few studies exist that investigate gender diverse students, more often than not reinforcing the hetero-cis-normative approach of there being two genders that are dictated by sex (Matsuno & Budge, 2017; Schilt & Westbrook, 2009). In terms of mental health, depression, anxiety, and sleep are particularly relevant for TGNC students (Beiter et al., 2015; Eom et al., 2022; Tan et al., 2022). The current study thus aims to explore whether TGNC students have worse sleep quality, and higher levels of anxiety and depression compared to cisgender students. Further it investigates whether the relationships between anxiety and depression to sleep quality are more pronounced for TGNC students. The study used a between subjects' design with a sample of N=194 where 49 were identified as TGNC and 145 as cisgender. Mental health was assessed using the GAD-7 (Spitzer et al., 2006) for anxiety, PHQ-9 (Manea et al., 2015) for depression, and SQS (Yi et al., 2006) for sleep quality. There was a significant effect of gender identity on depression with TGNC persons scoring higher on the PHQ-9. Apart from this, TGNC participants did not report different mental health than cisgender students, neither was the moderation through gender identity significant. A central implication is that the current sample may experience a more supportive environment, leading to gender identity not being a central negative influence on their mental health based on discrimination they may experience because of it (Budge et al., 2020; Eom et al., 2022). This potentially highlights the key importance of TGNC support, representation, and acceptance.

Introduction

Problem Statement

A significant body of literature emphasizes gender as a binary system, divided between males and females (Matsuno & Budge, 2017). This division reinforces sex as being indicative of gender, in that gender is assigned at birth and based on sex characteristics (Matsuno & Budge, 2017). While sex denotes the males and females of a species, gender is a more nuanced concept (Schilt & Westbrook, 2009). An individual's gender as assigned at birth may also not correspond to their current gender identity. Because of this, research that distinguishes only between male and female participants does not allow for gender diverse individuals to be properly represented (Matsuno & Budge, 2017).

Consequently, research sensitive to gender diverse individuals is an understudied field. Matsuno & Budge (2017) report that more than 50% of publications featuring issues concerning gender diverse identities were published between 2010 and 2017. Within these, the vast majority focused on binary gender identities such as male to female (MtF) and female to male (FtM) transgender. This illustrates a problematic lack of research that explores gender diverse and non-binary gender identities.

A particularly important group to consider are transgender and gender non-conforming (TGNC) students. While students already report higher levels of mental health concerns, the most common ones being anxiety, depression, and suicidal ideation (Beiter et al., 2015; Eisenberg et al., 2007), TGNC persons are yet more vulnerable. Matsuno & Budge (2017) report TGNC persons to be up to ten times more likely to experience anxiety and depression compared to cisgender persons. In fact, Budge et al. (2013) report a 50% prevalence of clinically significant depression and 44% prevalence of anxiety in TGNC people. When combined, the stress of being a student and the personal challenges associated with gender non-conformity may facilitate severe psychological distress, specifically anxious

and depressive symptoms (Kosciw et al., 2015; Lindquist et al., 2017; Wang et al., 2020).

The aim of the current study is to address the limitation in previous research regarding the psychological status of university students who identify as TGNC.

An overview of Gender Identity

Gender identity, as first coined by Stoller (1964), denotes a person's internal and private experience of one's own gender. Gender is often used interchangeably with sex and seen as both binary and dictated by a person's sex characteristics, the two categories being men and women (Moleiro & Pinto, 2015). However, gender is a different concept that describes a range of characteristics and social expectations, largely along a masculinity-femininity spectrum and serves a social organisation function (Matsuno & Budge, 2017).

To understand the notion of gender as a binary system, it is useful to consider hetero-cis-normativity (Worthen, 2020). Hetero-cis-normativity refers to a suit of societal, social, and cultural assumptions about human nature (Schilt & Westbrook, 2009; Worthen, 2020). This includes, but is not limited to, the assumption that male and females sex characteristics determine a person's gender, that there are two and only two genders, that gender is unchangeable and inherent to a person, and that only attraction between these two 'opposite' genders is tolerable, natural, or acceptable (Schilt & Westbrook, 2009; Worthen, 2020). Traditionally, being of male sex is associated with embodying masculine traits, while being of female sex is associated with embodying feminine traits (Schilt & Westbrook, 2009; Worthen, 2020). This association has led to the fusion of sex and gender, where one's sex characteristics are indicative of one's personality (Schilt & Westbrook, 2009; Worthen, 2020).

People who identify with their gender as assigned at birth are referred to as *cisgender* in the literature (Moleiro & Pinto, 2015; Worthen, 2020). Cis is Latin and means 'on this side

of' or 'on the same side'. Cisgender thus refers to an individual's gender being the same as the one assigned at birth. The antonym of cis is *trans* which means 'on the other side of' or 'on the opposite side'. *Transgender* describes all people whose assigned gender does not reflect their gender identity or expression (Chan et al., 2022). This includes non-binary, genderfluid, and agender identities, as such individuals do not (exclusively) identify with their gender as assigned at birth (Moleiro & Pinto, 2015). While 'transgender', or 'trans' technically serves as an umbrella term to denote all people with gender diverse identities (Chan et al., 2022; Kosciw et al., 2015), transgender and gender non-conforming (TGNC) is a more inclusive term that is used most in recent literature (Worthen, 2020). Within the Lesbian, Gay, Bisexual, Transgender, and Queer community (LGBTQ+) the specific gender identity is usually named (Moleiro & Pinto, 2015).

Depression and Anxiety among (TGNC) students

Both people who identify as TGNC and students often struggle with mental health issues (Beiter et al., 2015; Budge et al., 2013). In fact, mental health disorders account for approximately half of the total burden of disease in young adults in the USA (Beiter et al., 2015; Eisenberg et al., 2007; Hunt & Eisenberg, 2010).

Anxiety, according to the DSM-5 (American Psychiatric Association, 2013), is largely characterised by excessive worries about various events that persist through and affect various domains of an individual's life. Depression in the DSM-5 (American Psychiatric Association, 2013) is described as a persistent state of feeling sad, empty, and or hopeless. This is often accompanied by physical symptoms such as unintended weight loss or gain.

Reported risk factors for anxiety and depression are similar in the general population, TGNC, and student samples (Budge et al., 2013; Eisenberg et al., 2007; Lindquist et al., 2017; Rantala et al., 2018). These include financial strain, poor relationships with friends and family, low self-esteem and body image, as well as a high (study) workload, and drug abuse

(Beiter et al., 2015; Eisenberg et al., 2007; Hobaica et al., 2021; Hunt & Eisenberg, 2010; Lund et al., 2010; Resnick et al., 1997; Silva et al., 2023).

To understand the unusually high prevalence of depression and anxiety reported by TGNC persons, hetero-cis-normativity and the minority stress model may be considered (Lindquist et al., 2017; Schilt & Westbrook, 2009; Worthen, 2020). Hetero-cis-normative societal assumptions about gender and sexuality are intrinsically homo- and transphobic, as such identities deviate from the expected norm (Schilt & Westbrook, 2009; Worthen, 2020). As a result of their deviance, TGNC people are likely to be subject to many ex- and implicit forms of discrimination and victimisation, both perceived and experienced (Budge et al., 2013; Chan et al., 2022; Lindquist et al., 2017). TGNC people have a high likelihood of being discriminated against, or victimised, due to gender non-conforming being a more overt form of defiance of hetero-cis-normativity (Lindquist et al., 2017; Worthen, 2020). This experience of discrimination and victimisation is summarised as minority stress according to the minority stress model (Lindquist et al., 2017). Exemplary for such discrimination is discouraging TGNC people from using their preferred restroom, something 58% of TGNC students experience according to Chan et al. (2022). Such minority stress is associated with negative mental health outcomes like developing anxious and or depressive symptoms (Chan et al., 2022; Lindquist et al., 2017). A persistent experience of stress based on a person's identity is also likely to accelerate the development of anxious and or depressive symptoms in TGNC people (Brady et al., 2022; Eom et al., 2022; Kosciw et al., 2015; Lindquist et al., 2017). Additionally, such a persistent experience of stress is likely to affect an individuals' sleep and vice versa (Dudo et al., 2022; Howell et al., 2008; Lund et al., 2010). A more intense experience of stress is likely to cause worse sleep which, in turn, may lower the capacity to deal with stress (Eom et al., 2022).

Depression, anxiety, and stress are important concepts to better understand, especially

in TGNC students. Being affected by anxiety and or depression early in life can lead to a life-long burden of consequences as they accumulate in various domains such as academic and professional achievement, interpersonal relationships, and general life satisfaction (Hunt & Eisenberg, 2010; Resnick et al., 1997). One consequence that has been repeatedly shown to carry significant negative influence on mental, social, and physical functioning is poor sleep quality (Dudo et al., 2022; Howell et al., 2008; Lund et al., 2010).

Sleeping habits among (TGNC) students

Sleep is essential for both the mental and physical regeneration of the body, making it crucial for building and maintaining a good mental health (Lund et al., 2010). Sleep is a natural, recurring, easily reversible state of rest of an organism that is primarily characterised by dormancy and a decrease in sensitivity to stimuli (Yi et al., 2006). Sleep quality refers to the degree to which one experiences excellence in sleep (Yi et al., 2006).

Chronic low quality sleep quality is associated with absenteeism and accidents at work and school, lower vitality, a decrease in social and daytime functioning, mental, and physical health, and a generally lower quality of life (Dudo et al., 2022; Howell et al., 2008; Lund et al., 2010). Additionally, research has established a solid relationship between symptoms of depression and anxiety and low sleep quality (Dudo et al., 2022; Lund et al., 2010). In fact, low-quality sleep may facilitate the maintenance of depressive and anxiety disorders (Ohayon & Roth, 2003). Moreover, a study by Dudo et al. (2022) reports a 7% prevalence of depression in students with good sleep quality versus a 77% prevalence of depression in students with poor sleep quality. This issue is highlighted further when considering that 25% of students sleep less than 6.5 hours a night, with a mean student sleep time per night of 7.02 (Dudo et al., 2022). Given that the established ideal amount of sleep per night is approximately 8 hours, based on the average amount required for young adults to function properly (Hirshkowitz et al., 2015; Roehrs et al., 1996), this may be considered

problematic. TGNC student's levels of sleep problems, anxiety, and depression are yet significantly higher than those of cisgendered students as Wang et al. (2020) report. Further, Eom et al. (2022) report that TGNC persons sleep quality is drastically negatively impacted by discrimination and that they often experience more of the negative consequences of poor sleep quality as it interacts with stress in their daily lives.

The current Study

The purpose of the current study is to examine TGNC students' mental health compared to their cisgender counterparts. Despite the increase in research that is sensitive to gender diverse identities, there still exist major gaps in the literature (Matsuno & Budge, 2017). The increase in research dealing with TGNC and gender diverse identities in recent years is a promising trend. However, the field is still at an early stage of constantly changing definitions, approaches, and findings (Matsuno & Budge, 2017). One such gap exists in the exploration of the relationships between depression, anxiety, and sleep. For TGNC student populations these relationships are solemnly explored, despite the prevalence of symptoms being unusually high within them (Beiter et al., 2015; Matsuno & Budge, 2017). This is problematic, as a solid understanding of risk factors and their influence on mental health is crucial to help this exceptionally vulnerable population (Silva et al., 2023; Wang et al., 2021). This study is intended to help close these gaps in the literature.

The current study aims to examine whether the associations between anxiety and depression to sleep are stronger for TGNC students compared to cisgender students. In order to examine this, there are two central research questions. First, are there differences in sleep quality, anxiety, and depression between cisgender and TGNC students? The corresponding hypotheses are:

H₁: TGNC students report lower sleep quality than cisgendered students.

H₂: TGNC students report higher levels of depression than cisgendered students.

H₃: TGNC students report higher levels of anxiety than cisgendered students.

Second, are the relationships between anxiety and depression to sleep quality more pronounced for TGNC students compared to cisgender ones? The related hypotheses are:

H₄: There is a stronger association between depression and sleep quality for TGNC students compared to cisgender students.

H₅: There is a stronger association between anxiety and sleep quality for TGNC students compared to cisgender students.

Methods

Design

The study used a between subject design. Participants were recruited using convenience sampling. To answer the first research question, gender identity (cisgender vs TGNC) functions as the independent variable and depression levels, anxiety levels, and sleep quality as the dependent variables. To answer the second research question, depression and anxiety levels are regarded as the independent variables, sleep as the dependent, and gender identity as the moderator variable.

Participants

Participants were invited through JS&V Exaltio, a local queer youth association, and Sona, the University of Twente's test subject pool. If recruited through Sona, participants could earn 0.25 Sona credits.

In order to be eligible to partake, participants had to meet the inclusion criteria of being enrolled in a higher education program at the time of the study, be proficient in English, be over 18 years old, and agreeing to report their gender identity.

The study used a convenience sample of N=194 (145 cisgender, 49 TGNC, $M_{\text{age}}=20.88$, $SD=2.34$) between the ages of 18 and 32.

Participants were 29.9% Dutch, 54.6% German, and 15.5% from other countries. Of

the participants, 76.8% were bachelor students, 7.7% were master students, and 15.5% were enrolled in a polytechnic university. Lastly, 29.9% had one or more previously diagnosed mental condition.

Materials

The study was conducted within the Qualtrics survey online environment. Six ad hoc items and three questionnaires were used to assess the dependent and independent variables. The ad hoc items were age, gender, study program, pre-existing mental health condition, and hours of sleep per night.

To indicate their gender identity, participants could select ‘Cisgender’, ‘Transgender’, ‘Non-Binary’, ‘Agender’, ‘Genderfluid’, and ‘Other’ in which case they were asked to specify. Participant responses were summarised as *cisgender and TGNC* as the latter acts as an umbrella term for all gender diverse identities.

The Generalised Anxiety Disorder – 7 (GAD-7) (Appendix A) was used to assess students’ anxiety levels. The GAD-7 is a seven-item self-report measure, designed to assess generalised anxiety disorder in participants, based on the DSM-5 diagnostic criteria for generalised anxiety disorder (Spitzer et al., 2006). Participants answer all items according to a four-point Likert type scale based on their experiences in the previous two weeks. The options are not at all, several days, more than half the days, and nearly every day. Participants receive 0, 1, 2, and 3 points respectively. These are summed to indicate the anxiety levels of participants, ranging from 0 to 21. Scores 0-4 indicate minimal anxiety, 5-9 indicate mild anxiety, 10-14 indicate moderate anxiety, and scores greater than 15 indicate severe anxiety (Spitzer et al., 2006). The GAD-7 has an optimised sensitivity of 89%, a specificity of 82%, and an excellent internal consistency with an α of 0.92 (Borgogna et al., 2021; Spitzer et al., 2006) and has been validated in both student and LGBTQ+ populations which makes it ideal to use in this study (Borgogna et al., 2021; Wang et al., 2021).

To assess students' depression levels, the Patient Health Questionnaire (PHQ-9) (Appendix B) was used. The PHQ-9 is a nine-item self-report measure designed to assess depression, based on the nine DSM-5 diagnostic criteria items for major depressive disorder (Manea et al., 2015). Participants answer all items according to a four-point Likert type scale based on their experiences in the previous two weeks. The options are not at all, several days, more than half the days, and nearly every day. Participants receive 0, 1, 2, and 3 points respectively. These are summed to indicate the depression levels of participants, ranging from 0 to 27. Scores 0-4 indicate minimal depression, 5-9 indicate mild depression, 10-14 indicate moderate depression, 15-19 indicate moderately severe depression, and scores greater than 20 indicate severe depression (Manea et al., 2015). The PHQ-9 has a sensitivity of 77%, a specificity of 85%, and a good internal consistency with an α of 0.85 (Borgogna et al., 2021; Manea et al., 2015). Lastly it has been validated in both student and LGBTQ+ populations (Borgogna et al., 2021; Tan et al., 2022; Wang et al., 2021), making it ideal to use in this study.

Students' sleep quality was assessed through the Sleep Quality Scale (SQS) (Appendix C). The SQS is a 28-item self-report measure designed to assess sleep quality (Yi et al., 2006). The subscales used to assess sleep quality are daytime dysfunction, restoration after sleep, difficulty in falling asleep, difficulty in getting up, satisfaction with sleep, difficulty in maintaining sleep (Shahid et al., 2011; Yi et al., 2006). Participants answer all items according to a four-point Likert type scale based on their experiences in the previous one month. The options are none or 1-3 times a month, sometimes: 1-2 times a week, often: 3-5 times a week, and almost always: 6-7 times a week. Participants receive 0, 1, 2, and 3 points respectively. The scores are summed to indicate the sleep quality of participants, ranging from 0 to 84, a higher score indicating a poorer sleep quality (Yi et al., 2009). It has an excellent internal consistency with a Cronbach α of 0.92 and a good test-retest reliability

score of 0.81 (Howell et al., 2008; Shahid et al., 2011; Yi et al., 2006). It has been tested and validated in a student sample, meaning it is appropriate to use in this study (Howell et al., 2008).

Procedure

The ethical approval (request # 221200) was provided by the ethics committee/domain humanities and social sciences of the Faculty of Behavioural, Management and Social Sciences at the University of Twente.

Students were invited to participate in this study based on their voluntary informed consent. Participants were then tasked with providing demographic information (age, country of birth, level of study, gender identity, and mental health history). Afterwards, participants were asked to fill out the GAD-7, the PHQ-9, and the SQS. The order in which they were presented with these questionnaires was randomised to avoid a survey fatigue effect. The SQS had one ad hoc item added to know participants average sleep hours per night. After filling out the last questionnaire the survey ended. Participants from the University of Twente could earn 0.25 Sona credits for participating. Other participants were not rewarded for their participation.

Statistical analysis

The data used were the survey results which were downloaded directly from Qualtrics. All analysis of data was processed using SPSS. Participants that did not meet the inclusion criteria and participants that did not answer all questions were excluded from the data. The survey was completed by 204 participants, all of which fulfilled the inclusion criteria. Ten participants completed the survey in under three minutes and were removed as this was considered too little time to properly complete the survey. The final sample consisted of 194 participants. To answer the first research question, group means and

correlations between study variables were calculated, and three univariate analyses of variance conducted. The independent variable was gender identity, the dependent variables were depression levels, anxiety levels, and sleep. To answer the second research question, two moderation analyses through linear regression were conducted. Depression and anxiety levels acted as independent variables, sleep as the dependent variable, and gender identity as a moderator.

Results

Descriptive Statistics

The group mean scores of the GAD-7 (anxiety), PHQ-9 (depression), SQS (sleep quality), hours of sleep per night (Sleep H), and age between cisgender and TGNC participants can be appreciated in Table 1. To note here is that the average scores for all groups for depression and anxiety are close to, or above clinical diagnostic cut-off scores for conditions (Manea et al., 2015; Spitzer et al., 2006).

Table 1*Means per Test per Gender.*

Test	Total (N = 194)		Cisgender (N = 145)		TGNC (N = 49)		ANOVA	
	Mean	SD	Mean	SD	Mean	SD	F-value*	p
Anxiety	9.04	5.50	8.88	5.44	9.48	5.73	0.600	0.511
Depression	10.22	6.28	9.68	6.10	11.79	6.62	2.106	0.042
Sleep quality	35.94	13.70	35.42	13.55	37.48	14.17	2.062	0.364
Sleep H	6.93	1.344	7.00	1.348	6.71	1.323	-0.287	0.196
Age	20.88	2.344	20.83	2.274	21.01	2.562	0.193	0.620

* *Effect of Gender (reference group = cisgender students)*

Gender Identity shows a significant correlation with depression and pre-existing mental health condition. Anxiety, depression, and sleep quality scores are all significantly correlated with each other, hours of sleep per night (Sleep H), and a pre-existing mental health condition (Condition). Only anxiety, depression, and sleep quality correlate strongly, all other significant correlations are small. Table 2 summarises all correlations and p-values.

Table 2*Correlations between the main variables.*

		Anxiety	Depression	Sleep Quality	Gender	Sleep H	Condition
Anxiety	Correlation	1					
	Sig.						
Depression	Correlation	.777	1				
	Sig.	<.001					
Sleep Quality	Correlation	.668	.702	1			
	Sig.	<.001	<.001				
Gender	Correlation	.047	.146	.066	1		
	Sig.	.511	.042	.364			
Sleep H	Correlation	-.230	-.258	-.373	-.093	1	
	Sig.	.001	<.001	<.001	.196		
Condition	Correlation	-.266	-.352	-.309	-.190	.058	1
	Sig.	<.001	<.001	<.001	.008	.423	
Age	Correlation	-.169	-.196	-.131	.036	.137	-.116
	Sig.	.019	.006	.069	.620	.058	.106

Statistical Analysis

There was no statistically significant difference between genders in sleep quality and anxiety. Therefore, hypotheses one and three were rejected. Hypothesis two was confirmed because the difference between cisgender and TGNC students on depression was significant at the $\alpha \leq 0.05$ level.

The fourth and fifth hypotheses were assessed using a moderation analysis through linear regression. A summary of the results relating to H₄ and H₅ can be found in Tables 3 and 4, as well as Figures 1 and 2. Both hypothesis four and five must be rejected as the associations from anxiety and depression to sleep quality were not more pronounced for TGNC students. Neither interaction effect was statistically significant at the $\alpha \leq 0.05$ level.

Table 3

Interaction effect of depression with gender on sleep (reference group = cisgender students).

Variable	F-value	p
Depression	1.390	<.001
Gender	-1.298	.435
Gender × Depression	.740	.642

Table 4

Interaction effect of anxiety with gender on sleep (reference group = cisgender students).

Variable	F-value	p
Anxiety	1.356	<.001
Gender	.999	.557
Gender × Anxiety	1.310	.432

Figure 1

The interaction effect between gender and depression on sleep quality.

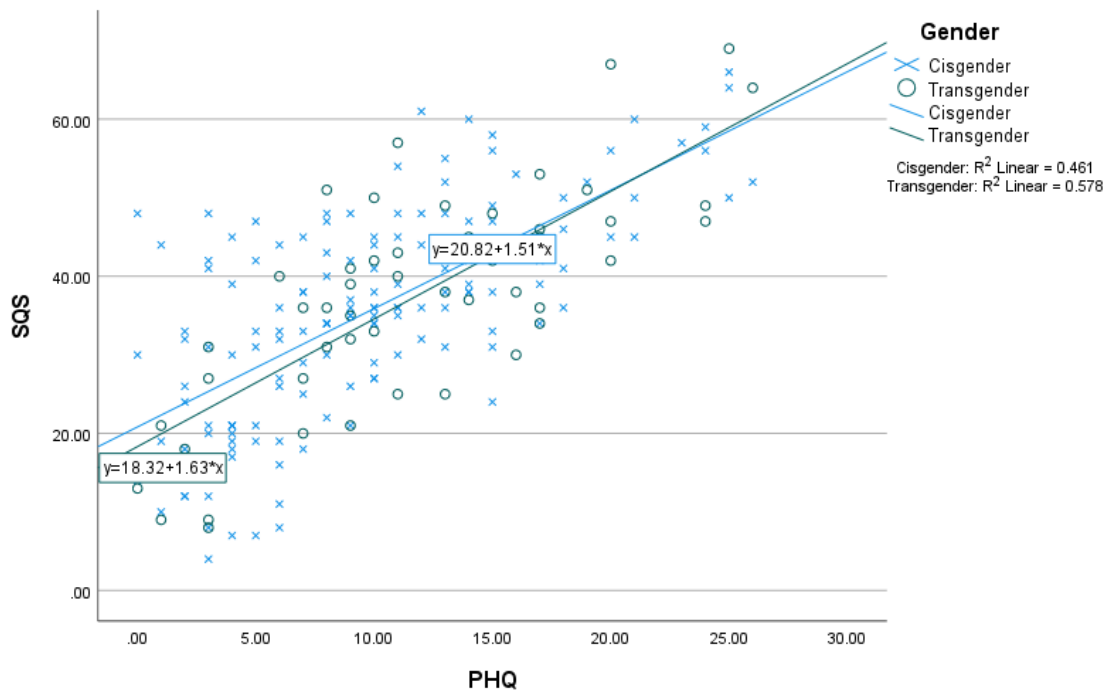
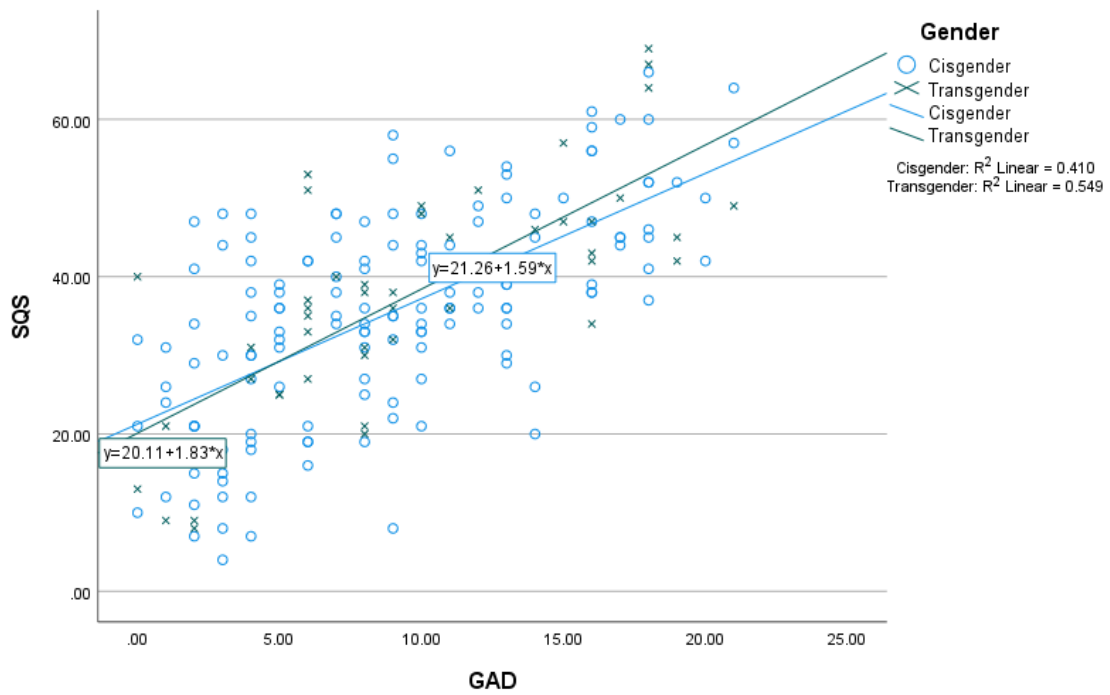


Figure 2

The interaction effect between gender and anxiety on sleep quality.



Discussion

The purpose of the study was to explore TGNC student mental health. A central goal was to contribute to LGBTQ+ and gender sensitive research. The central research goal to the study was to explore whether and in what ways gender identity influences the relationship between anxiety and depression with sleep in students. As hypothesised in H₂, TGNC students do report higher levels of symptoms of depression than cisgender students. This converges with the expectations raised by the discussed literature, however, not to the expected extent. Hypotheses one and three could not be confirmed based on the results as participants did not differ in terms of reported sleep quality or anxiety. Hypotheses four and five could also not be confirmed as gender identity did not demonstrate a clear moderating function.

To explain the results of the present study, multiple factors must be considered. The first consideration in explaining the results is social desirability bias. It denotes the tendency of research participants to give responses that align with their perception of societal values and norms, rather than a response that reflects their actual attitude towards a topic (Grimm, 2010). Such a bias is often elicited when participants are asked about issues that have a strong social stigma, such as cheating, environmental preservation, or drug use (Grimm, 2010). Hetero-cis-normativity and the minority stress model in connection with social desirability bias may offer an insight into the results. Hetero-cis-normative assumptions about gender and society perpetuate a social environment wherein LGBTQ+ persons encounter persistent negative and or dismissive stigma towards their self-expression and lifestyle as they are connected to being LGBTQ+ (Schilt & Westbrook, 2009; Worthen, 2020). This likely introduces a major, persistent source of stress as TGNC self-expression defies multiple domains of hetero-cis-normativity (Brady et al., 2022; Lindquist et al., 2017; Schilt & Westbrook, 2009; Worthen, 2020). As a result, TGNC people may attempt to present

themselves more favourably, both consciously and unconsciously. In the current study, TGNC persons were specifically invited to participate. Further, gender identity being a central concept to the research was information public to all those the study was advertised to. Thus, it is not unreasonable to assume that TGNC persons may have given more socially desirable answers to the questionnaires used which may have led to inaccuracies in responses. Future research investigating such minority and hetero-cis-normativity diverging populations should include measures of social desirability bias to account for a possible effect resulting from it.

The second consideration is that TGNC participants do not experience minority stress to the expected extent, thus their mental health is better than expected. The literature raised strong expectations that TGNC persons would report significantly worse mental health than cisgender participants (Borgogna et al., 2021; Budge et al., 2013; Chan et al., 2022; Kerr et al., 2013; Kosciw et al., 2015; Lindquist et al., 2017; Schilt & Westbrook, 2009; Tan et al., 2022; Wang et al., 2021). However, these expectations were not met as both groups scored similar or the same across the main measures. A central theory that underlies these expectations is hetero-cis-normativity and the minority stress model (Lindquist et al., 2017; Schilt & Westbrook, 2009; Worthen, 2020). This is important as highly educated, young, Dutch people may, in general, be exceedingly accepting and supportive of LGBTQ+ lifestyles and TGNC persons. Both young persons (18 – 29) and those with higher levels of education consistently report higher levels of tolerance and acceptance of LGBTQ+ people (Pew Research Center, 2020). The Netherlands specifically is an exceptionally progressive country in terms of LGBTQ+ acceptance and rights and is persistently reported to be one of the highest scoring countries in regard to this (European Commission, 2019; Flores, 2019). Exemplary for this, in connection to TGNC acceptance and rights, is that 82% of Dutch people support the freedom for transgender persons to legally change their gender to their

desired one and that 61% support the addition of a third legal gender for gender non-conforming persons according to the Eurobarometer on Discrimination by the European Commission (2019). While the current sample reports much less pronounced and non-existent differences between cisgender and TGNC persons in terms of mental health than in comparative data from Borgogna et al. (2021), such factors must be considered substantial in their potential influence on the results. The sample used by Borgogna et al. (2021) consisted of university students from 60 different universities across the USA and Canada. While Canada may be considered as similarly socially accepting of LGBTQ+ and TGNC persons, the USA cannot (Flores, 2019). Thus, given the significantly more accepting environment that TGNC persons may encounter in Dutch universities and the resulting lesser experience of minority stress, their mental health is likely more similar to that of cisgender students.

The final consideration connects to the previous point raised as it pertains to the current sample specifically and local LGBTQ+ and TGNC acceptance. There is a clear promotion of LGBTQ+ acceptance in Enschede and the UT. As a result, it may be the case that TGNC persons do not experience minority stress to the same extent reported in the literature (Budge et al., 2020; Chan et al., 2022). Hetero-cis-normativity and minority stress are amongst the main driving factors of TGNC persons mental health being reportedly worse than their cisgender counterparts (Budge et al., 2020; Worthen, 2020). Therefore, when their impact is reduced through LGBTQ+ acceptance and representation, their negative influence may be reduced (Budge et al., 2020; Chan et al., 2022; Worthen, 2020). In fact, Eom et al. (2022) report a clear positive relationship between TGNC discrimination and sleeping problems. As TGNC participants of the current study did not differ from cisgender participants in terms of sleep quality, it is likely that they experienced less discrimination and or that the validation of their identity through the various mentioned campaigns diminished the extent to which discrimination was experienced (Budge et al., 2020; Eom et al., 2022).

Examples of local inclusion efforts are multiple pride organisations (Th!nk with Pride, J&SV Exaltio) and LGBTQ+ spaces (Tankstation, Spacebar, Stonewall) at the UT and in Enschede. The UT runs regular diversity inclusion and acceptance campaigns such as ‘Diversity Week’, ‘Movie with Pride’, TGNC support groups, and many recurring events to promote and highlight LGBTQ+ works (Universiteit Twente, 2023) while the city of Enschede hosts their own annual pride week. Because participants were recruited through the UT’s Sona programme and J&SV Exaltio it is highly likely that these campaigns had a positive influence on the TGNC participants from the current study specifically. This would both underline the outstanding importance of inclusion campaigns and representation of the LGBTQ+ community and highlight Enschede and the UT as excellent examples for such. Based on this, future research should examine the role of local LGBTQ+ representation and initiatives by universities on the mental health of TGNC students.

Limitations

First, the chosen measurement instruments present a significant strength of the study. The study had a very low rate of non-completion, meaning participants that started the study almost certainly finished it as well. This may be credited to the measures chosen. Brief measures were specifically sought for data collection for two reasons. One, brief measures allow research to explore multiple factors without risking response fatigue (Borgogna et al., 2021; Spitzer et al., 2006), and two, they are often as valid and reliable as lengthy measures (Shahid et al., 2011; Yi et al., 2009). Moreover, the measures chosen made available good normative data to allow comparison with, and validation of the current sample. Measures such as the Gender Minority Stress and Resilience Measure (Testa et al., 2015) were not viable due to their length. However, future research would likely benefit from assessing minority stress specifically in TGNC populations to investigate its potential moderating effect, similar to the current study. Specifically, comparing various Dutch universities

regarding the minority stress experience of TGNC students would likely be a worthwhile research undertaking. Knowledge about the potential impact of inclusion campaigns from this angle may significantly enrich knowledge about and efforts regarding inclusion and diversity.

Second, while the final sample used in the present study consisted of significantly more cisgender than TGNC participants, both the overall sample size and the TGNC proportion are notable. TGNC persons make up around 2% of the population (Ipsos, 2021) while making up 25% of the current sample. It was crucial for the viability of the study to recruit a large enough TGNC persons sample to draw any meaningful conclusions from comparing groups. Given the significant number of TGNC participants recruited, this was another resounding success. Future research would, however, likely benefit from further differentiating between participants gender identities to gain a more detailed understanding of student mental health, such as Borgogna et al. (2021) who differentiate between cisgender men and women, trans men and women, and non-binary persons. This was not viable in the current study as the sample was not large enough to draw meaningful inferences from the data, nor was it in line with the goal of comparing cisgender with TGNC identities laid out in the beginning.

Finally, and in connection to this, the current study is unique through its approach to gender and gender identity. The majority of research, past and present, perpetuates hetero-cis-normative assumptions about gender and sex (Matsuno & Budge, 2017; Schilt & Westbrook, 2009). This study took radical steps to break this norm. Choosing to not differentiate participants based on sex characteristics, but instead purely based on their indicated gender identity, was critical to advance the understanding and acceptance of TGNC focused research. In light of this, the results may be considered positively unexpected as TGNC persons report similar depression and the same anxiety and sleep quality as cisgender people, rather than the significantly higher scores that were expected. While H_2 : TGNC students

report higher levels of depression, could be confirmed, all other hypotheses could not. Thus, in the current sample, gender identity did not demonstrate a clear and consistent involvement in the mental health status of students. However, in terms of exploring the role of gender identity in student mental health, the study remains a success. The insights achieved contribute to the growing literature on TGNC and LGBTQ+ issues and advance the field. An important take away for future research in any field may be that offering the option to indicate one's gender identity freely enriches research. Providing participants, and the larger science community, with research inclusive of everyone must be beneficial to make research both relevant and applicable to everyone.

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Appendix A

GAD-7

Over the last 2 weeks, how often have you been bothered by the following problems?

Not at all – Several days – More than half the days – Nearly every day (0-3)

1. Feeling nervous, anxious, or on edge
2. Not being able to stop or control worrying
3. Worrying too much about different things
4. Trouble relaxing
5. Being so restless that its hard to sit still
6. Becoming easily annoyed or irritable
7. Feeling afraid as if something awful might happen

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all Somewhat difficult Very difficult Extremely difficult

Appendix B

PHQ-9

Over the last 2 weeks, how often have you been bothered by any of the following problems?

Not at all – Several days – More than half the days – Nearly every day (0-3)

1. Little interest or pleasure in doing things
2. Feeling down, depressed, or hopeless
3. Trouble falling or staying asleep, or sleeping too much
4. Feeling tired or having little energy
5. Poor appetite or overeating

6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down
7. Trouble concentrating on things, such as reading the newspaper or watching television
8. Moving or speaking so slowly that other people could have noticed? Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual
9. Thoughts that you would be better off dead or of hurting yourself in some way

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all Somewhat difficult Very difficult Extremely difficult

Appendix C

SQS

The following survey is to know the quality of sleep you had for the last one month.

Read the questions and check the closest answer.

Rarely: None or 1-3 times a month – Sometimes: 1-2 times a week – Often: 3-5 times a week
– Almost always: 6-7 times a week (0-3)

® = scoring is reversed

1. I have difficulty falling asleep
2. I fall into a deep sleep ®
3. I wake up while sleeping
4. I have difficulty getting back to sleep once I wake up in the middle of the night
5. I wake up easily because of noise
6. I toss and turn
7. I never go back to sleep after awakening during sleep

8. I feel refreshed after sleep ®
9. I feel unlikely to sleep again after sleep ®
10. Poor sleep gives me headaches
11. Poor sleep makes me irritated
12. I would like to sleep more after waking up
13. My sleep hours are enough ®
14. Poor sleep makes me lose my appetite
15. Poor sleep makes it hard for me to think
16. I feel vigorous after sleep ®
17. Poor sleep makes me lose interest in work or others
18. My fatigue is relieved after sleep ®
19. Poor sleep causes me to make mistakes at work
20. I am satisfied with my sleep ®
21. Poor sleep makes me forget things more easily
22. Poor sleep makes it harder to concentrate at work
23. Sleepiness interferes with my daily life
24. Poor sleep makes me lose desire in all things
25. I have difficulty getting out of bed
26. Poor sleep makes me easily tired at work
27. I have a clear head after sleep ®
28. Poor sleep makes my life painful