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Parental involvement, depression, and sexual experiences across adolescence: a cross-sectional survey among adolescents of different ages

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ABSTRACT

Background: Early sexual activity and multiple sexual partners are deemed risky sexual behaviors and connected to mental disorders such as depression. Parent–adolescent relationship is connected both to risky sexual behaviors and depression.

Objective: To ascertain if there is a connection between parental involvement and adolescent sexual behavior in different age groups from early to late adolescence, and the role of depression in this association.

Methods: Data from School Health Promotion Study, a cross-sectional school survey in Finland from the years 2010 and 2011 with 186,632 adolescents as informants was used. We examined the association of sexual behaviors and parental involvement with self-reported depression, at first separately and then in the same model. Analyses were conducted in seven age groups, separately for girls and boys. The main outcomes were analyzed by χ^2 test and logistic regression.

Results: Among both girls and boys, low level of parental involvement was connected to having experienced sexual intercourse and, among those sexually active, reporting more sexual partners in early and middle adolescence. Parental involvement and depression were independently associated with the sexual behaviors studied and had only a slight modifying effect on each other in this context.

Conclusion: Promoting parental involvement in adolescents' lives is likely to be beneficial to adolescents' sexual health.

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KEYWORDS

Adolescence; risky sexual behavior; depression; parental involvement; self-reported measures

Introduction

Sexual development in adolescence requires maturation in physical, psychological, and social domains. Emotional development takes place over a much longer period than does physical and cognitive development (Steinberg, 2005). First intercourse is often

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characterized as sexual debut. It is normative and developmentally appropriate to have experiences of intercourse in late adolescence, while sexual debut in early adolescence can be seen as problem behavior (Madkour, Farhat, Halpern, Godeau, & Gabhainn, 2010; Savioja, Helminen, Fröjd, Marttunen, & Kaltiala-Heino, 2015). Early sexual activity is connected to risky sexual behaviors such as a greater number of sexual partners and failure to use contraception, which in turn exposes these adolescents to unwanted pregnancies and sexually transmitted infections (Edgards, 2000, 2002; Kotchick, Shaffer, Forehand, & Miller, 2001; O'Donnell, O'Donnell, & Stueve, 2001). What is more, a large body of research shows that sexual activity per se among early and middle adolescents, and sexual risk-taking in particular, are connected to low socioeconomic status, living without both parents, and conflicts between parents and between parent and adolescent (Boislard P & Poulin, 2011; Davila et al., 2009; Kotchick et al., 2001; Madkour et al., 2010; Miller, Benson, & Galbraith, 2001; Wight, Williamson, & Henderson, 2006). All these correlates suggest that early and risky sexual activity are indicative of developmental problems rather than of rapid and favorable maturation.

In addition to sociodemographic family characteristics, research on early and/or risky sexual behavior in adolescence has focused on aspects of parenting as a risk/protective factor. Low level of parental monitoring is connected to early sexual activity, more sexual partners, and less condom use, while conversely higher levels of parental monitoring are a protective factor (DiClemente, Wingood, Crosby, Sionean, et al., 2001; Markham et al., 2010; Meschke, Bartholomae, & Zentall, 2002; Wight et al., 2006). In the USA, it was found that adolescents spending more time alone at home and with less supervision than their peers were more likely to be sexually active, and among boys the amount of unsupervised time also correlated with more lifetime sexual partners (Cohen, Farley, Taylor, Martin, & Schuster, 2002). Adolescents whose parents know their friends and whereabouts are less likely to have engaged in risky sexual behaviors (Coley, Votruba-Drzal, & Schindler, 2009). On the other hand, positive, open parent-adolescent communication was connected to greater use of contraception (DiClemente, Wingood, Crosby, Cobb, et al., 2001; Stanton, Li, Pack, & Cottrell, 2002), postponing first sexual intercourse (Rai et al., 2003), and less sexual risk-taking in general (Wang et al., 2013). However, excessive perceived parental control or stricter parental rules were considered a risk factor for ever having sex in adolescence (Markham et al., 2010).

The prevalence of depressive disorders rises significantly from childhood to adolescence (Costello, Erkanli, & Angold, 2006; Egger & Angold, 2006; Wichstrøm et al., 2012). Depression is almost twice as common among adolescent girls as among adolescent boys (Patton et al., 2014). Sexual activity in early adolescence is connected to depression (Hallfors et al., 2004; Jamieson & Wade, 2011; Kaltiala-Heino, Kosunen, & Rimpelä, 2003; Oshri, Tubman, & Jaccard, 2011; Valle, Roysamb, Sundby, & Klepp, 2009) and there is also evidence that this association persists until middle adolescence (Hallfors, Waller, Bauer, Ford, & Halpern, 2005; Savioja et al., 2015). This association has been shown to gradually disappear, and to be even reversed in late adolescence (Savioja et al., 2015), concurring with developmental theories (Moshman, 2011; Steinberg, 2005). Adolescents suffering from depressive symptoms are further at greater risk for sexual risk-taking (Brown et al., 2006; Donenberg, Emerson, & Mackesy-Amiti, 2011; Hallfors et al., 2004, 2005; Kosunen, Kaltiala-Heino, Rimpelä, & Laippala, 2003; Langille, Asbridge, Kisely, & Wilson, 2012; Lehrer, Shrier, Gortmaker, & Buka, 2006; Mazzaferro et al., 2006; Mun,

Windle, & Schainker, 2008; Paxton & Valois, 2007; Rubin, Gold, & Primack, 2009; Seth et al., 2011; Turner, Latkin, Sonenstein, & Tandon, 2011).

Positive aspects of parenting, such as parental involvement, appropriate monitoring and care together with sound interpersonal relations in a family are beneficial for an adolescent's mental health (Burnett-Zeigler et al., 2012; Fröjd, Kaltiala-Heino, & Rimpelä, 2007; Yu, Clemens, Yang, Li, & Stanton, 2006). Adolescents whose parents know their friends and whereabouts are less likely to have depressive symptoms (Fröjd et al., 2007; Hamza & Willoughby, 2011). Depressive symptoms are more common among adolescents who have difficulties communicating with parents (Fletcher, 2004; Fröjd et al., 2007; Schwartz et al., 2012; Stanton, Li, & Galbraith, 2000; Yu et al., 2006). Depressed adolescents perceive parental monitoring to be at lower levels than average (Yu et al., 2006).

To summarize, research has associated certain aspects of parenting/ parent-adolescent relationships with both adolescent depression and early and risky sexual behavior and has demonstrated an association between adolescent depression and sexual activity. Depression could explain the associations between parent-adolescent relationship and sexual behavior, or vice versa, or depression and aspects of parenting could be independently associated with sexual behavior. Schuster, Mermelstein, and Wakschlag (2013) did not find parental control or parent-adolescent communication to be significant factors for depressive symptoms and risky sexual behavior in adolescence. Wilson and Donenberg (2004) found that high-quality parent-adolescent sexual health communication was connected to less sexual risk-taking among adolescents receiving psychiatric treatment. These findings suggest an independent role of aspects of parenting in adolescent sexual behavior.

The studies reviewed above have focused on slightly different aspects of parenting and parent-adolescent interaction. Terms describing aspects of parenting, such as involvement, monitoring, and care may also to some extent be used interchangeably, or at least they likely overlap, even if some focus more on limit setting and directing by parents, and others on showing interest and communicating positively. Nevertheless, it can be summarized that positive parental involvement that includes parental interest in and knowledge about the adolescent's personal life, and good parent-adolescent communication have been connected to better outcomes regarding adolescents' sexual behavior and mental health. However, there are hardly any studies focusing simultaneously on the associations between all three factors, aspects of parenting, sexual behavior, and mental health in adolescence. Taking simultaneous account of all three factors can result in an important evidence base for promoting adolescent sexual health.

The aim of this study was to ascertain if there is a connection between parental involvement and adolescent sexual behavior in different age groups from early to late adolescence, and the role of depression in this association. This study addressed the following questions:

- (1) Is parental involvement connected to adolescent sexual behavior, namely to having experienced sexual intercourse and having had sexual intercourse with five or more partners?
- (2) Do the possible associations between parental involvement and adolescent sexual behavior persist when depression is adjusted for?

- (3) Are the associations between parental involvement, depression, and adolescent sexual behavior similar or different among early, middle, and late adolescents?
- (4) Are the possible associations in (1), (2), and (3) similar among adolescent boys and girls?

In light of the existing literature, we hypothesized that low levels of parental involvement reported by adolescents would be associated with more experiences of sexual intercourse and more sexual risk-taking in early and middle adolescence. Depression could be a cause and also a consequence of both adolescent's early and risk-taking sexual behavior and of low parental involvement. Low parental involvement and depression could each independently be associated with adolescents' early and risky sexual behaviors or one of them could cancel out the other when studied simultaneously. We left the hypothesis open as to whether depression would partially or totally explain the possible associations between parental involvement and sexual behaviors. Although depression is more common among girls than boys, the association between depression and experience of sexual intercourse has been shown to be quite similar across genders (Savioja et al., 2015). We therefore anticipated no major gender differences in the associations to be studied. However, because of the known gender differences in the prevalence of adolescent depression, we still deemed it worthwhile to conduct the analyses separately for girls and boys.

Materials and methods

This study used the data of the Finnish School Health Promotion Study (SHPS), which is a nationwide classroom survey dealing with health behaviors and is based on self-reported measures (www.thl.fi/kouluterveyskysely). Every student answered the questionnaire anonymously. The SHPS has been conducted yearly since 1995. Originally only 14- to 16-year-old secondary school students responded to the survey, but since 1999 the survey has also been conducted among upper secondary and vocational school students (16–20 years old). Until 2011, the SHPS was carried out in alternate years in western parts of Finland and eastern parts and then the results of two consecutive years were combined to represent the whole of Finland. The SHPS was granted approval by the ethics committees of Pirkanmaa Hospital District and the National Institute of Health and Welfare. This study utilized the data of the SHPS from 2010 to 2011 including all the age groups, 14- to 20-year-olds, included in the study.

In Finland the vast majority, 99% of 14- to 16-year-old adolescents attend secondary school. Although compulsory education ends after secondary school, attendance at upper secondary education, where students are typically 16–18 years old, is about 93%. Accordingly, the data of the SHPS covered the majority of 14- to 18-year-old Finnish adolescents. Students aged 19–20 were not so well represented in the study because they have usually already graduated from the schools at which the study is conducted. Students attending school on the study day responded to the survey. Students absent on the survey day (10–15%) were not contacted. Furthermore, a slight loss of potential respondents was due to the fact that not every school participates in the SHPS. The survey was sent to every municipality, and each municipality decided if the schools in their area would participate in the survey. The final coverage of the 2010–2011 study was 80% of all 14- to 16-year-old secondary school students, 73% of 16- to 18-year-old

upper secondary school students, and 43% of 16- to 18-year-old vocational school students in the whole of Finland.¹ The total number of respondents was 186,632 of whom 92,478 (49.6%) were boys and 94,154 (50.4%) were girls. The respondents cannot be identified from the data.

Sexual activity was elicited by the question 'Have you ever had sexual intercourse?' The response alternatives were 'yes' and 'no'. In the whole sample ($n = 186,632$), 36.9% of the girls and 32.7% of the boys had experienced sexual intercourse. In Finland, girls experience their first sexual intercourse at age 16.5 on average and boys at age 17.5.²

The number of sexual partners was elicited by the question 'How many sexual partners have you had sexual intercourse with?' The response alternatives were 'one', 'two', 'three or four', and 'five or more'. The number of sexual partners was analyzed as a dichotomized variable, the cutpoint being in five or more sexual partners, which, according to earlier research, was regarded as risky sexual behavior (Kaltiala-Heino, Fröjd, & Marttunen, 2015). Among those adolescents who were sexually active ($n = 65,063$), 15.2% of the girls and 16.9% of the boys reported having had intercourse with five or more sexual partners.

Depressive symptoms were measured with a Finnish modification of the short (13-item) Beck Depression Inventory (Beck & Beck, 1972; Beck, Rial, & Rickels, 1974), Raitasalo's modification of the BDI (R-BDI) (Raitasalo, 2007). The Beck Depression Inventory is a widely used scale with established validity and reliability among both adults and adolescents (Beck et al., 1974; Bennett et al., 1997; Olsson & Von Knorring, 1997). The 13-item BDI has been shown to be a valid method for identifying depressive symptoms among adolescents (Beck & Beck, 1972; Beck et al., 1974; Bennett et al., 1997; Kaltiala-Heino, Rimpela, Rantanen, & Laippala, 1999). The Finnish version, R-BDI, is equivalent to the original 13-item BDI, but to every item an opening question and one positive response alternative have been added. The scoring is as in the original 13-item version (Kaltiala-Heino et al., 1999). Each item is scored 0–3 and the maximum score is 39. Adolescents with a sum score of 0–4 were categorized as non-depressed, those scoring 5–7 as mildly depressed, 8–15 as moderately depressed and those scoring 16 and over as severely depressed. Scores indicating moderate or severe depression (8 or more) are referred to as self-reported depression. Moderate or severe self-reported depression was present in 16.9% of the girls and 7.7% of the boys.

Parental involvement was measured with three questions. The first question was 'Do your parents know most of your friends?' with response alternatives 'they both know' (coded for the analyses (=2), 'only father knows' (=1), 'only mother knows' (=1), and 'neither of them knows' (=0)). The second question was 'Do your parents know about your whereabouts on Friday and Saturday nights?' with response alternatives 'always' (=2), 'sometimes' (=1), and 'mostly not' (=0). The third question was 'Are you able to talk with your parents about matters important to you?' with response alternatives 'often' (=3), 'fairly often' (=2), 'now and then' (=1), and 'hardly ever' (=0). A sum score was formed of the responses so that the maximum score was 7. Scores 0–3 were referred to as low parental involvement, scores 4–5 to as average parental involvement, and scores 6–7 to as high parental involvement. Of the girls (boys), 17.7% (18.4%) reported low, 44.7% (44.3%) average, and 37.6% (37.2%) high parental involvement.

The sociodemographic variables used were family structure (living with mother and father vs. in any other family constellation) and mother's and father's highest educational

qualification (comprehensive school only/ upper secondary school or vocational school/ upper secondary school or vocational school and further vocational studies/university or university of applied sciences).

Data analysis

Distributions are given above for having experienced sexual intercourse, for parental involvement, and for depression in the whole sample, and for having had five or more partners for intercourse among those sexually active, separately for girls and boys. Bivariate associations between having experienced sexual intercourse and parental involvement, and, among those who were sexually active, having had five or more partners for intercourse and parental involvement were examined with cross-tabulations and significance was tested with χ^2 test/Fisher's exact test where appropriate. In all the analyses we used all available data. Those participating in the survey may have occasionally skipped some questions, and due to this, there may be slight variation in number of respondents in different analyses. Multivariate associations were studied using logistic regression. Having experienced sexual intercourse was entered as the dependent variable. First, depression (yes vs. no) and then parental involvement (high/average/low, using high as reference category) were entered each alone as independent variables. Crude odds ratios (ORs) with 95% confidence intervals (CI) were calculated. Next depression and parental involvement were entered simultaneously, yielding adjusted ORs (95% CI) (Model 1). Finally, sociodemographic variables were adjusted for (Model 2). The analyses were run separately for boys and girls, among the whole sample and stratified for age group (age in years: 14/15/16 ...). Age groups 19 and 20 were combined because of their smaller size and because they were less representative than age groups 14–18. Among those reporting they were sexually active, similar analyses were performed using risk-taking sexual behavior (having had five or more partners for intercourse) as the dependent variable. Because of the large data size, and to avoid bias due to multiple testing, we set the limit for statistical significance at $p < .01$.

Attrition

Of the respondents, 1230 (0.7%) had skipped questions on parental involvement items, 31 (0.0%) had skipped the depression scale, and 4929 (2.6%) had not responded on if they had experienced sexual intercourse. Of those who had experienced intercourse, 449 (0.7%) had not reported with how many different partners they had had intercourse. Not responding on parental involvement questions and experience of intercourse were more common among boys (3.1% vs. 2.1% and 0.9% vs. 0.4%, respectively; in both, $p < .001$). Non-response in all was statistically significantly associated with younger age (mean (SD), but in practice, differences in age between those responding and those skipping were negligible: non-response to parental involvement 16.1 (1.2) vs. 16.3 (1.3); non-response to depression scale 16.2 (1.3) vs. 16.3 (1.3); and non-response to experience of intercourse 16.2 (1.2) vs. 16.3 (1.3). Among those who had experienced intercourse, non-response on number of partners was more common among boys (1.0% vs. 0.4%, $p < .0001$), and those not responding were slightly younger (mean (SD) 16.3 (1.3) vs. 16.9 (1.2) years, $p < .001$).

Results

Bivariate associations

Across age groups 14–18, the proportion of those who had experienced sexual intercourse was lowest among adolescents who reported high parental involvement. Experience of sexual intercourse was more common among those reporting average parental involvement, and most common among those reporting low parental involvement (Table 1). Differences between parental involvement groups were greater in the younger age groups.

Among sexually active girls, reporting five or more partners for intercourse was more common in the average parental involvement group than in the high parental involvement group, and most common in the low parental involvement group. This was seen in all age groups (Table 2). Among sexually active boys, the proportion of those reporting five or more partners for intercourse was higher in the group with low parental involvement than among those reporting high parental involvement, but no such systematic differences were seen between high and average parental involvement group (Table 2).

In the whole sample, 44.5% of depressed adolescents had had sexual intercourse, while among non-depressed adolescents, the figure was 34.6% ($p \leq .001$). Among sexually active adolescents, 25.1% of depressed adolescents had had five or more partners for intercourse, while among non-depressed respondents the figure was 14.4% ($p \leq .001$).

Multivariate associations between parental involvement, depression, and sexual behavior

In the whole sample, ORs for having experienced intercourse were increased in the average parental involvement group and highest in the low parental involvement group, among both boys and girls. The finding persisted when depression, and finally sociodemographics were adjusted for (Table 3). Among those sexually active, ORs for risk-taking sexual behavior (five or more partners) were increased in those who reported low parental involvement among both boys and girls, and this persisted when depression, and finally socio-demographics were adjusted for (Table 4).

Table 1. Proportions (% (n/N)) of those having experienced sexual intercourse among adolescents with high, average, and low parental involvement.

	High parental involvement	Average parental involvement	Low parental involvement	<i>p</i> -Value
Age (years)	Girls			
14	6.8 (378/5530)	12.6 (861/6834)	26.0 (708/2720)	<.001
15	16.2 (1375/8511)	23.7 (2613/11016)	38.3 (1678/4383)	<.001
16	34.2 (2884/8435)	40.4 (4019/9938)	50.8 (2012/3960)	<.001
17	50.5 (4092/8107)	55.9 (4840/8657)	63.4 (2064/3256)	<.001
18	63.8 (2056/3225)	64.2 (2196/3423)	69.6 (960/1379)	<.001
19–20	78.2 (583/746)	79.8 (863/1082)	83.4 (456/547)	.064
all	32.9 (11368/34554)	37.6 (15392/40950)	48.5 (7878/16245)	<.001
Age (years)	Boys			
14	8.2 (462/5625)	13.3 (830/6226)	25.4 (576/2266)	<.001
15	16.2 (1379/8524)	21.6 (2242/10384)	32.8 (1406/4287)	<.001
16	31.1 (2496/8021)	35.3 (3431/9715)	43.1 (1712/3971)	<.001
17	44.6 (3375/7574)	47.9 (4163/8188)	53.6 (1972/3683)	<.001
18	53.9 (1640/3041)	58.5 (2126/3616)	63.4 (1089/1719)	<.001
19–20	66.8 (270/404)	73.8 (484/656)	73.2 (300/410)	.038
all	29.0 (9622/33189)	33.8 (13276/39285)	43.2 (7055/16335)	<.001

Note: Statistically significant differences are shown in bold.

Table 2. Proportions (% (n/N)) of those having had five or more sexual partners among sexually active adolescents with high, average, and low parental involvement.

	High parental involvement	Average parental involvement	Low parental involvement	<i>p</i> -Value
Girls				
Age (years)				
14	6.4 (24/373)	7.4 (63/856)	12.5 (88/702)	<.001
15	5.1 (69/1365)	7.6 (197/2592)	12.5 (208/1669)	<.001
16	9.9 (285/2879)	11.4 (456/4006)	16.2 (325/2004)	<.001
17	14.3 (585/4086)	15.6 (751/4283)	22.0 (451/2052)	<.001
18	17.6 (362/2051)	21.4 (468/2190)	27.6 (263/954)	<.001
19–20	31.5 (183/581)	33.9 (292/861)	42.1 (191/454)	<.001
all	13.3 (1508/11335)	14.5 (2227/15328)	19.5 (1526/7835)	<.001
Boys				
Age (years)				
14	13.9 (62/445)	19.1 (154/806)	31.7 (178/562)	<.001
15	12.9 (176/1360)	12.6 (277/2194)	24.0 (334/1389)	<.001
16	12.8 (318/2477)	12.3 (419 / 3407)	19.9 (336/1690)	<.001
17	14.5 (487/3362)	13.0 (537/4141)	20.3 (397/1954)	<.001
18	18.1 (295/1633)	18.3 (387/2110)	25.9 (281/1083)	<.001
19–20	29.6 (80/270)	32.6 (157/481)	42.4 (126/197)	.003
all	14.9 (1418/9547)	14.7 (1931/13139)	23.7 (1652/6975)	<.001

Note: Statistically significant differences are shown in bold.

Multivariate analyses stratified for age

ORs for having experienced sexual intercourse among 14- to 16-year-old girls were increased among those with depression and among those reporting average and low parental involvement when depression and parental involvement were studied separately (Table 3 crude ORs), simultaneously (Table 3 Model 1), and after sociodemographic variables were adjusted for (Table 3 Model 2). Experience of sexual intercourse was also associated with average and low parental involvement among 17-year-old girls. In age groups 18 and 19–20, associations between low parental involvement and having experienced sexual intercourse were leveled out in the multivariate models. Among boys aged 14–16 ORs for having experienced sexual intercourse were increased among those displaying depression as well as among those reporting average and low parental involvement, when depression and parental involvement were entered separately (Table 3 crude ORs), simultaneously (Table 3 Model 1), and after adjusting for sociodemographic variables (Table 3, Model 2). An association between low parental involvement and having experienced intercourse also persisted among 17- and 18-year-olds in the multivariate models. After age 17, depression was no longer associated with experience of intercourse among boys. Among the oldest, 19- to 20-year-old boys, adjusting for sociodemographics leveled out associations between parental involvement and having experiences sexual intercourse.

Among sexually active girls, ORs for reporting five or more partners for intercourse were increased among those displaying depression and among those reporting low parental involvement in all 15- to 20-year-olds when each of these variables was entered into the model alone (Table 4 crude ORs) or simultaneously (Table 4 Model 1). After further adjusting for sociodemographics, these findings persisted in all age groups except the oldest (19–20), where only depression was associated with risk-taking sexual behavior (Table 4 Model 2). In 14-year-old girls, only depression was statistically significantly associated with experience of intercourse with multiple partners, and this finding persisted after adjusting for sociodemographics (Table 4).

Table 3. ORs (95% CI) for having experienced sexual intercourse according to self-reported depression (yes vs. no) and parental involvement (average vs. high, low vs. high), stratified for age groups.

		Girls	Boys			Girls	Boys
14						Sociodemographics controlled for	
Crude	Depression	2.7 (2.4–3.0)**	4.7 (4.1–5.4)**	M2		1.8 (1.6–2.1)**	3.4 (2.9–4.0)**
	Average involvement	2.0 (1.7–2.2)**	1.7 (1.5–1.9)**				
	Low involvement	4.8 (4.2–5.5)**	3.8 (3.3–4.4)**				
M1	Depression	1.9 (1.7–2.1)**	3.6 (3.1–4.1)**			1.7 (1.5–2.0)**	1.5 (1.3–1.7)**
	Average involvement	1.8 (1.6–2.0)**	1.6 (1.4–1.8)**				
	Low involvement	3.8 (3.3–4.4)**	2.9 (2.5–3.4)**				
15							
Crude	Depression	2.0 (1.9–2.2)**	2.6 (2.3–2.8)**	M2		1.5 (1.4–1.6)**	1.9 (1.7–2.1)**
	Average involvement	1.6 (1.5–1.7)**	1.4 (1.3–1.5)**				
	Low involvement	3.2 (3.0–3.5)**	2.5 (2.3–2.8)**				
M1	Depression	1.6 (1.5–1.7)**	2.3 (1.8–2.3)**			1.5 (1.4–1.6)**	1.3 (1.2–1.4)**
	Average involvement	1.5 (1.4–1.6)**	1.4 (1.3–1.5)**				
	Low involvement	2.8 (2.5–3.0)**	2.2 (2.0–2.4)**				
16							
Crude	Depression	1.5 (1.4–1.6)**	1.6 (1.4–1.8)**	M2		1.2 (1.1–1.3)**	1.3 (1.2–1.5)**
	Average involvement	1.3 (1.2–1.4)**	1.2 (1.1–1.3)**				
	Low involvement	2.0 (1.8–2.1)**	1.7 (1.6–1.8)**				
M1	Depression	1.3 (1.2–1.4)**	1.4 (1.3–1.6)**			1.2 (1.2–1.3)**	1.2 (1.1–1.2)*
	Average involvement	1.3 (1.2–1.4)**	1.2 (1.1–1.3)**				
	Low involvement	1.9 (1.7–2.0)**	1.6 (1.5–1.7)**				
17							
Crude	Depression	1.1 (1.1–1.2)**	1.1 (1.0–1.2)	M2		1.0 (0.9–1.1)	0.9 (0.8–1.0)
	Average involvement	1.2 (1.2–1.3)**	1.1 (1.1–1.2)**				
	Low involvement	1.7 (1.6–1.8)**	1.4 (1.3–1.6)**				
M1	Depression	1.0 (0.9–1.1)	1.0 (0.9–1.1)			1.2 (1.1–1.3)**	1.0 (1.0–1.2)
	Average involvement	1.2 (1.2–1.3)**	1.1 (1.1–1.2)**				
	Low involvement	1.7 (1.6–1.8)**	1.4 (1.3–1.6)**				
18							
Crude	Depression	1.0 (0.9–1.1)	1.1 (0.9–1.3)	M2		1.5 (1.4–1.7)**	1.3 (1.2–1.5)**
	Average involvement	1.0 (0.9–1.1)	1.2 (1.1–1.3)**				
	Low involvement	1.3 (1.1–1.5)**	1.5 (1.3–1.7)**				
M1	Depression	0.9 (0.8–1.1)	1.0 (0.9–1.2)			1.0 (0.9–1.1)	1.0 (0.8–1.1)
	Average involvement	1.0 (0.9–1.1)	1.2 (1.1–1.3)**				
	Low involvement	1.3 (1.2–1.5)**	1.5 (1.3–1.7)**				
19–20							
Crude	Depression	0.9 (0.7–1.1)	0.8 (0.6–1.1)	M2		0.9 (0.8–1.0)	0.9 (0.8–1.0)
	Average involvement	1.1 (0.9–1.4)	1.4 (1.1–1.8)				
	Low involvement	1.4 (1.1–1.9)	1.4 (1.0–1.8)				
M1	Depression	0.8 (0.6–1.0)	0.7 (0.5–1.0)			1.1 (0.9–1.4)	1.3 (1.0–1.8)
	Average involvement	1.1 (0.9–1.4)	1.4 (1.1–1.9)*				
	Low involvement	1.5 (1.1–2.0)*	1.5 (1.1–2.0)				
All							
Crude	Depression	1.4 (1.3–1.4)**	1.7 (1.7–1.8)**	M2		1.1 (1.1–1.2)*	1.4 (1.3–1.5)*
	Average involvement	1.2 (1.2–1.3)**	1.3 (1.2–1.3)**				
	Low involvement	1.9 (1.8–2.0)**	1.9 (1.8–1.9)**				
M1	Depression	1.2 (1.1–1.2)**	1.5 (1.4–1.6)**			1.2 (1.1–1.2)*	1.2 (1.1–1.2)*
	Average involvement	1.2 (1.2–1.2)**	1.2 (1.2–1.3)**				
	Low involvement	1.8 (1.8–1.9)**	1.7 (1.7–1.8)**				

Note: First, crude ORs are given. In Model 1 (M1), depression and parental involvement are entered as independent variables, and in Model 2 (M2), sociodemographic variables are adjusted for.

**ORs statistically significant at level $p < .001$.

*At level $.01 < p < .001$.

Among sexually active boys, similarly, reporting five or more partners for intercourse was associated with depression and low parental involvement among 14- to 18-year-olds when each of these independent variables was entered into the model alone (Table 4 crude ORs) or simultaneously (Table 4, Model 1). In 14- and 15-year-olds,

Table 4. OR (95% CI) for having had five or more sexual partners according to self-reported depression (yes vs. not) and parental involvement (average vs. high, low vs. high) among those sexually active, stratified for age groups.

		Girls	Boys			Girls	Boys
						Sociodemographics controlled for	
14							
Crude	Depression	2.1 (1.5–2.9)*	3.4 (2.6–4.3)**				
	Average involvement	1.1 (0.7–1.8)	1.5 (1.1–2.0)*				
	Low involvement	2.1 (1.3–3.3)	2.9 (2.1–4.0)**				
M1	Depression	1.8 (1.3–2.5)**	2.8 (2.2–3.7)**	M2	1.9 (1.3–2.7)**	2.7 (2.0–3.6)**	
	Average involvement	1.0 (0.6–1.7)	1.4 (1.0–1.9)		1.1 (0.6–1.8)	1.3 (0.9–1.8)	
	Low involvement	1.7 (1.0–2.7)	2.1 (1.5–2.9)**		1.5 (0.9–2.5)	2.0 (1.4–2.8)**	
15							
Crude	Depression	2.5 (2.1–3.0)**	4.1 (3.5–4.9)**				
	Average involvement	1.5 (1.2–2.0)*	1.0 (0.8–1.2)				
	Low involvement	2.7 (2.0–3.5)**	2.1 (1.7–2.6)**				
M1	Depression	2.2 (1.8–2.7)**	3.6 (3.0–4.4)**	M2	2.1 (1.7–2.6)**	3.6 (3.0–4.4)**	
	Average involvement	1.4 (1.1–1.9)*	0.9 (0.7–1.1)		1.4 (1.0–1.8)**	0.9 (0.7–1.1)	
	Low involvement	2.1 (1.5–2.8)**	1.5 (1.2–1.9)**		1.8 (1.3–2.5)**	1.5 (1.2–1.9)**	
16							
Crude	Depression	1.8 (1.5–2.1)**	3.6 (3.1–4.3)**				
	Average involvement	1.2 (1.0–1.4)	1.0 (0.8–1.1)				
	Low involvement	1.8 (1.5–2.1)**	1.7 (1.4–2.0)**				
M1	Depression	1.6 (1.4–1.9)**	3.3 (2.7–3.9)**	M2	1.5 (1.3–1.8)**	3.1 (2.5–3.7)**	
	Average involvement	1.1 (0.9–1.3)	0.9 (0.7–1.1)		1.1 (0.9–1.3)	0.8 (0.7–1.0)	
	Low involvement	1.5 (1.3–1.8)**	1.3 (1.1–1.5)*		1.4 (1.2–1.7)**	1.2 (1.0–1.4)	
17							
Crude	Depression	1.8 (1.6–2.1)	2.4 (2.1–2.9)**				
	Average involvement	1.1 (1.0–1.2)	0.9 (0.8–1.0)				
	Low involvement	1.7 (1.5–1.9)	1.5 (1.3–1.7)**				
M1	Depression	1.7 (1.5–1.9)**	2.2 (1.9–2.8)**	M2	1.6 (1.4–1.9)**	2.1 (1.8–2.6)**	
	Average involvement	1.1 (0.9–1.2)	0.9 (0.7–1.0)		1.0 (0.9–1.1)	0.8 (0.7–1.0)	
	Low involvement	1.5 (1.3–1.7)**	1.3 (1.1–1.5)**		1.4 (1.2–1.6)**	1.2 (1.0–1.4)	
18							
Crude	Depression	1.8 (1.6–2.2)**	1.7 (1.4–2.2)**				
	Average involvement	1.3 (1.1–1.5)*	1.0 (0.9–1.2)				
	Low involvement	1.8 (1.5–2.1)**	1.6 (1.3–1.9)**				
M1	Depression	1.7 (1.4–2.0)**	1.5 (1.2–1.9)**	M2	1.7 (1.4–2.0)**	1.4 (1.1–1.8)	
	Average involvement	1.2 (1.0–1.4)	1.0 (0.8–1.2)		1.2 (1.0–1.3)	1.0 (0.8–1.2)	
	Low involvement	1.6 (1.3–1.9)**	1.5 (1.2–1.8)**		1.4 (1.2–1.7)*	1.4 (1.1–1.7)*	
19–20							
Crude	Depression	1.7 (1.3–2.1)**	2.2 (1.6–3.2)**				
	Average involvement	1.1 (0.9–1.4)	1.2 (0.8–1.5)				
	Low involvement	1.6 (1.2–2.0)**	1.8 (1.2–2.5)*				
M1	Depression	1.5 (1.2–2.0)**	2.0 (1.4–2.9)**	M2	1.1 (1.2–2.1)**	2.0 (1.4–3.0)	
	Average involvement	1.1 (0.9–1.4)	1.1 (0.8–1.5)		1.1 (0.8–1.4)	1.0 (0.7–1.4)	
	Low involvement	1.4 (1.1–1.9)*	1.5 (1.1–2.2)		1.4 (1.0–1.8)	2.0 (1.4–3.0)**	
All							
Crude	Depression	1.6 (1.5–1.8)**	3.0 (2.7–3.2)**				
	Average involvement	1.1 (1.0–1.2)	1.0 (0.9–1.1)				
	Low involvement	1.5 (1.5–1.7)**	1.8 (1.6–1.9)**				
M1	Depression	1.5 (1.4–1.6)**	2.6 (2.4–2.9)**	M2	1.5 (1.4–1.6)**	2.5 (2.3–2.8)**	
	Average involvement	1.1 (1.0–1.1)	0.9 (0.9–1.1)		1.0 (1.0–1.1)	0.9 (0.8–1.0)	
	Low involvement	1.4 (1.3–1.5)**	1.4 (1.3–1.6)**		1.3 (1.2–1.4)**	1.3 (1.2–1.5)**	

Note: First, crude ORs are given. In Model 1 (M1), depression and parental involvement are entered as independent variables, and in Model 2 (M2), sociodemographic variables are adjusted for.

**ORs statistically significant at level $p < .001$.

*At level $.01 < p < .001$.

these findings persisted when sociodemographics were adjusted for. In 16- and 17-year-old boys, adding sociodemographics leveled out parental involvement, but in 18-year-olds, depression was leveled out (Table 4, Model 2). Even among 19- and

20-year-old boys low parental involvement in the final model was associated with risk-taking sexual behavior (Table 4).

Discussion

We found that less parental involvement in an adolescent's life was connected to the adolescent more often having experienced sexual intercourse in early and middle adolescence. As was our hypothesis, this was found among both girls and boys. Compared to same-aged adolescents with high parental involvement, having experienced sexual intercourse was more common if parental involvement was on an average level, and still more common if an adolescent reported low parental involvement. These associations were strongest among the youngest adolescents, and diminished gradually toward the older age groups. Low level of parental involvement also implied more risky sexual behaviors among those adolescents who were sexually active, and this was seen across the different age groups. These findings concur with those of existing research, suggesting that parent-adolescent connectedness and appropriate parental monitoring may be protective of very early and risk-taking sexual behaviors during adolescent development (Markham et al., 2010; Meschke et al., 2002; Miller et al., 2001).

Our study adds to the existing body of research by showing that the associations between lower parental involvement and adolescent's early and risk-taking sexual behavior persist when depression is adjusted for. In early and middle adolescence, being sexually active has been associated with mental disorders, particularly depression (Hallfors et al., 2004, 2005; Jamieson & Wade, 2011; Kaltiala-Heino et al., 2003; Oshri et al., 2011; Savioja et al., 2015; Valle et al., 2009), and so has risk-taking sexual activity (Kaltiala-Heino et al., 2015; Kosunen et al., 2003). Depression has also been associated with poorer parent-adolescent communication, less parental knowledge of and involvement in the adolescent's life (Burnett-Zeigler et al., 2012; Fröjd et al., 2007; Hamza & Willoughby, 2011; Schwartz et al., 2012; Yu et al., 2006). Our results demonstrate that depression and low parental involvement both have independent associations with early and risk-taking sexual behavior among early and middle adolescents, and they only slightly modify each other in this context. Even though the findings are based on cross-sectional data, they suggest that both low level of parental involvement and depression are independent predisposing factors to initiating sex life inappropriately early and engaging in risky sexual behaviors. Of course, the data being cross-sectional, we cannot rule out the alternative explanation that adolescents who initiate sex life early distance themselves from their parents by not disclosing to the parents information on their whereabouts.

Among girls aged 18–20 and among boys aged 19–20, parental involvement was not associated with having experienced sexual intercourse, and depression was leveled out from age 17. In late adolescence and early adulthood, being sexually active is developmentally normative (Cromer, 2011; Madkour et al., 2010) and more likely indicates positive development than any psychosocial problems. Seeking greater emotional and behavioral autonomy, accepting oneself, becoming capable of balanced interaction with others, and taking responsibility for one's own decisions are essential skills to develop during adolescence (Steinberg & Morris, 2001). It is developmentally appropriate that toward early adulthood the role of relationships with parents loses significance regarding an adolescent's romantic and erotic relationships.

In the age group studied, having had intercourse with five or more partners can be considered to be risk-taking sexual behavior (Kaltiala-Heino et al., 2015). In early and middle adolescence, among girls up to age 18, sexually active adolescents reporting low level of parental involvement had more commonly had five or more partners for intercourse. High level of parental involvement in an adolescent's life can thus be assumed to be protective against risk-taking sexual behavior, even though this cross-sectional study cannot show causal relationships. Reporting five or more partners for intercourse was also associated with depression among sexually active adolescents, in boys up to age 17 and in girls even among 19- to 20-year-olds.

Cultural aspects and expectations regarding sexual behaviors may differ between boys and girls. For example, a double standard may prevail, attaching different values to boys' and girls' sexual activity (Bordini & Sperb, 2013; Crawford & Popp, 2003), approving boys' sexual activity, whereas girls' sexual activity may be viewed with disapproval. Low level of parental involvement, implying inadequate support and lack of care, was in the present study a significant factor among both girls and boys for having experienced sexual intercourse in early or middle adolescence, and among sexually active adolescents, low parental involvement was associated with risky sexual behavior even in the oldest age groups. The role of parental involvement seems rather similar for both girls' and boys' sexual behavior. However, depression retained its statistically significant association with risk-taking sexual behavior even among 19- to 20-year-old girls, which may suggest that for girls being sexually very active is more reprehensible even in late adolescence/emerging adulthood, which lends support to the notion of a sexual double standard.

Methodological considerations

A strength of this study was the large population-based sample representing Finnish comprehensive school students well. The response rate was high. Yet it is possible that the students absent from school on the day of the survey (10–15%) suffered more commonly from various psychiatric and psychosocial problems. Therefore, the prevalence of self-reported depression and risk-taking sexual behavior in this study may be underestimated. Nonetheless it is unlikely that non-response had an effect on the associations studied (Van Loon, Tijhuis, Picavet, Surtees, & Ormel, 2003). Among those who participated, non-response to the variables relevant for the present study was more common among boys and statistically significantly associated with younger age, but in practice, differences according to sex and age were minimal and not likely to bias the findings.

The study sample was divided into seven age groups for the analyses. The majority of respondents were in the age groups 14–18. There were fewer respondents in the age groups 19–20, accounting for approximately 2% of the whole study population. This is because 19- to 20-year-old adolescents have usually already left the schools in which the SHPS is conducted. They may not be as representative of their age group as are the younger subjects of this study in their respective age groups, but as the size of the 19- to 20-year age group sample is still considerable, about 4000, the data size sufficed to conduct the analyses in these groups as well. It is possible that students still attending the study schools at ages 19–20 are experiencing social, psychological, or other problems that have delayed their graduation from the studied educational institutions, and thus both

depression and problems related to sexuality could be more common among them than in the age group at large.

Sexual activity was measured by asking whether or not the adolescent had experienced sexual intercourse. Adolescents' sexual development is known to progress gradually from holding hands and first kisses to intimate relationships and sexual intercourse. However, research often measures whether an adolescent has experienced his/her first sexual intercourse since it is connected to pregnancies and other outcomes. The cutpoint for having had multiple sexual partners was set as high as five or more partners. Yet, at least among the youngest age groups, for example, three or four sexual partners may indicate risky sexual behavior. Actually we further ran the analyses with three or more partners as indicator of risky sexual behavior, with corresponding findings among all the age groups 14–18 (data not shown). Sexual behavior in adolescence may have different meanings in different countries, and therefore testing the validity of our findings in different cultures is warranted.

The use of only self-reported measures for depression and parental involvement can be considered a limitation in our study.

Self-reported depression was assessed using the R-BDI, a state measure giving no information on the duration of depressive symptoms. However, self-reported depression in adolescence is known to be a persistent problem and to correspond well with clinical depression (Charman, 1994). To avoid overestimating the rates of depression, the cutpoint was set as high as 8 so that adolescents scoring for mild depression were not considered depressed in this study.

Different concepts to illustrate adolescent–parent interaction and quality of the relationship likely overlap, and these terms may be used interchangeably. We included in parental involvement that parents are aware of adolescents' whereabouts and friends, and whether the adolescent feels s/he can discuss important matters with parents. As far as we know there is no validated method to measure parental involvement. Scott et al. (2013) measured parental involvement by assessing the frequency of parents' engagement in conversations and activities with their child and scored the items on a 3-point scale. King, Berg, Butner, Butler, and Wiebe (2014) divided the construct of parental involvement into behavioral involvement, monitoring, and relationship quality. Stattin and Kerr (2000) for their part criticized the concept of monitoring by claiming that measures called 'monitoring' often actually focus on what information adolescents disclose to parents, and not on what parents do to check or control. They concluded that 'monitoring' often actually means knowledge, and knowledge is disclosed by adolescents themselves. Our measure of parental involvement does not confuse the aspects emanating from parents and adolescents, but focuses on the adolescent's perspective, and adds to disclosure/knowledge the aspect of connectedness, that the adolescent feels that the parents are accessible. Our measure is a report of parental involvement as perceived by adolescents themselves. The assessment of parental involvement could have gained more reliability, or different views, if it had also been possible to elicit responses to the same questions from the parents. However, this was not possible due to the design of the study. Nevertheless, the adolescent's own perception is likely important for her/his well-being and behavior.

Given that the SHPS provides only cross-sectional data, we cannot draw conclusions about causality. Future research needs to explore causalities in longitudinal study designs.

Summary

Low level of parental involvement and depression are independently associated with early sexual experiences and risk-taking sexual behavior among early and middle adolescents. Promoting parental involvement in adolescents' lives is likely beneficial for adolescents' sexual health.

Notes

1. Well-being of adolescents in Finland 2000–2013. National Institute for Health and Welfare (THL). Report 25/2014. <http://www.julkari.fi/handle/10024/1>.
2. http://www.vaestoliitto.fi/tieto_ja_tutkimus/vaestontutkimuslaitos/seksologinen_tutkimus/suomalaisten-seksuaalisuus-finse/finsex-seksielaman-aloittaminen/.

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