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Abstract

Background. Children with mild/moderate intellectual disabilities are at greater risk for mental health problems, with socio-economic factors and adversity partly accounting for this. Fewer data are available for adolescents.

Methods. Secondary analysis was undertaken the *Next Steps* annual panel study following a cohort through adolescence into adulthood containing self-report mental health data up to age 16/17. Participants with mild/moderate intellectual disabilities were identified through data linkage with educational records.

Results. Adolescents with mild/moderate intellectual disabilities were more likely than non-disabled peers to experience socio-economic disadvantage and bullying. Incidence rates of **new** mental health problems were generally not significantly different between adolescents with and without intellectual disabilities.

Conclusions. These findings are consistent with higher rates of persistent mental health problems beginning earlier amongst children with intellectual disabilities. Attention needs to be paid to the timecourse of mental health problems, and the impact of socio-economic factors, family and peers on mental health.

Introduction

A developing body of research, typically involving secondary analysis of large-scale representative general population datasets, is consistently reporting higher rates of what are broadly defined as mental health problems amongst children with intellectual disabilities compared to peers without intellectual disabilities (Einfeld et al., 2011). For example, a secondary analysis of the UK's 1999 and 2004 ONS Child and Adolescent Mental Health Surveys (Emerson and Hatton, 2007), reported a point prevalence of all ONS defined psychiatric disorders of 36% for children with intellectual disabilities aged 5-15 years compared to 8% for children without intellectual disabilities. For children with intellectual disabilities compared to children without intellectual disabilities, higher rates of emotional disorders (12% vs 3.7%), anxiety disorders (11.4% vs 3.2%), hyperkinesis (ADHD; 8.3% vs 0.9%), conduct disorders (20.5% vs 4.3%) and tic disorders (0.8% vs 0.2%) were reported, with no statistically significant differences in rates of depressive disorders (1.4% vs 0.9%) or eating disorders (0.2% vs 0.1%). Secondary analysis of other UK and Australian general population cohort studies involving younger children also report higher and more persistent rates of mental health and behavioural issues with children with intellectual disabilities compared to their peers without intellectual disabilities (Emerson, 2003, 2015; Emerson and Einfeld, 2010; Emerson, Einfeld and Stancliffe, 2011; Emerson et al., 2014).

Studies using the same datasets have also consistently demonstrated that children with intellectual disabilities, compared to their peers without intellectual disabilities, are more likely to be in situations of lower socio economic position and adversity which have been well established to be associated with poorer child mental health in the general population (Emerson, 2015; Emerson and Spencer, 2015). For example, children with intellectual disabilities from an early age have been shown to be more likely than children without

intellectual disabilities to live in conditions characterised by persistent poverty and hardship (Emerson, 2015; Emerson and Brigham, 2014; Emerson et al., 2009, 2010; Shahtahmasebi et al., 2011), inadequate nutrition (Emerson, 2015; Gore et al., 2015), cold and poor housing in an inadequate state of repair (Emerson, 2015; Emerson and Hatton, 2005), exposure to bullying and violence (Jones et al., 2012; Spencer et al., 2005), parents with mental health issues themselves (Emerson, 2015; Emerson et al., 2006; Emerson, McCulloch et al., 2010), and exposure to adverse life events (Emerson, 2003; Hatton & Emerson, 2004).

As with the general population of children, all these adversities have been shown to be associated with poorer mental health in children with intellectual disabilities, largely in cross-sectional studies (Emerson, 2003, 2015; Emerson & Brigham, 2015; Emerson & Einfeld, 2010) but also in some longitudinal studies where earlier exposure to adversity is associated with later rates and persistence of mental health issues (Emerson, 2015; Emerson et al., 2011, 2015). Furthermore, it seems that the impact of cumulative adversities on mental health may be greater for children with intellectual disabilities than for children without intellectual disabilities (Emerson and Hatton, 2007; Emerson et al., 2011, 2014), although this has not been reported in all studies (Emerson and Einfeld, 2010). In other words, under conditions of no adversity rates of most mental health problems can be similar for children with and without intellectual disabilities, but as adversity increases rates of mental health problems rise more steeply for children with intellectual disabilities than for children without intellectual disabilities.

A small number of studies have included information on older children or adolescents (Dickson et al., 2005; Emerson and Hatton, 2007; Emerson & Halpin, 2013). For example, Emerson and Hatton (2007) reported that 11-16 year olds with intellectual disabilities were more likely than 5-10 year olds with intellectual disabilities to report an emotional disorder

(measured by self and parent report combined), equally likely to report a conduct disorder, and less likely to report hyperkinesis. Dickson et al. (2005) reported higher rates of anti-social behaviour amongst adolescents aged 11-15 years old with intellectual disabilities compared to adolescents without intellectual disabilities, with these differences in rates of antisocial behaviour accounted for by co-occurring differences in socio economic position and adversity, and large differences in rates of mental health and behaviour problems (37.8% adolescents with intellectual disabilities vs 9.2% adolescents without intellectual disabilities).

Extensive epidemiological research concerning adolescents in the general population in a number of countries (see Collishaw, 2014, for a recent review) has reported high and increasing rates of depression, anxiety, emotional disorders, self-harm and suicide, and in some countries conduct problems/antisocial behaviour amongst adolescents, with rates of distress peaking in late adolescence (Keyes et al., 2014). Socio-economic factors and adversities such as maternal depression and bullying/peer victimisation are consistently associated with adolescent mental health problems; while levels of peer bullying have been largely stable or decreasing, levels of maternal depression have been increasing (Schepman et al., 2011) and disparities in rates of adolescent emotional problems between high income and low income families have widened sharply (Gore Langton et al., 2011). Some studies in Scotland have suggested an 'equalisation hypothesis' that adolescence is an age at which socio-economic gradients in health inequalities attenuate or temporarily disappear (West, 1997; West and Sweeting, 2004; West et al., 1990), although research studies in other countries relating to adolescent mental health have not found results consistent with this hypothesis (e.g. Emerson et al., 2005).

The research to date on socio-economic position and the mental health of children with intellectual disabilities generally shares a number of characteristics, largely a function of

the availability of large-scale representative cohort data for secondary analysis. First, most studies have conducted secondary analysis of large-scale longitudinal family cohort surveys, where the intellectual disability of the child has been determined via a combination of brief cognitive testing and parental report. Second, most of these studies have focused on younger children up to the age of 11 years old, with relatively few studies focusing on adolescents. Third, most of these studies rely on parental report of the child's mental health rather than self-report. Finally, most of these studies use measures of mental health designed for children, rather than measures also used with adults.

The study reported here conducts a secondary analysis of a representative longitudinal cohort survey of adolescents and young adults in England. Adolescents with mild/moderate intellectual disabilities are identified via linkage to the national pupil database using the Special Educational Needs category of 'moderate learning difficulties', and the mental health measure used is the self-reported GHQ-12, commonly used in large-scale surveys of adults. The GHQ-12 is a screening tool for identifying the onset of psychological distress, and asks people to rate various aspects of their 'health in general' in the past month compared to 'usual'. Research questions were: 1) Are there differences in mental health between participants with and without intellectual disability? 2) What predicts mental health among participants with intellectual disability? Does this differ from predictors among participants without intellectual disability? 3) Are there differences in family circumstances and exposure to peer victimisation between participants with and without intellectual disabilities, and are between-group differences in mental health apparent after controlling for these environmental differences?

Method

This paper is based on a secondary analysis of data collected in Waves 1 to 4 of *Next Steps* (formerly known as the Longitudinal Study of Young People in England), as Wave 4 was the last wave utilising the GHQ-12 as a measure of mental health. *Next Steps* is an annual panel study that followed a cohort from early adolescence into adulthood in seven waves in total. It has collected information about their education and employment, economic circumstances, family life, physical and emotional health and wellbeing, social participation and attitudes. *Next Steps* data has also been linked to the Department for Education's National Pupil Database (NPD). *Next Steps* is currently managed by the Centre for Longitudinal Studies at University College London and is funded by the Economic and Social Research Council. Prior to 2013 it was managed and funded by the Department for Education. *Next Steps* data files and documentation were obtained from the UK Data Service. Full details of the method and design of *Next Steps* are available in a series of user guides (Department for Education, 2011a). Key aspects are summarised below.

Sampling

Fieldwork commenced in 2004 when the sampled children were aged 13-14 (school year 9). The initial (Wave 1) sample was drawn from a sampling frame based on children attending maintained schools, independent schools and pupil referral units in England who in February 2004 were in Year 9 (or equivalent) and were born between 1 September 1989 and 31 August 1990. Schools in deprived areas and students from minority ethnic groups were oversampled. At Wave 1, 73% of selected schools participated leading to an issued sample of approximately 21,000 young people. The attained sample at W1 was 15,770 children (75% response rate). This cohort was followed-up every year until 2010 (age 19-20).

Identification of Participants with Mild/Moderate Intellectual Disability

Data linkage with the 2004 and 2006 NPD was undertaken to identify participants with Special Educational Needs (SEN). Linkage was successful for 15,240 young people present at Wave 1 (97% of the *Next Steps* sample). Linkage included data on stage of assessment and primary/secondary category of Special Educational Needs (SEN).

Following the example of previous studies (Emerson & Halpin, 2013; Naylor et al, 2011), we used the SEN category of Moderate Learning Difficulty (MLD), if the child was at the School Action Plus stage of assessment of SEN or had a formal Statement of SEN, as an indicator of mild/moderate intellectual disability. In the NPD there are 12 mutually exclusive SEN categories, with the primary need SEN category reported in the statistics for all SEN children and, if required, an additional secondary need SEN category identified. In this study a child had to have a primary need of SEN identified in the NPD; children could have a co-occurring secondary SEN need but MLD was the primary reason for their SEN identification.

School Action Plus and Statements require the involvement of professionals external to the school in the categorisation of SEN. Current guidance defines MLD in relation to pupils having ‘attainments significantly below expected levels in most areas of the curriculum despite appropriate interventions [and having] ... much greater difficulty than their peers in acquiring basic literacy and numeracy skills and in understanding concepts’ (Department for Education, 2011b).

Of the children sampled, 527 (3.5% of the unweighted linked sample) were identified as having mild/moderate intellectual disabilities in either 2004 or 2006. Consistent with the data from existing epidemiological research, the prevalence of mild/moderate intellectual disability was significantly higher among boys than girls (4.3% vs 2.5%; Prevalence Ratio=1.75 (95% CI 1.46-2.09)) and among children who are eligible for free school meals,

an indicator of household poverty, (8.0% vs 1.9%; Prevalence Ratio =4.10 (95% CI 3.14-5.35)) (Emerson, 2012; Maulik et al, 2011; Roeleveld et al, 1997).

Procedure

Data in the first four waves was collected by face to face interviews using computer assisted personal interviewing with the young person themselves and their parents.

Measures

Mental Health

At Waves 2 and 4 participants were administered the GHQ-12 as a self-completion instrument. The GHQ-12 is a widely used and well-validated screening measure of risk of mental health problems, containing 12 items concerning self-rated symptoms over the past four weeks (six worded positively, six worded negatively) using four-point scales relating to the frequency or severity of the symptom in comparison to what is usual for the respondent (e.g. better than usual; same as usual; less than usual; much less than usual). There is extensive evidence demonstrating the validity of the GHQ-12 with adolescent populations (e.g. Baksheev et al., 2011; Bowe, 2017; French & Tait, 2004; Mann et al., 2011), although research concerning the use of the GHQ-12 with adolescents with intellectual disabilities is lacking. For this study the standard GHQ scoring method (0,0,1,1) was used with a relatively conservative threshold of 4+ being indicative of probable caseness (Goldberg & Williams, 1988; Goldberg et al, 1997).

Socio-Demographic Variables

Family socio-economic position

Linkage to the 2004 (Wave 1) and 2006 (Wave 3) NPD included linkage to data on eligibility for free school meals (FSM). Eligibility for FSMs is determined by data linkage to

government records of receipt of at least one of a defined list of means-tested welfare benefits by the child's parent(s). It should be noted that this indicator is of eligibility for, not uptake of, free school meals. We created a binary variable of FSM eligibility scored 1 if the child was eligible at Wave 1, Wave 3 or both Waves of *Next Steps* and scored 0 if the child was not eligible at both Waves. FSM eligibility is a commonly used proxy indicator of low household socio-economic position (Kounali et al, 2008).

We extracted data from *Next Steps* on the employment status of parental figures living in the household at Waves 1-4 inclusive. We created a binary variable of living in a workless household scored 1 if no resident parental figure was in employment or full time education at any of the four Waves and scored 0 if at least one resident parental figure was in employment or full time education in each of the four Waves.

Household composition

We extracted data from *Next Steps* on household composition at Waves 1-4 inclusive. We created a binary variable of single parent household scored 1 if only one parental figure was resident at any of the four Waves and scored 0 if two parental figures were resident in each of the four Waves.

Area deprivation

Linkage to the 2004 (Wave 1) and 2006 (Wave 3) NPD also included linkage to data derived from the postal code of the child's residence to the Income Deprivation Affecting Children Index (IDACI) (Noble et al, 2008). IDACI scores are the percentage of children in each Lower Level Super Output Area (LSOA) that live in families that are considered income deprived. Income deprivation is defined by receipt of means-tested welfare benefits. LSOAs are neighbourhoods with an average population of 1500 (range 1000-3000). IDACI scores were transformed into sample quintiles. We created a binary variable of High Neighbourhood

Deprivation scored 1 if the child was living in the lowest IDACI quintile at Wave 1, Wave 3 or both Waves of *Next Steps* and scored 0 if the child was not living in the lowest IDACI quintile at both Waves.

Peer victimisation

We extracted data from *Next Steps* on child self-reported experience of peer victimisation (bullying) at Waves 1-3. At each of these waves children were asked about exposure to five types of peer victimisation experienced in the last 12 months:

1. *Have you ever been upset by being called hurtful names by other students, including getting text messages or emails from them?*
2. *Have you ever been excluded from a group of friends or from joining in activities?*
3. *Have other students at your school ever made you give them money or personal possessions?*
4. *Have other students ever THREATENED to hit you, kick you or use any other form of violence against you?*
5. *Have other students ever ACTUALLY hit you, kicked you or used any other form of violence against you?*

If the young participant selected a 'yes' option they were then asked about the frequency of exposure (response options: every day, a few times a week, once or twice a week, once every two weeks, once a month, less often than this, it varies). Preliminary analysis of responses indicated a strong association between threat of and actual violence, but weak associations between other forms of peer victimisation. As a result we combined self-report of threat of or actual violence at each of the three Waves. For each of the four types of peer victimisation (name calling, social exclusion, theft, violence) we created one binary variable; whether this

had happened at all in any 12 month period in Waves 1-3 (contrasted with it having never happened in any of the three Waves).

Sample Retention

Retention rates from Wave 1 to Wave 4 were calculated for participants with/without intellectual disability. For participants without intellectual disability, there were 14,687 participants at Wave 1 (age 13/14 years) and 10,721 participants at Wave 4 (age 16/17 years), a retention rate of 73% from Wave 1 to Wave 4. For participants with intellectual disabilities there were 527 participants at Wave 1 (an unweighted prevalence of 3.5%) and 314 participants at Wave 4 (an unweighted prevalence of 2.8%), a retention rate of 60% from Wave 1 to Wave 4.

Approach to Analysis

In the first stage of analysis we made simple bivariate comparisons between participants with and without intellectual disability with regard to GHQ-12 scores. In the second stage of analysis we investigated, for GHQ-12 scores, the strength of association between socio-demographic factors and outcomes separately for participants with and without intellectual disability. Missing data among socio-demographic variables was imputed using multiple imputation routines in SPSS 22 to create five parallel imputed data sets. Poisson regression with robust standard errors was used to estimate prevalence ratios uniquely associated with each variable in the model (Knol et al, 2012; Zocchetti et al, 1997). The subsequent analysis used the following approach: (1) candidate variables for each group and outcome were identified if the bivariate association between the variable and outcome was either statistically significant or had a prevalence ratio greater than or equal to 2.0; (2) variables were entered in order of bivariate strength of association with the outcome

of interest (prevalence ratio); (3) variables were only retained in the model if *at the point of entry* they were significantly related to the outcome of interest or had a prevalence ratio of 1.50 or greater.

In the final stage of analysis we estimated the strength of association between intellectual disability and GHQ-12 scores while controlling for between group differences in exposure to socio-demographic variables that have been established as important social determinants of poorer health. We used Propensity Score Matching routines in SPSS 22 to match each participant with intellectual disability with a participant without intellectual disability with a similar propensity score for intellectual disability based on exposure to socio-demographic variables (Austin, 2011; Blackford, 2007; Oakes & Johnson, 2006). We used the lowest tolerance for matching (0.05) that allowed complete matching for all participants with intellectual disability.

Results

Are there differences in mental health between participants with and without intellectual disability?

As Table 1 shows, using weighted data from Wave 2, boys with intellectual disability were significantly more likely to score in the GHQ12 caseness range than boys without intellectual disability (17% vs 12%; PR = 1.38 (95% CI 1.07-1.78)). There were no significant differences for girls (22% vs 26%; PR = 0.85 (95% CI 0.64-1.14)) or overall (19% vs 19%; PR = 0.98 (95% CI 0.81-1.19)). Using weighted data from Wave 4, pupils with intellectual disability were significantly less likely to score in the GHQ12 caseness range than pupils without intellectual disability (17% vs 22%; PR = 0.76 (95% CI 0.61-0.95)). There were no

significant differences for boys (13% vs 15%; PR = 0.84 (95% CI 0.61-1.17)) or girls (24% vs 29%; PR = 0.83 (95% CI 0.61-1.21)).

[insert Table 1]

Due to the different rates of attrition for participants with and without intellectual disabilities by Wave 4, we investigated the association between intellectual disability, mental health and attrition within the sample from Wave 2 to Wave 4. Among boys with intellectual disability, attrition was 42% higher among those with possible mental health problems at Wave 2 (PR = 1.42 (95% CI 0.89-2.27)) compared with 7% lower among those with possible mental health problems at Wave 2 for boys without intellectual disability (PR = 0.93 (95% CI 0.77-1.11)). Among girls with and without intellectual disability, attrition was lower among those with possible mental health problems at Wave 2 (with intellectual disability PR = 0.88 (95% CI 0.39-1.99), without intellectual disability PR = 0.96 (95% CI 0.84-1.11)). Overall, attrition was 19% higher among those with possible mental health problems at Wave 2 who had intellectual disability (PR = 1.42 (95% CI 0.89-2.27)) compared with 6% lower among those without intellectual disability who had possible mental health problems at Wave 2 (PR = 0.94 (95% CI 0.85-1.05)).

To assess the impact of these variations in attrition we used multiple imputation routines in SPSS 22 to impute missing Wave 4 GHQ12 scores from Wave 2 GHQ12 scores. Analysis of the imputed data indicated no significant difference overall or when disaggregated by gender between the mental health status of adolescents with and without intellectual disability (overall PR = 0.90 (95% CI 0.73-1.09), boys PR = 1.05 (95% CI 0.79-1.39), girls PR = 0.91 (95% CI 0.68-1.20)).

What predicts mental health among participants with intellectual disability? Does this differ from predictors among participants without intellectual disability?

Table 2 shows factors most strongly associated with potential mental health problems amongst male and female adolescents with and without intellectual disabilities, at Wave 2 and (using imputed data for GHQ12 scores) at Wave 4.

[insert Table 2]

At Wave 2, similar factors concerning being bullied were associated with potential mental health problems for 13/14 year-old boys with and without intellectual disabilities, although bullying in the form of social exclusion was much more strongly associated with potential mental health problems for boys with intellectual disabilities. For girls at Wave 2, being bullied was also associated with potential mental health problems for girls with and without intellectual disabilities, although for girls with intellectual disabilities other socio economic factors (workless household and single parent household) were also associated with potential mental health problems.

At Wave 4, for 16/17 year-old adolescent boys with and without intellectual disabilities, being bullied was still associated with potential mental problems using imputed GHQ12 data. Reporting potential mental health problems earlier at Wave 2 was also associated with potential mental health problems for both groups of adolescent boys, with the socio economic variable of eligibility for free school meals a factor just for adolescent boys with intellectual disabilities. For adolescent girls at Wave 4, earlier reporting of potential mental health problems at Wave 2 was associated with potential mental health problems at Wave 4 for adolescent girls with and without intellectual disabilities. Being bullied was associated with potential mental health problems at Wave 4 only for adolescent girls without intellectual disabilities.

We also explored whether intellectual disability status moderated the association between socio economic position (SEP) and poor mental health (see Figure 1). At Wave 2 low SEP (defined in this study as being exposed to two or three of the indicators of low SEP at any wave (FSM eligibility, workless household, high neighbourhood deprivation)) was associated with poorer mental health for participants with intellectual disability (PR = 1.57 (95% CI 1.08-2.29), $p < 0.05$), but not for those without intellectual disability (PR = 0.99 (95% CI 0.90-1.09)). Similarly at Wave 4 low SEP was associated with poorer mental health for participants with intellectual disability (PR = 1.63 (95% CI 1.09-2.43), $p < 0.05$), but not for those without intellectual disability (PR = 1.03 (95% CI 0.95-1.11)).

[insert Figure 1]

Are there differences in family circumstances and exposure to peer victimisation between participants with and without intellectual disabilities, and are between-group differences in mental health apparent after controlling for these environmental differences?

Table 3 reports the prevalence of a range of indicators of socio economic position and peer victimisation/bullying for adolescents with and without intellectual disabilities. Participants with intellectual disability were significantly more likely than their peers to be brought up by lower SEP families, live in more socially deprived neighbourhoods, be bullied and to have fewer friends.

[insert Table 3]

Finally, we investigated whether controlling for these differences in socio economic position between adolescents with and without intellectual disabilities made any difference to the

relative rates of potential mental health problems reported by adolescents with and without intellectual disabilities, using propensity score matching. As the final column of Table 1 shows, controlling for differences in socio economic position resulted in no overall differences in levels of potential mental health problems between boys and girls with and without intellectual disabilities at Wave 2 and Wave 4.

Discussion

The analyses reported in this paper show some similarities and differences with previous research concerning the mental health of adolescents with intellectual disabilities aged 13/14 years old and 16/17 years old. In common with a wide range of previous research, adolescents with mild/moderate intellectual disabilities in this study were more likely than their peers without intellectual disabilities to experience a range of socio economic disadvantage and peer victimisation/bullying. However, **incidence** rates of **new** potential mental health problems were generally not significantly different between adolescents with and without intellectual disabilities; at Wave 2 boys with intellectual disabilities were more likely than boys without intellectual disabilities to report **emerging** potential mental health problems but at Wave 4 adolescents with intellectual disabilities were less likely than adolescents without intellectual disabilities to report **emerging** potential mental health problems. However, the difference at Wave 4 was not significant when GHQ-12 scores were imputed from Wave 2 GHQ-12 scores to counteract the impact of sample attrition.

There are some potential explanations for the lack of difference found in **incidence** rates of **new** potential mental health problems between adolescents with and without intellectual disabilities, none of which are mutually exclusive. The most likely explanation lies in the wording of the GHQ-12, where participants are asked to rate changes from the usual within the past month. As such, the GHQ-12 **should** be considered to be a measure of incidence of

newly developed mental health problems, rather than a measure of the prevalence of mental health problems among participants, as people with chronic mental health problems would not register a change from the usual in the past month. If a population of young people with mild/moderate intellectual disabilities are more likely to be experiencing chronic mental health problems beginning at an earlier age, then a higher prevalence of mental health problems in this group is compatible with equal incidence rates of mental health problems in adolescence. This explanation is compatible with previous studies reporting higher rates of mental health problems amongst adolescents with intellectual disabilities (e.g. Emerson & Hatton, 2007) where measures such as the Strengths and Difficulties Questionnaire were used which ask people about their feelings and behaviours in the last six months, with no reference to changes from the usual. It is also important to note that the GHQ12 is a self-report measure of potential mental health problems focused on emotional and affective mental health problems rather than typically reported proxy measures with a large behavioural component or measures such as antisocial behaviour, where bigger differences between children with and without intellectual disabilities are commonly reported and where differences persist throughout adolescence (e.g. Dickson et al, 2005; Emerson & Hatton, 2007). It is also worth noting that whilst the GHQ12 has been extensively validated with adolescents generally, research investigating the GHQ12's validity with adolescents with intellectual disabilities is lacking.

There are also some methodological limitations of this study that may have had an impact on the findings. For example, differential attrition of the sample over time was a major issue in this study. Not only were there higher rates of attrition overall for adolescents with intellectual disabilities compared to adolescents without intellectual disabilities, but amongst adolescents with intellectual disabilities attrition was more likely to occur among those with

emerging potential mental health problems at Wave 2, which was not the case for attrition amongst adolescents without intellectual disabilities. This would have the consequence of reducing **incidence** rates of reported potential mental health problems amongst adolescents with intellectual disabilities at Wave 4 compared to adolescents without intellectual disabilities.

In addition, the Next Steps sample is drawn from mainstream schools and pupil referral units but not from special schools, and it is **likely** that adolescents with an MLD label in special schools would be more likely to report potential mental health problems than similar adolescents in mainstream schools, particularly if potential mental health problems are a reason for exclusion from mainstream education. In terms of the measures used in these analyses, the robustness of free school meal eligibility as a socio economic indicator has also been questioned (Kounali et al, 2008).

Beyond potential methodological explanations, the findings of these analyses seem to suggest a number of factors potentially at work. First, among boys with intellectual disabilities, overall incidence rates of potential mental health problems are similar at Wave 2 and Wave 4, whereas among boys without intellectual disabilities incidence rates of potential mental health problems increase from Wave 2 to Wave 4. Girls with and without intellectual disabilities report higher incidence rates of potential mental health problems than boys at both waves, with incidence rates increasing for girls from Wave 2 to Wave 4. Overall, these findings are consistent with general research showing distress peaking at late adolescence (Keyes et al, 2014) and with adolescents with intellectual disabilities experiencing more persistent mental health problems from a younger age than adolescents without intellectual disabilities.

A potential reason for this may be the importance of peer relationships at this point in people's lives. Analyses in this study suggest that for adolescents without intellectual disabilities peer victimisation/bullying factors rather than socio economic factors were associated with adolescent distress, consistent with the equalisation hypothesis (West, 1997; West and Sweeting, 2004; West et al., 1990). Adolescents without intellectual disabilities were also more likely than their peers with intellectual disabilities to spend their spare time with friends. For adolescents with intellectual disabilities the picture was slightly more nuanced – peer victimisation/bullying factors were also strongly associated with potential mental health problems, but some socio economic factors were also relevant factors. Although adolescents with intellectual disabilities were more likely to experience a range of socio economic disadvantages and more likely to experience peer victimisation/bullying, they were also less likely to spend most of their time with friends. It is possible that these adolescents spend less time with friends and more time with family (see e.g. Buttimer & Tierney, 2005; Taheri et al., 2016), which may buffer some of the impact of peer victimisation/bullying and also increase the impact of socio economic factors on their mental health at this point.

Overall, these analyses suggest that greater attention needs to be paid to the mental health of adolescents with mild/moderate intellectual disabilities. Methodologically, the impact of differential attrition in longitudinal cohort samples needs to be systematically examined. The trajectory of psychological distress needs to be considered separately from the trajectory of behavioural issues and antisocial behaviour throughout adolescence, particularly at different ages throughout adolescence into young adulthood. For example, is the trajectory of a peak of distress in late adolescence in the general population mirrored in the population of people with mild/moderate intellectual disabilities, or are rates of distress elevated for people with

intellectual disabilities at a younger age and persistent for longer into adulthood? The relative impact of family and socio economic factors and peers on mental health also requires further careful examination, particularly when considering the consequences of interventions designed to reduce distress amongst adolescents. For example, adolescents with mild/moderate intellectual disabilities may be protecting their mental health by spending less time in a potentially hostile group of peers, but at a cost of isolation and loneliness carrying forward into adulthood.

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Table 1: Potential mental health problems among adolescents with and without intellectual disability

	Sex	Participants with intellectual disabilities		Other participants		Unadjusted Prevalence Ratio	Prevalence ratio for propensity score matched groups (tolerance 0.05)
		Total n	%	Total n	%		
Wave 2 (age 13/14) weighted	Boys	309	17%	6082	12%	1.38* (1.07-1.78)	1.16 (0.77-1.76)
	Girls	163	22%	5985	26%	0.85 (0.64-1.14)	0.86 (0.59-1.25)
	Total	472	19%	12067	19%	0.98 (0.81-1.19)	0.94 (0.72-1.24)
Wave 4 (age 16/17) weighted	Boys	256	13%	5302	15%	0.84 (0.61-1.17)	0.69 (0.44-1.10)
	Girls	139	24%	5234	29%	0.83 (0.61-1.21)	0.88 (0.61-1.26)
	Total	395	17%	10536	22%	0.76* (0.61-0.95)	0.76 (0.57-1.01)
Wave 4 (age 16/17) imputed	Boys	259	16%	6312	15%	1.05 (0.79-1.39)	0.86 (0.59-1.26)
	Girls	144	26%	6223	28%	0.91 (0.68-1.20)	0.84 (0.59-1.18)

	Total	403	20%	12535	22%	0.90 (0.73-1.09)	0.80 (0.62-1.04)
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Table 2: Predictors of potential mental health problems for participants with and without intellectual disability			
Outcome/ Group	Variable	People with ID	People without ID
Boys Wave 2	Bullied (threat/actual violence)	1.63 (0.87-3.08)	1.65**** (1.36-1.99)
	Bullied (names)	1.67 (0.98-2.85)	1.88**** (1.57-2.25)
	Bullied (socially excluded)	7.40**** (2.68-20.40)	1.62**** (1.38-1.90)
Girls Wave 2	Workless household	1.76 (0.91-3.41)	
	Single parent household	1.61 (0.91-2.85)	
	Bullied (threat/actual violence)		1.52**** (1.43-1.76)
	Bullied (names)	3.20* (1.08-9.51)	1.79**** (1.57-2.04)
	Bullied (socially excluded)	1.64 (0.93-2.89)	1.59**** (1.43-1.76)
	Bullied (robbed)		1.21* (1.04-1.41)
Boys Wave 4 (imputed)	W2 GHQ caseness	2.05** (1.20-3.48)	3.10**** (2.76-3.49)
	FSM eligibility	1.70 (0.97-2.98)	
	Bullied (threat/actual violence)		1.32**** (1.16-1.51)
	Bullied (names)		1.19* (1.04-1.36)
	Bullied (socially excluded)	2.81** (1.42-5.55)	1.20** (1.06-1.36)
Girls Wave 4 (imputed)	W2 GHQ caseness	3.32**** (1.99-5.53)	2.63**** (2.43-2.85)
	Bullied (threat/actual violence)		1.12* (0.02-1.22)
	Bullied (names)		1.20**** (1.09-1.32)
	Bullied (socially excluded)		1.14** (1.05-1.24)

Table 3: Exposure of participants with/without intellectual disability to established social determinants of poorer health

	% PWID	% Others	PR adjusted for sex
<i>Socio-Economic Position</i>			
FSM eligible W1 or w3	45%	17%	2.82*** (2.52-3.17)
Workless HH W1-4 (any wave)	48%	19%	2.77*** (2.50-3.08)
<i>Household Composition</i>			
Single parent household W1-4 (any wave)	46%	30%	1.58*** (1.42-1.75)
<i>Neighbourhood</i>			
Lowest Q of IDACI W1 or W3	30%	16%	2.02*** (1.73-2.36)
<i>Friendships</i>			
Spare time mainly spent with friends (W2)	56%	75%	0.70*** (0.64-0.77)
<i>Peer Victimization (W1-3 any wave)</i>			
Threatened with violence/attacked	51%	40%	1.26*** (1.15-1.38)
Robbed	16%	6%	3.00*** (2.41-3.74)
Called names etc	56%	41%	1.51*** (1.39-1.64)
Socially excluded	43%	30%	1.58*** (1.42-1.76)

Notes:

Data weighted using W1 cross-sectional rates unless specified

^aData weighted using W5-7 cross sectional weights

*** p<0.001

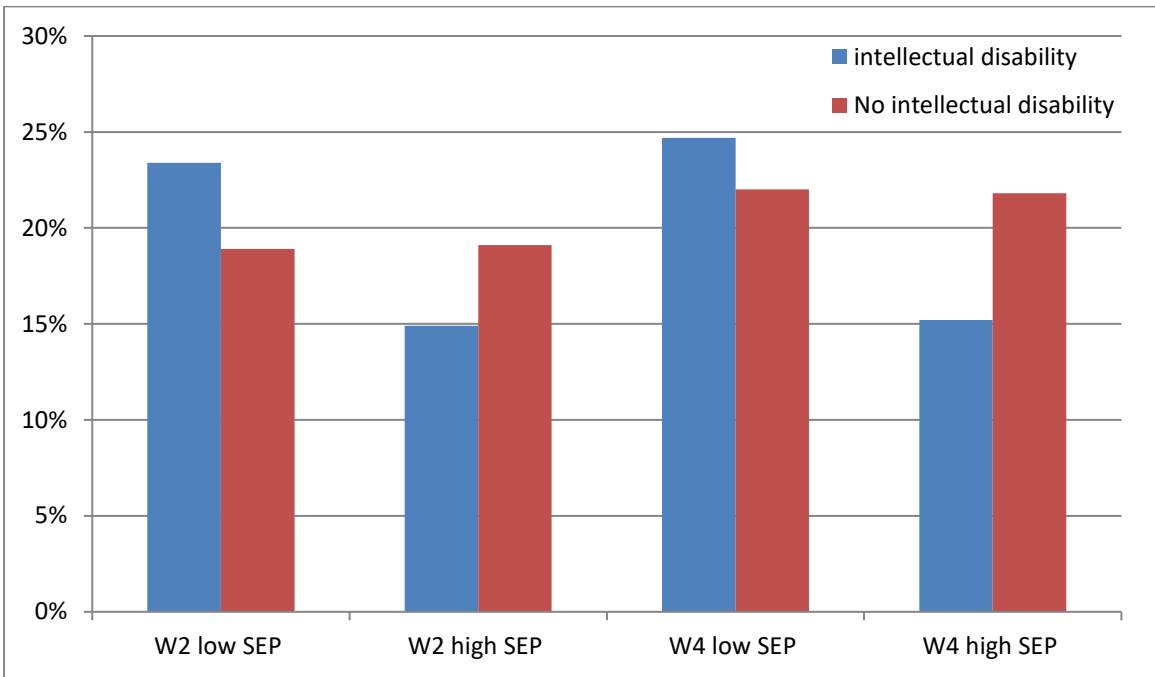


Figure 1: Prevalence of potential mental health problems among adolescents with and without intellectual disability in high and low SEP families