The Impact on Educational Attainment of Mental Health Problems in Adolescence

Extended abstract

Background

Mental health problems in childhood and adolescent are common. Clinical diagnosis and treatment of adolescent psychiatric disorders has increased over recent decades [1]. Worldwide, around 10-20% of adolescents suffer from mental health disorders [2]. Mental health in childhood and adolescence is a matter of contention. It has great consequences for the well-being of children and adolescents. Moreover, mental health problems in adolescent have been linked to poor educational outcomes [3] and increased risk of Neet status (not in education, employment or training) [4, 5]. In the literature, mental health problems are commonly divided into i) internalizing problems (i.e. depressive and anxiety problems) and ii) externalizing problems (i.e. conduct problems, hyperactivity and behavior problems). For externalizing problems, consistent negative associations with educational outcomes are found in several studies in USA [6-8], Canada [8], New Zealand [9], Netherlands [10], Sweden [11] and Norway [12]. However, for internalizing problems, results are rather mixed [13]. While some studies find association with high school dropout, failure to enter college and neet status [5, 14-18], other studies report no association between internalizing problems and disadvantaged educational attainment [19, 20].

Most of the previous studies mention above have used symptoms of self-reported mental health problems rather that clinical diagnosis. One of the main strengths of this study will be the use of longitudinal register data containing information on clinical diagnosis linked to information on educational attainment. Another strength in this study is that we have information on educational achievement in elementary school (i.e. anonymously grade on national exams and teacher-assigned grades). A related advantage of the present study is that we have longitudinal register data has a very large sample size (n=303 969), so analyses can be undertaken for relatively small groups such as different diagnosis. Moreover, the large sample group allow for gender-stratified analysis. Previous research point to that there is a lack of large scale longitudinal studies examining the impact of mental health on educational attainment [5]. The unique data in the present study allows for analyses that contribute to knowledge about how different mental health problems among boys and girls affect educational attainment.

Data, sample and variables

Our sample consists of the full cohorts of all youth aged 15 to 18 years of age in the period 2008-2012. For these teenagers we have access to several individual registers such as the historical event database FD-trygd (individual data on welfare benefits, labour market participation, income and demographics) and The National education database (NUDB) for the period 2008-2016. This data is administered and merged by Statistics Norway. Importantly this data is merged to the Norwegian patient register (NPR) to obtain mental health information on these youth. Diagnostic data on mental health disorders from NPR were obtained for the period 01.01.2008–31.12.2016. The NPR is an administrative database of records reported by all government-owned hospitals and outpatient clinics, and by all private health clinics that receive governmental reimbursement. The reporting of encrypted national ID numbers from the Norwegian Patient Register began 2008, allowing us to link NPR to other national registers. The NPR Diagnostic codes in the NPR follow the World Health Organization's International Classification of Diseases, version 10 (ICD-10).

The Regional Committee for Medical Research Ethics in Norway approved the current study (2016/1434).

Dependent variables

We construct three dummy variables to capture the association between mental health and school performance. The first dependent variable indicates whether he/she had a normal progression in upper secondary school measured at age 19 (yes=1, no=0). The second variable indicates whether he/she has completed upper secondary education at age 21 (yes=1, no=0). The third variable is whether he/she has started in higher education, which is coded 1 if he/she is registered in higher education and 0 otherwise.

Mental disorders

An individual is said to have a mental health disorder if he or she was registered in the Norwegian Patient Register (NPR) with one or several consultations at the Children's and Young People's Psychiatric Out-Patient Clinic (BUP) from the year he/she turns 15 to the year he/she turns 18. We distinguish between two different types of mental disorders: internalizing and externalizing disorders. *Internalizing disorders* include depressive disorders, mood disorders (excluding bipolar) anxiety disorders, obsessive-compulsive and related disorders, trauma and stressor-related disorders, as well as eating disorders (ICD 10: F32-F34, F38-F43,

F48, F50, F93-F94). *Externalizing disorders* include hyperkinetic disorders (ADHD) and conduct disorders (ICD 10: F90-F91). We classify the remaining ICD 10-codes as "Other", which mainly include disorders related to mental retardation and developmental disorders (ICD10: F70-F89).

Covariates

Immigrant background is measured by three dummy variables (Native, Western countries and non-Western countries). The *study programme* distinguishes between vocational and academic track. *GPA-scores* is measured in the 10th grade as an average of credits/marks reflecting performance in class, tests and national exams in all 11 main school subjects undertaken in middle school. *Socioeconomic background* (SES) is measured by parental education and income. *Timing of parental divorce* is measured by two dummy variables (younger than 13 years and older than 13 years). The analyses also control for birth cohorts. We also include contextual school variables such as the number of students in the school, both in middle school and upper secondary school. Not least, we include a set of covariates intended to capture peer effects. Peers mental health is captured by the *share of pupils with mental health problems at middle and upper secondary school* is measured by three dummy variables (share of pupils with externalized problems, share of pupils with internalized problems, share of other mental health problems). Peers family background is capture by average income of parents in the same cohort and school, and this two we do for both middle school and upper secondary school.

Estimation strategy

We measure mental health and cognitive skills several years prior to when we measure our outcome variables. Importantly our rich longitudinal data permits us to control for a broad array of time varying and time-invariant covariates to deal with confounding factors.

Our basic fixed effect model can be written as:

$$(1)\ Y_{isc} = \beta_0 + \beta_1 H_{isc} + \beta_2 X_{isc} + \beta_2 S_{sc} + \sum_{c=1993}^{1997} \tau_c + \vartheta_s + \mu_{isc}$$

Y upper secondary school completion for individual *i* in school s and cohort c (year of birth). *H* is categorical variable capturing individual mental health diagnosis from the NPR register and is our key explanatory variable. *X* is a vector of individual and parental characteristics, including lower secondary GPA. S is a vector of time-varying lower secondary school characteristics; τ

and *v* are cohort and school fixed effects, and μ is an observation specific error term. Standard errors are adjusted for by clustering at the school level to taken into account eventual within-school correlations. We carry out separate analyses for boys and girl. The reason being that they differ in important behavioural and performance measures. We control for school characteristics that are stable over time by including school dummies.

Preliminary results

The findings show that youth with mental health problems spend more than the expected time to complete an upper secondary education, they are less likely to not have completed upper secondary school by age 21, and they are less likely to start in higher education. These results applies to both boys and girls. Finally, the findings revel that externalizing behavior problems seems to have a more adverse effect than internalizing behaviour problems on educational attainment.

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