School of Health, Care and Social Welfare

MENTAL HEALTH PROBLEMS IN A SWEDISH LGBTI POPULATION AND THE SOCIAL DETERMINANTS OF HEALTH

Differences in depressive symptoms and its relations to sociodemographic factors

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ABSTRACT

The aim of this study was to investigate potential mental health disparities in terms of self-rated depressive symptoms in between groups of LGBTI populations in Sweden and whether age, household income and long-standing illness could explain the possible differences. METHOD: A quantitative study with cross-sectional design was performed among the participants of the EU-LGBTI-II study (n = 2502) in a non-probability sample. Depression symptoms were measured by “Have you been feeling downhearted or depressed over the last two weeks?” and dichotomized into “depressive symptoms” and “no depressive symptoms” through the sample median value. A multivariable logistic regression analysis was performed, adjusting for household income, age and chronic illness. RESULTS: Prevalence of depressive symptoms was highest among trans (59.8%) and intersex individuals (58.3%) and lowest among gay (30.8%). Associations between sociodemographic factors and both LGBTI subgroups and depressive symptoms were also found. In the model, odds of having depressive symptoms were higher in Trans and Intersex (OR=1.76, 95CI 1.32-2.34) and lower in Gay individuals (OR=0.75, CI 0.57-0.99) as compared to lesbians (reference group). There was no statistically significant difference in depressive symptoms between bisexuals and lesbians. DISCUSSION: Depressive symptoms were more common among trans and intersex people. The results are mostly aligned with previous research of LGBTI mental health.

Keywords: Depression, LGBTI, Intersectionality, Minority stress, Public Health, Sweden

CONTENTS

1 INTRODUCTION

The present master thesis project in public health sciences aimed to work with mental health and sociodemographic variables of respondents from Sweden within a large-scale survey implemented by the European Union Agency for Fundamental Rights [FRA] in 2019, the EU-LGBTI-II Survey (FRA, 2021).

First, it is necessary to define the LGBTI acronym. LGBTI stands for "Lesbian, Gay, Bisexual, Transexual and Intersex" (FRA, 2020a), and it represents sexual orientations that are non-heterosexual, gender identities that differ from the sex assigned at birth, and sexual characteristics (chromosomal, physiological and hormonal) that do not correspond to the binary male and female as the case of trans and intersex, respectively. In this study, "sexual and gender minorities" will serve as a synonym to LGBTI.

Several authors cited in this master thesis use different combinations of the acronyms for sexual and gender minorities due their different population sample characteristics, therefore, "LGB", "LGBT" or "LGBTI" might refer to different segments of the total population. In fact, there is a great variety of terms used in different science fields, and there is not a consensus of which specific acronym best describes the whole sexual and gender minority population, instead it depends on the research goals and which terms are currently being used by the community (Thelwall et al. 2022).

This topic has not been exactly covered along the Public Health Master course – it was mostly the author's interest and in the horizon from his previous related readings, such as theoretical discussions about gender, intersectionality, and health (Butler, 2014; Preciado, 2018; Crenshaw, 1989). However, health inequalities in general and the social determinants of health were consistently brought up as a public health concern during the whole master education (Dahlgren & Whitehead, 1991). From his psychological sciences background, general health inequalities were briefly studied back then (Barata, 2009), but only during the current author's public health master and while searching for a topic that would encompass his previous interests with public health is it that this subject became a promising study field. It is relevant to say that, the author himself is driven to research with this minority group since he also identifies as belonging to the sexual and gender minorities.

As will be discussed in the background, health disparities among sexual and gender minority groups are of big relevance to public health sciences (Bränström, 2013). Historically pathologized, stigmatized, and studied only under the prism of some specific infectious diseases, researchers in the twenty first century started to draw their attention more integrally to this population after the increase in their social representation (Bränström, 2013). Back then, one of these first topics of study was mental health (Meyer, 2003).

2 BACKGROUND

Inequities in health are a big issue that have been addressed by public health experts and researchers (Whitehead & Dahlgren, 2006; Marmot, 2015). Health disparity, as coined in the US in the 90's, "was intended to denote a specific kind of health differences among some groups of people", this is to say, "worse health among socially disadvantaged people, members of disadvantaged racial/ethnic groups and economically disadvantaged people within racial/ethnic groups" (Braveman, 2014, p.6) which stresses that not all health differences are health disparities. Another definition provided by Braveman et al. (2011) is that health disparities are "systematic, plausible avoidable health differences according to race/ethnicity, skin color, religion, or nationality; socioeconomic resources or position; gender, sexual orientation, gender identity; age, geography, disability, illness, political or other affiliation or other characteristics associated with discrimination or marginalization" (Braveman et al., 2011, p. 150). Health equity, on the other hand, "is the principle underlying a commitment to reduce – and, ultimately, eliminate – disparities in health and its determinants, including social determinants" (Braveman, 2014, p.6). Whitehead & Dahlgren (2006) pose three distinguishing features to social inequities in health: they are systematic, socially produced (and therefore modifiable) and unfair. They are directly or indirectly generated by social, economic, and environmental factors and structurally influenced lifestyles, and therefore amenable to change (Whitehead & Dahlgren, 2006). In the present master thesis, health disparities and health inequities will be used as synonyms.

The LGBT population, from all social minority groups subjected to experience inequalities in health, have their demands addressed by public health policies and research only during the past years (Bränström & van der Star, 2016). They were covered since the HIV/AIDS epidemic in the 1980s, which brought up visibility of LGBT as a group with specific health needs (Bränström & van der Star, 2013). LGBTI are a diverse group in terms of sociodemographic factors, such as ethnic, cultural, educational, income and the relevance of their sexual minority status in each one's life. Still, they all have similar experiences regarding stigma, discrimination, rejection, and threat of violence, regardless of their country or cultural background (Bränström & van der Star, 2013).

Research across Europe has shown that LGBTI individuals experience health inequalities in both physical and mental health, with LGB people reporting worse physical health compared to the general population (Zeeman et al, 2019). LGB have a higher risk at developing certain types of cancer at young age, and some conditions include musculoskeletal problems, arthritis, spinal problems, chronic fatigue syndrome, overweight, while gay men show a high incidence of long-term gastrointestinal problems and lesbians a higher rate of polycystic ovaries compared to women in general (Zeeman et al, 2019). There is also incipient research of trans and intersex health, which reports inequalities in accessing healthcare services and high rates of mental ill health, respectively (Zeeman et al, 2019).

Studies from north America and Europe presented that LGB individuals are significantly likelier to be diagnosed with major depression and several anxiety disorders compared to

heterosexual individuals, with LGB youths at greater risk of suicide (Bränström et al., 2016). These studies also show that general indices of health (self-rated health status, acute physical symptoms) and prevalence of specific health conditions (asthma, headaches, gastro-intestinal problems) are respectively poorer and worse among LGB individuals compared to heterosexuals (Bränström et al., 2016).

2.1 Theoretical Framework

To shed light to the latest research of mental ill health disparities among LGB individuals and heterosexuals, Meyer (2003) reconceptualized his earlier minority stress theory for gay men (Meyer, 1995) to offer a conceptual framework to lesbians, gays and bisexual individuals explaining how stigma, prejudice and discrimination create an environment that might lead people of stigmatized minorities to have higher chances of developing mental illnesses. He draws part of his arguments from different theories of both individual and social stress (Lazarus and Folkman,1984; Allport, 1954; Dohrenwend, 2000) and posits that "a minority stress model is inferred from several sociological and social psychological theories" (Meyer, 2003 p. 675).

Meyer's minority stress theory describes specific stress processes along a continuum that go from distal stressors or objective events and conditions (prejudice and victimization events, expectations of rejection and discrimination) to proximal personal, subjective processes (hiding and concealing, internalized homophobia) since the latter component relies on individual appraisals. Meyer also described ameliorating coping processes that consisted of personal (individual level) and group (group level) resilience resources that could be employed by minority individuals (Meyer, 2003; Meyer, 2015) and form the basis of some of the latest public mental health interventions for LGBTI populations (Goldbach et al., 2021). Bränström & van der Star (2016) also define the minority stress theory as "the excess stress that LGBT individuals experience compared with heterosexual individuals by virtue of their stigmatized sexual orientation or gender identity" (Bränström & van der Star, 2016). This theory, differently from what it limited itself in the beginning, is nowadays seen as accountable for disparities in both physical and mental health among the sexual minorities, and not only mental ill health (Lick, Durso & Johnson, 2013; Bränström et al., 2016).

An important theoretical construct for understanding inequalities in health and its relation to the social determinants of health is the socioecological model by Dahlgren & Whitehead (1991), mentioned in a report for the WHO. The model itself was designed to shed light on the health inequities that social groups and nations experience, like West and East Europe or industrialized versus non-industrialized countries, due to a divide of different socio-economic groups and privilege of some in detriment of others that can be translated in asymmetries in mortality and morbidity of the populations.

Finally, a recent field of research on the social determinants and vulnerabilities is that of intersectionality, which presents itself as an inspiring analytical framework for public health scientists, allowing them to identify inequalities more precisely, developing strategies and

ensuring results are relevant within specific communities (Bauer, 2014). Intersectionality can be understood as intersections between dimensions of social differences in sexual orientation, gender expression, age, sex characteristics, race, social class, for example, associated with social and cultural differences that people experience (Zeeman et al., 2019). People that already carry some markers of difference, like ethnic difference, functional disability, or having low social support might have increased marginalization when those markers associate or intersect with being LGBTI (Zeeman et al., 2019). First coined by the black feminist Kimberlé Crenshaw (1989), this term was used originally to highlight the way that race and gender were mistakenly treated as mutually exclusive categories, whereas in reality it was a completely different experience for the women of color that carried such markers. Literature further shows that there are some intersectional vulnerabilities among some LGBTI individuals, such as those living in rural areas, pertaining to an ethnic minority, lower income backgrounds and those in a political asylum or refugee condition (Zeeman et al., 2019).

2.2 Mental health, depression and depressive symptoms

According to the WHO (2021) depression is the leading cause of disability worldwide and a major contributor to the overall global burden of disease, affecting more women than men. Depression, together with anxiety, is in the category of common mental disorders, with the number of people with depression in 2015 estimated to be more than 300 million (WHO, 2017). It is also the major contributor to suicide deaths, which presents itself as another major public health concern (WHO, 2017). Some of the common symptoms of depression include sadness, loss of interest or pleasure, tiredness and lack of energy, poor concentration, disturbed sleep or appetite and low self-confidence (Grønli et al., 2022). In major depressive disorder, one of many depressive disorders, symptoms must be present during the same 2-week period, represent a change from previous functioning, and not be attributable to the physiological effects of a substance or to another medical condition (DSM V, 2013).

Some classic risk factors for depression include low socioeconomic status (Saraceno et al., 2005; Allen et al. 2014), being female in comparison to male (Kuehner, 2017), having a chronic disease (Lotfaliany et al., 2018) and old age depending on factors such as presence of chronic disease, low-income country residency and social isolation (Allen et al., 2014). The present study will not study depression as a medical diagnosis but use the scale of depressive symptoms in the EU-LGBTI-II survey (European Union Agency for Fundamental Rights [FRA], 2021) as an indicator of mental health problems among the LGBTI population. Therefore, mental health problems in the present master thesis can be read as a synonym of depressive symptoms.

2.3 LGBTI health research in Sweden

In a study based on a Swedish population, Bränström et al., (2016) examined physical health disparities between sexual minority individuals and the general population, showing significant disparities among adolescents and young adult groups and smaller disparities among adults and older LGB adults compared to heterosexuals, after adjusting for confounders, which was partially supported by the minority stress theory (Bränström et al., 2016). Representative studies of the Swedish population have already demonstrated that gay and bisexual men and bisexual women have twice as high a risk of mental ill health compared to heterosexuals (Forte, 2019). HIV is also much more common among gay and bisexual men, as well as tobacco usage among gay men and bisexual women, and use of cannabis by young gay and bisexual men and bisexual women when compared to heterosexuals (Forte, 2019).

There is a knowledge gap and a greater disparity in research among LGBTQ ("Q" stands for "queer", see Forte, 2019, for more detail) Swedish youth, due to their increased vulnerability if compared to older individuals of the same group, and with transgender and intersex groups (Forte, 2019). Regarding intersex individuals, further research is needed to understand the general health profile of the group and their experiences of accessing healthcare (Zeeman & Aranda, 2020). There are some additional recommendations of including LGBTQ in-depth studies of causes of increased risk of ill health in Sweden, since most of them are conducted in North America, along with LGBTQ categorization in national surveys in Sweden with questions pertaining to their health status (Forte, 2019).

In summary, we can see there are a lot of both physical and mental health inequities in LGBT groups when comparing to straight population across different countries, and that the study of this minority population in epidemiological studies is relatively new comparing to other health inequalities studied in the past. There are some research gaps among transexual and intersexual individuals, disparities in health among sexual minorities themselves, and some socioeconomic vulnerabilities that might increase the ill health of LGBTI groups when those social categories are juxtaposed. Most of the recent research has been done in US and some parts of Europe, but little it is known about the health condition of LGBTI groups in Sweden, and there is a need to have more research with this population.

3 AIMS AND STUDY QUESTIONS

The aim of this study is to investigate potential mental health disparities in terms of self-rated depressive symptoms in-between groups of LGBTI populations in Sweden and whether age, household income and long-standing illness could explain these differences in the outcome.

The specific study questions are:

1. Are there differences between LGBTI subgroups in Sweden in terms of depressive symptoms?

2. Does household income, age and long-standing illness have an association with depressive symptoms and with being LGBTI, respectively?

3. Are potential differences between LGBTI subgroups in terms of depressive symptoms explained by age, household income and by long-standing illnesses?

4 METHODS AND MATERIAL

The methodological approach for the current study was quantitative, empirical, and based on a large European web-administrative 2019 survey by the European Union Agency for Fundamental Rights (FRA, 2021), an agency of the European Union, which the author was granted the consent and approval for usage after formal request. This was the second version of the same web-survey of European LGBT population administered in 2012, with the addition of Intersex respondents and participants of 15 years old or more. Further, the rationale of this empirical thesis project followed the deductive logic since it was based on previous theories.

The sample subjects of the survey consisted of self-identified Lesbians, Bisexuals, Gays, Transgender, and Intersex individuals of at least 15 years old from the 27 European Union member states plus UK, North Macedonia and Serbia (FRA, 2020a). The uncleaned dataset of 141,621 responses was validated and edited in a cleaned form of 139,799 valid responses. The sampling method for the study was done through self-selected subjects that came across the survey through the awareness-raising campaign done by the FRA in partnership with other national organizations of each country, online dating apps and national pride events (FRA, 2020a).

In the present study, only data from Sweden was used. The targeted sample size – which was exceeded – is described in the official report of the study (FRA, 2020a, p. 62): 2,016 expected individuals for Sweden with a realized sample of 2,502 anonymous participants that fulfilled the purpose of the current master thesis.

The study design is cross-sectional, partly descriptive and partly analytical, due to the nature of the administered survey and some of our research questions, that test a possible relationship among variables.

4.1 Informed consent

Participation in the online survey was anonymous, voluntary and participants could leave the survey at any point based on their free will (FRA, 2020a). In the introduction to the online tool during the collection, subjects were told briefly about the importance of the survey and its purpose in relation to fundamental rights of European and LGBTI people. A privacy statement that assured the anonymity of the respondents, how the information would be handled, how it would be used in future, the legal basis for the collection and other strategical aspects were presented to the participants at this stage and available as an annex in the official report of the survey (FRA, 2020a, p. 114).

Consent for using the FRA LGBTI dataset (FRA, 2021) in the thesis study was granted from FRA and the GESIS Leibniz-Institut in June 2022 after the payment of a 30-Euro fee paid by the author. The GESIS Leibniz Institut is a German institute of social sciences where data was handled through the electronic filing of a data usage agreement form available at the GESIS webpage. Some of the conditions for the use of the information also included assuring confidentiality and anonymity, deleting the dataset after the study, and sending a copy of the final study materials to the GESIS institute.

4.2 Ethical considerations

There are some ethical challenges regarding the current study. Although a master student level thesis is not considered research in Sweden and, therefore exempted of passing through a national ethical committee, this study might still resemble standard research since it involves sensitive data of thousands of sexual minority European citizens from a relatively recent survey. Furthermore, within the framework of the present masters' degree, students are not permitted to collect data themselves from vulnerable subjects or about sensitive topics (such as mental health, sexual minorities, immigrants, asylum seekers, etc.). When using secondary data, however, such topics are allowed to be researched on the condition of having consent from both the owners of the data and the thesis supervisor and following the four ethical requirements specified by the Swedish Research Council (2017). The following ethical requirements were applied within the study: information assignment, consent, confidentiality and purpose.

During any study involving humans, risks and benefits must be assessed to carry out the research. For this study, such risks – as the potential deanonymization of participants and the damaging consequences from such acts – were carefully assessed against their potential benefits. Although mental health is a sensitive topic, the potential benefits from the results of this study far exceed their risks; results could be employed to improve health conditions of this population and contribute to the specific public health knowledge.

From the authors' perspective, handling and processing the dataset in the school servers implied in maintaining the participants' confidentiality and restricting the access to the data to only his thesis supervisor. All the results presented in this study were reported on a group level, without a possibility to identify the respondents and therefore assuring their

anonymity. Only variables relevant to the research questions were handled, and all the other variables were excluded in the beginning of the analysis, which ensures transparency in the purpose of the study. After the completion of the master thesis defense and any eventual necessity to check the dataset by the examiners, all received and processed information was permanently erased from the school servers.

4.3 Data protection

The present study was based on an online survey in which the author was not involved in the data collection. Some ethical criteria and protective conditions during the data collection and data storage reported by the Fundamental Rights Agency (2020a) included anonymizing all respondents, storing the respondent answers in computer systems with limited access by specific users and by protecting the respondent session using a SSL protocol / HTTPS with no option to access the survey in an unprotected insecure mode (FRA, 2020a).

The dataset was stored and handled on Mälardalen University servers during the degree project period. Analysis and information processing were carried out in university research labs with school equipment which possesses individual virtual hard drive disks available only to the respective student owner. This was done to ensure that the information would not be disclosed and due to GDPR (General Data Protection Regulation) regarding students' handling of sensitive personal information. All the information remained anonymized during the whole process of the study, including in this final version of the thesis where results are available only at group level. Only the author of the present study and its thesis supervisor had access to the full information contained in the dataset, as it was specified in the dataset user agreement of FRA/GESIS when requesting the data. Protection of login access and password to the computers and the dataset was also employed to assure further security.

4.4 Data collection

The survey was launched on Monday 27 May 2019 at 11:00 on Central European Time (CET) and was concluded on Monday 22 July 2019 at 19:04 CET (FRA, 2020a). This LGBTI dataset comprised of twelve sections, with a total of 120 questions, only two of them (TR and IX) specific for trans and intersex respondents. The last two questions (J section) were optional and were an open entry response. A summary of the whole questionnaire is:

A. Introduction and screening (16 questions);
TR. Questions specifically for trans respondents (9 questions);
IX. Questions specifically for intersex respondents (14 questions);
B. Public perception of increase or decrease in tolerance and violence (5 questions);
C. Discrimination (17 questions);
D. Safe environment (4 questions);
E. Physical/sexual attack (11 questions);
F. Harassment (12 questions);

G. Social context (2 questions);
H. Respondent background (24 questions);
I. Knowledge about the survey (4 questions);
J. Individual story (2 questions).

A thorough description of all survey questions is available elsewhere (FRA, 2020b). For the current degree project, the variables that were used are presented in sections A (Introduction and screening) and H (Respondent background), respectively. Participants living in Sweden were filtered using the variable A10 ("please select the country where you live") with code 27 (Sweden). A more detailed explanation of the used variables is described in the following section and in Appendix B.

4.5 Measures

The studied individual-level variables can be seen in detail below, along with their recoding process.

4.5.1 Depressive symptoms

The dependent variable or the outcome in the present study was depressive symptoms. In the survey, depressive symptoms were measured using a single question to all participants: "Have you been feeling downhearted or depressed over the last two weeks?" and possible responses along with the coded values in the dataset were: "all the time" (1), "most of the time" (2), "more than half of the time" (3), "less than half of the time" (4), "some of the time" (5), "at no time" (6) and "prefer not to say" (-888). There were no missing values, which means that all 2502 valid participants responded to this question. In order to make my research question feasible, I dichotomized the H19 variable and made a cutoff based on the median of the sample (value = 5), and the median itself was categorized as part of the lower part of the new recategorization. The new variable therefore was categorized as "depressive symptoms" (1) and "no depressive symptoms" (0). We will discuss in further details the recoding rationale along with the validity of the item measure itself.

4.5.2 LGBTI subgroups

Our independent variable for the study was the sexual and gender identity group, named "Respondent_Category" in the original dataset and used in the present work as "LGBTI subgroups". This variable had six different categories and all participants were assigned to only one of them: lesbian, gay, bisexual male, bisexual female, trans or intersex. According to the official report (FRA, 2020a), these categories were achieved based on the questions of section A (introduction and screening, specifically from A2, A4, A5 and A6). Trans category is an umbrella category that included the following names in the screening process: trans women, trans men, cross-dressing women, cross-dressing men, non-binary, genderqueer, gender fluid, agender, polygender and others (FRA, 2020a). Intersex are individuals born

with or who later developed sexual variances in terms of physical, hormonal and genetic features. These variations relate to a range of physical traits that lie outside the binary, medical or social norms of male and female (Zeeman & Aranda, 2020), showing ambiguity in terms of sex characteristics. It is important to stress that the categories of lesbian, gay and bisexual in this variable refer to cisgender individuals, whose sex assigned at birth is the same as their current gender identity, differently from the trans and intersex category. This variable, therefore, encompasses both sexual orientation identity and gender identity, considered minority in the average population.

Due to the scarce number of intersex individuals in the sample and in order to fit the independent variable to our logistic regression model, we recategorized the intersex and trans individuals into the same category, representing gender minority individuals. Bisexuals were also grouped into a single category, forming the categorical variable with 4 categories (Lesbian, Gay, Bisexual and Gender minority) for the last question.

4.5.3 Sociodemographic variables

Household income (H20) was taken as an indicator for socioeconomic status in the current study, and the following question was asked to all: “Thinking of your household’s total income, is your household able to make ends meet?”. The respective alternatives available were: “with great difficulty” (1), “with difficulty” (2), “with some difficulty” (3), “fairly easy” (4), “easily” (5), “very easily” (6), “Prefer not to say” (-888) and “Don’t know” (-999). The variable was recoded dichotomously as perceived household income and for the first three options it was ascribed the label “low/difficult” (1) and for the other following three “high/easy” (2). There was only one “prefer not to say”, which was coded as a missing value, and zero frequencies for “don’t know”.

Long-standing illness (H18) was asked to participants in the following way: “Do you have any long-standing illness or health problem?”. An info button displayed: “Long-standing means illness or health problems or which have lasted, or are expected to last, for 6 months or more”. The following options were: “Yes” (1), “No” (2), “Prefer not to say” (-888) and “Don’t know” (-999). The variable was recoded in the same values except for “prefer not to say” (5 cases) and “don’t know” (2 cases) that were ascribed as missing values.

Respondent’s age (A1) was asked as: “how old are you?” with a numerical value answer. If age input was less than 15, the survey terminated with a short farewell message. The participant’s age was coded nominally in the dataset as “15-17”, “18-24”, “25-29”, “30-34”, “35-39”, “40-44”, “45-49”, “50-54”, “55-59”, “60-64” and “65+”. Recoding was done in two categories, young age (15-24 years) and adult age (25-65+ years).

4.6 Method of analysis

Analyses were carried out with statistical methods in IBM Statistical Package for Social Sciences version 28. The sample was described using descriptive statistics such as measures of frequency and percentages for the categorical variables. Measures of association such as odds ratios and Pearson chi-square analyses were also employed. For all the statistical analyses, a significance level of .05 was used. For answering the first two research questions, Pearson's Chi-square tests were performed. The third and last question was answered with a binomial logistic regression analysis, first with a univariate then in a multivariate logistic model, controlling for the possible confounders discussed above (age, household income and long-standing illness).

5 RESULTS

5.1 General sample description

The Swedish sample consisted of a total of 2502 individuals. 76.1% (n = 1904) of the participants reported to be living in Sweden all their life, and 89.6% (n = 2242) reported to be citizens of the country. In residence type, 89.6% (n = 2243) lived in an urban area in comparison to a rural, 50.6% (n = 1265) were single in comparison to being in a relationship and 53% (n = 1325) had less than a university degree in comparison to those who had at least a bachelor's degree. Sample age ranged from 15 years to 65+ years old, and 62.1% (n = 1553) aged 34 years old or below. From the original respondent categories, sizes of subgroups from the biggest to the smallest was Gay (39.9%), Trans (25.3%), Lesbian (13.1%), Bisexual female (11.8%), Bisexual male (9%), and Intersex (1%) persons.

5.2 Differences in depressive symptoms among LGBTI individuals

For answering the first research question, if there were significant differences in depressive symptoms among LGBTI subgroups in Sweden, a Pearson chi-square test was performed (Table 1). Table 1 also shows numbers and proportions with and without depressive symptoms by their sexual and gender minority status (LGBTI). There was a significant association between being gay, lesbian, bisexual male, bisexual female, trans, or intersex and having or not having depressive symptoms with a moderate effect size.

From the results, we can see that the highest prevalence of depressive symptoms in the sample subgroups are for trans and intersex individuals, those of which had approximately the same proportion of people with depressive symptoms. Then we had bisexual female individuals, followed by bisexual males and lesbians, these two having approximately the

same proportions. From the sample, gays had the lowest prevalence of depressive symptoms among the subgroups.

Table 1 Cross-tabulation of LGBTI subgroups and having depressive symptoms.

LGBTI subgroups	Depressive symptoms		Total
	n	%	*n*
Lesbian	130	39.6	328
Gay	307	30.8	998
Bisexual Female	144	49.0	294
Bisexual Male	89	39.4	226
Trans	378	59.8	632
Intersex	14	58.3	24
Total	1062	42.4	2502

Note: Only frequencies and prevalence of those having depressive symptoms are shown in the table. Having and not having depressive symptoms was based on an ordered scale ("Have you been feeling downhearted or depressed in the past two weeks?") whose values were dichotomized for analysis. Association of depressive symptoms and LGBTI subgroups: $\chi 2(5) = 143.32$, $P < .001$ (with a moderate effect size, $V = .24$).

5.3 Association between household income, age, long-standing illness and depressive symptoms

For answering the first part of the second research question, if sociodemographic factors and long-standing illness had an association with depressive symptoms, Pearson chi-square tests were performed. For all the tested variables, a significant association was found (Table 2). Effect sizes measured with Cramer's V test showed that only household income had a moderate effect size with depressive symptoms and that although statistically significant, age and long-standing illness had a weak effect size with depressive symptoms.

From the results, we can see that young LGBTI had a higher prevalence of depressive symptoms (54%) if compared with the adult category. Those who reported that had difficulties in making ends meet, or that reported a lower household income, had a higher prevalence of depressive symptoms (64%) when compared to those who reported a higher household income. Finally, those in the sample that reported having a long-standing illness

or health problem had a higher prevalence of depressive symptoms (54%) when compared to those who did not reported having a long-standing illness.

Table 2 Cross-tabulation of sociodemographic characteristics and depressive symptoms

Sociodemographic characteristics	Depressive Symptoms	
	n	%
Age [*]		
Young	375	54.0
Adult	687	38.0
Household income [**]		
Low/difficult	454	63.7
High/easy	607	33.9
Long-standing illness or health problem [***]		
Yes	591	53.9
No	468	33.5

Note. Only frequencies and prevalence for depressive symptoms are shown in the table.

[*] Chi-square for the association between age and depressive symptoms. $\chi2(1) = 52.20$, $P < .001$, $V = .14$.
[**] Chi-square for the association between household income and depressive symptoms. $\chi2(1) = 184.40$, $P < .001$, $V = .27$.
[***] Chi-square for the association between long-standing illness and depressive symptoms. $\chi2(1) = 104.70$, $P < .001$, $V = .2$.

5.4 Association between household income, age, long-standing illness and LGBTI subgroups

In order to answer the second part of the second research question, Pearson chi-square tests were performed (Table 3). For this, the original respondent category variable was not employed, but the modified version with Gay, Lesbian, Bisexual (male and female) and gender minority individuals (trans and intersex) was used. From the results presented, there was a significant association between age, household income and long-standing illness with the respondent categories (Table 3).

Comparing the four subgroups, the gender minority (trans and intersex) had more young individuals (36%), were the subgroup which reported the lowest household income (42.4%) and also were the subgroup that had the highest number of individuals with long-standing illness (54.7%).

Respondent Category	Young Age*		Low Household Income**		Long-standing*** illness	
	n	%	*n*	%	*n*	%
Lesbian	75	22.9	78	23.8	151	46.3
Gay	224	22.4	193	19.3	330	33.1
Bisexuals	154	29.6	164	31.5	258	49.8
Gender Minority	242	36.9	278	42.4	358	54.7

Note. Gender minority comprises the categories of "intersex" and "transex" individuals.

* Chi-square for the association between age and respondent category. $\chi2(3) = 46.12$, $P < .001$, $V = .14$.

** Chi-square for the association between household income and respondent category. $\chi2(3) = 109.51$, $P < .001$, $V = .21$.

*** Chi-square for the association between long-standing illness and respondent category. $\chi2(3) = 85.74$, $P < .001$, $V = .18$.

5.5 Differences among LGBTI subgroups in depression symptoms predicted by sociodemographic factors and long-standing illness

A binomial logistic regression model was built in order to answer the last study question. The author's interest in using such a model was to assess if odds ratios in different LGBTI subgroups for having depressive symptoms would change drastically after adjusting for some of the classical risk factors for depression (chronic illness – measured in the study as long-standing illness, low household income and age). The steps of the model building were as follows. First, a simple logistic regression with only the respondent category as a predictor was performed to assess odds ratio as a "crude" model (described in Table 4). Then, multicollinearity was measured for the three predictors according to Field's (2018) instructions. Since SPSS does not produce collinearity diagnostics in logistic regression, the only way to check statistics of tolerance and VIF for the predictors is to run a linear regression using the same outcome and predictors (Field, 2018). VIF and tolerance values

were all acceptable and a more detailed inspection in the collinearity diagnostics also did not show further problems.

The next step was to run an initial hierarchical analysis to fit competing models and decide which one was the best according to the parsimony principle. Respondent category, household income, long-standing illness and age were added in each new block, and the model improved significantly after each predictor added. If one of the predictors would not further improve the model, Field (2018) suggests to keep the logistic regression as simple as it can be, which means to discard that predictor that did not improve the model.

Finally, the fit model was run with the following reference values that would facilitate the interpretation: for the four sexual and gender categories, lesbian was the reference group; in the household income, high/easy was the reference group; in long-standing illness, not having illness was the reference group; finally, adult age was the reference in the age variable (young vs adult).

Table 4 Univariate binomial logistic regression for the association between LGBTI subgroups and depressive symptoms.

	b	*Odds Ratio*	95% CI OR	
			LL	*UL*
Included				
Constant	-0.42			
Lesbian	0	1.00		
Gay*	-0.39	0.68	0.52	0.88
Bisexual**	0.21	1.24	0.93	1.64
Gender Minority***	0.82	2.26	1.72	2.96

Notes. Lesbian is the reference group. Gender minority comprises the categories “intersex” and “transex” individuals. R^2 = .04 (Hosmer-Lemeshow), .05 (Cox-Snell), .07 (Nagelkerke). Model $\chi 2$ (3) = 139.26, p <.001. *p = .003. **p = .138. ***p<.001. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

As shown in Table 4, the model with only one predictor (LGBTI subgroups) presents two statistically significant results from the three: “Gay” and “Gender minority”. The first interpretation we can make is that when compared to reference group (Lesbians), the Gay category has almost 30% lower odds of having depressive symptoms. In the other hand, the Gender Minority (trans and intersex) group shows odds of more than two times of having depressive symptoms when compared to the Lesbian group.

When we adjust the model for the covariates (Table 5), we can see that the values for the odds ratio differ slightly, with the Gay and Gender Minority categories still being statistically significant. What we see in the Gay category is a slight increase in the odds that get closer to one, but when compared to lesbians, they still have 25% lower odds of having depressive symptoms. In the last category, for Gender minority (trans and intersex), we see that the odds ratio is smaller than in the crude model but there is still 76% of more odds of the Gender minority having depressive symptoms when compared to the reference group.

In sum, after adjusting for the factors described above in the final model, there was a slight decrease in size of the odds ratio in both groups that were significantly different from the reference group in the univariate model. This leads to the conclusion that such factors had some confounding effect in the association between depressive symptoms and the LGBTI subgroups. Nevertheless, the adjusted results are still statistically significant and show disparities in the sexual and gender minority categories in terms of depression symptoms.

Table 5 Multivariate logistic regression for the association between LGBTI subgroups and depressive symptoms.

	b	*Odds Ratio*	95% CI OR	
			LL	*UL*
Included				
Constant	-1.16			
Lesbian	0	1.00		
Gay*	-0.28	0.75	0.57	0.99
Bisexual**	0.08	1.08	0.81	1.46
Gender Minority***	0.56	1.76	1.32	2.34

Notes. Lesbian is the reference group. Gender minority comprises the categories “intersex” and “transex” individuals. Multivariable refers to the model that was adjusted to the following covariates (not displayed in the table): household income, long-standing illness, and age. Covariates b’s and odds ratio for the additional predictors are available in the Appendix A. R^2 = .10 (Hosmer-Lemeshow), .14 (Cox-Snell), .18 (Nagelkerke). Model $\chi 2$ (6) = 366.40, p <.001. *p = .044. **p = .588. ***p<.001. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

6 DISCUSSION

This study aimed to investigate disparities in mental health problems among lesbian, gay, bisexual, transsexual and intersex individuals living in Sweden in terms of self-rated depressive symptoms. The study results indicate that when compared to lesbians, having depressive symptoms was more common among trans and intersex individuals and less common among gays. The studied sociodemographic factors were associated with both the LGBTI subgroups and depression symptoms, which added confidence that one should have adjusted for these factors in the regression analysis. Furthermore, the observed differences between the LGBTI subgroups in having depression symptoms were explained by the studied sociodemographic factors only to a small extent.

6.1 Quality criteria

It is necessary to address questions concerning the quality of the present study, what will be called quality criteria before the finding's discussion. Gerstman (2013) refers to the difference in epidemiological studies between parameters and estimates. The former comprises the error-free value of the epidemiologic measure and the latter describes an imperfect estimation of the parameter based on the data from the study, due to the impossibility to directly observe or calculate a given parameter in most of the time (Gerstman, 2013). As in all scientific studies, there are two types of measurement error that can be present: random and systematic error. Therefore, in a scientific result, one might see the estimates as a product of the parameter or "truth" and the presence of information or measurement bias and the random error (concerning the sampling method). Apart from these components, another factor that can also affect a result is the confounding or the extraneous variables that might be affecting the outcome or a given studied disease. The results found and presented in the previous chapter pertain to the scope of the sample gathered of a Swedish population. Now we will discuss each of these components in detail, along with the validity, reliability and generalizability of the results.

6.1.1 Study method

The present master thesis study employed a survey collected in a single point of time which characterizes a cross-sectional design. Different from an experimental design, such methods only study individuals under natural circumstances, and do not allow to manipulate independent variables (Gerstman, 2013). Questions associated with this type of design are that the independent and the dependent variables are measured at the same time, like a snapshot of the participant conditions, and no causal relationships can be inferred. Still, appraising the quality of a study as lower based on its design and if it is "cross-sectional" might be a common mistake among scholars (Savitz & Wellenius, 2023). Despite many caveats, such as reversed causality and the others mentioned above, cross-sectional designs might give a very good picture of prevalence, association and the etiology of an exposure with the disease (Savitz & Wellenius, 2023). In another words, it is unlikely to say by the study

design that the sexual and gender minority status might have a causal link to having depressive symptoms or, more broadly, being depressed, but this does not take away its relevant associative findings.

Other limitations in the method refer to the fact that the question measuring depression symptoms was not widely validated, posing some threats to the reliability of the study. Additionally, the small sample size of intersex individuals hindered us from contributing to some of the research gaps in the LGBTI literature in regards of this specific group.

6.1.2 Sample and data collection

As stated previously, this study was done based on an online sample of self-selected individuals that voluntarily participated in the survey, which means that this was a non-probability or non-randomized sampling process. This raises some methodological questions concerning the sample quality, specifically the generalizability of results beyond the population sample and its external validity. It is not possible, therefore, to generalize the findings to the whole population. Further, since there is no control over the selection process, we cannot assess the different levels of motivation and interest in participating in the survey and the proneness of some individuals in detriment to others to respond to the research. Since the present study was based on a survey, there is always some chance that the participants might not respond to all questions truthfully (Cresswell & Cresswell, 2018), but especially among the LGBTI population due to social stigma there is a high chance for participants to be more open about their sexuality and gender in a web-survey than in a face to face research (FRA, 2020a).

Additionally, since there are no official statistics on the number and the structure of the LGBTI population, the matching between the sample and the target population cannot be assessed, according to FRA (2020a). Despite this, efforts were made by the organization that applied the survey to bench-mark the respondent categories based on previous knowledge of prevalence of the target population, such as provided by the United Kingdom annual population survey (FRA, 2020a).

In general, the original sample with the 28 EU countries was similar to the Swedish sample in terms of participants' age. According to the official report, the total sample was predominantly young – 75% of respondents aged 34 years or below, in accordance with the previous cohort of the FRA LGBT survey. More than half of the Swedish respondents were also aged 34 or below. This might be since younger people are more active in the dating sites and social media that served as recruitment channels. According to FRA, the targeted sample size for people aged 55 years was not achieved in any of the LGBTI categories, which raises further concerns. Moreover, since this was an online anonymized survey, the location of the respondents in Sweden is not provided by the institution, and we cannot say if it is representative of all regions of the country. Finally, the fact that almost ninety percent of all Swedish respondents came from an urban area, also highlights the need of such research to address sexual and gender minorities that live in countryside settings.

6.1.3 Measurements in the study

The dependent variable was measured as “Have you been feeling downhearted or depressed over the last two weeks?”, and despite the initial claim that the present master study did not intend to study depression as a clinical condition or disease, there was not a single reference in the official report in terms of whether the item was validated as an indicator of depression or about what was the purpose of the question itself in the survey (FRA, 2020a).

A study by Miller et al. (2020) conducted a systematic review and a meta-analysis of common depression screening tools that are usually employed in primary care settings. These authors found evidence that ultrashort screening tools (1 or 2 questions) are valid as an accurate indicator of depression, such as was the case with the Yale single question scale, MDI-1 (Major depressive inventory 1), the single MHI-1 (Mental Health Inventory 1) and the Single PHQ-1 – Patient Health Questionnaire 1 (Miller et al., 2020). The Yale single question, developed in a context of internists to screen for depression among older adults (Lachs et al., 1980) also had a very similar statement with the EU-LGBTI-II survey “Do you often feel sad or depressed?” – except that its response consisted of a single yes or no – and is still used nowadays as a validated measure with different patient populations (Watkins et al., 2007, Avasarala et al., 2003). Notwithstanding, evidence shows that single item scales of unimodal constructs such as psychological dimensions, psychiatric states or diseases – especially depression, mood, and anxiety – can be as reliable as their multi-item counterparts (Verster et al., 2021), which might give some evidence for the validity of the measurement used in this study and, possibly but riskily, attribute the presence of depression from this measurement such as Ünsal et al. (2022) did when studying the same dataset.

With these questions in mind, in order to establish cutoffs for depressive symptoms that could facilitate the statistical analysis and the interpretations, and considering that the measurement was not validated as a scale as far the author knows, the median value of the sample for depressive symptoms was employed as a cutoff. This was done in accordance with another study that also dichotomized the depressive symptoms in the same survey for research purposes (Ioverno, 2023), since using the median as a cutoff for dichotomization seems to be a common practice among researchers despite that it can also produce many problems in general (MacCallum et al. 2002). However, some advocates of dichotomizing variables argue that depending on the research field, this decision may have a positive impact on predicting chances of the outcome happening or not based on risk factors. Farrington and Loeber (2000) argue that variables or scales, in cases such as criminology and psychiatry, are not interval variables and that differences between values do not imply either a metric (for example, “less than half of the time” does not necessarily mean twice as “some of the time” in the present case of depressive symptoms) or that those values are necessarily normally distributed in a population. Farrington and Loeber (2000) further add that as an advantage, dichotomizing simplifies the presentation of results and produces meaningful findings that are more easily understandable to a wider audience. Despite some caveats such as the loss of information, they stress the utility of dichotomizing and of measuring the strength of variables using odds ratios, how interaction effects can be studied in detail, and how a risk factor might vary according to the value of another variable. In sum, there are many possible problems after dichotomizing the dependent variable, especially in terms of loss of

information, but for a study master thesis this might give a clear image of the associations maintaining in mind the cons associated with it.

The independent variable, sexual and gender minority category or "Respondent Category" was used in the first research question as the original version from the dataset but recoded for the third question to increase the power of the statistical analysis and not leave any missing frequencies in the logistic regression cells, since the intersex category had a very low number of respondents (n = 24). The first downside of this decision is that the analysis for the intersex group as a single entity was lost, which was one of the intents of this study and a promising research gap. However, regrouping it with the trans category is still reasonable since both are considered a gender minority by most researchers and many experiences of people diagnosed with a disease of sex development (intersex) at birth, could change their assigned gender at birth later in life, then identifying mostly as trans (Zeeman & Aranda, 2020) which makes it difficult to create a clear boundary between the two categories.

To make the results interpretation clearer, the bisexual category was also condensed into a single category. Finally, since the trans category is considered an umbrella term and encompassed different self-designations by the respondents (trans women, trans men, cross-dressing women, cross-dressing men, non-binary, genderqueer, gender fluid, agender, polygender and others) it is valid to ask whether this is a homogeneous group and how the results would be if another criterion of grouping was employed. In the logistic regression, lesbians were chosen to be the reference group due to a twofold reason. First, according to a population-based study in Sweden that investigated disparities among LGB, Björkenstam et al. (2017) concluded that bisexual individuals and gay men were more likely to report a past diagnosis of depression than heterosexuals and lesbians (Björkenstam et al., 2017). Second, in a metanalysis comparing sexual minority men and women, it was found that minority men are slightly more exposed to victimization than minority women in general (Katz-Wise & Hyde, 2012).

The presence of long-standing illness or health problems was used as a covariate for the final model. Long-standing illness in this study was used as a synonym for chronic illness, the latter of which is a well-known risk factor for depression (Lotfaliany et al., 2018; Read et al., 2017). In the survey, long-standing illness was identified as an illness or health problem that lasted or was expected to last at least 6 months. Still, since the type of illness was not inputted by the participants, one might not know exactly what those that responded positively might mean, and if those conditions are some of the common chronic physical illnesses studied in association with depression such as diabetes, lung disease, stroke, cardiovascular diseases, arthritis, multiple sclerosis (Lotfaliany et al., 2018; Read et al., 2017; Feinstein, 2011) or something else.

In a seminal text of the measurement of social class in epidemiology, Liberatos et al. (1988) argue that multiple indicators for this measure might shed light to different aspects of this complex construct. Although not univocal in its roots, and since it came from sociology research and served to different theories and ideologies, social class or socioeconomic status can be assessed for epidemiologic purposes through three different subdimensions (occupation, education, and income) and by a composition of the three (Liberatos et al.,

1988). In the present study, household income was chosen to reflect the social status of a very heterogeneous population. Household income can be a potent predictor of prestige, even though it is relatively unstable over time and might be difficult to compare several different households and sizes with different costs of living (Liberatos et al., 1988). Low SES (socioeconomic status) is considered as a risk factor for depression, and in a meta-analysis Lorant et al. (2003) conclusively found that low SES individuals had higher odds of being depressed. Conversely, Freeman et al. (2016) also showed that a high SES was a protective factor for depression. In order to facilitate the operationalization of the results, the six categories of household income were recoded into two, low/difficult and high/easy. An important problem associated with this decision include the loss of information of middle categories in the self-reported income and how that might impact or not the odds ratio for depressive symptoms in the final model.

The last covariate applied to the model was age. Although not exactly a classical risk factor for depression, major depression is more frequently among young adults (early-onset depression) than older adults (late-onset depression), although the latter have more serious consequences such as increased risk of morbidity, suicide, and decreased physical, cognitive, and social functioning (Fiske et al., 2009). Additionally, prevalence of major depression among 18-29 years old individuals is threefold higher than the prevalence in individuals aged 60 years or older (DSM V, 2013). Notwithstanding, young individuals seem to be an exceptional vulnerable group among the sexual and gender minorities (Forte, 2019), what supported the decision to establish a cutoff that could encompass and discriminate this category from the rest.

6.1.4 Covariates and extraneous variables

There are, of course, many other extraneous variables to the present study that could be affecting the results. First, we can say that besides the factors mentioned and controlled in the logistic regression model, there are other risk factors for depression and depressive symptoms. Genetic (Dall'Aglio et al., 2021; Penner-Goeke & Binder, 2022), inflammatory (Beurel et al., 2020), stressful life situations (Plieger et al., 2015), exposure to childhood trauma (Li et al., 2016), co-occurrence of another mental disorder (Hölzel et al., 2011), familial history of mental illness (Goodman, 2020), lack of social support (Lakey & Cronin, 2008) are some of them, just to mention a few. Furthermore, a very interesting classical risk factor for depression in the context of this study is gender, specifically, the higher incidence of depressive disorders among females than males in the normal population (Nolen-Hoeksema, 2011). Despite being controversial whether it is a risk factor on its own, with some advocates (Nolen-Hoeksema & Girgus, 1994) and critics (Hölzer et al, 2011), the author of this present study also opted to not include it as a risk factor in the model due to both the strong association with the LGBTI subgroups variable and because he understands that the present gender diversity among this minority population makes such normative and binary distinctions irrelevant.

Secondly, more intricate models of the relationship between depression and belonging to a sexual and gender minority could also explain the variation in the depressive symptoms' outcomes in the study. Ünsal et al. (2022) through the same original survey (FRA, 2021) and using data from adults from 28 countries, found that community participation predicted lower and higher levels of depression through identity disclosure and victimization, the last two moderated by structural stigma in a multi-level analysis model. However, due to the scope of this master thesis study, moderation and mediation effects and more intricate models such as multi-level analysis were not employed, which could have also affected the quality of the results presented.

6.2 Results discussion

The present study found substantial evidence that mental health disparities in terms of depressive symptoms exist among LGBTI subgroups in Sweden. The higher prevalence of depressive symptoms presented among trans and intersex individuals and followed by bisexual females and males seem to be in line with past international research that showed bisexuals and trans people experience greater disparities in mental health when compared to lesbian and gay counterparts (Zeeman et al. 2019, p. 978). LGBTI people of young age also had higher prevalence of depressive symptoms in comparison to older age in this study, which is partially in line with previous findings in the international literature that shows that LGBTI young people have increased risk of mental illness, especially for depression, anxiety and suicidal behavior when compared with young heterosexuals (Forte, 2019; Agardh et al. 2022), but not in comparison to older LGBTI individuals. This might be because most of the scientific research is focused on analyzing health disparities between groups of heterosexuals and non-heterosexuals in the population and not within the LGBTI themselves except for some cases (such as Björkenstam et al., 2017), and maybe due the fact that health disparities in sexual and gender minorities have been quite a recent phenomenon studied in the epidemiology and public health literature. Findings by Agardh et al. (2022) in a recent Swedish population-based study with a sample of youth LGB highlight the need of more research on young LGB experiences of victimization, since young LGB had increased odds for depression, anxiety, experience of sexual violence and coercion when compared to the straight population.

In the analysis, intersex and trans individuals had an increased odds for having depression symptoms when compared to lesbians. A study based on a web-survey with trans individuals (male, female trans and non-binary individuals) in Sweden showed that those individuals had worse outcomes in self-reported health (general health and quality of life) than the average population (Zeluf et al., 2016). Moreover, a population-based study by Bränström et al. (2021) showed that Swedish transgender were at substantially greater risk of having experienced both suicidal ideations and attempted suicide compared to cisgender individuals due to many risk factors, including depressive symptoms and substance abuse. Few studies have reported specifically on intersex mental health disparities. Zeeman and Aranda (2020) report that in an Australian study, 26% of the intersex sample (n = 272) had engaged in self-harm with the incidence of suicide attempts at 19%. As many as 60% of this sample

considered suicide, in comparison to 3% of the Australian population (Zeeman and Aranda, 2020). Intersex in general also experience peer, romantic or sexual relationships as challenging and avoid intimate relationships as a form of self-preservation or protection against hostile reactions from others (Zeeman and Aranda, 2020). On the other hand, this study showed that gay men had slightly lower odds of having depressive symptoms than lesbians, which might suggest that this group in Sweden is at less risk comparing to other minorities conversely to what previous research found (Björkenstam et al., 2017).

Bisexuals, especially bisexual women, appear to be more vulnerable in terms of self-reported mental health than lesbians in a previous Swedish study, but no statistical significance was found for bisexual men and gays in such research (Björkenstam et al., 2017). This is in line with the prevalence found in the present study, where bisexual females had 49% incidence of depressive symptoms compared to approximately 39% for lesbians and male bisexuals. Some suggested that female bisexuals might be more likely to experience stress due the double discrimination from both heterosexual and homosexual populations, which would then be internalized as a stigma and result in greater risk for mental disorders compared to lesbians (Colledge et al., 2015). As stated earlier, in systematic reviews bisexuals have been depicted as having poorer general health and mental health outcomes when compared to lesbian and gay counterparts, due to the same argument of biphobia, placing their high disparities close to trans individuals within the LGBT group (Zeeman et al., 2019).

Understanding Sweden's role as an inclusive country for minorities in general might also raise further questions. According to the Europe Rainbow Map (ILGA, 2022), Sweden is placed in 4th place of the most respectful human rights country for LGBTI+, behind Malta, Denmark and Belgium and in the same position as Norway and Luxembourg among the 49 countries assessed, based on an index of laws and policies that both protect or discriminate this population. In a study by Pachankis and Bränström (2018) about the relationship between life satisfaction, concealment and stigma, a measure of "country level structural stigma" was created by merging the index of the Europe Rainbow Map with a measure of social attitudes from the European Social Survey. Sweden was also placed among the lowest countries with country level structural stigma scores in Europe and with low sexual identity concealment and high life satisfaction (Pachankis & Bränström, 2018). Models of how stigma manifests have been proposed by researchers, and it can influence societies in three different levels: structural, interpersonal, and individual (Hatzenbuehler & Pachankis, 2016). At a structural level, stigma can be defined as unjust laws, policies, and communities' attitudes that deny, or fail to protect, the equal rights of sexual minorities (Hatzenbuehler, 2016). A future research question is to understand why, despite Sweden being a LGBTI friendly country with inclusive policies and protective laws, this study found inequal distributions of depressive symptoms that resemble previous research on mental disorders of LGBTI on an international level. One possible explanation to this unequal distribution across the LGBTI subgroups is that minority stress stigma affects Lesbians, Gays, Bisexuals, Transex and Intersex differently, despite the country level structural stigma.

Despite being one of the most accepted theories nowadays, minority stress theory might not have ruled out other rival hypothesis by the mere accumulation of empirical associations

(Michael Bailey, 2019). Some critics of the model argue that other explanations such as genetic influences on depression in non-heterosexual individuals and early experiences of rejection augmented by a genetic "rejection sensitivity" would confer increased susceptibility to experiences of stigmatization while also explain the health disparities in these individuals compared to heterosexuals (Michael Bailey, 2019). Other interesting arguments against the model (reproduced by the own Meyer in a forthcoming paper) suggest that minority stress theory will no longer be sufficient to explain the disparities due the major and positive societal changes towards sexual and gender minorities and the normalization and inclusion of being "gay" (Meyer, 2023). Such allegations, however, do not match with the current research according to Meyer (2023), and in the 69 countries where it is still illegal being homosexual or in those where it is legal but not widely accepted, societal attitudes are still harmful towards those individuals (Pillay et al., 2022). Although twenty years passed since this seminal article (Meyer, 2003), minority stress theory is still a young and growing model that had the merit of identifying an important health phenomenon in the sexual minorities when homosexuality was recently de-pathologized.

Despite some suggested that intersectionality applied to quantitative research involves using specific study methods and statistical tests (Bauer, 2014), the intersectionality framework was used here as guide for studying intersections of gender and sexual minority in the Swedish population, as it was also done previously in other countries (Ünsal et al., 2022). Nevertheless, criticisms such as from Bowleg (2008) on the focus of scholars in the white middle-class lesbian, gay and bisexual populations when researching sexual and gender minorities are applicable, and it points to a direction in accounting different societal minority markers in Swedish minority groups (color, ethnicity, religious background and with functional and cognitive impairments) in future research. Meyer (2003) already pointed out the fact that his findings and theories are limited to a more unidimensional minority identity (such as white gay men) and that the stigma suffered by those with multiple minority identities (gender, sexuality, and color) might have an even more harmful impact on stress than more privileged minority individuals.

Further research should employ other social markers of exclusion and discrimination such as race, ethnicity, functional and cognitive impairments and identify vulnerable intersections of these identities among LGBTI people in Sweden. Specific risk factors for depression among young and adult LGBTI individuals should also be further investigated, and models that include more complex relationships between sociodemographic variables and mental health outcomes might give a better perspective on how social determinants can impact the incidence of common mental health disorders among gay, lesbian, bisexual, transexual and intersex individuals in Sweden and worldwide. Studies based on probability sampling, with validated depression and depressive symptoms scales and with longitudinal designs should also be employed to further explore the present findings.

To sum up, this study has several methodological limitations, as stated earlier. However, some strengths of this study consist of employing a relatively recent survey of sexual and gender minority individuals unbiased by the covid-19 effects, since the collection was pre-pandemic. Another strength is that as far as the author knows, the present study might be the

first to research disparities in terms of depressive symptoms among LGBTI individuals in Sweden.

6.3 Relevance to public health and future research

This study followed some research gaps in the scientific literature about the mental health disparities among LGBTI people living in Sweden. Especially, it followed the advice of former research on the need to research the health in sexual minorities in Sweden other than in gays or bisexuals, but specifically the health of transgender and intersexual individuals, and the need to take an intersectional perspective on the impact of multiple social identities in sexual minority populations (Forte, 2019). As mentioned earlier, this study contributes to the research of mental health disparities within LGBTI subgroups in Sweden, which, in turn, might have a positive impact on public policies and public health interventions that can address the more vulnerable sexual and gender minorities and tackle such disparities in a proactive and planned way. This study is also answering a call about the need of public health researchers to go further in the LGBT health beyond some transmittable diseases and include all their needs in the global and public health agenda (Bränström & van der Star, 2013). In a macro perspective, the present study is also aligned with the third goal of the sustainable development goals in the UN 2030 agenda, that is the commitment to ensure healthy lives and promote well-being for all at all ages, and the tenth goal to reduce inequalities within and among countries (United Nations, 2015).

The results showed that it is more common for trans and intersex individuals to have depressive symptoms compared to lesbians, and that contrary to previous national findings it might be more common for lesbians to have depressive symptoms in comparison to gays in Sweden. This might be a future focus for the health authorities in Sweden for mental health awareness campaigns. The results also have clinical and medical implications for physicians, psychologists, and mental health care workers. This study used some classical risk factors for depression as covariates to the relationship between sexual and gender minorities and depressive symptoms. Future research should systematically investigate specific risk factors for this population and their possible relations to the minority stress framework. Future studies might also benefit from employing validated scales of common mental disorders and from national health surveys that include sexual and gender status in their questions.

7 CONCLUSIONS

This study found disparities among LGBTI subgroups in terms of self-reported depressive symptoms. It also found significant associations between age, long-standing illness, and household income with depressive symptoms on the one hand and between age, long-standing illness and household income and being part of LGBTI group on the other. These three factors also partially explained the differences in depressive symptoms among LGBTI, although associations between depressive symptoms and being lesbian, gay, intersex/transex

remained significant even after adjusting for such confounders. In sum, this study showed that depressive symptoms are more common among trans and intersex individuals when compared to lesbians in Sweden. Contrary to some research based on a Swedish population (Björkenstam et al., 2017), gays might report slightly fewer depressive symptoms when compared to lesbians.

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APPENDIX A

Multivariate logistic regression. “Adjusted” LGBTI subgroup values.

	b	*Odds Ratio*	95% CI OR	
			LL	*UL*
Included				
Constant	-1.16			
Lesbian	0	1.00		
Gay*	-0.28	0.75	0.57	0.99
Bisexual**	0.08	1.08	0.81	1.46
Gender Minority***	0.56	1.76	1.32	2.34
Household income****	0.97	2.63	2.17	3.19
Long-standing illness*****	0.68	1.98	1.66	2.37
Age******	0.70	2.02	1.66	2.45

Notes. Lesbian is the reference group. Gender minority comprises the categories “intersex” and “transex” individuals. “Adjusted” refers to the displayed values after the inclusion of the following predictors (not displayed in the table): household income, long-standing illness, and age. R^2 = .10 (Hosmer-Lemeshow), .14 (Cox-Snell), .18 (Nagelkerke). Model $\chi 2$ (6) = 366,40, p <.001. *p = .044. **p = .588. ***p<.001. ****p<.001. *****p<.001. ******p<.001. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

APPENDIX B

Questions used from the EU-LGBTI-II survey (FRA, 2020b). Text in brackets are programming instructions shown only in the questionnaire file, not for the respondents. Text in brackets starting with the words "INFO BUTTON" are displayed for the respondent during the survey.

A1. Respondent's Age
How old are you?
(Numerical answer)

|_| |_| years

A2. Respondent's sex assigned at birth
What sex were you assigned at birth?
(Single response)

[INFO BUTTON: Sex assigned at birth is the classification of people as male, female, intersex or another sex assigned at birth often based on physical anatomy. The sex assigned at birth is recorded in your birth certificate when you were born]

1. Female
2. Male
3. Other, please specify [insert open text response field – max 30 characters]

A4. In terms of sexual orientation, we can only use a limited number of categories for our analysis. So we could like to ask you which group best matches your sexual orientation. Select the answer that best matches your sexual orientation.
(Single response)

1. Lesbian [Do not show this answer category if A3 = 2]
2. Gay [Do not show this answer category if A3 = 1]
3. Bisexual
4. Heterosexual/straight
5. Other, please specify [Insert open text response field – Max 30 characters]
-999. Don't know

A5. Some people are born with sex characteristics (like sexual anatomy, reproductive organs, and/or chromosome patterns) that do not belong strictly to male or female categories or belong to both at the same time. This is known as 'intersex'. Would you describe yourself as intersex?
(Single response)

[INFO BUTTON: Variations of sex characteristics can present themselves prenatally and at birth but also during childhood, in puberty or in adulthood. You might have noticed a variation in your sex characteristics at a very early age or later on in life, and you may have

surgical or medical treatment to modify them.]

1. Yes
2. No

A6. Are/were you a trans person? The term trans is used in this survey as a broad umbrella term that includes all those who are transgender, non-binary, gender variant, polygender, agender, gender-fluid, cross dressers, transsexual, or men and women with a transsexual past, and other terms. [Ask if A3=1 or 2 or 6]
(Single response)

1. Yes
2. No

H18. Do you have any long-standing illness or health problem?
(Single response)

[INFO BUTTON: Long-standing means illness or health problems or which have lasted, or are expected to last, for 6 months or more]

1. Yes
2. No
-888. Prefer not to say
-999. Don't know

H19. Have you been feling downhearted or depressed over the last two weeks?
(Single response)

1. All the time
2. Most of the time
3. More than half of the time
4. Less than half of the time
5. Some of the time
6. At no time
-888. Prefer not to say

H20. Thinking of your household's total income, is your household able to make ends meet?
(Single response)

1. With great difficulty
2. With difficulty
3. With some difficulty
4. Fairly easy
5. Easily

6. Very easily
-888. Prefer not to say
-999. Don’t know

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