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Authors

Sigurdson, Johannes Foss
Undheim, Anne Mari
Wallander, Jan Lance
[et al.](#)

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The Longitudinal Association of Being Bullied and Gender with Suicide Ideations, Self-Harm, and Suicide Attempts from Adolescence to Young Adulthood: A Cohort Study

JOHANNES FOSS SIGURDSON, MA , ANNE MARI UNDHEIM, PhD, JAN LANCE WALLANDER, PhD, STIAN LYDERSEN, PhD, AND ANNE MARI SUND, MD, PhD

Longitudinal associations between being bullied during adolescence and suicide ideations, self-harm, and suicide attempts into young adulthood were examined. A large representative sample was examined in 1998 ($N = 2,464$, MA 13.7), 1999/2000, and 2012 to reassess the outcome measures. At all ages, bullied participants showed more suicide ideation, self-harm, and suicide attempts, regardless of gender. Bullied females showed a decrease in suicide ideation from adolescence to adulthood, while bullied males showed an increase in suicide attempts in the same time period. Being bullied in adolescence strongly predicts suicidal behavior and self-harm. Preventive efforts might reduce the risk of later suicidality.

Extensive research has examined bullying's link with suicide ideation, self-harm, and suicide attempts (e.g., Klomek et al., 2008; Olweus, 1991; Roland, 2002; Undheim & Sund, 2010). Bullying, intimidation, and victimization involve more powerful peers repeatedly targeting an individual with negative actions (Olweus & Limber, 2010). Bullying may manifest as teasing, active

exclusion from a social group, or physical assault (Roland, 2002).

Bullying is common among adolescents. Globally, rates of being bullied are reported to be 6%–35% among adolescents (Craig et al., 2009; Undheim & Sund, 2010). The rate differs significantly between the genders: In 29 of 40 countries, girls aged 11–15 years had higher occurrence of

JOHANNES FOSS SIGURDSON and ANNE MARI UNDHEIM, The Regional Centre for Child and Youth Mental Health and Child Welfare (RKBU), Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway; JAN LANCE WALLANDER, The Regional Centre for Child and Youth Mental Health and Child Welfare (RKBU), Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway and University of California, Merced, CA, USA; STIAN LYDERSEN, The Regional Centre for Child and Youth Mental Health and Child Welfare (RKBU), Faculty of Medicine, Norwegian

University of Science and Technology, Trondheim, Norway; ANNE MARI SUND, The Regional Centre for Child and Youth Mental Health and Child Welfare (RKBU), Faculty of Medicine, Norwegian University of Science and Technology, Trondheim and St. Olavs Hospital, Trondheim, Norway.

Address correspondence to Johannes Foss Sigurdson, The Regional Centre for Child and Youth Mental Health and Child Welfare (RKBU), Norwegian University of Science and Technology (NTNU), PO Box 8905, MTF5, Trondheim N-7491, Norway; E-mail: Johannes.f.sigurdson@ntnu.no

bullying than boys in the same age group (Craig et al., 2009). Being bullied becomes less prevalent starting in middle school, independent of gender (Baly, Cornell, & Lovegrove, 2014; Smith, Madsen, & Moody, 1999). In adolescence, males are more likely to be physically bullied (Undheim & Sund, 2010), whereas females are more likely to be exposed to more covert forms of bullying, such as gossip and social exclusion (Craig & Pepler, 2003).

A spectrum of suicidal behavior exists among humans; thinking about death and suicide and committing suicide constitute this spectrum's extremes (Bridge, Goldstein, & Brent, 2006). Self-harm and suicidal acts are forms of self-injurious behavior and often diverge regarding frequency, intention, and lethality (Hamza, Stewart, & Willoughby, 2012). In an international meta-analysis study, the last-year prevalence of suicide attempts and nonsuicidal self-harm among adolescents aged 14–19 years was 3%–15% and 7%–16.2%, respectively (Madge et al., 2008); in another study examining seven European countries, the average lifetime and 1-year prevalence of deliberate self-harm among adolescents aged 15–16 years were 17.8% and 11.5%, respectively (Madge et al., 2008). In Norway, 1-year incidence rates for self-harm and suicide attempts are 3.6% and 1.7% for 14- to 15-year-olds and 13.8% and 4.5% among somewhat older adolescents (Larsson & Sund, 2008; Tørmoen, Rossow, Larsson, & Mehlum, 2013). People who self-harm are more likely to attempt suicide (Lipschitz et al., 1999; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006) and complete suicide (Angst, Stassen, Clayton, & Angst, 2002). Self-harm and suicide attempts tend to emerge during early adolescence and are most common in the early twenties (Klonsky, Victor, & Saffer, 2014). In Norway, the rate of suicide increased 2.5 times from the 1970s to the 1990s and then stabilized (Mehlum, Gjertsen, & Hytten, 2000) and is most common among adults aged 20–29 years (16.6 per 100,000 individuals; Mehlum et al., 2000). In that age group, the rate of suicide is two

to three times higher among males than among females (SSB, 2015).

Factors causing self-harm and suicidal behavior are complex; however, mental health problems appear to explain 50%–90% of suicides (Cavanagh, Carson, Sharpe, & Lawrie, 2003; Harris & Barraclough, 1997). Contextual and relational factors may also predict suicidal behavior (Hjelmeland & Knizek, 2013). During adolescence, males and females undergo rapid physical, cognitive, and interpersonal development. Insecure attachment, independence issues, and problematic social peer relations (i.e., bullying) are common during adolescence and the transition from adolescence to adulthood (i.e., emerging adulthood; Arnett, 2000). Bullying's characteristic psychological maltreatment (Hart & Glaser, 2011) may attack the individual's need for fulfillment and lead to degradation, humiliation, and loss of personal and social value, thereby promoting suicide ideation, self-harm, and suicide attempts. Individuals bullied during adolescence have shorter education, poorer spouse/partner relationships (Sigurdson, Wallander, & Sund, 2014), less work participation (Strøm et al., 2013), and higher unemployment (Varhama & Björkqvist, 2005); these effects may impede establishment of a career path. Failure to complete stage-salient tasks appears to promote behavioral disorders, impede completion of subsequent tasks (Cicchetti & Rogosch, 1999), and increase suicide risk, especially among males (Conner & Goldston, 2007). In this context, examining bullying's relationship with suicidal behavior—particularly regarding gender differences in bullying's effects—may help to differentiate interventions aiming to protect or assist bullying victims.

Gender may moderate bullying's relationship with suicide ideation and self-harm. Females more commonly have suicide ideation (Reinherz et al., 1993) and suicidal behavior (Borges et al., 2010; Hjelmeland & Bjerke, 1996); however, completed suicide is more common among males (Canetto & Sakinofsky, 1998). Specifically,

females more commonly attempt suicide in adolescence, but this rate decreases in young adulthood (Thompson & Light, 2011); in contrast, males' rate of attempting suicide remains fairly constant over time (Canetto & Sakinofsky, 1998).

Peer victimization predicts subsequent suicide ideation and suicidal behavior; however, longitudinal research of this topic is required (Klomek, Sourander, & Gould, 2010). Additionally, few studies have examined bullying's association with suicide attempts. Some studies have longitudinally examined bullying's effect on suicidal behavior. Peer victimization predicts suicide ideation, self-harm, and suicide attempts up to age 25, controlling for child abuse, maladaptive parenting, domestic violence, and mental health problems (Winsper, Lereya, Zanarini, & Wolke, 2012). In a prospective longitudinal study covering 50 years, bullied individuals more commonly experienced depression, anxiety disorders, and suicidality (Takizawa, Maughan, & Arseneault, 2014). No research has longitudinally tested whether gender moderates the relationship between being bullied and suicide ideation, self-harm, or suicide attempts. Therefore, in this study we examined concurrent and longitudinal associations between being bullied and suicide ideation, self-harm, and suicide attempts in a representative community sample over 14 years, starting when participants were 13.7 years old. We expected that bullied participants would more commonly report suicide ideation, self-harm, and suicidal attempts at all assessment points and that gender would moderate the observed associations. The study's explicit aims were as follows:

1. To examine the association between being bullied (at T_1) and suicide ideation in adolescence and young adulthood.
2. To examine the association between being bullied (at T_1) and self-harm and suicide attempts in adolescence and young adulthood.

METHOD

Sampling Procedure

The Youth and Mental Health Study is a longitudinal study conducted in mid-Norway to examine risk and protective factors in the development of mental health in adolescents aged 12–15 years (Sund, 2004). In autumn 1998, from the total population of 9,292 adolescents aged 13–14 years and attending eighth and ninth grade in Trøndelag, a representative sample of 2,813 students (98.5% attending public schools) was drawn from 22 schools with probability according to school size (cluster sampling). Twenty-one students (0.7%) were ineligible (e.g., due to hospital admission, temporary vacation, or insufficient knowledge of Norwegian). Thus, 2,792 adolescents were eligible and 2,464 participated (88.3%; further sampling details are presented in Sund, Larsson, & Wichstrom, 2001).

Sample and Assessment Points in Adolescence

In 1998 (T_1), baseline data were collected: Participants were aged 13.7 ± 0.58 years ($N = 2,464$, range: 12.5–15.7; 50.8% female; response rate: 88.3%). Participants were divided among four strata: (1) City of Trondheim ($n = 484$, 19.5%), (2) Suburbs of Trondheim ($n = 432$, 17.5%), (3) Coastal region ($n = 405$, 16.4%), and (4) Inland region ($n = 1,143$, 46.4%; Sund, 2004). In 1999 (T_2), the participants were aged 14.9 ± 0.6 years (range: 13.7–17.0; 50.4% girls; $N = 2,432$). One hundred four participants from T_1 dropped out at T_2 ; 72 new participants (who had changed their mind about participating) were added from the same schools. Data were collected using questionnaires completed during school time.

Sample in Young Adulthood (T_4)

Individuals participating at T_1 or T_2 ($N = 2,532$) completed a follow-up survey

in young adulthood during the spring of 2012 (completed either online or on paper, $n = 1,260$ and $n = 6$, respectively; referred to as T_4 because a portion of the T_2 sample participated in an unrelated assessment at 20 years, T_3). T_4 occurred approximately 13.5 years after T_1 ; participants' mean age was 27.2 ± 0.59 years (range: 26.0–28.2). At T_4 , 92 participants were ineligible due to death or unknown home address ($n = 13$ and $n = 79$, respectively); accordingly, 2,440 participants were invited to participate and 1,266 participated (51.9%; 56.7% female). All waves of data collection were approved by the Regional Committee for Medical Research Ethics in Central Norway.

Independent Variable at T_1

Being Bullied. Participants reported if they have ever been (1) teased, (2) physically assaulted, or (3) excluded from peer relationships at school or while traveling to or from school during the last 6 months; responses used a 5-point scale (0 = *never*, 1 = *1–2 times*, 3 = *about once a week*, 4 = *2–3 times a week*, and 5 = *more often*; Alsaker, 2003). Following Roland (2002), responses were dichotomized (1 = *once a week or more*, 0 = *twice or less in the past 6 months*). Participants were classified as being bullied if they had a dichotomized score of 1 on one or more items; otherwise, they were classified as nonbullied. In addition, as an alternate approach, those being bullied were ordinal-scored using a sum score of the three variables indicating bullying, with scoring similar as the 5-point scale.

Outcome Measures at T_1 , T_2 , and T_4

Suicide ideation was assessed using an original scale that included five items. Four were from the Mood and Feelings Questionnaire (Angold et al., 1987) containing 33 items examining depressive symptoms experienced in the last 2 weeks among children aged 8–18 years: *I thought that life was not worth living*; *I thought about death or dying*; *I*

thought my family would be better off without me; and *I thought about killing myself*. One item from the Center for Epidemiologic Studies Depression Scale (Andrews, Lewinsohn, Hops, & Roberts, 1993) was added: *I would have killed myself if I had known a way of doing it*. Responses to these items used a 3-point scale (0 = *not true*, 1 = *sometimes true*, 2 = *true*). The sum score ranged from 0 to 10 and was skewed. Therefore, responses were truncated to a 4-point ordinal scale (0 = 0, *none*; 1–1.5 = 1, *low*; 1.5–6 = 2, *moderate*; 6–10 = 3, *severe*). The scale's internal consistency was satisfactory at each time point using Cronbach's α and average-corrected item-total correlations (AITCs). Internal consistency was T_1 : $\alpha = 0.821$, AITC = .63; T_2 : $\alpha = 0.866$, AITC = .70; and T_4 : $\alpha = .861$, AITC = .71.

Self-harm was measured by the question *Have you ever deliberately taken an overdose of pills or in any other way tried to hurt yourself?* Possible responses were *No, never*; *Yes, once*; and *Yes, several times* (Wichstrøm, 2000). Responses were dichotomized (1 = *Yes, once* or *Yes, several times*; 0 = *No, never*).

Suicide attempts were measured using the question *Have you ever tried to commit suicide?* Possible responses were *No, not really*; *Yes, once*; and *Yes, several times* (Wichstrøm, 2000). Responses were dichotomized as 1 = *Yes, once* or *Yes, several times*, and 0 = *No, never*.

Socioeconomic status (SES) was measured at T_1 by participants' report of their mother and father's occupation and with an open question asking what their parents did at work; responses were classified following the ISCO-88 (ILO, 1990) into *professional leader*, *upper middle class*, *lower middle class*, *primary industry*, and *manual worker*. The father's occupation was used unless the participant lived with their mother only, in which case mother's occupation was used.

Ethnicity was measured at T_1 by the participants' report of their parents' origin: 2.6% of participants had two non-Norwegian parents ($n = 65$); the majority

of these participants had parents from outside Europe ($n = 39$, 1.6%). Twenty-two (0.9%) were also foreign adopted, but age of adoption was not registered. These figures are equivalent with national data for the same age groups at the time (SSB, 2001).

Statistical Analysis

At each time point, frequency of suicide ideation, self-harm, and suicide attempts was stratified by bullying status (i.e., bullied vs. nonbullied) and gender. Regarding bullying status, frequency of suicide ideation, self-harm, and suicide attempts was compared between time points using chi-square tests for binary data and linear-by-linear tests for ordinal data. We compared the risk of suicide ideation, self-harm, and suicide attempts between bullied versus nonbullied and between the genders. The main analysis used generalized linear mixed models (GLMMs; Demidenko, 2004). We carried out analyses with suicide ideation, self-harm, and suicide attempts as respective dependent variables and conducted intra-group analysis of changes over time among the groups. We used an ordinal logistic GLMM with suicide ideation categorized into four categories, and binary logistic models for self-harm and suicide attempt. A time index with each time point and parents' SES were included as categorical covariates. Gender and bullied status were included as binary covariates (an alternate analysis was also carried out using bullied status as an ordinal covariate). We included all two-way and three-way interactions among these covariates to obtain a realistic model with all possible interaction effects. Few participants had non-Norwegian ethnicity; therefore, ethnicity's effect was not analyzed. The model included a random effect of each individual. Results are reported separately by gender; 95% confidence intervals are reported where relevant. Values of $p < .05$ were considered significant. Analysis

was performed using SPSS version 22 (Armonk, NY: IBM Corp., 2013).

RESULTS

Demographic Characteristics

Nearly one tenth (9.9%) of participants were bullied at T₁ (233 of 2,532), and were divided into the following groups: *females, nonbullied*; *females, bullied*; *males, nonbullied*; and *males, bullied*. Gender did not significantly affect bullying prevalence (females, bullied: $n = 12$, 10.0%; males, bullied: $n = 112$, 9.7%; $p = .784$). The different forms of being bullied were distributed as follows: for girls and boys, respectively: teasing, 8.7% and 7.7%; physical assault, 1.4% and 2.8%; and exclusion, 3.9% and 3.3%.

Attrition Analysis

Gender, parental SES, ethnicity, and bullying at T₁ were compared between responders and nonresponders at T₄. Responders were more commonly female [56.9% vs. 44.4%, $\chi^2(1) = 39.44$, $p < .001$], and fewer were with non-Norwegian background [1.7% vs. 3.6%, $\chi^2(1) = 8.79$, $p = .003$]. Parental SES differed significantly between responders and nonresponders [$\chi^2(4) = 27.20$, $p < .001$]. More responders were upper middle class [33.6% vs. 25.5%, $\chi^2(1) = 17.19$, $p < .001$], and fewer were workers [34.1 vs. 41.8, $\chi^2(1) = 5.93$, $p < .015$]. The rate of bullying (assessed at T₁) did not differ significantly between responders and nonresponders.

Outcome Characteristics

Bullied participants of either gender were significantly more likely to report suicide ideation, self-harm, and suicide attempts at all time points ($p > .001$ –.027; Table 1). The risk differences between bullied and nonbullied were larger among females (Table 2), except regarding suicide attempts

TABLE 1

Distribution of Outcome Variables of Suicide Ideation, Self-Harm, and Suicide Attempts by Gender and Time Point (N = 2,532)^a

Outcome	Range	T ₁		T ₂		T ₄	
		Nonbullied (%) n	Being bullied (%) n	Nonbullied (%) n	Being bullied (%) n	Nonbullied (%) n	Being bullied (%) n
Suicide ideation							
Female	None	69.6 (753)	44.6 (54)	69.1 (717)	52.2 (60)	86.1 (516)	67.7 (44)
	Low	17.5 (189)	20.7 (25)	14.4 (149)	14.8 (17)	4.8 (29)	18.5 (12)
	Moderate	11.4 (123)	23.1 (28)	13.4 (139)	23.5 (27)	7.7 (46)	7.7 (5)
	Severe	1.6 (17)	11.6 (14)	3.1 (32)	9.6 (11)	1.3 (8)	6.2 (4)
Male	None	85 (883)	61.3 (68)	85.3 (856)	63.6 (68)	81.1 (348)	71.1 (32)
	Low	7.7 (80)	12.6 (14)	7.9 (79)	12.1 (13)	8.2 (35)	11.1 (5)
	Moderate	6.5 (68)	22.5 (25)	5.7 (57)	20.6 (22)	8.9 (38)	15.6 (7)
	Severe	0.8 (8)	3.6 (4)	1.2 (12)	3.7 (4)	1.9 (8)	2.2 (1)
Self-harm							
Female	No	93.9 (1,010)	79.5 (93)	89.3 (913)	72.8 (83)	86.7 (517)	76.6 (49)
	Yes	6.1 (66)	20.5 (24)	10.8 (111)	27.2 (31)	13.3 (79)	23.4 (15)
Male	No	97.9 (1,009)	92.8 (103)	95.7 (950)	84.8 (89)	96.5 (408)	88.6 (39)
	Yes	2.1 (22)	7.2 (8)	4.3 (43)	15.2 (16)	3.5 (15)	11.4 (5)
Suicide attempts							
Female	No	96.7 (1,039)	87.9 (102)	93.8 (955)	80.5 (91)	93.8 (558)	90.8 (59)
	Yes	3.3 (35)	12.1 (14)	6.2 (63)	19.5 (22)	6.2 (37)	9.2 (6)
Male	No	98.7 (1,016)	94.5 (103)	97.9 (970)	88.7 (94)	96.9 (408)	84.1 (37)
	Yes	1.3 (13)	5.5 (6)	2.1 (21)	11.3 (12)	3.1 (13)	15.9 (7)

^aAdolescents assessed at three time points: mean age 13.7 (T₁), mean age 14.9 (T₂), and mean age 27.2 (T₄) (N = 2,532).

TABLE 2

Risk Differences Over Time in Suicide Ideation, Self-Harm, and Suicide Attempts for Those Nonbullied (N = 2,361) Versus Being Bullied (N = 233) in Adolescence^a

Outcome	Groups	Range	%Risk diff. at T ₁	%Risk diff. at T ₂	%Risk diff. at T ₄
Suicide ideation	Female	Low	3.2	0.4	15.8
		Moderate	11.7	10.1	3.5
		Severe	10.0	6.5	5.5
	Male	Low	4.9	4.2	2.9
		Moderate	16.0	14.9	6.7
Self-harm	Female	Severe	2.8	2.5	0.3
		Yes	14.5	14.8	10.1
		Male	Yes	5.1	11.0
Suicide attempts	Female	Yes	10.8	13.3	3.0
	Male	Yes	4.2	9.2	12.8

^aAdolescents assessed at three time points: mean age 13.7 (T₁), mean age 14.9 (T₂), and mean age 27.2 (T₄) (N = 2,532).

TABLE 3

Effect of Being Bullied Separated by Gender with Suicide Ideation, Self-Harm, and Suicide Attempts Using Ordinal or Binary Logistic GLMM Regression (N = 2,532)^{a,b}

Outcome	Gender	Time point	OR ^c	CI lower	CI upper	p Value
Suicide ideation ^d	Female	T ₁	3.10	2.15	4.47	.000
		T ₂	2.37	1.61	3.47	.000
		T ₄	2.68	1.52	4.73	.001
	Male	T ₁	3.97	2.62	6.03	.000
		T ₂	3.63	2.37	5.57	.000
		T ₄	1.76	0.89	3.49	.103
Self-harm ^e	Female	T ₁	4.01	2.37	6.78	.000
		T ₂	3.30	2.07	5.26	.000
		T ₄	1.91	1.01	3.63	.047
	Male	T ₁	3.15	1.31	7.59	.011
		T ₂	4.62	2.47	8.67	.000
		T ₄	3.86	1.31	11.41	.014
Suicide attempts ^e	Female	T ₁	4.07	2.07	7.82	.000
		T ₂	3.90	2.26	6.73	.000
		T ₄	1.30	0.49	3.45	.600
	Male	T ₁	5.12	1.85	14.14	.002
		T ₂	6.26	2.94	13.30	.000
		T ₄	6.06	2.25	16.36	.000

CI, confidence interval.

^aBeing bullied status, gender, and time points and their interactions as covariates. Parent socioeconomic status (T₁) as covariate only.

^bAdolescents assessed at three time points: mean age 13.7 (T₁), mean age 14.9 (T₂), and mean age 27.2 (T₄).

^cOrdinal logistic regression with four-category outcome.

^dBinary logistic regression.

among males in young adulthood (males: 12.8; females: 3.0).

Mixed Models: Main Results

A comparison of odds ratios (ORs) of suicide ideation, self-harm, and suicide attempts between bullied and nonbullied participants in separate GLMM analyses at each time point are shown in Table 3; these examined the main effects of being bullied and time on all outcome variables, with gender and parents' SES as covariates and considering all two- and three-way interactions. Overall, bullied participants were more likely to report suicide ideation, self-harm, and suicide attempts at all time points; except at T₄, bullied females do not have significantly higher suicide attempts

than their nonbullied peers and bullied males have not significantly higher suicide ideation than their nonbullied peers. The results measuring being bullied at an ordinal level were consistent with being bullying measured at a dichotomized level (the results of the latter shown here).

Mixed Models: Intragroup Change Over Time Among Gender and Bullying Status

We used the GLMMs to examine intragroup change over time. Figures 1–3 illustrate differences in the groups' trajectories regarding suicide ideation, self-harm, and suicide attempts (T₁ vs. T₂, T₂ vs. T₄, and T₁ vs. T₄, all findings shown). Regarding suicide ideation (Figure 1), bullied and

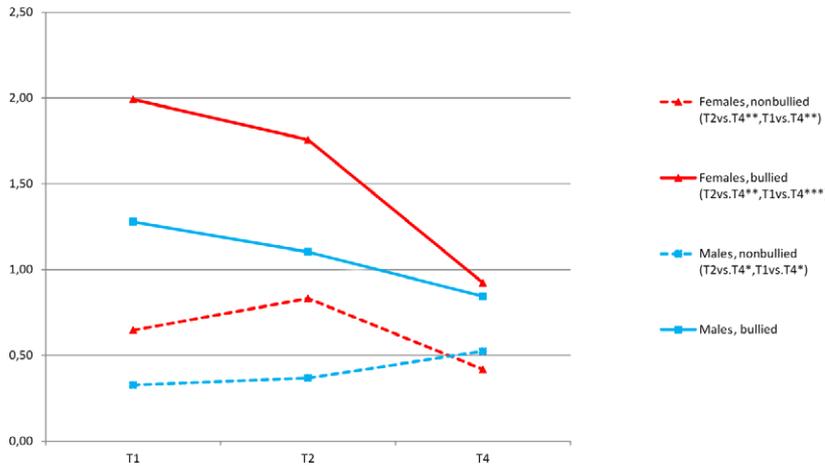


Figure 1. Mean values of suicide ideation for the groups females, nonbullied; females, bullied; males, nonbullied; and males, bullied, assessed at mean age 13.7 (T₁), mean age 14.9 (T₂), and mean age 27.2 (T₄) ($N = 2,532$).^{1,2} Note. ¹Intragroup GLMM comparisons between time points: *** $p < .001$, ** $p < .005$, * $p < .05$. ²Females, nonbullied ($n = 1,085$), females, bullied ($n = 121$), males, nonbullied ($n = 1,043$), and males, bullied ($n = 112$).

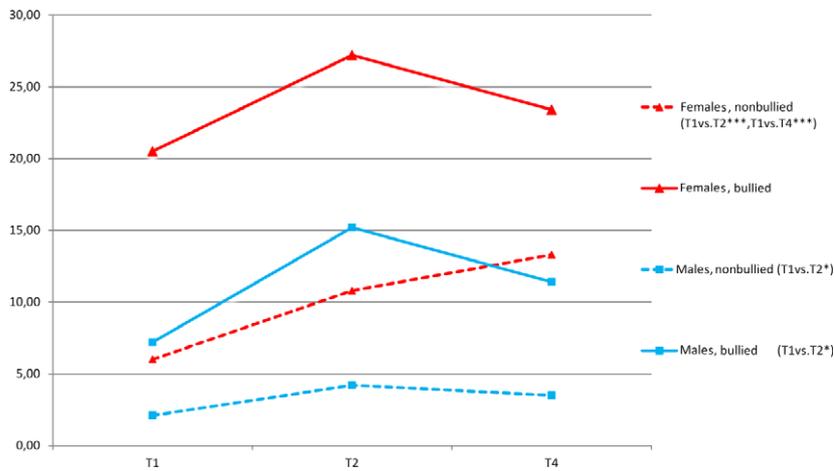


Figure 2. Percentages of self-harm for the groups females, nonbullied; females, bullied; males, nonbullied; and males, bullied, at mean age 13.7 (T₁), mean age 14.9 (T₂), and mean age 27.2 (T₄) ($N = 2,532$).^{1,2} Note. ¹Intragroup GLMM comparisons between time points: *** $p < .001$, ** $p < .005$, * $p < .05$. ²Females, nonbullied ($n = 1,085$), females, bullied ($n = 121$), males, nonbullied ($n = 1,043$), and males, bullied ($n = 112$).

nonbullied participants' trajectories were similar but began at different levels. Among females, suicide ideation decreased from T₁ and T₂ to T₄, independent of bullying ($p < .05-.001$); however, for males, it increases slightly (T₁ vs. T₄, T₂ vs. T₄, both p values $< .05$) among nonbullied. Self-harm (Figure 2) shows a pattern with an increase in prevalence of self-harm from

T₁ versus T₂ and T₁ versus T₄ among nonbullied females (both $p < .001$) and from T₁ to T₂ among both nonbullied and bullied males (both $p < .05$). Regarding suicide attempts (Figure 3), bullied females decreased their levels of suicide attempts from T₂ to T₄ ($p < 0.05$), while nonbullied females had an increase from T₁ to T₂ and from T₁ to T₄ ($p < .005$). Both bullied and

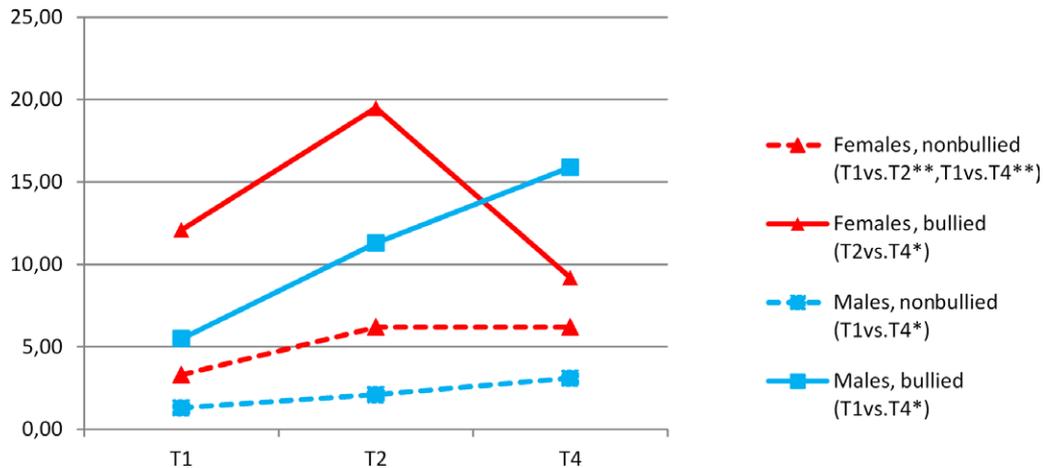


Figure 3. Percentages of suicide attempts for the groups females, nonbullied; females, bullied; males, nonbullied; and males, bullied, at mean age 13.7 (T_1), mean age 14.9 (T_2), and mean age 27.2 (T_4) ($N = 2,532$).^{1,2} Note. ¹Intra-group GLMM comparisons between time points: *** $p < .001$, ** $p < .005$, * $p < .05$. ²Females, nonbullied ($n = 1,085$), females, bullied ($n = 121$), males, nonbullied ($n = 1,043$), and males, bullied ($n = 112$).

nonbullied males have a heightened level of suicide attempts at T_4 compared to T_1 (both $p < .05$).

DISCUSSION

In this study we examined bullying's association with the development of suicide ideation, self-harm, and suicide attempts from adolescence to young adulthood and the possible moderating effect of gender on these associations. Overall, the following patterns were evident: Bullied females most commonly reported suicide ideation, self-harm, and suicide attempts (ORs: 2.00–4.07). The only result deviating from this trend was that bullied males most commonly reported attempting suicide in young adulthood. The observed risk differences were larger among females than among males on all outcome measures except suicide attempts in young adulthood. Bullied females' more frequent reporting of suicide ideation and self-harm in adolescence and young adulthood suggests that bullying affects young females particularly strongly, while the detrimental effect of bullying

shows possibly a delayed effect among young adult males.

Gender moderated bullying's effect on suicide ideation, self-harm, and suicide attempts in different directions support the "gender paradox" (Canetto & Sakinofsky, 1998). The following explanations of this observation have been proposed. Females may generally report their health history more accurately and therefore more commonly recall lifetime events such as self-harm (Mościcki, 1994). Females more commonly experience depression in adolescence years (Brent, Baugher, Bridge, Chen, & Chiapetta, 1999; Roland, 2002); this may lead to self-harm as an expression of distress and signal for help. Heightened stress may be associated with traditional gender roles (Webster Rudmin, Ferrada-Noli, & Skolbekken, 2003) and cultural context (Canetto & Sakinofsky, 1998). Suicide risk factors particularly affecting males include more commonly alcohol and other substance use and both the prevalence and the lethality of suicide attempts (Gould, Greenberg, Velting, & Shaffer, 2003; Shaffer et al., 1996).

Characteristic forms of bullying differ between the genders in adolescence: Girls

tend to bully using indirect and interpersonal aggression (e.g., gossiping; Nansel et al., 2001), whereas boys tend to use direct physical aggression (Undheim & Sund, 2010). Gender-based differences in bullying may underlie differing rates of self-harm and suicide attempts. Future research should compare different bullying types' long-term effects on self-harm.

Among bullied participants, suicide ideation and attempts decreased among females from adolescence to young adulthood, while self-harm remained stable. In young adulthood, suicide attempts were considerably less common among bullied females than among bullied males. Accordingly, our results only partly support the general notion that females at all ages more commonly report suicide ideation and suicidal behavior (Canetto & Sakinofsky, 1998; Mościcki, 1994), although completed suicides are more common among men. This may reflect a stable gender-based difference in vulnerability to negative life events. In a longitudinal twin study, women reported more global social support than men (Kessler, Myers, & Prescott, 2005); this may protect women against completed suicides.

In this study, bullied males more commonly reported suicide attempts than both bullied and nonbullied females; however, in the general population suicide attempts are more commonly reported by women (Hjelmeland & Bjerke, 1996). This finding was unexpected and should be independently replicated.

The transition from adolescence to young adulthood may be more difficult for bullied males than for bullied females due to poorer coping skills (e.g., substance use, social avoidance, lack of social support); this may increase the risk of negative outcomes among bullied males in young adulthood.

Bullying creates great distress during adolescence (Kumpulainen et al., 1998). Mental health problems may explain 50%–90% of suicides (Cavanagh et al., 2003; Harris & Barraclough, 1997). In this study, bullied adolescent participants more commonly experienced externalizing and

internalizing mental health problems and psychiatric hospitalization in young adulthood; controlling for baseline mental health problems, depressive symptoms was the only significant remaining factor (Sigurdson, Undheim, Wallander, Lydersen, & Sund, 2015). It is important to note that depression explains much of self-harm and suicide attempts (Conner & Goldston, 2007) and may partly mediate the maladaptive developmental trajectory from bullying to self-harm and suicidal behavior in adolescence.

Few studies have examined whether gender moderates adolescent bullying's longitudinal association with self-harm, suicide ideation, and suicide attempts. Almost none have examined the transitional period from adolescence to early adulthood, when most people leave education for work. Most studies have used cross-sectional designs to examine bullying's association with suicidality, preventing them from testing causal inferences. In contrast, the present findings indicate that exposure to bullying increases adolescents' present and future risk of suicide ideation and suicidal behavior.

Strengths and Limitations

This study used a longitudinal design and possible effects of bullying were observed for over a decade longer than previous studies often using clinical samples or retrospective reports.

The present sample represents the adolescent population in mid-Norway, but is not nationally representative. The sample's homogeneity impedes generalization of the present findings to other countries; similar future research should therefore sample more diverse populations.

The data for this study were collected using self-report. Motivations such as social desirability might therefore have biased participants' responses; however, participants' confidentiality and anonymity were protected and this typically leads to valid and reliable self-report data (Brenner, Billy, & Grady, 2003). There has also been some concern regarding the registration of suicide

attempts using hospital data (Wichstrøm & Rossow, 2002). These data could be biased because it is believed that suicide attempts by men are underreported in these types of data. The main reason for this is social stigma (Bertolote et al., 2005). Community samples could be a more reliable and valid approach in this matter as it is suspected that most report the truth when anonymity is granted. However, self-reported data also have their limitations; we do not have a good external indicator on the severity of the suicidal behavior. Most likely are the cases reported in a spectrum from acts with little injury to serious attempts that required hospitalization.

The response rate was excellent at both T₁ and T₂; however, it was modest at T₄ (51.9%). The response rate decrease likely reflected the 14-year interim between T₂ and T₄ and is comparable with those observed in Internet-based surveys (Cook, Heath, & Thompson, 2000). The moderate follow-up response rate increases the likelihood of attrition bias; however, our attrition analysis identified no systematic bias regarding bullying or suicide ideation.

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CONCLUSION

Among both genders, exposure to bullying during adolescence increases the risk of suicide ideation, self-harm, and suicide attempts; this effect persists into young adulthood. In adulthood, bullied adolescent males were most likely to report suicide attempts. Bullied adolescent females were most likely to report suicide ideation in adolescence and persistent self-harm from adolescence into adulthood. This result should inform relevant public health policy. Specifically, suicide prevention strategies in the school years should particularly target bullied individuals. Multidimensional school-based antibullying campaigns using preventive strategies may change attitudes and behavior within peer groups and thereby decrease bullying and the risk of current and later self-harm and suicide attempts. Clinicians should inquire about experience of bullying, particularly regarding patients with known suicidality.

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