

Brothers and Sisters—“More” is Better? Effects on School, Violence and Health

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Received: January 1, 2017

Accepted: February 16, 2017

Online Published: May 18, 2017

doi:10.22158/wjer.v4n2p313

URL: <http://dx.doi.org/10.22158/wjer.v4n2p313>

Abstract

Aims: The aim of this study was to understand the differences between adolescents with and without brothers and sisters, in what concerns to risk behaviours, health and the relationship with their peers and family.

Sample: The Portuguese HBSC (Health Behaviour in School-Aged Children) survey included a total of 6026 students where 47.7% were boys.

Results: Male adolescents with three or more brothers drink and smoke more, feel sadder, are more nervous and angrier, have more worries, and more frequently act as bullies. Boys who are only child are more satisfied with life and report more frequently that they like school. Boys with more than three sisters practice more physical activity. Girls with one brother are less victimized and have better relationships with their friends.

Keywords

siblings, risk behaviours, adolescence, school

1. Introduction

Brothers and sisters—more is better? Effects on school, violence and health Sibling relationships influence development and adjustment across the lifespan, in spheres ranging from peer and romantic relationships to health and risk behaviours and also to pro-social versus anti-social life course trajectories. Strengthening sibling relationships is a potential approach for promoting healthy family

functioning, fostering youths' psychological health and social competence, as well as preventing health risk behaviours (Gass, Jenkins, & Dunn, 2007), such as substance use (Bank, Kothari, Snyder, Wilson, & Feingold, 2011; Kothari, Srenson, Bank, & Snyder, 2014; Low, Shortt, & Snyder, 2012). The magnitude of sibling influences on adolescents' substance use is often greater than parental influences (Kokkevi et al., 2007; Kothari et al., 2014). Research indicates that siblings' substance use behaviours are stronger when they share the same gender (Trim, Leuthe, & Chassin, 2006) and are close in age (Kokkevi et al., 2007; Samek, McGue, Keyes, & Iacono, 2014; Scholte et al., 2008).

Also, younger siblings drinking was associated with older sibling's excessive alcohol use and low parental monitoring (Gossrau-Breen, Kuntsche, & Gmel, 2010).

The relationships between siblings have been linked to a range of child and adolescent outcomes, including depression, identity and self-esteem, aggression, delinquency, school adjustment and achievement, peer and romantic relationships, substance use and other health risk behaviours (Kim, McHale, Crouter, & Osgood, 2007; Rende, Slomkowski, Lloyd-Richardson, & Niaura, 2005).

Siblings play a key role in one another's adjustment. Research on children and adolescents reveals concordance between sibling relationship qualities (e.g., warm) and adjustments in several domains, including externalizing and internalizing problems, school, peer relationships, parental characteristics and other family factors like parental adjustment (Kim et al., 2007).

Siblings can influence each other indirectly by providing behaviour models (Whiteman, Jensen, & Maggs, 2013; Whiteman, Zeiders, Killoren, Rodriguez, & Updegraff, 2014). Secure attachment relationships with siblings can enhance a child's sense of security, acting as a protective factor against mal adjustment, while children with negative sibling attachment experiences may be more prone to view themselves as unworthy of love, exposed to anxiety and depression, viewing the social world as negative and untrust worthy, resulting in delinquency, substance abuse and aggressive behaviours. Studies have shown a negative effect of sibling warmth on problematic behaviour (Noller, 2005; Pike, Coldwell, & Dunn, 2005). The lack of warmth in the sibling relationship has been associated with externalizing problems (Dunn, 2005; McElwain & Volling, 2005) while children with warm sibling relationships develop less internalizing problems (Kim et al., 2007), and when the sibling relationship is supportive, they report less depressive symptoms after stressful life events when compared with children with unsupportive sibling relationship (Gass, Jenkins, & Dunn, 2007). A positive sibling relationship has been associated with healthy emotional regulation (Kennedy & Kramer, 2008) and prosocial behaviour (Pike et al., 2005).

Whiteman and Christiansen (2008) showed that two-thirds of second—born children were influenced by their sibling in various domains of development, such as depression, risky behaviour and peer competence.

Despite the importance of sibling relationships, and particularly the potential implications of growing up with fewer siblings, the impact of the number of siblings on personality traits has received little attention so far; still, sibling relationships are considered fundamental, with a long-term impact on an

individual's character and on their future relationships success.

Wang (2007) compared children with and without siblings. The results suggest that while there were significant but modest differences in the siblings' behavioural patterns, these differences decreased as children got older, and there was no significant difference in personality development in the last wave of data when the children reached young adulthood.

The potential implications of growing up with fewer siblings has been studied. One study showed that children who grow up with few siblings have greater educational success than those with many siblings because they must compete for parental resources (Steelman, Powell, Werum, & Carter, 2002). Downey and Condron (2004) suggested that one sibling may provide all the necessary interaction required to develop social skills: further siblings may increase the number of interactions but do not necessarily promote social skills as the necessary sibling interaction has been met with a single brother or sister.

Yucel (2014) found that children who have four or more siblings show more serious problem internalizing, risk behaviours, lower self-concept, and an inferior locus of control when compared to only children. The analysis of the benefits of having either sisters or brothers, showed little evidence of the value of having sisters compared to having brothers. Also, compared to having older siblings, having younger siblings appears more beneficial for personality traits, particularly in predicting self-concept and locus of control.

Sibling and peer relationships are highly important in children's and adolescents' daily experiences, being significant contexts of individual development. A substantial body of research has documented the extent of peer victimization and its potential effects on children and adolescent's mental health. This effect is significant when victim and bully are siblings. Some studies found that victimization by a sibling was predictive of peer victimization. In accordance, children and adolescents victimized by both a sibling and a peer reported the greatest mental distress (Tucker, Finkelhor, Turner, & Shattuck, 2014). The present study in addition to studying the influence of the number of siblings in school, violence and health also studies the differences between siblings of different genders or not. Although there are already several studies around this topic, very few study all the variables of this study.

The aim of this study was to understand the differences between adolescents with and without brothers or sisters, in what concern storisk behaviours, health and relationship with peers and family.

2. Method

2.1 Procedures

This survey is part of the Health Behaviour in School-aged Children (HBSC) study (Currie et al., 2004; Currie et al., 2012; Matos et al., 2006; Matos et al., 2012).

An online questionnaire with open-ended and closed-ended questions was administered in classroom context, with the assistance of the IT teacher, and took an average of 50 minutes (a regular class length) be completed. Researchers were available to answer any student's questions. This study followed all

ethic recommendations regarding research on humans and got the approval of the ethical committee. This study had the approval of a scientific committee, the national ethical committee and the national commission for data protection and strictly followed all the guidelines for the protection of human rights; adolescents' participation in the survey and completion of the questionnaires was voluntary and completely anonymous.

2.2 Participants

The Portuguese HBSC survey included 6026 students (47.7% boys), from the 6th Grade (35.8% boys), 8th Grade (39.1% boys) and 10th Grade (25.1% boys), with an average age of 13.8 years ($SD = 1.68$). They students were randomly selected from 36 national vertical clusters of schools, a total of 473 classes, geographically stratified by Regional Education Divisions in Portugal. The overall procedure has been described elsewhere (Currie et al., 2004; Matos et al., 2012). The sample is nationally representative of the respective grade levels. The response rate was 79%.

2.3 Measures

Adolescents responded to an extensive questionnaire, including questions on demographics (gender, school grade and socio-economic status). Several other aspects were asked, namely, drinking experiences, use of tobacco, being a provoker and/or bullied in school; feeling sad, nervous and angry; frequency of worries and concerns; liking school; life satisfaction; physical activity; general health; satisfaction with friends and family relationships; communication with parents; communication with brothers/sisters; easiness in making friends; and number of siblings (See Table 1).

Table 1. Items of the Questionnaire

	Items	Responses
Drunkenness	Have you ever been drunk?	1. No, never 2. Yes, 1-3 times 3. Yes, more than 4 times
Frequency of tobacco use	How often do you smoke tobacco at the present?	1. Don't smoke 2. Less than once per week 3. At least once a week 4. Every day
Subjective health complaints	In the last 6 months: how often have you had the following: a) Feeling low (sad, depressed) b) Irritability or bad temper c) Feeling nervous	1. Rarely or never 2. More than once a week 3. Almost every day
Health	How do you feel?	1. Excellent

		2. Good
		3. Reasonable
		4. Bad
Worries	How often gets worries?	1. Rarely or never
		2. Almost every month
		3. Almost every week
		4. More than once a week
		5. Almost every day
Was bullied in school	How many times have you been bullied in school over the past two months?	1. I wasn't bullied in school in the past two months
		2. once a week
		3. Several times a week
Bullier in school	How many times did you bully someone in the last two months?	1. I haven't bullied anyone in school in the past two months
		2. Unless once a week
		3. Several times a week
School	Do you like school?	1. Yes, I Like School
		2. No, I Don't like school
Physical Activity	How often do you practice physical Activity?	1. Every Day
		2. More than twice a week
		3. Once a week
		4. At least once a week
		5. Never
Family communication	How easy is it for you to talk with your mother?	1. Easy
Siblings communication	How easy is it for you to talk with your father?	2. Difficult
	How easy is it for you to talk with your sister/brother?	3. Not have or do not see
Easiness in making friends	Is it easy or difficult for you to make friends?	1. Very Easy
		2. Easy
		3. Difficult
		4. Very Difficult
Number of siblings	How many brothers and/or sisters do you have?	
Life Satisfaction	"10" is the best possible life for	10 – best possible life

	you and “0” is the worst possible life for you. In general, where on the ladder do you feel standing at the moment?	0 – worst possible life
Family Relationship	“10” is the best relationship with your family and “0” is the worst possible for you. In general, where on the ladder do you feel standing at the moment?	10 – best relationship 0 – worst relationship
Friends Relationship	“10” is the best relationship with your friends and “0” is the worst possible for you. In general, where on the ladder do you feel standing at the moment?	10 – best relationship 0 – worst relationship

2.4 Data Analysis

IBM SPSS Statistics 22 program was used for the statistical analyses, ad-hoc analysis, hypothesis testing, and predictive analytics.

To analyse the differences between adolescents with or without siblings (sisters and/or brothers) Chi-Square analysis (χ^2) was used, as well as a One Way ANOVA (life satisfaction; satisfaction with friends relationship; satisfaction with family relationship).

The statistical analysis was performed separately for boys and girls, in order to understand the effects of having or not siblings (sisters and/or brothers), as well as if there are differences between boys and girls considering the number and gender of their siblings.

3. Results

As mentioned, the main objective and purpose of this study was to understand, in depth, the differences between adolescents with and without siblings (sisters and/or brothers) on risk behaviours, health and relationships with peers and family, and specifically on drunkenness, use of tobacco, being a bully and being bullied in school, being sad, nervous and angry, frequency of worries, liking school, life satisfaction, relationships satisfaction (friends and family), physical activity and general health, communication with parents and siblings and easiness in making friends.

3.1 Boys

Regarding the use of tobacco and drunkenness experiences (see Table 2) the adolescents who don't have brothers report that they have never been drunk. Teenage boys with three or more brothers have been drunk more frequently ($\chi^2_{(6)} = 44.11$; $p < 0.001$) and more frequently report smoking every day ($\chi^2_{(6)} = 29.25$; $p < 0.001$).

Regarding having or not sisters, when asked about drunkenness and consume of tobacco (see Table 3), teenage boys who have three or more sisters smoke more frequently. There were no differences found for drunkenness.

Teenage boys with three or more brothers feel sad ($\chi^2_{(6)} = 58.54$, $p < 0.001$), nervous ($\chi^2_{(6)} = 34.02$, $p < 0.001$) and angry ($\chi^2_{(6)} = 50.36$, $p < 0.001$) (see Table 2).

Teenage boys with three or more sisters are sad almost every day ($\chi^2_{(6)} = 44.20$, $p < 0.001$). Adolescents who don't have sisters are nervous almost every day ($\chi^2_{(6)} = 44.20$, $p < 0.001$) (see Table 3).

Boys with three or more brothers ($\chi^2_{(9)} = 33.73$, $p < 0.01$) or sisters ($\chi^2_{(9)} = 21.63$, $p < 0.01$) report that their health is bad. Adolescents with three or more brothers ($\chi^2_{(12)} = 36.74$, $p < 0.001$) or sisters ($\chi^2_{(6)} = 22.76$, $p < 0.05$) indicate being worried almost every day (See Tables 2 and 3).

When analysing violence, boys with three or more brothers ($\chi^2_{(6)} = 34.12$, $p < 0.001$) or sisters ($\chi^2_{(6)} = 19.07$, $p < 0.01$) provoke others more often (See Tables 2 and 3).

As shown in Tables 2 and 3, single child boys (without brothers $\chi^2_{(3)} = 11.66$, $p < 0.01$, or sisters $\chi^2_{(3)} = 15.12$, $p < 0.01$) report more often that they like school; boys with three or more sisters practice physical activity every day ($\chi^2_{(3)} = 23.10$, $p < 0.05$).

Boys without sisters report that is easier to communicate with their mother ($\chi^2_{(6)} = 12.75$, $p < 0.01$) (See Table 3).

Table 2. Drunkenness Experiences and Tobacco Use for Boys/Number of Brothers

		Without brothers		One brother		Two Brothers		Three or more Brothers		Total	χ^2	df
		N	%	N	%	N	%	N	%			
Drunkenness	Never	1188	89.7	816	86.1	171	88.1	56	70.9	2231	44.11***	6
	1-3 times	90	6.8	88	9.3	16	8.2	9	11.4	203		
	More than 4 times	46	3.5	44	4.6	7	3.6	14	17.7	111		
Tobacco	Don't smoke	1236	93.5	885	93.5	179	92.7	63	79.7	2363	29.25***	9
	Less than once per	23	1.7	20	2.1	1	0.5	3	3.8	47		

week											
At least											
once	a	32	2.4	21	2.2	6	3.1	5	6.3	64	
week											
Every day		31	2.3	21	2.2	7	3.6	8	10.1	67	

*** $p \leq .001$; Values in bold refer to adjusted residuals higher than 1.9.

Table 3. Drunkenness and Tobacco Use for Boys/Number of Sisters

		Without sisters		One sister		Two Sisters		Three or more sisters		Total	χ^2	df
		N	%	N	%	N	%	N	%			
		Drunkenness	Never	1217	89.0	832	86.2	127	89.4			
1-3 times	96		7.0	89	9.2	10	7.0	8	11.8	203		
More than 4 times	55		4.0	44	4.6	5	3.5	7	10.3	111		
Tobacco	Don't smoke	1281	93.9	896	92.8	131	92.3	53	77.9	2361	53.65***	9
	Less than											
	once per week	25	1.8	17	1.8	3	2.1	2	2.9	47		
	At least											
	once a week	33	2.4	26	2.7	3	2.1	2	2.9	64		
	Every day	25	1.8	26	2.7	5	3.5	11	16.2	67		

*** $p \leq .001$; Values in bold refer to adjusted residuals higher than 1.9

In order to examine the average differences in the variable life satisfaction (min-0; higher level-10) ANOVA was used. Differences were found among groups [$F(3, 2545) = 0.541, p < 0.05$]. Post hoc comparisons with the Tukey HSD test indicated that boys without brothers are more satisfied with life ($M = 7.60; SD = 1.87$) similarly to having or not sisters [$F(3, 2540) = 0.960, p < 0.05$]. Post hoc comparisons using the Tukey HSD test indicated that boys that don't have sisters ($M = 7.57; SD = 1.80$) or have one sister ($M = 7.57; SD = 1.92$) are more satisfied with life.

In order to examine the mean differences in the variable satisfaction with family relationships (min-0; higher level-10) ANOVA was used. There were no differences among groups, irrespectively of having or not brothers or sisters. The same result was found concerning satisfaction with friend's relationships.

3.2 Girls

The variables already presented for boys were also analysed for girls. Only the most relevant results will be presented.

Regarding violence (see Tables 4 and 5), girls with a brother report that they haven't been bullied ($\chi^2_{(6)} = 14.68, p < 0.05$).

Girls with three or more sisters have been bullied less than once a week ($\chi^2_{(6)} = 17.14, p < 0.01$) while those that do not have sisters report more frequently that they haven't been bullied.

Regarding communication with parents and making friends (see Table 5), girls with three or more brothers report that it is easy to make friends ($\chi^2_{(9)} = 27.87, p < 0.001$).

Table 4. Feeling Sad, Nervous and Angry for Boys/Number of Brothers

		Without brothers		One brother		Two Brothers		Three or more brothers		Total	χ^2	df
		N	%	N	%	N	%	N	%			
		Sad	Rarely or never	1052	79.5	742	78.2	152	78.4			
	More than once a week	241	18.2	178	18.8	34	17.5	16	20.3	469		
	Almost every day	31	2.3	29	3.1	8	4.1	14	17.7	82		
Nervous	Rarely or never	754	56.9	552	58.2	115	59.3	36	45.6	2411	34.02***	6
	More than once a week	508	38.4	362	38.1	66	34.0	29	36.7	2341		
	Almost every day	62	4.7	35	3.7	13	6.7	14	17.7	427		
Angry	Rarely or never	841	63.5	618	65.1	118	60.8	40	50.6	2814	50.36***	6
	More than once a week	444	33.5	299	31.5	63	32.5	25	31.6	2054		
	Almost every day	39	2.9	32	3.4	13	6.7	14	17.7	311		

*** $p \leq 0.001$; Values in bold refer to adjusted residuals higher than 1.9.

Table 5. Being Sad, Nervous and Angry for Boys/Number of Sisters

		Without sisters		One sister		Two Sisters		Three or more sisters		Total	χ^2	df
		N	%	N	%	N	%	N	%			
		Sad	Rarely or never	1081	79.0	767	79.4	103	72.5			
	More than once a week	253	18.5	168	17.4	33	23.2	15	22.1	469		
	Almost every day	34	2.5	31	3.2	6	4.2	11	16.2	82		
Nervous	Rarely or never	16	34.0	396	44.3	1839	48.2	160	38.0	2411	41.20***	6
	More than once a week	22	46.8	397	44.5	1708	44.7	214	50.8	2341		
	Almost every day	9	19.1	100	11.2	271	7.1	47	11.2	427		
Angry	Rarely or never	891	65.1	599	62.0	86	60.6	39	57.4	1615	38.66***	6
	More than once a week	430	31.4	339	35.1	43	30.3	19	27.9	831		
	Almost every day	47	3.4	28	2.9	13	9.2	10	14.7	98		

*** $p \leq .001$; Values in bold refer to adjusted residuals higher than 1.9.

In order to examine the average differences in the variable life satisfaction (min-0; higher level-10) ANOVA was used. No differences were found among groups.

Differences among groups [$(F(3, 2622) = 1.191, p < 0.05)$] were found in the variable satisfaction with friends relationship in girls with one brother (presenting better friends relationship ($M = 8.58$; $SD = 1.81$), however, no differences were found considering girls with or without sisters.

In respect to the variable satisfaction with family relationships (min-0; higher level-10) differences among groups [$(F(3, 2614) = 1.191, p < 0.05)$] were found, specifically, girls without sisters ($M = 8.72$; $SD = 1.82$) have better relations with their family.

4. Discussion

The aim of this study was to understand the differences between adolescents with and without siblings, concerning risk behaviours, health and relationships with peers and family.

When analysing the differences between adolescents with and without siblings, it was found that boys who do not have brothers show less risk behaviours; for instance, these adolescents drink less. Previous findings of the effects of sibling alcohol use, refers that having brothers with alcohol habits increase the risks of having the same habits (Grossrau-Breen, Kuntsche, & Gmel, 2010). The results also showed evidence that these adolescents also like school, find more easy to communicate with their mother and are more satisfied with life. Previous studies have shown that children who grow up with fewer siblings have greater educational success (Steelman, Powell, Werum, & Carter, 2002). Supplementary to this idea, larger families might show poorer sibling relationships, reduced parental interpersonal resources and poorer parent-child relationships (McHale, Updegreff, & Whiteman, 2012).

It was found that male adolescents with three or more brothers drink and smoke more, provoke others more often and feel sad, nervous and angry more frequently. These findings confirm the results obtained by Yucel (2014), who concluded that four siblings have significantly worse internalizing problems behaviours, worse self-concept, and worse locus control compared to only children. In the same way, the study conducted by Kim and colleagues (2007) showed that siblings play an important role in each other's development, in various domains, including externalizing and internalizing problems, school adjustment, peer relationships and parental characteristics.

Other studies referred that secure attachment between siblings can enhance a child's sense of security, acting as a protective factor against maladjustment. Children and adolescents with negative attachment to their siblings may be more prone to view themselves as unworthy of love, resulting in anxiety and depression, and view the social world as negative and untrustworthy, resulting in delinquency, substance use and aggression (Noller, 2005).

The present results also confirm the study conducted by Yucel in 2014, which shows that adolescents benefit more from sisters than brothers. In the present study, adolescent boys with more than three sisters practice more physical activity while those boys who don't have sisters are more nervous.

When girls were analysed, we found that those who have one brother haven't been bullied and have better relationships with their friends. Girls with three or more sisters find easier to make friends although they report having been bullied more frequently. Girls who don't have sisters have a better relationship with their family.

The study presents two main limitations. Firstly, data were collected using a self-administered questionnaire that could influence the data by having to see only how the adolescent sees himself and how it relates to the various thematic of the questionnaire, and for that reason subjective. Secondly, the present study was based on a large national representative survey which intends to study adolescents' lifestyles and behaviours and was not especially designed to study siblings. Future studies should be more specific and oriented to investigate the type of relationship between siblings, similarity in age and

having supportive siblings.

5. Conclusion

To summarize, boys who do not have brothers present less risk behaviours, like school, find easier to communicate with their mother and are more satisfied with life. Boys with three or more brothers drink and smoke more, are more provocative and feel sad, nervous and angry more frequently. Adolescent boys with more than three sisters practice more physical activity while those boys who don't have sisters are more nervous. Girls who have one brother haven't been bullied and have better relationships with their friends. Girls with three or more sisters find easier to make friends although they report having been bullied more frequently. Girls who don't have sisters have a better relationship with their family.

Results show that the number of siblings, as well as their gender, are significant concerning the adolescents' adjustment. Our outcomes raise the question of what can be done in terms of intervention and policies oriented towards the prevention of internalizing and externalizing problems in large families. Intervention programs with parents aiming to support them coping with their children difficulties, as well as programs for children and adolescents with the purpose of reversing eventual negative effects of having many siblings are valued and suggested. Additionally, future studies should investigate the type of relationship between siblings, similarity in age and having supportive siblings.

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