Abstract

Background: Little is known about the exposure of youth with disability to cyber victimisation.

Objective/Hypothesis: To estimate the prevalence of peer cyber and non-cyber victimisation in a nationally representative sample of 14-year-old adolescents with and without disability and to determine whether gender moderates the relationship between disability and exposure to victimisation.

Methods: Secondary analysis of data collected in Wave 6 of the UK's Millennium Cohort Survey on 11,726 14-year-old adolescents living in the UK.

Results: Adolescents with disability had higher prevalence of cyber and non-cyber victimisation than those with no disability. For cyber victimisation there was a statistically significant interaction between gender and disability, with evidence of increased cyber victimisation for adolescents with disability compared to those with no disability among girls, but not boys. For non-cyber victimisation there was no evidence of an interaction between gender and disability.

Conclusions: The prevalence of both cyber and non-cyber victimisation was higher among adolescents with disability than those with no disability. The association between disability and risk of exposure to peer cyber victimisation appears to be moderated by gender.

Keywords

Introduction

Peer victimisation of children and young people constitutes a significant public health issue as: (1) the prevalence of exposure to peer victimisation is relatively high; and (2) exposure is related to a range of negative mental and physical health outcomes in childhood and later life.[1-3] Over the past decade, research has increasingly focused on cyber victimisation by peers; defined as victimisation conducted over the internet, especially social media.[4-6] Estimates of the prevalence of childhood exposure to cyber victimisation vary widely, largely as a result of variations in approaches to definition and measurement.[4] However, in the 2013/14 Health Behaviour in School-aged Children survey, 11% of 15 year old children in Europe reported being bullied by messages at least once in the past year and 9% reported being bullied by images at least once.[7] Exposure to cyber victimisation has been associated with higher rates of anxiety, depression, drug and alcohol use, loneliness, suicidal ideation, self-harm and lower rates of self-esteem, life satisfaction and academic achievement.[4, 8, 9] Meta-analysis has also suggested that gender may moderate the association between cyber-victimisation and depression with the strength of association being significantly greater for girls.[4]

A growing number of population-based studies have reported that children and young people with disabilities are at greater risk of exposure to peer victimisation than their peers,[10-14] and that exposure to peer victimisation may mediate the association between disability in adolescence and poorer mental health.[10, 14] Given that exposure to non-cyber victimisation is a known risk factor for cyber victimisation,[4] it is possible that children and young people with disabilities are also at increased risk of exposure to cyber victimisation. However, very few studies have addressed this issue.[4] Indeed, a recent systematic review of cyber victimisation among people with long-term health conditions and/or disabilities identified just 10 studies, only three of which used either nationally representative sampling frames or samples that were representative of large administrative regions within countries.[15]

First, a US telephone-based survey of 1,560 US youth aged 10-17 who had used the internet at least once a month for the past 6 months reported no difference in rates in the previous year of cyber sexual solicitation or victimisation between youth with/without physical disabilities.[16] However, it did report that youth receiving special education services, were significantly more likely to report distressing cyber sexual solicitation (7% vs 2%) and distressing cyber victimisation (8% vs 5%) than other youth. Second, a computer-based self-report survey undertaken on a national sample of 6,732 Swiss 9th grade students (approximate age 15) attending state schools reported lifetime and past year prevalence of cyber sexual victimisation was higher among students with physical disabilities than their peers (lifetime 24% vs 18%).[17] Third, a school based survey of 8,544 9th grade students (approximate age 15) in Skåne (the southernmost area of Sweden) reported higher rates of cyber victimisation in the past 12 months among students with disabilities when compared to their peers (boys 20% vs 12%; girls 28% vs 18%; overall 24% vs 15%).[18, 19]

There is also accumulating evidence that gender may moderate the association between disability and wellbeing across in adolescence. Specifically, adolescent girls with a disability appear to be at markedly greater risk of lower satisfaction with school than would be expected by the combined effects of disability status and gender.[20, 21]

The aims of the present study were: (1) to estimate the prevalence of peer cyber and non-cyber victimisation in a nationally representative sample of 14 year old adolescents with and without disability; (2) to estimate the extent to which gender moderates the relationship between disability and exposure to cyber and non-cyber victimisation.

Methods

We conducted secondary analysis of data collected on 14 year old children in Wave 6 of the UK's *Millennium Cohort Study* (MCS).[22] Information was collected from parental and child informants on 11,726 children (63% retention from Wave 1). Data used in the present analyses were collected by

computer assisted personal interview with a parental informant and, separately, computer assisted self-interview (n=10,828) or personal interview (n=143) with the adolescent.

Measures

Disability

We defined adolescents as having a disability if the parental informant reported that their child: (1) had '*physical or mental health conditions or illnesses lasting or expected to last 12 months or more*'; (2) that this reduced their '*ability to carry out day-to-day activities*'; and (3) that this limitation had lasted for at least 6 months. Disability data were missing for 5.6% of the unweighted sample.

Cyber Victimisation

Adolescent informants were asked; '*How often have other children sent you unwanted or nasty emails, texts or messages or posted something nasty about you on a website?*'. Response options were; 'never', 'less often than every few months', 'every few months', 'about once a month', 'about once a week', 'most days'. No time frame was specified for this question. Cyber victimisation data were missing for 1.8% of the unweighted sample.

Non-cyber Victimisation

Adolescent informants were asked '*How often do other children hurt you or pick on you on purpose*?' Response options were the same as above. No time frame was specified for this question. Non-cyber victimisation data were missing for 1.8% of the unweighted sample.

Potential Confounders

Covariates included in statistical models were gender, household income, household material hardship, single/two parent headed household. Gender was asked as a simple male/female binary question and was complete for all informants. Three indicators of socio-economic position were extracted from the MCS: (1) household income poverty; (2) material hardship; and (3) whether the child was living in a one or two parent figure headed household. *Income poverty* was defined as

living in a household whose equivalised income was 60% less than the sample median.[23]

Experiencing *material hardship* was defined as not being able to afford two or more of a list of five goods/activities that have been identified as basic necessities for UK families (e.g., having celebrations on special occasions such as birthdays, Christmas or other religious festivals).[24] Missing data for SEP indicators was 0.0% for income poverty, 5.6% for material hardship and 0.0% for single/dual parent headed household. All percentages relate to the unweighted sample.

Ethical Approval

The organisers of the MCS received approval from NHS Multi-Centre Ethics Committees and informed consent was gained from children and parents/guardians.[22, 25, 26]

Approach to Analysis

First, we present crude prevalence rates for cyber and non-cyber victimisation, disaggregated by disability status and gender. Second, we used ordinal regression (with 6 outcome levels) to test the association between disability, gender and victimisation when adjusted for the potential confounders listed above. In a sex by disability by outcome level crosstabulation, only 1 of 24 cells for cyber-victimisation had an observed frequency of less than five (4%) and no cells had an observed frequency of less than five for non-cyber victimisation. No cell for either outcome had an observed frequency of zero. As such, the data satisfied the rule of thumb assumption for such analyses that no cells should be void and <20% should have a count of less than five.[27] Finally, we estimated the significance of gender moderation of the association between disability and victimisation by including an interaction term between disability and gender in the ordinal regression models. Analyses were undertaken in IBM SPSS 24 using the 'complex samples' facility to take account of clustering in the original sample and sample weights provided with the data to take account of known biases in recruitment and retention.

Results

Adolescents with disability had higher prevalence of cyber and non-cyber-victimisation compared to those with no disability (Table 1). For cyber victimisation there were significant main effects for gender and a statistically significant gender*disability interaction (Table 2). Stratification of the analyses by gender indicated that the main effect for disability was significant among girls (Cumulative Odds Ratio (COR)=1.84 (1.46-2.32), p<0.001), but not boys (COR=1.26 (0.99-1.59), n.s.). Inspection of the crude prevalence rates for cyber victimisation (Table 1) indicates that the relative difference in exposure rates between adolescent girls with/without disability was highest for more frequent victimisation. For non-cyber victimisation there were significant main effects for disability, but not gender, and no significant gender*disability interaction (Table 2).

Discussion

Adolescents with disability were significantly more likely than their peers to report cyber and non-cyber-victimisation. For both adolescents with/without disability the prevalence of exposure to non-cyber-victimisation was greater than exposure to cyber-victimisation. The association between disability and risk of exposure to cyber victimisation (but not non-cyber victimisation) appears to be moderated by gender with very high rates of exposure to cyber victimisation among girls with disability. These differences in exposure rates may identify one of the pathways that contribute to the gender moderation of the association between disability and wellbeing in adolescence, with girls with a disability being at greater risk of low school satisfaction than would be predicted by the combined effects of disability and female gender.[20, 21] Among samples of adolescents, cyber-bullying victimisation is associated with engagement in risky online behaviours.[28, 29] Such behaviour clearly exacerbates vulnerability to victimisation, but also highlights the critical importance of education regarding cyber safety. Our research has demonstrated that such education and prevention strategies are especially important among adolescents with disability because they are at heightened risk of cyber-victimisation. Education and prevention strategies need to address the

increased vulnerability of adolescent girls with disability to cyber victimisation and incorporate

accessible, online information in a variety of formats, for example, the Easy English website provided

by the Australian eSafety Commissioner (https://www.esafety.gov.au/key-issues/tailored-advice/help-easy-english).

The main strength of the study is its use of a nationally representative sample of adolescents. The

main limitations of the study are the use of single item measures of cyber and non-cyber harassment

with no stated temporal period and which contain little information about the nature of cyber-

harassment. Future research is needed to understand the mechanism that may underly the very

high rates of exposure to cyber victimisation observed among girls with disability. For example, it

would be important to explore whether these differences were consistent across different types of

cyber bullying. For example, it might be useful to explore private versus (e.g., text messaging) more

public forms of cyber bullying (e.g., Facebook or Twitter). It might be useful to explore cyber bullying

that involves written information versus distribution of photos and images. Another avenue for

future research is the impact of cyber bullying, non-cyber bullying and the combination of cyber and

non-cyber bullying on victims with disability.[30]

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Table 1: Prevalence of Exposure to Cyber and Non-cyber Victimisation								Adjusted ordinal regression results (cumulative odds ratios)
		Reported Frequency of Victimisation						
	Disability status	'Never'	'Less than every few months'	'Every few months'	'About once a month'	'About once a week'	'Most days'	
Cyber victimisation								
Boys	Disability (n=515)	74.5% (69.7-78.8)	18.9% (14.9-23.6)	1.6% (0.8-3.3)	2.9% (1.5-5.6)	2.0% (0.9-4.5)	0.1% (0.0-0.8)	
	No Disability (n=4,657)	78.2% (76.5-79.8)	16.4% (15.0-17.0)	2.9% (2.3-3.5)	1.3% (0.9-1.9)	0.9% (0.6-1.3)	0.4% (0.2-0.7)	
Girls	Disability (n=424)	49.2% (43.7-54.9)	29.0% (23.7-34.9)	8.8% (5.8-13.2)	6.1% (3.8-9.6)	4.2% (2.1-8.3)	2.7% (1.4-5.1)	
	No Disability (n=4,480)	63.4% (61.3-65.5)	24.8% (22.9-26.7)	5.4% (4.6-6.3)	3.1% (2.5-3.9)	2.0% (1.5-2.6)	1.3% (0.8-2.0)	
Total	*Disability* (n=939)	*63.1% (59.0-67.0)*	*23.4% (19.9-27.4)*	*4.9% (3.3-7.0)*	*4.3% (2.9-6.4)*	*3.0% (1.8-5.1)*	*1.3% (0.7-2.4)*	Disability (COR=1.54 (95%CI 1.30-1.81), p<0.001)
	No Disability (n=9,137)	*70.9% (69.6-72.3)*	*20.5% (19.3-21.8)*	*4.1% (3.6-4.7)*	*2.2% (1.8-2.6)*	*1.4% (1.1-1.8)*	*0.8% (0.6-1.2)*	Female gender (COR=2.18 (95%CI 1.93-2.47), p<0.001)
Non-cyber victimisation								
Boys	Disability (n=519)	42.5% (36.9-48.2)	26.8% (22.3-31.9)	6.1% (4.1-9.0)	4.2% (2.4-7.4)	9.6% (6.6-13.8)	10.8% (7.7-15.0)	
	No Disability (n=4,659)	52.8% (50.8-54.9)	26.6% (24.9-28.3)	5.1% (4.5-5.8)	4.9% (4.1-5.8)	6.0% (5.2-6.9)	4.6% (3.8-5.5)	
Girls	Disability (n=425)	40.5% (34.5-46.7)	26.4% (21.4-32.1)	7.4% (4.6-11.6)	5.7% (3.5-9.30	9.2% (6.3-13.1)	10.8% (7.5-15.2)	
	No Disability (n=4,477)	52.8% (50.7-54.8)	28.1% (26.4-29.8)	4.6% (3.9-5.4)	5.2% (4.5-6.1)	5.2% (4.6-6.0)	4.1% (3.4.5.0)	
Total	*Disability* (n=944)	*41.6% (37.5-45.8)*	*26.6% 23.0-30.6)*	*6.7% (4.9-9.1)*	*4.9% (3.3-7.2)*	*9.4% (7.3-12.1)*	*10.8% (8.5-13.6)*	Disability (COR=1.79 (95%CI 1.51-2.14), p<0.001)
	No Disability (n=9,136)	*52.8% (51.3-54.3)*	*27.3% (26.1-28.6)*	*4.9% (4.4-5.4)*	*5.0% (4.5-5.7)*	*5.6% (5.1-6.2)*	*4.4% (3.8-5.0)*	Female gender (COR=0.98 (95%CI 0.88-1.09), n.s.)

Notes: PRR = prevalence rate ratio; * p<0.05, ** p<0.01, *** p<0.001
Ordinal regression results addressed potential confounding for between-group differences in gender, material hardship, income poverty and single/two parent status of household

Table 2: Results of Ordinal Regression Models Testing for Disability by Gender Interaction Effects		
Cyber-Victimisation	Cumulative Odds Ratio (COR)	p
Disability	1.22 (0.97-1.55)	n.s.
Gender	2.09 (1.83-2.37)	<0.001
Disability*Gender	1.54 (1.10-2.15)	<0.05
Non-cyber-Victimisation		
Disability	1.72 (1.37-2.15)	<0.001
Gender	0.98 (0.88-1.08)	n.s.
Disability*Gender	1.10 (0.78-1.53)	n.s.
Note: Models also adjusted for between-group differences in gender, material hardship, income poverty and single/two parent status of household		