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School achievement and adolescent self-harm: methodological issues may have led to misleading conclusions in a highly powered national study

We welcome the work of Rahman and colleagues whose study on school achievement, depression and self-harm using routinely collected data contributes to the limited evidence base on educational risk factors for adolescent mental health problems.[1] Although they found little evidence for an association between early school achievement and later self-harm, because of a number of methodological issues we found their findings hard to interpret.

First, the exposure variable, school achievement, is dichotomised into two broad groups, meaning that within-group changes in achievement that do affect later mental health outcomes may be masked.

Second, the authors adjust for a range of poorly defined potential confounders. For example, the terms intellectual 'disability' and 'difficulties' are used interchangeably. Particularly with the latter, there is a risk of co-linearity with the exposure. How 'conduct disorder' is defined is also unclear as it appears to comprise a heterogeneous group of problems including eating disorders, autism and speech and language disorders, even reading disorder.

Third, the authors do not comment on whether high-risk subgroups, such as those with special educational needs, have been included in the analysis. These individuals may not be expected to follow the national curriculum and would therefore be omitted from the study. Similarly, linkage of health and education data is less likely to be possible for more mobile, socioeconomically deprived populations.[2] Exclusion of such groups would create a biased sample and the possibility of underestimating the association.

Finally, the absence of key demographic, social and mental health variables within the routinely collected education and health data-sets raises the question of whether the study's findings could be explained by residual confounding. Ethnicity, adverse childhood experiences, bullying and substance misuse could each act as confounders.[3] We would also recommend controlling for absence and exclusion from school given their association with poor outcomes.[4] Most pertinently, it is not clear whether depression has been considered a potential confounder of the association between achievement and self-harm.[3]

In addition to these methodological issues, two further points are worth raising. The results show that low achievement at age 7, but not age 11, is associated with adolescent self-harm. The authors state that 'among those who self-harm there was no evidence of a decline in attainment in primary school'. However, the authors provide no analysis in support of this interpretation, as they did not report the effect of within-individual changes in attainment between age 7 and 11.

The authors have hypothesised that there is a more acute relationship between achievement and self-harm in adolescence, but this rich longitudinal data has not been used to disentangle the nature and direction of this acute relationship. This huge linked data-set offers a wealth of opportunities to better understand the relationship between school achievement and self-harm and we look forward to seeing further analyses, the results of which have the potential to make an important contribution to health and education policy.

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Authors' reply

We agree with the author that in this initial paper we present broad findings exploring novel relationships at scale in a large longitudinal electronic cohort linking primary care and educational data. We agree that a finer-grain analysis of individual pupils' achievements and scores within key stages may give interesting results. We focused on dichotomised achievements at key stages as this is the indicator relevant to and generally acted on by schools.

We agree that we have used the terms intellectual disability and difficulty interchangeably and this may be considered problematic. We have defined intellectual disability within the paper and this is based on previously published work.[1] However, pupils with intellectual disability will be less likely to achieve their key stage results (exposure) and may be more likely to have depression or self-harm (the outcome). As such having intellectual disabilities is considered a confounder related to both the outcome and the exposure. If we had considered it as a variable with co-linearity (for example achievement can be predicted from having an intellectual disability so there is no need to include both in the model) and left it out of the model we run the risk of confounding bias in our analysis. We chose to take a conservative approach and treat it as a confounder and include it in the model.

In our paper, we included, as supplementary material, the Read codes used to identify conduct disorder. These were developed in conjunction with two clinicians. Lists developed in this way are used frequently in e-cohort studies of this type. However, ideally

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when using Read code lists we would hope to use externally validated lists. We have done this for depression and self-harm[2,3] but at the time of extracting data for this study we did not have access to a validated list for conduct disorder.

Children with special educational needs were identified using a variable in the educational data-set. They have been included in the analysis. Although we adjusted for intellectual disability we did not for special educational needs. We made this decision based on the broad nature of special educational needs status, which includes those with hearing impairment and dyslexia. The majority of children with special educational needs status follow the national curriculum.

We disagree with the letter authors in that one of the advantages of linked primary care data in Wales is the whole population coverage rather than a sampled one, such as that currently available in England. We are, therefore, able to anonymously link across general practices and individuals in Wales so we can identify house moves and continue to follow any pupil registered with a general practitioner or attending any hospital in Wales. This also applies to deprived populations. Therefore, we do not believe we have underestimated the association for the reason suggested.

In Wales the ethnic minority group is only approximately 2.1% of the population in 2001. We do not feel ethnicity will greatly affect the results in this analysis. Adverse childhood experiences, bullying, absence, exclusion from school and other events are important factors. However, we would argue that rather than confounders these are on the pathway to explaining the link between educational achievement and poor mental health and self-harm. As such it would be a mistake to adjust for them.

We strongly refute that there is 'no analysis in support of this interpretation' regarding no evidence among those who self-harm of decline in attainment in primary school. We demonstrated that the children who self-harm were doing as well as those who do not self-harm at age 11 (the end of primary school). They cannot be identified from primary school using key stage attainment results. We used the cut-off that schools use for 'achieved' key milestones or did 'not achieve' key milestones. These are the cut-offs that schools report and act upon. As such they are the most useful in feeding findings back to schools to enable them to translate these findings into practice. Self-harm and attainment were associated in secondary school in our study.

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The importance of routine enquiry about a possible history of sexual abuse or sexual violence

Thanks to Dr Ingrassia for her recent editorial on the Independent Inquiry into Child Sexual Abuse in the UK, particular her focus on the role of mental health services.[1] She cites the mental health trust's collaboration project commenced in 2006 but omitted to mention that since 2008 it has been a policy requirement that all those on the care programme approach are routinely assessed about their possible history of sexual abuse or sexual violence – so-called 'routine enquiry'. However, training figures for routine enquiry obtained from National Health Service (NHS) mental health trusts indicate that in 2015 (and again in 2017) routine enquiry is becoming less likely in clinical practice and we argued that the policy needed re-invigoration.[2]

Sexual assault referral centres (SARCs) provide a one-stop health shop for those that report a sexual assault. The NHS England specification for the SARC service[3] implies that a thorough mental health assessment should take place in a SARC not least because decisions should be made about the best mental health service to access if required: if risk is a concern the crisis team; if the client is known to mental health services maybe the community mental health team or child and adolescent mental health services; or possibly an Improving Access to Psychological Therapies service if trauma is not complex.

In our experience such pathways are seldom formally negotiated, in the main, mental health services rebuff many SARC referrals. This often leaves specialist voluntary sector counselling services overwhelmed as they take on not just individuals with 'acute' cases (those recently sexually assaulted) but those with historic abuse too. The new national strategy for sexual abuse and assault services proposes that integrated commissioning is required involving NHS England, Clinical Commissioning Groups, Police and Crime Commissioners, local authorities, the Ministry of Justice and the Home office with the creation locally of a new Sexual Assault and Abuse Services Partnership Board.[4]

The articulation of formal pathways for those experiencing trauma following a sexual assault is clearly an important task for these new commissioning boards. In a recent audit of a SARC service we found the following.[5] In a sample of 105 people who consented to undertake a full assessment: 76% of the sample had seen a health professional for their mental health in the preceding 12 months with half being treated by their general practitioner but an important subgroup of people (31%) were being seen by a mental health professional most often a psychiatrist; nearly one-fifth of the sample (19%) had been previously admitted to a psychiatric unit where, on average, they had been admitted three times in total. The remainder of the sample without any previous history of mental health treatment was now, following the sexual assault, at risk of developing a mental health problem.

To conclude, as Dr Ingrassia stated, 'the responsibility rests with the sensitive and well-informed clinician's ability to see past the presenting problem' – maybe a willingness to assess in this manner is a prerequisite to better pathways between SARCs and mental health services in the future.

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