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Mental Health Disparities Between Both-, Other- and Same-Sex Attracted Adolescents: The Role of Bullying Victimization, Gender and Age

Vera H. Cup¹ · Henny M. W. Bos² · Gonneke W. J. M. Stevens¹ · Margreet E. de Looze¹

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Abstract

Research shows that both-sex attracted adults have poorer mental health than other- and same-sex attracted adults, but evidence regarding whether similar disparities exist among adolescents remains limited. To investigate this, the current study examines differences in life satisfaction and emotional problems between both-, other- and same-sex attracted adolescents. It also studies whether bullying victimization can explain these differences and whether the associations vary by gender and age. Cross-sectional data from the nationally-representative Dutch Health Behavior in School-aged Children (HBSC) study conducted in 2017 and 2021 were analyzed, including 11,683 adolescents ($M_{\text{age}} = 14.7$, $SD = 1.60$; 49.7% girls). Both-sex attracted adolescents ($n = 507$, 4.3%) report lower life satisfaction and more emotional problems than their other- ($n = 10,930$, 93.6%) and same-sex attracted peers ($n = 246$, 2.1%). Bullying victimization partially explains the mental health disparities between both- and other-sex attracted adolescents, yet does not account for differences between both- and same-sex attracted peers. The links between romantic attraction and mental health outcomes were similar across gender and age, but differences existed concerning bullying victimization. The results suggest that both-sex attracted adolescents are a unique group that deserves special attention in the literature on mental health disparities.

Keywords Bisexuality · Mental health · Life satisfaction · Emotional problems · Bullying victimization · Adolescence

Introduction

Research consistently demonstrates that both-sex attracted people experience poorer mental health as compared to other- and same-sex attracted individuals (Ross et al., 2018). The majority of these studies have concentrated on adults, leaving a notable gap in the understanding of bisexual adolescents.¹

Given that adolescence is a crucial period for relational and sexual development (Cacciatore et al., 2019) as well as establishing lifelong mental health (Kessler et al., 2007; Sawyer et al., 2012), exploring explanatory factors that may increase the risk of poor mental health among both-sex attracted adolescents is essential for developing strategies to prevent mental health issues in later life. Based on the minority stress theory (Meyer, 2003), it can be expected that both-sex attracted adolescents are less satisfied with their lives and experience higher levels of emotional problems than other- and same-sex attracted adolescents, as they experience unique levels of minority stress due to their divergence from both the heterosexual and the monosexual norm. The current study examined mental health differences between both-, other-, and same-sex attracted adolescents in the Netherlands. It explored whether bullying victimization can explain these differences, and examined gender and age differences in the link with romantic attraction on the one hand and mental health and bullying victimization on the other.

The minority stress theory (Meyer, 2003) states that sexual minorities, such as gay, lesbian and bisexual individuals, face unique and challenging stressors in their daily

✉ Vera H. Cup
v.h.cup@uu.nl

¹ Department of Interdisciplinary Social Science, Faculty of Social and Behavioural Sciences, Utrecht University, Utrecht, The Netherlands

² Sexual and Gender diversity in Families and youth, Faculty of Social and Behavioural Sciences, University of Amsterdam, Amsterdam, The Netherlands

¹ In this paper, the term ‘both-sex attracted’ is primarily used to describe sexual orientation, as it best represents the way in which it was measured in the current study. The term ‘bisexual’ is sometimes used for clarity or when it better fits the context. Bisexuality is defined as a sexual orientation characterized by emotional, romantic and/or sexual attraction to individuals of more than one gender.

lives, due to their divergence from the heterosexual norm. These stressors encompass distal forms of stress, such as prejudice and discrimination, as well as proximal stressors like internalized homophobia (Goldbach and Gibbs, 2016). According to the theory, these stressors adversely affect the mental health of sexual minorities. Although the minority stress theory was initially designed for adults, it has also been recognized as relevant for adolescents (Goldbach and Gibbs, 2016). Adolescents who are attracted to both genders do not conform to the heterosexual norm as their sexual attraction is not limited to persons of the other-sex. This divergence from exclusive heterosexuality exposes both-sex attracted adolescents to similar minority stressors experienced by exclusively same-sex attracted adolescents (Meyer, 2003). Additionally, due to their sexual attraction to multiple genders, these adolescents also challenge the monosexual norm, which assumes that people are attracted to only one gender (Feinstein and Dyar, 2017). Deviating from these two norms may make both-sex attracted adolescents uniquely vulnerable to experiencing exclusion, discrimination, and victimization, and thus to poorer mental health (Hequembourg and Brallier, 2009).

A meta-analysis, including 52 studies of which 7 included adolescent participants, showed that both-sex attracted people generally report higher or equivalent rates of depression and anxiety compared to same-sex attracted individuals (Ross et al., 2018). Furthermore, a few other studies with a focus on adolescents, suggested that both-sex attracted adolescents, as compared to same-sex attracted peers, are at increased risk for suicidality (Marshall et al., 2011) and adverse psychological health outcomes (Hughto et al., 2016). A study that included participants between 16 and 23 years old, also found that both-sex attracted adolescents report lower well-being than same-sex attracted peers (Shilo and Savaya, 2012). One reason for the scarcity of studies on differences between both- and same-sex attracted adolescents, and especially young adolescents, may be that comparing both-sex attracted adolescents with same-sex attracted adolescents is not feasible in many studies, due to the small number of both-sex attracted participants, which limits statistical power. As a result, existing studies often treat all sexual minority individuals as one group or do not differentiate between adults and adolescents (e.g., Lucassen et al., 2017, Dürrbaum and Sattler 2020). As studies that compared both-sex attracted adolescents with same-sex attracted adolescents are relatively scarce and mostly had small, non-representative samples, it is important to replicate their findings in larger and representative studies. Based on the previous literature and the minority stress theory it can be expected that both-sex attracted adolescents in the current study are likely at the highest risk of poor mental health compared to their other- and same-sex attracted peers.

During the adolescent life phase, a common form of minority stress is bullying victimization (Moyano and Sánchez-Fuentes, 2020). In the Netherlands, same- and both-sex attracted adolescents face a higher risk of bullying victimization than their other-sex attracted peers (Kaufman and Baams, 2021), with both-sex attracted adolescents reporting the highest rates of bullying victimization (Huijnk and Van Beusekom, 2021). As a meta-analysis found strong causal associations between bullying victimization and poorer mental health for adolescents (Moore et al., 2017), higher levels of bullying victimization may explain the poorer mental health of both-sex attracted adolescents as compared to their other- and same-sex attracted peers. Given the lack of literature addressing the explanatory power of bullying victimization on the mental health of both-sex attracted adolescents compared to other- and same-sex attracted peers, further investigation is essential.

Associations between both-sex attraction and mental health may vary across genders, as gender may influence the extent to which both-sex attraction is related to experiencing minority stress and/or the extent to which minority stress impacts mental health. It can be hypothesized that the mediating effect of bullying victimization is stronger for boys than for girls, as people in general hold more negative attitudes towards both-sex attracted men than both-sex attracted women (Helms and Waters, 2016). This might result in both-sex attracted boys experiencing more negative affect and discrimination in the form of bullying victimization than both-sex attracted girls. This in turn may negatively influence the mental health of both-sex attracted boys, leading to a stronger association between both-sex attraction and mental health for boys than for girls. Empirical research on this topic reports mixed results. Some studies among adults indicate no gender differences (Katz-Wise and Hyde, 2012), and another study on adolescents found that sexual minority girls are more frequently victims of bullying as compared to gay and bisexual boys (Kahle, 2020). Conversely, it has been suggested that girls' mental health is more susceptible to the impact of stressors (such as bullying victimization) than boys' (Hankin et al., 2007; Hyde et al., 2008). This could mean that the impact of attraction to both-sexes on mental health is more pronounced for girls than for boys. In line with the latter reasoning, a meta-analysis concluded that the disparities in mental health between sexual minority adolescents and those attracted to the other-sex were larger for girls than for boys (Dürrbaum and Sattler, 2020). Given the mixed theoretical and empirical evidence on potential gender differences, it remains unclear how gender may impact the relationship between romantic attraction, mental health outcomes, and bullying victimization.

Moreover, the association between romantic attraction, mental health and bullying victimization may also vary by

age. Generally, older adolescents tend to report poorer mental health compared to their younger peers (Orben et al., 2022). Due to the accumulating effect of sexual minority stressors (which are largest for both-sex attracted adolescents) differences in mental health between both-, other- and same-sex attracted adolescents may increase with age. Empirical research on age differences in the association between romantic attraction and bullying victimization found that victimization risk increases with age for sexual minority adolescents, while it remains stable or declines for other-sex attracted peers (DeSmet et al., 2018). Thus, it can be expected that differences in bullying victimization, and consequently, mental health, between both-sex attracted and other-sex attracted peers become larger with age. Regarding the comparison between both- and same-sex adolescents, no hypothesis can be formulated as no research has investigated age differences in bullying victimization comparing these two groups.

The current study investigates the Dutch context. Since the Netherlands is known for its inclusive policies and progressive attitudes toward sexual diversity, one would expect relatively small disparities in mental health and bullying victimization when comparing sexual minority adolescents with their other-sex attracted peers. Still, research indicates that despite the inclusive policies and progressive attitudes Dutch sexual minority adolescents in general tend to report poorer mental health (Hughes et al., 2023) and more bullying victimization (Kaufman and Baams, 2021) than other-sex attracted adolescents. Moreover, this progressive reputation might not resemble the contemporary situation, as the increase in positive attitudes towards sexually diverse people in the Netherlands has plateaued from 2017 onwards (Huijnk, 2022). Moreover, a recent report indicated that adolescents' attitudes toward homosexuality have become more conservative (GGD, n.d.). Researching the Dutch context provides a unique view into potential challenges that exist in a society that promotes equality and acceptance of sexual diversity, yet also encounters backlash.

Current Study

While there are many studies demonstrating that sexual minority adolescents have poorer mental health as compared to other-sex attracted adolescents, research on within-group differences among sexual minority adolescents is scarce. Using nationally representative data the current study aims to (1) explore differences in life satisfaction and emotional problems of both-sex attracted adolescents in comparison with other-sex attracted adolescents and same-sex attracted adolescents, (2) identify whether bullying victimization partly explains these differences, and (3)

explore if these associations are similar for boys and girls and across age groups. Consistent with the minority stress theory and previous empirical studies it is hypothesized that both-sex attracted adolescents report lower life satisfaction and higher levels of emotional problems than their other- and same-sex attracted peers. In addition, bullying victimization is expected to partly explain these mental health disparities. Based on contrasting theories and empirical findings, no specific hypothesis was formulated regarding gender differences. Overall, differences in life satisfaction, emotional problems and bullying victimization were expected to be more pronounced among older adolescents.

Methods

The current cross-sectional study used two data waves (2017 and 2021) of the Health Behavior in School-aged Children (HBSC) study. The HBSC study is a nationally representative study on the health, well-being, and social context of adolescents, carried out by Utrecht University, the Institute for Mental Health and Addiction (Trimbos Institute), and the Netherlands Institute for Social Research. The sampling and survey procedures for the different survey waves were identical. The study included data from adolescents aged 11 to 18 years old attending general secondary education. The samples were obtained using a two-stage random sampling procedure. First, a random sample of schools was drawn stratified by level of urbanization to ensure population representativeness, based on a national file of regular secondary schools, provided by the Ministry of Education, Culture and Science. Second, within each school, depending on school size, three to five classes of students were selected to participate. The school-level response rates were 37% in 2017 ($n = 85$) and 42% in 2021 ($n = 71$). At the student level, response rates were 91% in 2017 ($n = 7392$) and 88% in 2021 ($n = 5733$). Non-response was mainly due to sickness. Adolescents received no incentive for their participation in the study.

A passive informed consent procedure was used to inform parents and legal representatives about the study a week before data collection. Researchers obtained active informed consent from participating students during the data collection, after assuring them of the anonymity and confidentiality of their responses. The number of students who did not participate because they or their parents did not give permission was less than 1% in 2017 ($n = 56$) and 1.2% ($n = 69$) in 2021. Research assistants administered an online questionnaire in the classroom, which took the students ~45 min to complete. To maintain students' privacy while completing the survey, participants were placed in a classroom at individual desks spaced for

exam conditions. This study was approved by the ethical committee of the Institute for Mental Health and Addiction (2021) and the ethical committee of Utrecht University (2017).

This study combined two data waves (2017 and 2021) to increase the number of respondents belonging to a sexual minority group, thereby enhancing the power of the statistical analyses. The merged datasets from 2017 and 2021 resulted in a sample of 156 schools, with 623 classes. After excluding outliers based on age ($n = 35$), and adolescents who were either unsure about their romantic attraction ($n = 870$) or did not answer this question ($n = 537$) the final sample consisted of 11,683 adolescents between 11 and 18 years old ($M_{\text{age}} = 14.7$ $SD = 1.60$; 49.7% girls). Among these adolescents, 4.3% ($n = 507$) expressed romantic attraction to both sexes, 2.1% ($n = 246$) indicated attraction exclusively to the same sex, and 93.6% ($n = 10,930$) reported solely other-sex attraction. Remarkably, while the gender distribution was relatively equal for the other- and same-sex attracted groups, 78% of the both-sex attracted group consisted of girls ($n = 393$) (see Table 1 for more information about the sample).

Measures

Romantic attraction

Participants were asked whether they were romantically attracted to boys, girls, or both. Answer categories were ‘Boys’, ‘Girls’, ‘Both’ and ‘I don’t know yet’. Aligning the answer with the gender of the participant resulted in one of the four possible attraction categories: both-sex attracted (i.e., bisexual), other-sex attracted (i.e., heterosexual), same-sex attracted (i.e., gay or lesbian) and unsure. Participants who did not answer this question (4.1%) or were unsure about their romantic attraction (6.6%) were excluded from the current sample (see supplementary material for analyses on the unsure group). To be able to independently compare adolescents with both-, other- and same-sex attraction, dummy variables were created. By default, both-sex attraction was deemed as the reference category.

Life satisfaction

Life satisfaction was measured using the Cantril Ladder (Cantril, 1965). Participants were asked to rate their lives on a scale from 0 to 10, with higher scores reflecting higher life satisfaction. The Cantril ladder is a reliable and valid instrument for well-being among adolescents (Jovanović, 2016; Levin and Currie, 2014).

Table 1 Demographic Characteristics of Participating Adolescents

	<i>N (%)</i>
Gender	
Girl	5808 (49.7)
Age	
11	153 (1.3)
12	1872 (16.0)
13	2305 (19.7)
14	2458 (21.0)
15	2231 (19.1)
16	1594 (13.6)
17	848 (7.3)
18	222 (1.9)
Educational track	
Vocational	5011 (42.9)
Pre-academic	6672 (57.1)
Family affluence	
Low	980 (8.4)
Medium	5086 (43.5)
High	5602 (48.0)
Missing	15 (0.13)
Family structure	
Living with both parents	8878 (76.0)
Not living with both parents	2793 (23.9)
Missing	12 (0.1)
Migration background	
A migration background	2539 (21.7)
Native Dutch	9144 (78.3)
Romantic attraction	
Other-sex	10,930 (93.6)
Same-sex	246 (2.1)
Both-sex	507 (4.3)

Emotional problems

Emotional problems were measured using the Emotional Problems subscale of the Strengths and Difficulties Questionnaire (SDQ). The SDQ is a brief emotional and behavioral screening questionnaire for adolescents (Goodman et al., 1998). Participants were asked to answer five items on a three-point Likert scale: ‘not true’, ‘somewhat true’, or ‘certainly true’. Examples of items are: ‘I worry a lot’ and ‘I am often unhappy, down-hearted, or tearful’. Responses were summed, with higher scores indicating higher levels of emotional problems. The emotional symptoms subscale of the SDQ demonstrated measurement invariance across time, between boys and girls, migration backgrounds (native Dutch vs. migration background), and vocational and pre-academic educated

adolescents (Duinhof et al., 2015). This subscale had an acceptable reliability (Cronbach's $\alpha = 0.73$).

Bullying victimization

An adapted version of the Olweus bullying victimization questionnaire (Olweus, 2006) was used. Bullying was defined as the deliberate victimization of a student, repetitively and over time, by one or multiple other students who have more power than the victim. After reading this definition, participants were asked to indicate how often they had been bullied in the last few months. Answer categories ranged from 1 = 'I have never been bullied in the last few months' to 5 = 'I have been bullied a few times a week.'

Gender

Adolescents were asked to indicate whether they were a boy or a girl. As no further information was provided, participants may have interpreted this question as referring to either their sex assigned at birth or their gender identity.

Age

Participants' ages were calculated using their self-reported birth month and year, along with the date of the data collection.

Control Variables

Educational track

Adolescents were asked to indicate their educational track in the questionnaire. This variable was recoded into vocational (VMBO-b and VMBO-t) and pre-academic (HAVO and VWO). Due to the longer duration of the pre-academic tracks compared to the vocational tracks, individuals aged 16 and above in the sample are predominantly following a pre-academic track.

Migration background

Participants were asked to indicate where they and their parents were born. If adolescents themselves or at least one parent was born abroad, adolescents were identified as having a migration background.

Family structure

Participants indicated who resides in the home they spend all or most of their time. Answers to a series of binary variables related to different family members (e.g., mother, father, sister) were recoded into a dichotomous variable,

distinguishing between adolescents living with both parents and not living with both parents.

Family affluence

Family affluence was assessed using the revised Family Affluence Scale III (FAS III; Torsheim et al., 2016; Currie et al., 2024). The FAS III includes 6 items related to the material conditions in the participant's household (i.e., ownership of a car, number of computers, own bedroom, number of bathrooms, presence of a dishwasher, and abroad holiday frequency during the last year). To compare groups based on family affluence, responses were scored and summed with higher values indicating higher levels of family affluence. Participants were divided into three groups: low, medium, or high family affluence. The FAS III has demonstrated good validity, also during the COVID-19 pandemic (Boer et al., 2023).

Statistical Analysis

Analyses were conducted using R (version 4.4.0). Various packages, including Lavaan (Rosseel, 2012) were employed. As the missing rates were low (below 1%) for all variables, all regression models used the list-wise deletion approach. First, a one-way ANOVA with a post-hoc Games Howell test was performed to compare the estimated means of both-, other- and same-sex attracted adolescents on life satisfaction, emotional problems, and bullying victimization. The Welch test was applied as the assumption of homogeneity of variance was violated (Delacre et al., 2019). Next, to account for the nesting of students within the same school, multilevel analyses were conducted including two levels: the individual and school level. First, null models were computed to determine the proportions of variance in life satisfaction, emotional problems and bullying victimization explained by differences in school level, which is shown by the Intraclass Correlation (ICC) (see Table 4). Second, control variables and two dummy variables of romantic attraction (with both-sex attraction as reference category) were added to the model to investigate the associations with life satisfaction, emotional problems, and bullying victimization (model 1).

To investigate whether bullying victimization mediates the association between romantic attraction and life satisfaction and the association between romantic attraction and emotional problems, a mediation analysis was performed using the Lavaan package (Rosseel, 2012). These analyses assessed whether the association between romantic attraction and life satisfaction becomes significantly weaker after adding bullying victimization to the model. If the direct association between romantic attraction/emotional problems and life satisfaction is not significant anymore after adding

Table 2 Bivariate correlations between variables

	1	2	3	4	5	6	7	8	9	10
1. Gender ^a										
2. Age	−0.01									
3. Educational track ^b	0.01	0.19***								
4. Migration Background ^c	0.02*	0.03**	−0.05***							
5. Family structure ^d	−0.02*	−0.03**	0.12***	−0.10***						
6. Family affluence	−0.04***	−0.03**	0.14***	−0.15***	0.16***					
7. Same-sex attraction ^e	−0.01	0.01	0.00	0.01	−0.01	−0.00				
8. Other-sex attraction ^e	−0.09***	−0.04***	−0.02	−0.04***	0.05***	0.03***				
9. Life satisfaction	−0.20***	−0.16***	−0.03**	0.08***	0.14***	0.08***	−0.05***	0.19***		
10. Emotional problems	0.37***	0.06***	0.02*	−0.06***	−0.08***	−0.06***	0.05***	−0.20***	−0.48***	
11. Bullying victimization	−0.02	−0.09***	−0.13***	−0.04***	−0.04***	−0.04***	0.04***	−0.12***	−0.17***	0.19***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^aReference category is boys

^bReference category is vocational

^cReference category is native Dutch

^dReference category is not living with both parents

^eReference category is both-sex attraction

bullying victimization to the model, there is evidence for full mediation (Baron and Kenny, 1986). If this direct association is reduced but remains significant, there is evidence for partial mediation. Finally, to test for gender and age differences in the associations between romantic attraction and life satisfaction, emotional problems and bullying victimization, multilevel interaction analyses (model 1 + romantic attraction*gender; model 1 + romantic attraction*age) were performed. To deal with the non-normal distribution of the dependent variables while performing the regression analyses, standard errors were calculated using robust maximum likelihood estimation (Rosseel, 2012).

Results

Descriptive Statistics

Correlations between the variables are presented in Table 2. Table 3 presents the descriptive statistics by romantic attraction for life satisfaction, emotional problems and bullying victimization. When rating their life satisfaction on a scale from 0 to 10, both-sex attracted adolescents reported an average life satisfaction of around one point lower than their same-sex attracted peers and two points lower than their other-sex attracted peers. In addition, both-sex attracted adolescents reported higher levels of emotional problems than their same-sex attracted peers ($M_{\text{both}} = 5.42$ versus $M_{\text{same}} = 3.85$, on a scale from 0 to 10), and their other-sex attracted peers ($M_{\text{both}} = 5.42$ versus $M_{\text{other}} =$

2.59). Furthermore, regarding bullying victimization, both-sex attracted adolescents reported the highest levels ($M_{\text{both}} = 1.48$, on a scale from 1 to 5), followed by same-sex attracted adolescents ($M_{\text{same}} = 1.39$) and other-sex attracted peers reported the lowest levels of bullying victimization ($M_{\text{other}} = 1.17$). A one-way ANOVA, using Welch testing, showed significant differences between the mean scores for the three groups on life satisfaction ($F(2, 455.76) = 221.76$, $p < 0.001$), emotional problems ($F(2, 460.18) = 287.21$, $p < 0.001$) and bullying victimization ($F(2, 450.78) = 33.00$, $p < 0.001$). The post-hoc Games Howell test showed significant differences between both- and other sex attracted adolescents, with both-sex attracted adolescents being worst off for all outcome variables ($p < 0.001$). Both-sex attracted adolescents and same-sex attracted adolescents differed significantly in mean for life satisfaction and emotional problems ($p < 0.001$), but not for bullying victimization.

To assess the proportions of variance in life satisfaction, emotional problems and bullying victimization that could be explained by differences in school level, the ICC was calculated. The small ICCs (see Table 4) indicate that between-school differences accounted for only a small portion of the variance in the outcome variables. The findings of Model 1 (Table 4) showed that girls and older adolescents reported lower life satisfaction, more emotional problems and experienced lower bullying victimization compared to boys and younger adolescents. Students in the pre-academic track reported lower bullying victimization than peers in the vocational track. Adolescents from low-affluence families and adolescents not living with both

Table 3 Descriptive statistics of life satisfaction, emotional problems and experiencing bullying by romantic attraction

	Other-sex (<i>M, SD</i>)	Same-sex (<i>M, SD</i>)	Both-sex (<i>M, SD</i>)	<i>F</i> -value	<i>df</i>	<i>p</i> -value	Post-hoc results; <i>p</i> < 0.001
Life satisfaction (0–10)	7.46(1.56)	6.66(1.98)	5.58(2.07)	221.76	2,45576	<0.001	Both-sex < Other-sex; Both-sex < Same-sex; Same-sex < Other-sex
Emotional problems (0–10)	2.59(2.33)	3.58(2.62)	5.42(2.67)	287.21	2,46018	<0.001	Both-sex > Other-sex; Both-sex > Same-sex; Same-sex > Other-sex
Bullying victimization (1–5)	1.17(0.60)	1.39(0.95)	1.48(0.95)	33.00	2,45078	<0.001	Both-sex < Other-sex; Same-sex < Other-sex

parents reported lower life satisfaction and higher levels of emotional problems, as compared to adolescents from medium and higher-affluence families and adolescents living with both parents. Adolescents from families with a higher affluence reported lower rates of bullying victimization compared to adolescents from families with a lower affluence. Lastly, adolescents with a migration background reported fewer emotional problems and lower bullying victimization compared to adolescents without a migration background.

Comparison between both-sex attracted and other-sex attracted adolescents

To examine differences between both-sex attracted and other-sex attracted adolescents regarding life satisfaction, emotional problems and bullying victimization, linear regression analyses were performed (see Table 4 for results). Results showed that both-sex attracted adolescents reported lower life satisfaction ($B = 1.46$, 95% CI [1.29–1.64], $p < 0.001$, $\beta = 0.89$), higher levels of emotional problems ($B = -2.07$, 95% CI [-2.30–(-1.84)], $p < 0.001$, $\beta = -0.85$) and higher levels of bullying victimization ($B = -0.33$, 95% CI [-0.42–(-0.24)], $p < 0.001$, $\beta = -0.52$) as compared to their other-sex attracted peers. A linear regression analysis investigating the association between bullying victimization and life satisfaction and emotional problems showed that adolescents who reported higher levels of bullying victimization reported lower life satisfaction ($B = -0.47$, 95% CI [-0.54–(-0.40)], $p < 0.001$, $\beta = -0.18$) and higher levels of emotional problems ($B = 0.67$, 95% CI [0.59–0.75], $p < 0.001$, $\beta = 0.18$).

For life satisfaction, mediation analyses revealed a significant indirect association between romantic attraction and life satisfaction via bullying victimization ($B = 0.16$, 95% CI [0.11–0.20], $p < 0.001$, $\beta = 0.10$). The direct association between romantic attraction and life satisfaction became less strong after adding bullying victimization to the model ($B = 1.31$, 95% CI [1.13–1.48], $p < 0.001$, $\beta = 0.80$), but remained significant, suggesting partial mediation (see Fig. 1 Model a). For emotional problems, results showed a significant indirect association via bullying victimization between romantic attraction and emotional problems ($B = -0.22$, 95% CI [-0.28–(-0.16)], $p < 0.001$, $\beta = -0.09$). The direct association between romantic attraction and emotional problems became less strong after adding bullying victimization to the model, but remained significant ($B = -1.84$, 95% CI [-2.07–(-1.61)], $p < 0.001$, $\beta = -0.76$). Therefore, the results indicated that the higher rates of bullying victimization among both-sex attracted adolescents partially explain why both-sex attracted adolescents report higher levels of emotional problems (see Fig. 1 Model b).

Table 4 Results of linear regression analyses on life satisfaction, emotional problems and bullying victimization

	Life satisfaction				Emotional problems				Bullying victimization			
	<i>B</i>	<i>CI</i>	β	<i>R</i> ²	<i>B</i>	<i>CI</i>	β	<i>R</i> ²	<i>B</i>	<i>CI</i>	β	<i>R</i> ²
Model 0												
Intraclass Correlation	4%				3%				2%			
Model 1												
Intercept	6.71**	2.23–11.20		0.12	9.13**	3.29–14.97		0.18	3.24***	1.78–4.70		0.02
Gender												
Boys (ref.)	1				1				1			
Female	–0.54***	–0.60––0.49	–0.33		1.65***	1.56–1.74	0.68		–0.03**	–0.05––0.01	–0.05	
Age	–0.15***	–0.18––0.13	–0.15		0.08***	0.05–0.11	0.05		–0.03***	–0.04––0.02	–0.08	
Educational track												
Vocational (ref.)	1				1				1			
Pre-academic	0.05	–0.08–0.17	–0.03		–0.00	–0.20–0.20	0.02		–0.09**	–0.15––0.04	–0.14	
Family affluence												
Low (ref.)	1				1				1			
Medium	0.31***	0.19–0.43	0.19		–0.32***	–0.47––0.16	–0.13		–0.06	–0.11––0.00	–0.09	
High	0.43***	0.31–0.56	0.27		–0.48***	–0.63––0.33	–0.20		–0.07*	–0.13––0.02	–0.12	
Family structure												
Not living with both parents (ref.)	1				1				1			
Living with both parents	0.41***	0.34–0.48	0.25		–0.34***	–0.43––0.24	–0.14		–0.02	–0.04–0.01	–0.03	
Migration background												
Native Dutch (ref.)	1				1				1			
A migration background	0.04	–0.04–0.11	0.02		–0.17**	–0.28––0.06	–0.07		–0.03*	–0.06––0.00	–0.05	
Romantic attraction												
Both-sex (ref.)	1				1				1			
Same-sex	0.74***	0.42–1.06	0.45		–1.15***	–1.55––0.75	–0.47		–0.11	–0.26–0.04	–0.17	
Other-sex	1.46***	1.29–1.64	0.89		–2.07***	–2.30––1.84	–0.85		–0.33***	–0.42––0.24	–0.52	
Model 1 + Rom.att*Gender												
Same-sex	0.32	–0.23–0.87	0.20	0.12	–0.33	–1.06–0.40	–0.14	0.18	0.11	–0.17–0.39	0.18	0.02
Other-sex	0.33	–0.07–0.74	0.20		0.03	–0.44–0.51	0.01		0.20*	0.00–0.38	0.31	
Model 1 + Rom.att*Age												
Same-sex	0.04	–0.17–0.25	0.04	0.12	–0.03	–0.30–0.14	–0.02	0.18	0.07	–0.01–0.16	0.18	0.02
Other-sex	–0.03	–0.16––0.09	–0.031		0.01	–0.30–0.23	0.01		0.07*	0.00–0.13	0.17	

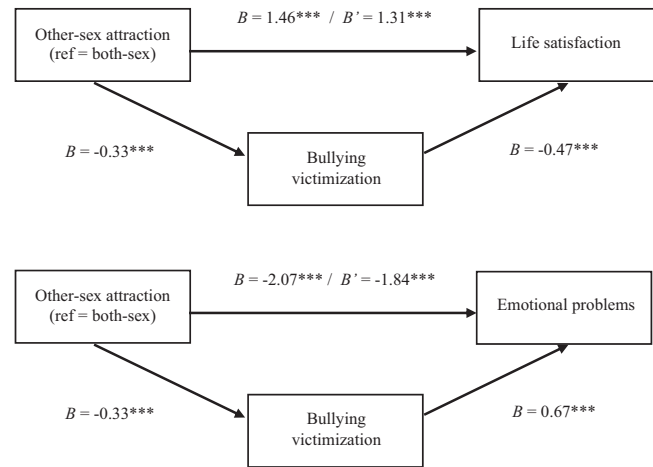
* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Comparison between Both-Sex Attracted and Same-Sex Attracted Adolescents

Differences in life satisfaction, emotional problems and bullying victimization between both-sex attracted and same-sex attracted adolescents were also investigated using linear regression analyses (see Table 4 for results). Both-sex attracted adolescents reported lower life satisfaction ($B = 0.74$, 95%

CI [0.42–1.06], $p < 0.001$, $\beta = 0.45$) and higher levels of emotional problems ($B = -1.15$, 95% CI [–1.55–(–0.75)], $p < 0.001$, $\beta = -0.47$) than their same-sex attracted peers. Regarding bullying victimization, no significant difference was found between both-sex attracted and same-sex attracted adolescents. Consequently, bullying victimization could not mediate the association between romantic attraction and either life satisfaction or emotional problems.

Fig. 1 Model a. Bullying victimization as a mediator on the association between both-sex attraction and life satisfaction. Model b. Bullying victimization as a mediator on the association between both-sex attraction and emotional problems.



Gender Differences

To test whether the observed associations were different for boys and girls, interaction terms were added to the model (romantic attraction*gender). For life satisfaction and emotional problems, no significant interaction was found when comparing both-sex attracted adolescents to other- and same-sex attracted adolescents. Regarding bullying victimization, no significant interaction effect was found when comparing both-sex attracted adolescents to same-sex attracted peers. In contrast, moderation analysis of gender on the association between romantic attraction and bullying victimization indicated that differences in bullying victimization were larger for boys than for girls when comparing both-sex attracted adolescents to other-sex attracted adolescents ($B_{rom.att*gender} = 0.20$, 95% CI [0.00–0.39], $p < 0.05$, $\beta = 0.31$). Analysis for boys and girls separately indicated that the difference in bullying victimization between both- and other-sex attracted adolescents is larger for boys ($B_{boys} = -0.46$, 95% CI [-0.65–(-0.27)], $p < 0.001$, $\beta = -0.72$) than for girls ($B_{girls} = -0.28$, 95% CI [-0.38–(-0.19)], $p < 0.001$, $\beta = -0.44$).

Age Differences

Interaction terms (romantic attraction*age) were added to the model to assess whether associations differed across age. No significant age differences were found for the association between romantic attraction and life satisfaction, nor the association between romantic attraction and emotional problems. The interaction analysis on the association between romantic attraction and bullying victimization did yield significant results, but only for the comparison between both- and other-sex attracted adolescents. Differences in bullying victimization between these groups were larger for younger adolescents as compared to older ones ($B = 0.07$, 95% CI [0.00–0.13], $p = 0.04$, $\beta = 0.17$).

Supplementary Analysis: Unsure Romantic Attraction as Reference Category

Supplementary analyses on adolescents who reported being unsure about their romantic attraction showed that these adolescents reported higher life satisfaction and lower rates of emotional problems than both-sex attracted peers ($p < 0.001$). Also, adolescents reporting an unsure romantic attraction showed higher life satisfaction than same-sex attracted peers ($p < 0.01$). As compared to other-sex attracted adolescents, unsure adolescents reported lower life satisfaction and higher levels of emotional problems ($p < 0.001$). Unsure-attracted adolescents reported lower bullying victimization than both-sex attracted peers ($p < 0.01$) and higher than other-sex attracted peers ($p < 0.001$). No differences between same-sex attracted and unsure-attracted adolescents were found regarding emotional problems and bullying victimization.

Discussion

Research has shown that both-sex attracted individuals experience poorer mental health compared to same-sex and other-sex attracted people (Ross et al., 2018). The current study contributes to the limited existing knowledge on whether similar patterns exist among adolescents and whether bullying victimization accounts for these disparities in two aspects of mental health: life satisfaction and emotional problems. Using the data of a large, nationally representative study in the Netherlands, this study found that both-sex attracted adolescents report lower life satisfaction and higher levels of emotional problems as compared to their other- and same-sex attracted peers. Higher levels of bullying victimization among both-sex attracted adolescents partially explained why they reported lower life satisfaction and higher levels of emotional problems as

compared to other-sex attracted adolescents. Bullying victimization did not explain differences in life satisfaction and emotional problems between both-sex and same-sex attracted adolescents, as these two groups reported similarly high levels of bullying victimization. Differences in bullying victimization were stronger for boys than for girls when comparing both- and other-sex attracted adolescents. Lastly, older adolescents reported lower bullying victimization and this decrease was more pronounced for both-sex attracted adolescents as compared to other-sex attracted adolescents.

The finding that both-sex attracted adolescents report lower life satisfaction and higher levels of emotional problems than their other- and same-sex attracted peers, is in line with a previous meta-analysis about the general population (Ross et al., 2018). As adolescence is a crucial time in which the foundation is laid for mental health across the lifespan (Kessler et al., 2007; Sawyer et al., 2012), there is a need for ongoing research into the underlying mechanisms that explain these disparities. The finding that bullying victimization cannot explain differences in mental health between both-sex attracted and same-sex attracted adolescents highlights the importance of investigating bisexual-specific minority stressors: stressors that only (or mostly) apply to both-sex attracted individuals and not (or to a lesser extent) to same-sex attracted individuals. The literature suggests different bisexual-specific minority stressors among adults, such as experiencing discrimination from both heterosexual and sexual minority communities (Mereish et al., 2017), having an ‘invisible’ identity (Panasilico and Amodeo, 2019), experiencing a lack of role models (McLean, 2018) and self-questioning their bisexual identity (Ross et al., 2010). To illustrate, both-sex attraction or bisexuality is often misrepresented or invisible in media and daily life, which may contribute to feelings of invisibility and invalidation (McLean, 2018). Although the representation of both-sex attracted adolescents has been growing recently, as seen in TV shows such as *Heartstopper* and *Sex Education*, this representation remains limited compared to the representation of other- and same-sex attracted people. Future research among adolescents should include these mechanisms, in particular the self-questioning and the lack of role models as adolescence is a key period for sexual orientation identity formation (Hall et al., 2021). This topic may be especially important, because the growing number of labels within the bisexual spectrum, such as pansexual and omniseual, can increase self-questioning among adolescents who experience attraction to multiple genders. In addition, qualitative studies could explore how both-sex attracted adolescents perceive the factors impacting their mental health themselves, potentially uncovering new bisexual-specific minority stressors unique to this stage of life.

The minority stress theory highlights how distal and proximal stressors might be interconnected in explaining the poorer mental health of sexual minority individuals. Unfortunately, the dataset used for this study did not include proximal stressors, such as feelings of shame related to their romantic attraction, making it impossible to investigate both distal and proximal stressors in this study. Future research may prioritize examining both as well as the interactions between the two for a more comprehensive understanding of the poorer mental health of both-sex attracted adolescents (Mereish et al., 2017).

In contrast with a previous meta-analysis (Dürbaum and Sattler, 2020) and a study on Dutch adolescents (La Roi et al., 2016), findings showed that disparities in life satisfaction and emotional problems between both- and other-sex attracted adolescents were equally strong for girls and boys. This may be due to power issues, as 80% of the both-sex attracted adolescents in the sample were girls and only 20% were boys. However, La Roi et al. (2016) also found a similar gender distribution but reported stronger disparities for girls than boys. These contrasting results suggest that more research on this topic is necessary. Gender differences were found in the association between romantic attraction and bullying victimization. Especially boys attracted to both sexes reported higher rates of bullying victimization compared to other-sex attracted boys. This might be due to more negative attitudes toward male bisexuality in society (Helms and Water, 2016). As such, bullying victimization is a less strong explanation for the difference in mental health between both- and other-sex attracted girls than for boys. Future research needs to investigate alternative explanations for the risk of poor mental health reported by both-sex attracted girls.

Contrary to the expectation that accumulating minority stressors would widen mental health differences among both-, same-, and other-sex attracted adolescents with age, the results did not show this pattern. The difference in bullying victimization between both-sex adolescents and other-sex adolescents was larger for younger adolescents as compared to older ones. One potential explanation for these findings is a reduction in negative attitudes toward both-sex attraction as adolescents age. While there is evidence of a reduction in negative attitudes toward same-sex attraction when adolescents grow older (Poteat and Anderson, 2012), further research is needed to determine if a similar trend exists for both-sex attraction, and whether this shift is even more pronounced as compared to the shift in attitudes toward same-sex attraction.

Limitations & Strengths

A few limitations of the current study need to be considered when interpreting the results. First, although the term

‘explain’ is used in this article, this study is based on cross-sectional data, meaning no causal inferences can be made. Therefore, the implied direction of bullying victimization explaining life satisfaction and emotional problems might be inaccurate. However, the likelihood of inverse causality is low, as Moore et al. (2017) found strong evidence that bullying victimization is a causative factor for poor mental health. Second, although anonymity was emphasized before adolescents filled in the survey, self-report data may entail a bias. For example, it is possible that both- and same-sex attracted adolescents did not disclose their romantic attraction in the questionnaire, which would have led to an underrepresentation of these groups and potentially an underestimation of the observed effects. A third limitation is the binary way of measuring gender. The question offered limited gender options and failed to distinguish between sex assigned at birth and gender identity. Research shows that gender-diverse sexual minorities report higher emotional distress and more bullying victimization compared to cisgender adolescents (Eisenberg et al., 2019), highlighting the need for inclusive gender identity measures. Related to this, the operationalization of romantic attraction within this study might have resulted in falsely attributing other- or same-sex attraction to participants who could not disclose their gender diversity. Future research is advised to use a multi-item measure, which includes at least one question about sex assigned at birth and one question on current gender identity (Jones, 2019). Subsequently, where possible, statistical analyses should distinguish between cisgender and gender-diverse individuals and further differentiate specific groups within the gender-diverse group, to provide a gender-inclusive representation of the lived experiences.

This study also has several strengths, such as the use of nationally representative data and the use of two data waves, which increased statistical power. Moreover, while most previous research on sexual minority adolescents did not focus on within-group differences, the current study did investigate differences between both- and same-sex attracted adolescents. This provided insight into the existing disparities in mental health between these sexual minority groups that would otherwise have remained unclear. Finally, this study focused on two aspects of mental health, life satisfaction and emotional problems, which strengthens the validity of the results.

Implications

The findings of this study have implications for mental health practitioners, sexuality educators, and schoolboards. Despite the relatively inclusive climate in the Netherlands, discrimination and exclusion of sexual minorities, also among adolescents, remain persistent issues (GGD, n.d.). The observed disparities in mental health between both- and

same-sex attracted adolescents underscore the need for more tailored mental health interventions that address the distinct experiences of these two groups, which are often treated as one. In order to develop these interventions, future research needs to explore which bisexual-specific stressors may play a role in the adolescent life phase, such as the challenges associated with having an ‘invisible’ identity, self-questioning your both-sex romantic attraction, a lack of role models, and experiencing stigma from the heterosexual as well as the sexual minority communities. In sexuality education programs, more attention could be paid to adolescents with both-sex attraction, for instance by including content that explicitly addresses the experiences and identities of both-sex attracted people. Elements that evoke empathy and perspective-taking from other- and same-sex attracted adolescents may be included as well, as this may improve the effectiveness of the program in reducing prejudice against both-sex attracted people (Cramwinckel et al., 2018). Additionally, as both-sex attracted adolescents experienced more bullying victimization than their other-sex attracted peers, schoolboards may need to prioritize creating a positive and inclusive school climate. Finally, it is crucial to recognize that not all adolescents attracted to both sexes experience poorer mental health; large variations in mental health exist within the group of both-sex attracted adolescents. Future research can focus on examining factors explaining this variation, such as demographic characteristics and varying experiences with bisexual-specific minority stressors. This would provide insight into why some both-attracted adolescents experience relatively low levels of mental health, while others thrive.

Conclusion

Although there is much evidence for the mental health disparities of both-sex attracted adults as compared to their same-sex attracted and other-sex attracted peers, it remains unclear whether similar disparities exist among adolescents. The results of this study revealed that both-sex attracted adolescents report poorer mental health as compared to their other- and same-sex attracted peers. Bullying victimization partially explains the mental health disparities between both-sex and other-sex attracted adolescents, yet does not account for differences between both-sex and same-sex attracted peers. These results highlight that, despite inclusive policies and accepting attitudes towards sexually diverse people within the Netherlands, substantial progress remains to be made in addressing the mental health disparities of both-sex attracted adolescents.

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Data Sharing and Declaration The datasets generated and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Compliance with Ethical Standards

Conflict of Interest The authors declared no competing interests.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process During the preparation of this work, the author(s) used ChatGPT to advise on statistical questions and refine the paper's grammar and academic writing style. The content of the paper originates from the authors themselves. The author(s) reviewed the content as needed and take(s) full responsibility for the publication

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Vera H. Cup is a Ph.D. candidate at the Department of Interdisciplinary Social Science at Utrecht University. Her major research interests include the mental health of bi+ adolescents.

Henny Bos is Professor Sexual and Gender Diversity in Families and Youth at the University of Amsterdam (Research Institute of Child

Development and Education). Her research has focused on children in planned lesbian mother and gay father families, and also on same-sex attracted, lesbian, gay and bisexual youth, and gender nonconforming youth.

Gonneke W.J.M. Stevens is Professor of Interdisciplinary Social Science at Utrecht University. Her research focuses on why adolescent (mental) health and wellbeing varies as a function of proximal and distal contexts.

Margreet E. de Looze is Assistant Professor of Interdisciplinary Social Science at Utrecht University, the Netherlands. Her major research interests include gender inequalities in adolescent health, well-being, and risk behaviors.