Master thesis

The moderating effects of educational level, religion and social support on the association between sexual orientation and mental health among Dutch adolescents

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Abstract (English)

Adolescents with a different sexual preference than heterosexual (non-heterosexuals) are known to report higher emotional problems. However, not much is known on how sexual orientation is associated with conduct problems and hyperactivity in adolescents. Therefore, this study focused on examining the association between sexual orientation and emotional problems, conduct problems and hyperactivity and the extent to which educational level, religiosity and social support can moderate this association.

Hierarchical multiple linear regression analyses were performed to examine the data of the cross-sectional Dutch HBSC data from 2013 and 2017 (N = 11,960; M_{age} = 14 years). Non-heterosexuals were found to report significantly higher levels of all outcomes than heterosexual adolescents. Few interaction effects were found. Those that were found significant did not support the hypothesis that differences between non-heterosexuals and heterosexuals on mental health problems were bigger the lower the educational level, but did partly support the hypothesis of social support at home.

This study supports the expectation that even in a tolerant society as the Netherlands, non-heterosexual adolescents still score higher on emotional problems, conduct problems and hyperactivity than their heterosexual peers. Overall this association seemed largely similar across level of education, religiosity and support at home and from friends.

Keywords: adolescents, sexual orientation, mental health, educational level, religion, social support.

Abstract (Dutch)

Van adolescenten met een andere seksuele voorkeur dan heteroseksueel (niet-heteroseksuelen) is bekend dat zij hogere emotionele problemen rapporteren. Er is echter niet veel bekend over hoe seksuele geaardheid wordt geassocieerd met gedragsproblemen en hyperactiviteit bij adolescenten. Daarom heeft dit onderzoek zich gericht op het onderzoeken van het verband tussen seksuele geaardheid en emotionele problemen, gedragsproblemen en hyperactiviteit en de mate waarin opleidingsniveau, religiositeit en sociale steun dit verband kunnen modereren.

Hiërarchische meervoudige lineaire regressieanalyses werden uitgevoerd om de gegevens van de transversale Nederlandse HBSC-gegevens van 2013 en 2017 (N = 11.960; Mage = 14 jaar) te onderzoeken. Niet-heteroseksuelen bleken significant hogere niveaus van alle uitkomsten te rapporteren dan heteroseksuele adolescenten. Er werden weinig interactie-effecten gevonden. Diegenen die wel significant bleken, ondersteunden de hypothese niet dat verschillen tussen niet-heteroseksuelen en heteroseksuelen op het gebied van psychische problemen groter waren naarmate het opleidingsniveau lager was, maar ondersteunden wel gedeeltelijk de hypothese van sociale steun vanuit thuis.

Dit onderzoek ondersteunt de verwachting dat zelfs in een tolerante samenleving als Nederland, niet-heteroseksuele adolescenten nog steeds hoger scoren op emotionele problemen, gedragsproblemen en hyperactiviteit dan hun heteroseksuele leeftijdsgenoten. Over het algemeen leek deze associatie grotendeels gelijk over opleidingsniveau, religiositeit en steun thuis en van vrienden.

Trefwoorden: adolescenten, seksuele geaardheid, geestelijke gezondheid, opleidingsniveau, religie, sociale steun.

Introduction

Adolescence is defined as a critical period in life in which an individual gains most of their biological, cognitive, psychological and social features (Perry & Pauletti, 2011; Twenge & Park, 2019). According to the World Health Organization (2020), adolescence is the time in life in which most mental health problems originate. Depression, anxiety and substance abuse are the most common health problems among adolescents (Rickwood et al., 2007). When these problems are not treated, it can lead to life-long psychological and physical problems that restrict individuals from living a fulfilling life (Viner et al., 2012; WHO, 2020). There are multiple determinants of mental health problems, which are rooted in individual and environmental factors, as well as the interaction between these factors (Bostwick et al., 2014; Meyer, 2003). There have been found differences in mental health between social groups, for instance based on race, ethnicity and gender (Meyer, 2007). A group for whom this also applies, are adolescents who have a different sexual preference than heterosexual (Költo et al., 2020; Meyer, 2007). Therefore, this study will focus on differences in mental health between heterosexual adolescents and adolescents with a different sexual preference than heterosexual. In this paper, the last group will be referred to as 'non-heterosexuals'. With realization that this term refers to multiple groups, such as homosexuals and bisexuals, these groups are taken together for writing purposes.

Minority stress model as an explanation for the sexual orientation – mental health linkage

A framework that can explain the differences in mental health between those who are attracted to the opposite sex and those who have a different sexual orientation, is the minority stress model (Meyer, 2003). The model elaborates on the basic concept of stress and adds that individuals can experience additional stress from stressful environments. This additional stress can derive from a conflict between values between a group of minority and the majority of society (Iniewicz et al., 2017). These conflicts in social context can result into social stress for those belonging to the minority group, when stressful environments that arise are characterized by stigma, prejudice and discrimination (Meyer, 2003). Discrimination due to sexual orientation can cause additional stress and has been found to be significantly more prevalent among non-heterosexuals than heterosexuals (Chakraborty et al., 2011; Mays & Cochran, 2001). When an individual is mistreated or stigmatized because of his/her group membership, this can negatively influence one's mental health (Schmitt et al., 2014). This can take place directly, such as violence, but also indirectly, such as insufficient attention to health of non-heterosexuals or unperceptiveness of their norms and culture (Meyer, 2007).

In line with the previous theoretical notion, non-heterosexual adolescents have been found to report lower mental health than heterosexual adolescents (Költo et al., 2020; Meyer, 2007). In addition, Költo et al. (2019) found that non-heterosexual adolescents are more likely to drink alcohol, smoke cigarettes and use cannabis. Previous literature also reports higher prevalence of depression, suicidality and use of substances among non-heterosexuals than heterosexual adolescents (Chakraborty et al., 2011; Mongelli et al., 2019; Pitonak, 2017). The level of tolerance towards homosexuality differs greatly across countries (Van Den Akker et al., 2013). However, in the Netherlands, a country that is known to be highly tolerant concerning non-heterosexuals (Keuzenkamp & Bos, 2007), similar results were found, where non-heterosexual adolescents reported lower psychological well-being ((Baams et al., 2013), higher levels of depression and lower levels of self-esteem (Bos et al., 2008) and higher levels of emotional problems (Kuyper et al., 2016) than heterosexual adolescents.

Research on sexual orientation and mental health focused mainly on as emotional and psychological problems. However, not much is known about the association between sexual orientation and problems outside of psychological problems. A study in Thailand found that non-heterosexuals reported more emotional and behavioral problems, such as attention problems and rule-breaking behavior, compared to heterosexual peers (Boonchooduang et al., 2019). As far as we know, in the Netherlands, the association between sexual orientation and adolescent conduct problems and hyperactivity has not yet been investigated.

As discussed, the minority stress model states that non-heterosexual adolescents perceive more discrimination and prejudices than heterosexual adolescents, and as such the first group experiences more mental health problems (Meyer, 2003). This assumes that if a non-heterosexual adolescent does not perceive discrimination in their social environment, no differences in mental health between heterosexual and non-heterosexual adolescents will be found. Therefore, this study not only investigates the linkage between sexual orientation and mental health, but also includes three factors that might impact upon this association: level of education, religion and social support.

Level of education and the sexual orientation – mental health linkage

According to Strand (1998), a higher educational level stimulates the level of openness for new ideas in an individual. Research shows that the higher the educational level, the more favorable an individual is to same-sex marriage (Lubbers et al., 2009; Van De Meerendonk & Scheepers, 2004). Similarly, Zhang and Brym (2019) found that level of education is positively related to tolerance of homosexuality in liberal countries. Results of the Dutch 2017 HBSC

study show that the overall attitude towards homosexuality in primary and secondary schools in the Netherlands is positive (Stevens et al., 2018). However, these results also indicate that the lower the educational level, the less positive attitudes towards homosexuality are. Especially students in the highest level of secondary education in the Netherlands report more positivity towards homosexuality in comparison to other educational levels. In addition, more highly educated students are more likely to believe that homosexual classmates can express their sexuality in school in comparison with lower educated students (Stevens et al., 2018).

Thus, if an individual is in a lower educational level, its peers are likely to have a more negative attitude towards homosexuals. When these attitudes result into discrimination and stigmatization, this can evoke the feeling of not being accepted, which can negatively affect the mental health of a non-heterosexual adolescent. This would mean that mental health differences between heterosexual and non-heterosexual adolescents are smaller whenever adolescents are in higher educational levels.

Religion and the sexual orientation – mental health linkage

A second factor that is expected to have a moderating effect on the relation between sexual orientation and mental health, is religiosity. Religiosity has been found to relate positively with dismissal of homosexuality (Janssen & Scheepers, 2019; Van De Meerendonk & Scheepers, 2004) and negative attitudes towards homosexuals (Schulte & Battle, 2004). In contrast with a popular religion belief to respect all others, homosexuality is often labeled as unnatural (Janssen & Scheepers, 2019). It is therefore plausible to believe that when an individual is raised religious, the individual themselves and their family are less accepting of homosexual feelings. As stated in the minority stress model, a conflict can occur if an individual does not adhere to the social norms of the majority. When an non-heterosexual adolescent is raised in an environment that is unaccepting of their sexual preference, the conflict that arises can lead to feelings of discrimination or stress, which can have a negative effect on the well-being of the adolescent. Lytle et al. (2018) found that religious homosexual adolescents had a higher prevalence of recent thoughts of suicide and suicide attempts over lifetime, in comparison with religious heterosexual adolescents.

These findings imply that if a non-heterosexual individual reports to be religious or finds themselves in religious communities, they are relatively probable to experience discrimination concerning their sexual orientation, because of the higher levels of unacceptance towards homosexuality in religion communities. This implies that mental health differences between

heterosexual and non-heterosexual adolescents are bigger whenever adolescents are raised religiously.

Social support and the sexual orientation – mental health linkage

While non-heterosexual adolescents are more likely to experience discrimination than heterosexual adolescents due to the conflict in their societal environment, this feeling can probably be reduced by signs of acceptance in their environment. The effect of discrimination on mental health that non-heterosexuals perceive, might depend on the amount of social support they receive (Schmitt et al., 2014). A study by Hefner and Eisenberg (2009) showed that adolescents with low social support from family and friends are six times more likely to show symptoms of depression than adolescents with high social support when they belong to a minority group. Burton et al. (2014) found that social support is particularly important if the stress that is experienced is stigma-related, such as discrimination on grounds of sexuality. Cain et al. (2017) found that social support can reduce mental health problems of non-heterosexual adolescents. Research shows higher prevalence of mental health problems in non-heterosexual adolescents than heterosexual adolescents when low levels of support are experienced (Perales & Campbell, 2020), or when the social relationships are experienced as negative by the non-heterosexuals (Barry et al., 2020). These findings imply that non-heterosexual individuals experience less mental health problems than their heterosexual peers, if they receive high social support from their environment. In Dutch research, this moderator has not yet been looked at in the association between sexual orientation and emotional problems, conduct problems and hyperactivity in adolescents. Previous research would suggest that mental health differences between heterosexual and non-heterosexual adolescents are smaller whenever adolescents perceive more support from friends and family.

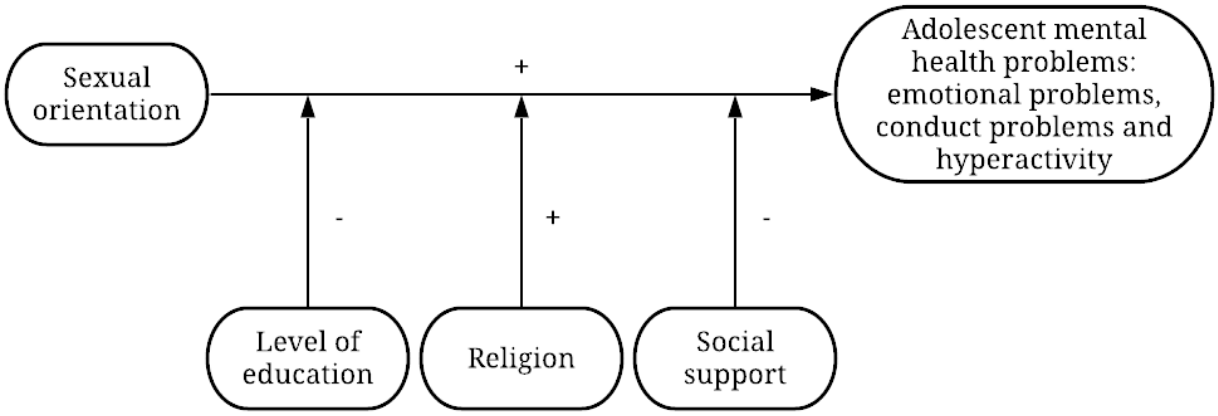
The current study

Although the association between sexual orientation and adolescent mental health has been studied, most research focuses on emotional problems. Not much is known about the effects of sexual orientation on problems outside of psychological problems in adolescence, such as conduct problems and hyperactivity. This study will take both aspects of mental health into account and in addition, level of education, religiosity and social support will be considered in this paper. The current study will analyze data from the Dutch HBSC 2013 and 2017 studies. The outcomes of this study are of great importance, as they can give insight on which factors to address when helping non-heterosexuals with mental health problems. As seen in Figure 1,

it is hypothesized that heterosexual adolescents will report less mental health problems than adolescents with a different sexual orientation. Another expectation is that the differences in mental health between heterosexual and non-heterosexual adolescents are smaller when adolescents are in a higher educational level. Based on literature, it is expected that when adolescents are raised religiously, the mental health differences between heterosexual and non-heterosexual adolescents will be bigger. Lastly, it is expected that the differences in mental health between heterosexual and non-heterosexual adolescents will be smaller when adolescents experience more social support from friends and family.

Figure 1

Model of current study



Methods

Sample

For this study, data from the Dutch 2013 and 2017 cross-sectional, school-based Health Behaviour in School-aged Children (HBSC) study were used. Students in their last year of primary education and throughout secondary education were asked to fill out the survey during school hours. The study was approved by the Ethics Committee of the Faculty of Social and Behavioral Sciences of Utrecht University. Only students from secondary education were included in this particular study, because questions about sexual preference were not posed in the survey for students in primary education. To recruit participants, schools were approached randomly, using a database for all schools in regular education. Respectively 40% and 37% of the secondary schools that were approached for participation, participated in the study in 2013

and 2017. The most important reasons for not participating in the HBSC study were that schools already participated in another study, or that they were approached for research too often. The final sample consisted of 11,960 participants (n_{2013} = 4782; n_{2017} = 7178), of which 5,784 boys (M_{age} = 14.09, SD = 1.58) and 6,176 girls (M_{age} = 14.04, SD = 1.52).

Measures

Sexual orientation. Participants were asked about their sexual preference. This was examined with the question 'are you attracted to boys, girls or both?'. The answer categories were 1) boys, 2) girls, 3) boys and girls and 4) do not know yet. Adolescents who were attracted to the opposite sex, were considered as heterosexual adolescents. Those who were attracted to the same sex or both sexes, were considered non-heterosexual adolescents. Participants who chose answer 4, were considered 'undecided'. These categories are consistent with previous research on this topic (Kuyper et al., 2016).

Emotional problems, conduct problems and hyperactivity. To assess emotional problems, conduct problems and hyperactivity-inattention problems, validated scales from the Strengths and Difficulties Questionnaire (SDQ) were used (Duinhof et al., 2015). Scales were assessed with five items for each subscale using a three point scale (1 = not true, 2 = somewhat true, 3 = very true). An example item of the emotional problems scale is 'I am often unhappy, down or in tears'. An example item for conduct problems is 'I fight a lot. I succeed in letting other people do something I want'. An example item for hyperactivity-inattention is 'I get easily distracted, I'm having trouble concentrating'. Cronbachs alpha's for the respective scales were α = .71, α = .47 and α = .71, which is in line with the study of Duinhof et al. (2015).

Level of education. Participants were asked to report their level of education. For the students in secondary education, the level of education can be divided into four categories that are known in the Dutch school system from low to high 1) VMBO-b / t; 2) VMBO-t / HAVO; 3) HAVO; HAVO / VWO; 4) VWO. Students were assigned to the lowest educational level when they were in classes with a combined level. Therefore, in this report there will be referred to VMBO-b, VMBO-t, HAVO or VWO.

Social support. Social support was divided into support from home and support from friends. Two subscales from the validated Multidimensional Scale of Perceived Social Support (MSPSS) were used to assess these concepts (Zimet et al., 1988). For both types of support four items were used. These items were answered by the participants on a 7-point scale (1 = really do not agree, 7 = totally agree). An example item of support at home is 'At home, I am getting the emotional support and help that I need' (Cronbach α = .92). An example item of support

from friends is 'I can talk about my problems with my friends' (Cronbach α = .93). The reliability of these scales was similar to those of the study of Zimet et al. (1988). These scales were made dichotomous for this study by summing and averaging the scores on the items to distinguish between adolescents that perceive a high level of support ($\geq$ 5.5) and those that did not.

Religion. For religion, it was asked if the participants were raised religiously. The answer categories were 1) Yes, Roman Catholic or Christian; 2) Yes, Islamist; 3) Yes, other namely … ; 4) No, not raised religiously. In this study, a distinction was made between participants who were raised religiously and those who were not.

Demographics. Few demographic variables were assessed. Age was asked through birth year and month. Students could indicate their gender by choosing 1) boy, 2) girl.

Analyses

IBM SPSS Statistics version 24 was used for the analyses. Before analyzing the data, missing values, outliers and impossible values were detected and dealt with. No patterns were thought of as unreliable or impossible.

Before conducting linear regression analyses, a number of assumptions was tested. The assumption for normality was violated, as the dependent variables were not normally distributed (Shapiro-Wilk < .05). This is, however, logical since most adolescents do not score high on emotional problems, conduct problems or hyperactivity. Also, the sample size of this study was large enough to continue the interpretation of the results (Li et al., 2012). To interpret the results of the regression analysis, two dummy variables have been made for the independent variable sexual orientation. The first dummy variable distinguishes heterosexual and non-heterosexual adolescents from each other. The second dummy variable distinguishes undecided adolescents from heterosexual adolescents.

Hierarchical multiple linear regression analyses were used to examine the association between the control variables age and gender and the outcomes first. Secondly, dummy variables for sexual orientation (heterosexual = reference group) were added in step 2 of the analysis, to test the main effects of sexual orientation on the outcomes, to address the first hypothesis. Each moderator was added in a separate analysis in the second step to test the main effect of these variables on the outcomes. Lastly, the interaction effect of the moderators and sexual orientation was added to the final model in separate analyses.

Results

Descriptive statistics

The participants in this study were for the most part heterosexuals (91.5%); 3.2% indicated they are attracted to the same sex or both sexes. Moreover, 5.3% said they did not know their sexual orientation yet. Overall, higher mean scores were found for hyperactivity-inattentions (M = 4.12, SD = 2.41) than for emotional problems (M = 2.56, SD = 2.32) and conduct problems (M = 1.83, SD = 1.51). Mean levels of outcomes across sexual orientation groups are reported in Table 1. Non-heterosexual adolescents reported more emotional problems, conduct problems and hyperactivity than heterosexual adolescents and those who were undecided. The undecided adolescents scored higher on emotional problems than heterosexual adolescents, similar on conduct problems, and lower on hyperactivity than heterosexual adolescents.

Correlations between study variables were assessed as well (Table 2). Correlations show that non-heterosexual adolescents score higher on all outcomes than heterosexual adolescents. There is no significant relation between being non-heterosexual and educational level and religiosity. Those who are undecided about their sexual orientation, reported more emotional problems, but less conduct problems and hyperactivity than heterosexual adolescents. This group reported no significant relation with religiosity and support at home. Because of the association between gender and age and the independent and dependent variables, these variables will be added in block 1 in each linear regression analysis as control variables.

Table 1

Means (M) and Standard Deviations (SD) for the dependent variables per sexual orientation

	Emotional problems		Conductproblems		Hyperactivity	
	M	SD	M	SD	M	SD
Sexual orientation						
Heterosexual	2.51[a]	2.27	1.82[a]	1.48	4.10[a]	2.40
Non-heterosexual	4.10[b]	2.78	2.40[b]	1.95	4.89[b]	2.32
Undecided	3.21[c]	2.45	1.71[a]	1.55	3.87[c]	2.43

Note. Bonferroni corrections were used to assess differences between groups per outcome.

Table 2

Pearson and Spearman Correlation Matrix of Study Variables and Control Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Non-heterosexual[a]											
2. Undecided[a]											
3. Emotional problems	.102**	.062**									
4. Conduct problems	.051**	-.026**	.228**								
5. Hyperactivity	.061**	-.024**	.269**	.370**							
6. Education level	.004	.066**	-.020*	-.201**	-.165**						
7. Religiosity[b]	-.009	.013	-.027**	-.015	-.083**	.002					
8. Support at home	-.084**	-.005	-.246**	-.280**	-.188**	.051**	.003				
9. Support from friends	-.026**	-.041**	-.105**	-.149**	-.052**	-.004	-.011	.371**			
10. Gender[c]	.029**	.055**	.339**	-.092**	-.005	.001	.027**	.000	.256**		
11. Age	.063**	-.117**	.066**	-.021*	.004	.034**	-.018*	-.116**	-.009	.010	

Note. [a]Reference category = heterosexual. [b]Reference category = not raised religious. [c]Reference category = male.

*p<.05, **p<.01

Sexual orientation and mental health problems

After controlling for age and gender, it was found that non-heterosexuals report significantly higher levels of emotional problems (B = 1.403, p = <.001), conduct problems (B = .624, p <.001) and hyperactivity (B = .790, p <.001) than heterosexuals. For those who are undecided, results showed significantly higher scores on emotional problems (B = .587, p <.001) and lower scores on hyperactivity (B = -.233, p = .019) than for heterosexual adolescents. Non-significant results were found on conduct problems (B = -.092, p = .136) for undecided adolescents in comparison with heterosexual adolescents.

The moderating role of educational level and religiosity in the association between sexual orientation and mental health problems

In order to investigate the moderating effect of educational level in the association between sexual orientation and mental health problems, educational level was included in the models. The second step of the linear regression showed the main effects for educational level with the highest educational level as a reference group (Table 3). Positive significant main effects of educational level were found on almost all outcomes, which indicates that more emotional problems, conduct problems and hyperactivity are reported in the lower educational levels than in the highest. One non-significant main effect was found; VMBO-t students do not report significantly higher emotional problems than VWO students. In the last step of the linear regression, two interactions were found to be significant. Firstly, the differences between non-heterosexual and heterosexual adolescents on conduct problems were stronger for adolescents at the VMBO-t level, than at the VWO level. Secondly, the differences between non-heterosexual and heterosexual adolescents on emotional problems were weaker for adolescents at the HAVO level than for their peers at the VWO level. No other significant interactions were found for educational level on the association between sexual orientation and mental health. The fact that only few interactions were significant was in line with the finding that the models in which the interactions were added, did not account for additional explained variance (ΔR^2 = .00).

When adding religiosity in the linear regression (Table 4), significant main effects were found for emotional problems and hyperactivity. Adolescents who were raised religiously, scored significantly lower on both outcomes. For conduct problems, no main effect was found. This was also the case for the interactions with religiosity in the last step of the model, meaning that the association between sexual orientation and mental health problems did not differ for

those who were raised religiously and those that were not. Again, the models in which the interactions were added, did not account for additional explained variance ($\Delta R^2 = .00$).

Table 3

Associations between sexual orientation and mental health problems, including educational level as a moderator

	Emotional problems				*Conduct problems*				*Hyperactivity*			
	B	SE	β	*p*	B	SE	β	*p*	B	SE	β	*p*
Step 1:												
Gender	1.567	.040	.338	.000**	-.270	.027	-.089	.000**	-.019	.044	-.004	.666
Age	.106	.013	.071	.000**	-.021	.009	-.022	.016*	.007	.014	.004	.642
Step 2:												
Non-heterosexual[a]	1.408	.112	.108	.000**	.630	.076	.074	.000**	.802	.123	.059	.000**
Undecided[a]	.612	.089	.059	.000**	.010	.061	.001	.869	-.096	.098	-.009	.328
VMBO-b[b]	.271	.060	.045	.000**	.867	.041	.221	.000**	1.060	.066	.169	.000**
VMBO-t[b]	.081	.053	.016	.126	.590	.036	.174	.000**	.891	.058	.165	.000**
HAVO[b]	.105	.053	.016	.050*	.318	.036	.093	.000**	.613	.059	.113	.000**
Step 3:												
VMBO-b * Non-heterosexual	-.443	.341	-.014	.194	.315	.232	.015	.174	.-.511	.375	-.015	.173
VMBO-t * Non-heterosexual	-.284	.289	-.012	.326	.540	.196	.035	.006*	-.307	.318	-.012	.334
HAVO * Non-heterosexual	-.730	.305	-.028	.017*	.130	.208	.008	.532	-.253	.336	-.009	.451
VMBO-b * Undecided	.199	.287	.007	.487	.262	.195	.014	.178	.107	.316	.004	.736
VMBO-t * Undecided	-.173	.235	-.008	.460	-.221	.159	-.016	.166	.261	.258	.012	.311
HAVO * Undecided	-.066	.224	-.003	.767	-.203	.152	-.015	.182	-.089	.246	-.004	.719

Note. [a]Reference category = heterosexual. [b]Reference category = VWO. *p<.05, **p<.001

Table 4

Associations between sexual orientation and mental health problems, including religiosity as a moderator

	Emotional problems				Conduct problems				Hyperactivity			
	B	SE	β	*p*	B	SE	β	*p*	B	SE	β	*p*
Step 1:												
Gender	1.567	.040	.338	.000**	-.270	.027	-.089	.000**	-.019	.044	-.004	.666
Age	.106	.013	.071	.000**	-.021	.009	-.022	.016*	.007	.014	.004	.642
Step 2:												
Non-heterosexual[a]	1.399	.112	.107	.000**	.623	.078	.073	.000**	.780	.124	.057	.000**
Undecided[a]	.591	.089	.057	.000**	-.091	.062	-.014	.139	-.224	.099	-.021	.023*
Religiosity[b]	-.180	.042	-.037	.000**	-.031	.029	-.010	.280	-.424	.046	-.083	.000**
Step 3:												
Religiosity * Non-heterosexual	-.036	.240	-.002	.882	.269	.167	.020	.076	.241	.267	.010	.368
Religiosity * Undecided	.009	.183	.001	.960	.073	.127	.007	.566	.182	.204	.010	.372

Note. [a]Reference category = heterosexual. [b]Reference category = not raised religious. *p<.05, **p<.001

The moderating role of family and friend support in the association between sexual orientation and mental health problems

For support, the two sources of support are included in separate regressions. When adding support at home in the linear regression (Table 5), negative significant main effects were found for all outcome variables. This indicates that individuals who perceive low family support, report higher emotional problems, conduct problems and hyperactivity. When looking at the interaction effects, the differences between undecided and heterosexual adolescents on emotional problems were weaker for adolescents who receive high support at home, than for those who receive low support at home. Also, differences between non-heterosexual and heterosexual adolescents on conduct problems were more pronounced for those who receive low family support. Furthermore, no significant interaction effects were found for support at home on the association between sexual orientation and mental health. This was supported by the finding that no additional variance was explained in the last step of the model ($\Delta R^2 = .00$).

Table 6 shows the linear regression results with support from friends as a moderator. The main effects that were found were similar of those of support at home; individuals who perceive low support from friends report higher emotional problems, conduct problems and hyperactivity. In the last step of the model, one positive significant interaction was found for non-heterosexual adolescents on emotional problems. This indicates that the differences between non-heterosexual and heterosexual adolescents on emotional problems were stronger for those who perceive high support from friends, than those who perceive low support from friends. No further significant interaction effects were found for support from friends and no additional variance was explained in the last step of the model ($\Delta R^2 = .00$).

Table 5

Associations between sexual orientation and mental health problems, including support at home as a moderator 005*

	Emotional problems				Conduct problems				Hyperactivity			
	B	SE	β	*p*	B	SE	β	*p*	B	SE	β	*p*
Step 1:												
Gender	1.567	.040	.338	.000**	-.270	.027	-.089	.000**	-.019	.044	-.004	.666
Age	.106	.013	.071	.000**	-.021	.009	-.022	.016*	.007	.014	.004	.642
Step 2:												
Non-heterosexual[a]	1.202	.109	.092	.000**	.459	.075	.054	.000**	.600	.123	.044	.000**
Undecided[a]	.561	.087	.054	.000**	-.114	.060	-.017	.056	-.258	.097	-.024	.008*
Support at home[b]	-1.088	.043	-.209	.000**	-.889	.030	-.263	.000**	-1.023	.049	-.190	.000**
Step 3:												
Support at home * Non-heterosexual	-.203	.219	-.011	.353	-.395	.150	-.034	.009*	.239	.246	.013	.331
Support at home * Undecided	-.608	.193	-.050	.002*	-.222	.133	-.028	.095	-.162	.217	-.013	.456

Note. [a]Reference category = heterosexual. [b]Reference category = low support. **p*<.05, ***p*<.001

Table 6

Associations between sexual orientation and mental health problems, including support from friends as a moderator

	Emotional problems				Conduct problems				Hyperactivity			
	B	SE	β	*p*	B	SE	β	*p*	B	SE	β	*p*
Step 1:												
Gender	1.567	.040	.338	.000**	-.270	.027	-.089	.000**	-.019	.044	-.004	.666
Age	.106	.013	.071	.000**	-.021	.009	-.022	.016*	.007	.014	.004	.642
Step 2:												
Non-heterosexual[a]	1.324	.111	.101	.000**	.587	.077	.069	.000**	.768	.125	.056	.000**
Undecided[a]	.508	.088	.049	.000**	-.128	.062	-.019	.037*	-.255	.099	-.024	.010*
Support from friends[b]	-.681	.042	-.140	.000**	-.312	.029	-.099	.000**	-.189	.047	-.037	.000**
Step 3:												
Support from friends * Non-heterosexual	.495	.223	.029	.026*	-.014	.156	-.001	.929	.409	.251	.023	.103
Support from friends * Undecided	-.261	.077	-.019	.139	-.144	.123	-.016	.244	-.295	.199	.021	.138

Note. [a]Reference category = heterosexual. [b]Reference category = low support. *p<.05, **p<.001

Discussion

The current study investigated the association between sexual orientation and adolescent emotional and conduct problems, and hyperactivity as well as the moderating role of level of education, religiosity and social support from friends and family on this association. Results showed that non-heterosexual adolescents reported more emotional problems, conduct problems and hyperactivity than their heterosexual peers. Most interactions revealed no significant results, meaning that mental health differences between heterosexual and non-heterosexual adolescents were largely comparable across level of education, religiosity and support at home and from friends. For educational level, two interactions were found to be significant. Firstly, the differences between non-heterosexuals and heterosexuals on conduct problems were bigger for adolescents on the VMBO-t level, than for adolescents on the VWO level. Second, the differences between non-heterosexual and heterosexual on emotional problems were smaller for adolescents on the HAVO than the VWO level. For religiosity, no interaction effects were found at all, which suggests that the association between sexual orientation and mental health problems did not differ for those who were or were not raised religiously. One of the interaction effects for support at home showed that differences between undecided and heterosexual adolescents on emotional problems were smaller when adolescents perceived high support, in comparison with those who perceived low support. Also, differences between non-heterosexual and heterosexual adolescents on conduct problems were smaller when receiving high support than low support at home. An unexpected result was found for the interaction with support from friends on emotional problems, which showed that differences between non-heterosexual and heterosexual adolescents were bigger when adolescents received more support from friends than when they received low support.

Firstly, differences were found between non-heterosexual and heterosexual adolescents for all mental health outcomes; emotional problems, conduct problems and hyperactivity. These findings support previous research, in which non-heterosexual adolescents score higher on mental health problems than heterosexual adolescents (Fish, 2020; McDonald, 2018). It is also in line with the minority stress model (Meyer, 2003), which states that conflicts between minority and majority groups in society can result in discrimination of the minority group (Iniewicz et al., 2017). This minority group, here non-heterosexual adolescents, experience additional stress due to discrimination which can result in lower mental health. In addition to investigating the differences between non-heterosexual and heterosexual adolescents, this study found another sexual orientation group that associates with the outcomes and that cannot be considered either heterosexual or non-heterosexual; undecided adolescents. No hypotheses

were made for this particular group. However, results showed that undecided adolescents score higher on emotional problems, lower on hyperactivity than heterosexual adolescents. No differences were found between undecided and heterosexual adolescents on conduct problems. A possible explanation for these inconsistent findings is that this group is a combination of individuals who are doubting if they are attracted to the same, both or opposite sexes or individuals who are not yet thinking about their sexual orientation. The diversity of this group could explain the diverse results. Undecided adolescents are known to be more vulnerable than their peers who do know their sexual orientation (Cénat et al., 2015; Talley et al., 2014).

Overall, the association between sexual orientation and mental health did not become stronger for adolescents when they were in a lower educational level, which is in contrast with the hypothesis. Two of the eighteen interactions were found to be significant. First, the differences between non-heterosexuals and heterosexuals on conduct problems were stronger for individuals at the VMBO-t level than for individuals at the VWO level. This finding is in line with the hypothesis. An unexpected result was that the differences between non-heterosexuals and heterosexuals on emotional problems were weaker for students on HAVO than VWO. This finding was in contrary with the hypothesis. The hypothesis was based on the idea that the lower the educational level, the lower the positive attitude towards homosexuality (Stevens et al., 2018), which in turn would lead to feelings of unacceptance and additional stress for non-heterosexuals. However, this is under the condition that non-heterosexuals are open about their sexual orientation, and that their classmates have this information. If others do not know, adolescents may not be discriminating them. An additional methodological explanation for not finding the expected results, can be that there were not enough non-heterosexual participants per educational level.

In contrast with the hypothesis, religiosity did not moderate the relationship between sexual orientation and adolescent mental health at all. The link between sexual orientation and mental health problems did not differ whether adolescents were raised religiously. This hypothesis was based on the expectation that attitudes towards non-heterosexuals were less positive in religious communities (Janssen & Scheepers, 2019; Schulte & Battle, 2004; Van De Meerendonk & Scheepers, 2004), which would increase the vulnerability of non-heterosexual adolescents for mental health problems according to the minority stress model. However, it is possible that this is not the case or in a lesser degree than expected. The reason for this could be that attitudes towards homosexuality differ across religions. As we have not distinguished between different religions, it is possible that these differences have been overseen. Another explanation could be that only adolescents who are highly involved in their religion are

surrounded by a non-supportive environment towards non-heterosexuals, as some research suggests that the amount of involvement in the religion can be a determinant for religion being a protective or harmful factor for the mental health of adolescents (Szymanski & Carretta, 2020; Van Den Akker et al., 2013).

For social support, differences between undecided and heterosexual adolescents on emotional problems were smaller when high support at home was experienced. Also, differences between non-heterosexuals and heterosexuals on conduct problems were weaker when high support than when low support from home was reported. This is in line with the expectations, whereas support can enhance the feeling of acceptance (Cain et al., 2017). A striking result was that differences between non-heterosexuals and heterosexuals became larger when receiving more support from friends. A possible explanation for this, is that this support is a reaction to non-heterosexual individuals who experience large amounts of mental health problems. In this case, this support has helped them, but not yet enough. Further, no significant interaction effects were found, in contrast with the hypothesis.

A strength of the current study is that two waves of data were used in the analysis to enhance the sample size. The HBSC study has a nationally representative sample and in this study multiple outcomes and moderator variables were examined. The present study had some methodological limitations that should be kept in mind when interpreting the results. First of all, due to sample size, adolescents who are attracted to the same sex and both sexes are taken together in one category in the current study. It may however be, that those groups differ on mental health problems (Bostwick & Harrison, 2020), but that these differences are not visible due to the merge. Secondly, sexual orientation was measured with only one question about sexual attraction. This question was about to whom the adolescents were attracted, but it is not clear if they are also outing this preference in their social environment. If that is not the case, no conflict will arise in the social environment of the non-heterosexual and discrimination will not occur for sexual orientation. To tackle this, Beaulieu-Prévost and Fortin (2015) suggest that sexual orientation should be measured by three aspects; attraction, behaviors and self-identification. The conclusions of this study should be seen in the light of these limitations.

Concluding, despite the Netherlands being a tolerant country towards homosexuality, non-heterosexuals are still experiencing more mental health problems than their heterosexual peers. Additionally, this association seemed largely the same across level of education, religiosity and social support. Understanding the stigma that plays a role in the well-being of non-heterosexual adolescent is important in criteria for therapy with these individuals. The better understanding

of this phenomenon will give practical insights for the development of interventions meet the needs of those most at risk.

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