Mental health problems in youth and later receipt of social assistance: do parental resources matter?

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ABSTRACT
In this article, we study the association between mental health problems in adolescence and early adulthood and later receipt of social assistance in the capital region of Finland. Using register data and following a cohort of adolescents to their early adulthood, we also examine whether the strength of this association varies according to household income during adolescence. We find that mental health problems from the ages of 16–17 and thereafter were associated with the receipt of social assistance at age 24, and more strongly among those with lower household income during their adolescence. Importantly, the same disorder groups emerged as the most important ones in predicting the use of social assistance across income quintiles. In this sense, we find similarity regardless of parental resources. This evidence is important for better understanding the mechanisms between circumstances during adolescence and later socioeconomic outcomes, including benefit use, yet the underlying factors should be studied further.

INTRODUCTION
Mental health problems can negatively affect the transition from youth to adulthood and independent livelihood, while family background and childhood living conditions also affect equality of opportunities among adolescents. The complex interrelationships between health and socioeconomic status in childhood and adult outcomes make it a compelling area of scientific investigation. In this article, our principal research question is how mental health problems in adolescence and early adulthood are associated with later receipt of social assistance in the capital region of Finland. In particular, we analyse whether the strength of this association varies according to parental resources. We build on and contribute to research on health and social inequalities among youth, social assistance use, and intergenerational transmission of disadvantage.

Mental health problems are known to have negative consequences for individuals and their families as well as the economy as a whole due to poorer educational attainment and labour market attachment, and higher costs in the social and health care sector.
(Frank and McGuire 2000; Fletcher 2013; Knapp et al. 2015). Mental health problems account for one of the largest and rapidly growing categories of disease burden worldwide (OECD/EU 2018) and the prevalence and incidence of psychiatric diagnoses and treatment have increased also among adolescents (Collishaw 2015; Saastamoinen et al. 2017; Gyllenberg et al. 2018). This trend does not only concern the health care sector but challenges the welfare state more broadly.

There is a wide literature showing that health problems in childhood or adolescence are strongly associated with various socioeconomic outcomes later in life (e.g. Haas 2006; Smith 2009; Warren et al. 2012; Hakulinen et al. 2019). Furthermore, there exists a socioeconomic gradient in health also among children, which could negatively affect social mobility among those from lower socioeconomic groups (Case, Lubotsky, and Paxson 2002). The strength of the relationship between early circumstances and later socioeconomic outcomes is a central policy question in the Nordic welfare states aiming to reduce social inequalities.

Parental resources, including education, income, and health, affect children’s later outcomes, and the intergenerational transmission of disadvantage is well illustrated in the literature (Wiborg and Hansen 2009; Aizer and Jannet 2014; Vauhkonen et al. 2017; Lesner 2018; Pitkänen et al. 2019). However, these two strands of literature on the impact of childhood health on socioeconomic attainment and intergenerational social mobility have rarely been combined, and little evidence exists on the moderating effect of parental resources on the association between mental health problems and later socioeconomic outcomes. From the perspective of health and social inequalities, it is important to study to what extent higher family resources buffer against the negative impact of health problems as could be suggested by the mechanism of compensatory advantage (e.g. Bernardi and Triventi 2020) and to what extent lower family resources create a so-called double jeopardy for children also affected by health problems (Jackson 2009). Our main contribution lies in investigating this issue in the Finnish context.

The transitions from compulsory schooling to further education, from parental home to one’s own home, and from studies to working life are all parts of a sensitive period, during which both mental health problems and low resources may influence on an individual’s future given the significant social and developmental changes that occur during this life stage. This article contributes to earlier literature by studying to what extent mental health problems in adolescence and early adulthood increase the need for social assistance in young adulthood. We analyse whether the strength of this association varies according to adolescent household income level as we expect parental resources to moderate the association between mental health problems and early adult outcomes.

With rich register data spanning from 2005 to 2016, we are able to follow a cohort of adolescents until they are 24 years old and study whether they have received social assistance and for how long. As our interest is in the livelihood of young adults we think that the receipt of social assistance at the age of 24 is a better indicator of socioeconomic vulnerability and instability than income, as social assistance is highly means-tested. The use of social assistance can also better reflect the resources and financial aid available through e.g. family networks. Therefore, focusing on the receipt of social assistance is meaningful from the point of view of young people’s socioeconomic attainment and risk of social exclusion.
This evidence is important for better understanding the mechanisms between early circumstances and later socioeconomic outcomes, the origins of social inequalities as well as the design and targeting of effective social policies. Developing cost-effective policies and early interventions to promote mental health is high on the political agenda, and providing information also on the related costs, such as transfer payments like social assistance, is valuable information for decision-makers (Brower, Rutten, and Koopmanschap 2001). The increase in mental health problems has received a lot of attention among policymakers, and investing in mental health has also been highlighted in the Finnish government programme (2019) together with reducing social exclusion and long-term social assistance receipt among young adults. As this article shows, these are somewhat interrelated objectives.

Theoretical framework and hypotheses

There is a burgeoning literature on the relationship between health and various socioeconomic outcomes, such as education, income, employment and disability pension. According to the proposed theories ill-health either leads to poorer socioeconomic outcomes – the so-called social selection thesis – or poor health status is a consequence of low income and unemployment – the so-called social causation thesis (Blane, Smith, and Bartley 1993; Kröger, Pakpahan, and Hoffmann 2015).

Supporting the social selection thesis, Böckerman and Ilmakunnas (2009) found that persons with poor self-assessed health were more likely to become unemployed, while Stewart (2001) showed that unemployed individuals with health problems were more likely to have longer unemployment spells. Studies on various health shocks, such as cancer or unanticipated hospitalizations, have shown that serious illness leads to decrease in earnings and employment (e.g. Moran, Short, and Hollenbeak 2011; García-Gómez et al. 2013; Lundborg, Nilsson, and Vikström 2015; Jeon 2017; Vaalavuo 2021).

There is equally evidence supporting the idea of social causation. Using information on exogenous job loss, Schröder (2013) showed that unemployment had long-term effects on both mental and physical health, and Vaalavuo (2016) found that poor and unemployed individuals were more likely to experience deterioration in self-assessed health status. A systematic review of the evidence shows that unemployment is associated with an increased risk of mortality (Roelfs et al. 2011) and also with worse mental health outcomes (Paul and Moser 2009). In a Canadian study unemployed youths had higher odds to report depression, greater distress and lower life-satisfaction than employed non-students or those out of work and out of school (Minh et al. 2020).

As with physical health, there exist socioeconomic disparities also in the prevalence of mental health problems. In her review, Reiss (2013) concluded that among socioeconomically disadvantaged children and adolescents it was two to three times more common to develop mental health problems. These problems can have long-lasting effects as mental health problems in childhood and adolescence can cause drop-outs from school and delays in studies (Leach and Butterworth 2012; Narusyte et al. 2017). In general, mental health problems are associated with lower educational outcomes, poorer living conditions, weaker labour market attachment and lower earnings (Murrali and Oyebode 2004; Pacheco, Page, and Webber 2014; Hakulinen et al. 2019).
Using sibling and twin data on Swedish men, Lundborg, Nilsson, and Rooth (2014) showed that most health conditions in adolescence had long-term effects on adult earnings with and without sibling effects, and all the included mental health problems (neurosis, personality disorder, alcoholism and substance abuse) had a strong effect. In Finland, Hakulinen et al. (2019) found that serious mental disorders between ages 15 and 25 were associated with an increased risk of not having secondary or higher education and not being employed between ages 25 and 52.

Serious mental health problems are also a leading cause for receiving disability pension in Finland; and for young adults without work history, disability pension usually means an increased risk of poverty (Kauppinen et al. 2014; Harkko, Virtanen, and Kouvonen 2018). Consequently, mental health problems can be a contributory factor leading to financial insecurity and social assistance receipt especially among young people who have not yet established themselves in the labour market.

As for intergenerational transmission of (dis)advantage, evidence shows that family background affects socioeconomic outcomes of children also in the Nordic welfare states (Wiborg and Hansen 2009). For example, Ilmakunnas (2018) showed that parental unemployment, low level of education, social assistance receipt, and living in a single-adult household in youth are associated with receiving social assistance later in life, and education can work as a protective mechanism for young adults. Furthermore, Vauhkonen et al. (2017) illustrated that almost half of the children who grew up in families with multiple disadvantage received social assistance in early adulthood compared to 10 per cent among those without parental disadvantage. Using sibling correlations and controlling for family income, their results point to socio-cultural transmission of disadvantage.

However, studies on intergenerational transmission of disadvantage have usually not accounted for health. Only a few studies have examined whether health in childhood plays a role as a mediator (Haas 2006) or moderator (Jackson 2009, 2015). The mechanisms through which social disadvantage is transmitted or how multiple disadvantages interact with each other are not yet fully understood. As Vauhkonen et al. (2017) admit in their conclusions, indicators such as mental and physical health should be incorporated in studies trying to understand the accumulation and inheritance of disadvantage. For example, Case, Lubotsky, and Paxson (2002) have argued that the impact of household income on children’s health could explain part of the intergenerational transmission of socioeconomic status.

As an exception, Anderson (2018) investigated the role of mental health in intergenerational mobility with British survey data. He found that mental and behavioural health symptoms in adolescence were associated with poorer social mobility outcomes. However, around half of the impact of conduct problems was accounted for by childhood risk factors such as deprivation and adversities. The attenuation was greatest in the lowest origin class suggesting social causation. At the same time, the association between mobility and emotional symptoms or hyperactivity did not appear to be attenuated by earlier socioeconomic conditions. Family’s socioeconomic background is not only associated with the occurrence of mental health problems, but family resources can also moderate the negative impact of ill-health on other outcomes. Wealthier and more educated parents have higher economic and social resources to facilitate children’s socioeconomic attainment even when faced with health challenges. Higher resources
might compensate for individual’s mental health problems through better access to services and parental investment as suggested by the idea of ‘compensatory advantage’ (e.g. Bernardi and Triventi 2020). On the contrary, mental health problems may create bigger obstacles for children from low socioeconomic background, as ‘double jeopardy’ hypothesis and mechanism of ‘cumulative (dis)advantage’ assert (DiPrete and Eirich 2006; Jackson 2009).

Based on earlier literature we test the following hypotheses. First, the probability of social assistance at age 24 is higher among those with prior mental health problems regardless of the adolescent household income level (H1). Second, the association varies according to household income level so that the association is stronger among adolescents of lower household income (H2).

**Institutional context in Finland**

Finland belongs to the cluster of Nordic welfare states that aim to promote equality and well-being through relatively generous social transfers and comprehensive and universal public service system. The level of income inequality and child poverty in Finland are low in international comparisons (Chzhen 2014; OECD 2015), but health inequalities remain wide (Lahelma et al. 2019).

In Finland, public authorities must guarantee adequate health and social services for everyone at a universal basis. Namely, it is the municipalities that have the responsibility to organize these services to their inhabitants. Out-of-pocket payments make up around a fifth of total health expenditure (OECD 2018), but persons under 18 years old are mainly exempted from health care fees, although other expenses (e.g. travel costs and time) may occur both for the child and the accompanying persons. Individuals, including children, pay part of the prescribed medicine after the reimbursement by the Social Insurance Institution. Social assistance recipients usually receive prescribed medicine free of charge.

Social assistance in Finland is a discretionary last-resort form of financial assistance paid to a household, meaning that any other benefits to which one might be entitled must be claimed first, including student loans and disability allowances. Social assistance recipients often receive other social security benefits (especially housing allowance), and social assistance is partly used to supplement their inadequate level and to compensate for high housing expenses. The level of social assistance is determined by the household’s income (including other benefits), assets and expenses, i.e. it is means- and needs-tested and intended to ensure individuals at least the minimum living needed for a life of human dignity (Act on Social Assistance 1997/1412). As of 2017, social assistance has been paid centrally by the Social Insurance Institute, but during the period under study here, it was paid and administered by municipalities.

Social assistance has traditionally been a short-term financial aid, but since the 1990s, the spells have become longer. The number of recipients, the length of the spells, and the expenditure reflect the fluctuations in the economy and (long-term) unemployment, but also the costs of living and the level of other social security benefits. In 2016, ca. 260 900 households (of which 73.5% were single person households) and 398,400 persons received social assistance, with a total expenditure of EUR 734.5 million (Tanhua and Kiuru 2017).
Data and methods

Data and study population

The empirical analysis is based on individual-level register data for the years 2005–2016 of the total population living in the capital region in Finland (cities of Helsinki, Espoo, and Vantaa). The data consists of information on the use of public specialized health care services with diagnosis codes based on international statistical classification of diseases and related health problems (ICD-10), reimbursed prescribed pharmaceuticals with codes for anatomical therapeutic chemicals (ACT), and social assistance receipt from the registers of Finnish Institute for Health and Welfare and Social Insurance Institution.

In addition, data includes information on various socioeconomic characteristics of the individuals as well as their families from the Statistics Finland. All data were anonymized and data from different sources were linked in Statistics Finland’s remote access service using personal identification codes (data license number TK53-1222-17).

We follow a cohort of persons born in 1990–1992 from the age of 16 until they turn 24 years. The study population is restricted to those who lived in one of the three cities at the start of the follow-up and were alive and living in Finland at the end of the study period ($n = 33,709$). Persons with unclear identification in the data were excluded from the study ($n = 95$).

Variables

Our dependent variable is the receipt of social assistance at the age of 24. This binary variable indicates whether the person lived in a household that received social assistance even for one month in the calendar year.

We build our principal independent variable to indicate mental health related problems overall and do not separate different disorders as it is common to have more than one disorder (Hermanson et al. 2015). We identify persons with mental health related problems using both the diagnoses from special health care (ICD-10 code groups F10-F99 for mental and behavioural disorders) and the reimbursements of psychopharmaceuticals (ATC codes N05A, N05B, N05C, N06A, N06BA, N06C). However, in an additional analysis, we also investigate the association of social assistance receipt and mental health problems by using individual disorder groups.

We categorize the study population into four groups: (1) no mental health related records during the study period (73.6% of the study population), (2) mental health problem (MHP) only at age 16–17 (2.4%), (3) MHP only at age 18–23 (17.2%), and (4) MHP both at age 16–17 and 18–23 (6.8%). In other words, we also make an attempt to analyse the association depending on the age. Table 1 presents the number of observations in each group and some basic characteristics in these categories.

To test our hypothesis on the moderating effect of parental resources, we use information on household income status from the time the individual was 16 years old. Household income refers to equivalised disposable household income (income after social transfers and taxes). As a limitation, transfers between households (e.g. child support from one parent to another) are not included in this measure. We use the OECD modified equivalence scale to standardize household income in order to accommodate for the fact that the needs of a household grow with each additional member but, due
to economies of scale in consumption, not in a proportional way. This scale takes into account the size of the household and the age of its members, assigning a value of 1 for the first adult of the family, 0.5 to all other adults in the family, and 0.3 to all children (below the age 14) in the family. In the analyses, we use information on income quintiles that are based on the total population of Helsinki, Espoo, and Vantaa in each year.1

We control for the number of adults (0 one, 1 more than one) and children (0 one, 1 more than one) in the household at age 16, and for the following individual characteristics measured at the age of 24: level of education (0 less than a secondary education, 1 secondary or higher education), labour market status (0 unemployed, 1 employed, 2 student, 3 other (pensioner, serviceman, other outside the workforce); based on the status at the end of the year), parental background (0 native-born Finn, 1 foreign-born), and whether or not the person lives alone. We also control for whether the person still lived in Helsinki, Vantaa or Espoo (with higher housing expenses than elsewhere in Finland) at the age of 24.

Methods and research strategy

After descriptive analysis of the data, we use logistic regression models to study the association between the receipt of social assistance at the age of 24 and the above-mentioned mental health categories. We complement the main results with logistic regression models separately for each subcategory of psychiatric diagnoses as an independent variable, instead of the variable with overall mental health categories to see whether there are differences between income quintiles in the association of a more specific disorder group and social assistance receipt. We run all the analyses separately for men and women as they have slightly different patterns of both MHP and social assistance use.

Table 1. Basic characteristics of the study population by mental health categories.

|                          | No MHP | MHP at age 16–17 | MHP at age 18–23 | MHP both at age 16–17 and 18–23 | Total study population |
|--------------------------|--------|------------------|------------------|-------------------------------|-----------------------|
| Number of observations   | 24,798 | 802              | 5813             | 2296                          | 33,709                |
| Proportion of the study population (%) | 73.6 | 2.4              | 17.2             | 6.8                            | 100                   |
| Men (%)                  | 53.6   | 47.6             | 43.4             | 34.9                           | 50.4                  |
| Native-born Finn (%)     | 89.7   | 91.3             | 93.6             | 94.8                           | 90.8                  |
| At least upper secondary education (%) | 84.7 | 64               | 74.1             | 57.1                           | 80.5                  |
| Living alone (%)         | 44.8   | 40.8             | 50.5             | 49.4                           | 46                    |
| Unemployed (%)           | 4.8    | 13               | 9.6              | 13.5                           | 6.4                   |
| Employed (%)             | 67.2   | 55.2             | 55.7             | 41                             | 63.2                  |
| Studying (%)             | 19.1   | 18.7             | 21.8             | 22.8                           | 19.8                  |
| Received SA at age 24 (%)| 9.4    | 25.9             | 28               | 39.3                           | 15                    |
| Mean household income (€) at age 16a | 25,277 | 20,822           | 22,787           | 20,058                         | 24,385                |
| In the lowest income quintile at age 16a (%) | 17.9 | 26.6             | 21.2             | 27.4                           | 19.4                  |
| No information on household income available at age 16a (%) | 2.3 | 4                | 1.7              | 3.3                            | 2.3                   |
| More than 1 adult (>18 yrs) in the household at age 16 (%) | 76 | 62.7            | 68.5             | 59                             | 73.2                  |
| More than 1 child in the household at age 16 (%) | 56.5 | 50.5             | 54.1             | 49                             | 55.4                  |

Note: MHP = mental health indicator, SA = social assistance receipt.
aIncome quintiles based on equivalised disposable household income at age 16.

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To test our hypothesis on the effect of household resources on the association between MHP and use of social assistance, we include an interaction between income quintile at age 16 and mental health category. Average marginal effects (i.e. effects calculated for each observation and then averaged) are presented to illustrate the effects and can be interpreted as percentage point changes in probabilities when the value of an independent variable increases by one unit. We use average marginal effects to interpret the results on interactions because approaching nonlinear interaction effects the way one would approach a linear interaction effect results in incorrect conclusions (Norton, Wang, and Ai 2004; Williams, 2012; Mize 2019). Marginal effects summarize the effect in terms of a model’s predictions and avoid the scaling issues of the coefficients in logit-based models (Mize 2019). Average marginal effects are also comparable across groups and models (Mood 2010). All analyses are performed using Stata 15.1 statistical package (Stata Corp, College Station, TX; Deb, Norton, and Manning 2017).

Results

Descriptive results

All together 26.4 per cent of our study population had a record related to a mental health problem (MHP) at some point of the study period: 9.2 per cent before and 24.0 per cent after the age of 18 (Table 1). Diagnoses were most common in the groups of mood [affective] disorders (F30-39), neurotic, stress-related and somatoform disorders (F40-48), and behavioural and emotional disorders with onset usually occurring in childhood and adolescence (F90-98) (Table A1 in the Appendix).

All together 29.8 per cent had received social assistance at some point between the ages of 18–24 and 15 per cent received it at the age of 24 (Table 1). Receiving social assistance at age 24 was almost as common among those living alone or with other living arrangements (18.1% and 12.5%, respectively). Clear differences can be observed in the receipt of social assistance according to our mental health indicator. It was much more common among those with MHP to receive social assistance and most common among those who had MHP both before and after the age 18: nearly 40 per cent of them received social assistance at age 24 and more than 60 per cent at some point between the ages 18–24.

On average, household income at age 16 was lower and achievement of at least upper secondary education degree or being employed at the end of the follow-up less common among those with MHP. In many ways, the descriptive details were least favourable among those with MHP both at age 16–17 and 18–23.

Figure 1 illustrates the income-based differences in the prevalence of MHP in the data. The proportion of persons with a MHP decreased with income: nearly a third of those in the lowest household income quintile at age 16 had a MHP at some point between ages 16 and 23 compared to a fifth in the highest quintile. The relative difference between the lower and the top quintiles was higher with MHP already at age 16–17.

Figure 2 illustrates that the use of social assistance was clearly more common among those from lower income families. Secondly, regardless of the household income it was more common for those with a MHP to receive social assistance as suggested by our hypothesis H1. However, the difference between the lowest and higher income quintiles was evident, and especially for those with MHP only at age 16–17.
### Multivariate analyses

The descriptive results were supported by the binary logistic regression models indicating that both MHP and lower household income at age 16 increased significantly the expected odds of receiving social assistance at age 24 (Tables 2 and 3). When comparing average marginal effects in models 1 and 2, we see that a considerable amount of the association is attenuated after taking education and employment status into account, as could be expected. However, even when controlling for these variables in model 2,

![Graph showing proportion of individuals with MHP at age 24 by household income.](image)

**Figure 1.** Proportion of individuals with MHP at age 24 by household income.
Note: MHP = mental health indicator; Income quintiles based on equivalised disposable household income at age 16.

![Graph showing proportion of study population that had received social assistance at age 24 by mental health category and household income.](image)

**Figure 2.** Proportion of study population that had received social assistance at age 24 by mental health category and household income.
Note: MHP = mental health indicator; Income quintiles based on equivalised disposable household income at age 16.
Table 2. Receiving social assistance at age 24: results of binary logistic regression analysis (odds ratios and marginal effects) for mental health problems and household income at age 16, males.

| Mental health category at age 24 (ref. no MHP) | Model 1 | Model 2 |
|------------------------------------------------|---------|---------|
| | OR [95% CI] | Margin [95% CI] | OR [95% CI] | Margin [95% CI] |
| MHP only at age 16–17 | 3.67 *** [2.89–4.66] | 0.17 *** [0.13–0.21] | 2.20 *** [1.67–2.91] | 0.08 *** [0.05–0.11] |
| MHP only at age 18–23 | 4.23 *** [3.80–4.71] | 0.20 *** [0.18–0.21] | 3.02 *** [2.67–3.41] | 0.12 *** [0.10–0.13] |
| MHP both at ages 16–17 and 18–23 | 6.69 *** [5.68–7.87] | 0.28 *** [0.25–0.32] | 3.14 *** [2.61–3.77] | 0.12 *** [0.10–0.14] |

| Household income at age 16 (ref. lowest quintile) | Model 1 | Model 2 |
|------------------------------------------------|---------|---------|
| | OR [95% CI] | Margin [95% CI] | OR [95% CI] | Margin [95% CI] |
| Quintile 2 | 0.59 *** [0.53–0.67] | −0.08 *** [−0.10 to −0.06] | 0.65 *** [0.56–0.74] | −0.05 *** [−0.07 to −0.03] |
| Quintile 3 | 0.37 *** [0.32–0.43] | −0.14 *** [−0.16 to −0.12] | 0.49 *** [0.42–0.58] | −0.08 *** [−0.10 to −0.06] |
| Quintile 4 | 0.22 *** [0.19–0.26] | −0.19 *** [−0.21 to −0.17] | 0.30 *** [0.25–0.36] | −0.12 *** [−0.14 to −0.10] |
| Quintile 5 | 0.12 *** [0.10–0.15] | −0.22 *** [−0.24 to −0.21] | 0.17 *** [0.14–0.21] | −0.15 *** [−0.17 to −0.14] |

MHP = mental health indicator; Income quintiles based on equivalised disposable household income at age 16. ***P < 0.001, **P < 0.01, *P < 0.05.
In the analyses we have controlled for the origin, number of adults and children in the household at age 16, and for hometown and whether living alone at age 24 in model 1, plus for educational level and labour market status at age 24 in model 2.

the probability of receiving social assistance is increased among those with a prior mental health problem both among men and women.

Interestingly, MHP only at age 16–17 still increased the odds by a factor of 2.2 for male and 1.8 for female (reference category no MHP), holding all other variables in the model constant. This suggests that MHP at age 16–17 might have a long-lasting impact on socio-economic outcomes. It should be noted, however, that from the data we are only able to observe that these individuals have not used public services due to psychiatric reasons or

Table 3. Receiving social assistance at age 24: results of binary logistic regression analysis (odds ratios and marginal effects) for mental health problems and household income at age 16, females.

| Mental health category at age 24 (ref. no MHP) | Model 1 | Model 2 |
|------------------------------------------------|---------|---------|
| | OR [95% CI] | Margin [95% CI] | OR [95% CI] | Margin [95% CI] |
| MHP only at age 16–17 | 2.5 *** [1.96–3.26] | 0.10 *** [0.06–0.13] | 1.8 *** [1.34–2.4] | 0.05 *** [0.02–0.08] |
| MHP only at age 18–23 | 3.64 *** [3.27–4.06] | 0.15 *** [0.14–0.17] | 3.23 *** [2.86–3.64] | 0.11 *** [0.10–0.13] |
| MHP both at ages 16–17 and 18–23 | 5.92 *** [5.18–7.77] | 0.24 *** [0.21–0.26] | 3.64 *** [3.09–4.19] | 0.13 *** [0.11–0.15] |

| Household income at age 16 (ref. lowest quintile) | Model 1 | Model 2 |
|------------------------------------------------|---------|---------|
| | OR [95% CI] | Margin [95% CI] | OR [95% CI] | Margin [95% CI] |
| Quintile 2 | 0.60 *** [0.53–0.68] | −0.08 *** [−0.10 to −0.06] | 0.72 *** [0.63–0.83] | −0.04 *** [−0.06 to −0.02] |
| Quintile 3 | 0.38 *** [0.33–0.44] | −0.13 *** [−0.15 to −0.11] | 0.45 *** [0.38–0.52] | −0.09 *** [−0.10 to −0.07] |
| Quintile 4 | 0.23 *** [0.20–0.28] | −0.17 *** [−0.19 to −0.15] | 0.29 *** [0.24–0.35] | −0.12 *** [−0.14 to −0.10] |
| Quintile 5 | 0.11 *** [0.09–0.14] | −0.21 *** [−0.23 to −0.20] | 0.14 *** [0.11–0.17] | −0.16 *** [−0.18 to −0.14] |

MHP = mental health indicator; Income quintiles based on equivalised disposable household income at age 16. ***P < 0.001, **P < 0.01, *P < 0.05.
In the analyses we have controlled for the origin, number of adults and children in the household at age 16, and for hometown and whether living alone at age 24 in model 1, plus for educational level and labour market status at age 24 in model 2.
prescribed psychopharmaceuticals, but not whether they have actually been fully recovered. In any case, for both males and females the odds of social assistance increased more with MHP only at age 18–23, and with MHP both at ages 16–17 and 18–23.

Our principal interest was on the possible interaction effect between MHP and household income at age 16. We estimate the probability of social assistance at age 24 by mental health category and household income quintile at age 16. The results are presented as average marginal effects in mental health categories across levels of household income in Tables 4 and 5, separately for men and women.

These results confirm our hypothesis H1 showing that, compared to those with no mental health records, MHP increases the probability of social assistance at age 24 in every income quintile among both males and females. There are large differences between the income quintiles, especially when education and labour market status are not controlled for (model 1); interestingly, adding these factors attenuated the effect less among the higher income groups. There were differences in the estimates also in model 2, especially between income quintile 1 and quintiles 4 and 5, suggesting that the effect of MHP varies by income quintile as expected in our hypothesis (H2). Some differences between genders and age at diagnosis can be observed, e.g. males have a somewhat higher probability in higher income quintile with MHP both at ages 16–17 and 18–23, but the overall picture is clear supporting the idea of double burden among low income children.

In a sensitivity analysis, we excluded those for whom we had no information on household income at age 16 and this slightly decreased the effects in the 1st quintile (most for males with MHP both at ages 16–17 and 18–23), but did not change the main results.

We conducted a complementary analysis in order to investigate whether there are differences in disorder groups related to social assistance at age 24 between income quintiles. First of all, there were some differences in the prevalences across quintiles (Table A1 in the Appendix). However, a logistic regression analysis – run separately for each income quintile and including each disorder group individually as an independent variable –

Table 4. Probability of social assistance at age 24 by mental health category and household income at age 16 among males: marginal effects of mental health across levels of household income (base outcome: no mental health records).

| Household income | MHP only at age 16–17 | MHP only at age 18–23 | MHP both at ages 16–17 and 18–23 |
|------------------|-----------------------|-----------------------|----------------------------------|
| Model 1 (N = 16,994) |                       |                       |                                  |
| Quintile 1       | 0.30 *** [0.20–0.40]  | 0.23 *** [0.19–0.28]  | 0.36 *** [0.30–0.43]             |
| Quintile 2       | 0.21 *** [0.12–0.31]  | 0.28 *** [0.24–0.32]  | 0.38 *** [0.31–0.45]             |
| Quintile 3       | 0.14 ** [0.05–0.23]   | 0.22 *** [0.18–0.26]  | 0.27 *** [0.19–0.34]             |
| Quintile 4       | 0.12 * [0.01–0.22]    | 0.17 *** [0.13–0.21]  | 0.24 *** [0.16–0.32]             |
| Quintile 5       | 0.07 [–0.01 to 0.16]  | 0.07 *** [0.06–0.12]  | 0.25 *** [0.16–0.33]             |
| Model 2 (N = 16,994) |                       |                       |                                  |
| Quintile 1       | 0.13 ** [0.05–0.22]   | 0.15 *** [0.12–0.19]  | 0.16 *** [0.11–0.22]             |
| Quintile 2       | 0.06 [–0.003 to 0.13] | 0.13 *** [0.10–0.17]  | 0.15 *** [0.10–0.21]             |
| Quintile 3       | 0.08 * [0.004–0.15]   | 0.13 *** [0.10–0.17]  | 0.10 *** [0.05–0.15]             |
| Quintile 4       | 0.07 [–0.019 to 0.16] | 0.11 *** [0.08–0.14]  | 0.09 ** [0.03–0.14]              |
| Quintile 5       | 0.06 [–0.018 to 0.13] | 0.07 *** [0.04–0.09]  | 0.15 *** [0.08–0.20]             |

MHP: mental health indicator; Income quintiles based on equivalised disposable household income at age 16. ***P < 0.001, **P < 0.01, *P < 0.05; [95% CI].

In the analyses we have controlled for the origin, the number of adults and children in the household at age 16, and for home-town and whether living alone at age 24 in model 1, plus for educational level and labour market status at age 24 in model 2.
mainly confirmed the above findings (Tables A2 and A3 in the Appendix). Average marginal effects allow us to compare between the quintile-specific models in which disorders are identified between ages 16–23.

Among both males and females the increases in the probabilities of social assistance receipt were largest for the disorder groups F10-19 (mental and behavioural disorders due to psychoactive substance use), F90-F98 (behavioural and emotional disorders with onset usually occurring in childhood and adolescence), F30-38 (mood [affective] disorders) and F40-48 (neurotic, stress-related and somatoform disorders). Most notably, we observed a quite large decrease in the effect between the lowest and higher income quintiles for the disorder groups F10-19 and F40-48. For both genders the effects were greatest for most of the associated disorder groups in the bottom income quintile, and lowest income quintile was also the only in which the effect was highly statistically significant for group F40-48. Between the income quintiles the effects were most consistent for the group F90-F98 among males and F30-39 for females.

**Discussion**

The strength of the association between early health problems and circumstances and later socioeconomic outcomes is an important social policy question. In the Nordic welfare states, the aim has been to break the transmission of disadvantage across generations, but we see that parents’ socioeconomic status continues to play a role for their children’s success in life (Wiborg and Hansen 2009; Kallio, Kauppinen, and Erola 2016; Vauhkonen et al. 2017). In addition, health problems may create bigger obstacles to attain higher socioeconomic status in later life for those with lower socioeconomic background, as suggested by theories of cumulative (dis)advantage and double jeopardy (DiPrete and Eirich 2006; Jackson 2009).

Mental health problems are increasingly common across the world and their burden to individuals, families and societies is an important determinant of living standards,
employment, social security, and service systems (OECD/EU 2018). The focus on mental health problems among adolescents and young adults, in particular, is important as they are likely to have long-lasting consequences for socioeconomic attainment in this delicate transitional phase of life (Lundborg, Nilsson, and Rooth 2014; Rodwell et al. 2018; Hakulinen et al. 2019). Mental health has seldom been taken into account in the studies on social mobility, while our evidence shows that it might play an important role in explaining transmission of disadvantage from one generation to the next.

In this article, we investigated to what extent financial problems, as indicated by the use of social assistance, in early adulthood are a continuation of mental health problems developed in adolescence and whether adolescents with lower socioeconomic background are more vulnerable to lasting negative effects of these problems. In general, as has been shown in earlier studies from different countries, children from lower income families are more likely to receive social assistance as young adults (e.g. Kaupinen et al. 2014) and to have mental health problems (Reiss 2013). Case, Lubotsky, and Paxson (2002) has suggested that part of the intergenerational transmission of socioeconomic status might work through the impact of parent’s income on children’s health. The richness of our data, allowing us to follow a cohort of individuals for a relatively long period, an exact measurement of psychiatric diagnoses and household income, and results separately for men and women as well as income groups, makes this study an interesting contribution in the field.

Our results indicate that (certain) mental health problems are strongly associated with the receipt of social assistance in early adulthood. Much of the association, but not all, is explained by lower education and weaker labour market status among those with mental health problems. While the association existed in all income quintiles, it was the strongest among those with lower equivalised disposable household income at age 16. This finding supports the ideas of cumulative disadvantage and double burden of facing both low family resources and mental illness. In general, we show that family income moderates the association between mental health problems and social assistance receipt. This can be a result of differences in the availability of financial aid and other resources from parents. Parental background could moderate the impact of mental health problems on later socioeconomic outcomes through possibilities to support, invest and offer opportunities during the childhood and youth. For example, in Norway and Denmark adult outcomes of children are found to be higher when parental income flow is balanced over childhood, and higher parental income is an advantage especially in the early and late periods of childhood (Carneiro et al. 2020; Lesner 2018). Lower resources might affect skill formation, networks and decision making of the adolescent (Lesner 2018).

Our finding could also partly reflect unobserved heterogeneity (e.g. in family circumstances and underlying causes of mental health problems) and – although our findings hold with an investigation of individual disorder groups – differences in the complexity of psychiatric problems and treatment. Our complementary analyses could benefit from a clinically more relevant grouping of the disorders, although results are in line with earlier studies predicting work incapacity, labour market exclusion and earnings in young adulthood (e.g. Narusyte et al. 2017; Lundborg, Nilsson, and Rooth 2014; Hammer and Hyggen 2010). In addition to the associated problems found in these studies (substance use, behavioural problems, neurosis), our results suggest that also mood (affective) disorders increase the probability of social assistance, especially among females, regardless of adolescent household income.
Possible socioeconomic associations between mental and behavioural health problems in childhood and youth and socioeconomic outcomes later in life should be further studied given the large increases e.g. in mood, emotional and anxiety disorders among adolescents and self-reported emotional symptoms especially among females in Finland and elsewhere (Gyllenberg et al. 2018; Mishina et al. 2018; Bor et al. 2014; Potrebny, Wiium, and Moss-Iversen Lundegård 2017). As Gyllenberg et al. (2014) discuss, if there are children with unmet needs and limited access to effective interventions, the long-term burden of early mental health problems is likely to remain high. Our results show the increased economical and social vulnerability among those with mental health problems.

Previously it has been found that mental health issues are more likely to be missed in young people than in any other age-group (Knapp et al. 2016; Huikko et al. 2017). As a shortcoming of the current register-based study, we might have underestimated disorders among adolescents due to unmet needs. Previous survey-based studies have shown that among adults the lower-income groups tend to be the most intensive users of the public health care, although in Finland special health care services (public and private together) were used more extensively in higher income groups when needs were accounted for (van Doorslaer et al. 2000; van Doorslaer, Masseria, and Koolman 2006). We were unable to account for mental health problems diagnosed and treated elsewhere than in the public special health care system. Further, while the use of private services is limited in Finland and private insurances are more common in households with higher income, it could affect the identified prevalence of mental health disorders especially in the higher income groups. However, our use of information on reimbursed prescribed medicines complements the data on service use.

The findings on the association between mental health problems and social assistance together with an intergenerational aspect are important for developing more effective measures to target interventions in the health and social care sector as well as along educational path of adolescents and young adults. In our study population, it was more common for those with mental health problems to have less than upper secondary education at age 24. Services promoting mental health, preventing problems and supporting those with problems in childhood and adolescence could be one way to reduce the length of welfare spells among young adults. The personnel of different services have, along parents and circle of acquaintances, an important role in recognizing possible problems. Early and close cooperation between health and social care sectors, and the educational system, seems fundamental in ensuring educational opportunities and livelihood for everyone.

Note

1. At the age of 16 there is no household income information for ca. 2% of the cohort in the data. These teenagers might have lived apart from their family or been in institutional care, and we do not have information concerning their socioeconomic background. In analyses they are included in the lowest quintile and excluded in sensitivity analyses.

Disclosure statement

No potential conflict of interest was reported by the author(s).
Funding

This research has received funding from the Finnish Social Insurance Institute and from the Academy of Finland Flagship Programme [grant number 320162].

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Table A1. Proportion (%) having a diagnosis in ICD-10 disorder groups F10-F99 from specialized health care and/or use of psychopharmaceuticals among those with MHP between ages 16–23 (N = 8911), by gender and by household income quintiles at age 16.

| F10-F19: Mental and behavioural disorders due to psychoactive substance use | All males (N = 3705) | All females (N = 5206) | Quintile 1 (N = 2074) | Quintile 2 (N = 2083) | Quintile 3 (N = 1780) | Quintile 4 (N = 1561) | Quintile 5 (N = 1413) |
|---|---|---|---|---|---|---|---|
| F20-F29: Schizophrenia, schizotypal and delusional disorders | 10.4 | 6.2 | 10.3 | 9.2 | 8 | 5.3 | 5.5 |
| F30-F39: Mood [affective] disorders | 9.2 | 4.4 | 7.9 | 6.8 | 6.4 | 5 | 5.2 |
| F40-F48: Neurotic, stress-related and somatoform disorders | 24.5 | 36.5 | 34.7 | 34 | 31.6 | 28.7 | 26.2 |
| F60-F69: Disorders of adult personality and behaviour | 25.3 | 32.2 | 32.2 | 32.5 | 30.8 | 25.8 | 22.6 |
| F70-F79: Mental retardation | 2.9 | 6.1 | 6 | 5 | 5.1 | 4 | 3.2 |
| F80-F89: Disorders of psychological development | 1.2 | 0.7 | 1 | 0.9 | 1.4 | 0.6 | 0.8 |
| F90-F98: Behavioural and emotional disorders with onset usually occurring in childhood and adolescence | 7.3 | 2.7 | 4.5 | 4.7 | 4.9 | 4.8 | 4 |
| Others (F00-F09: Organic, F50-59: Physiological, F99: Unspecified) | 15 | 10.7 | 17.3 | 13.4 | 11 | 10.6 | 8.1 |

Note: one person can be in more than one group. MHP = mental health indicator. Income quintiles based on equivalised disposable household income at age 16.
### Table A2. Receiving social assistance at age 24: results of binary logistic regression analysis (odds ratios and marginal effects) for disorder groups among males, by household income quintile at age 16.

| Diagnosis in ICD-10 disorder groupb between ages 16–23 | Male (N = 16,994) | Alla | Quintile 1 (N = 3263) | Quintile 2 (N = 3462) | Quintile 3 (N = 3463) | Quintile 4 (N = 3430) | Quintile 5 (N = 3376) |
|-------------------------------------------------------|-------------------|------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| F10-F19: Mental and behavioural disorders due to psychoactive substance use | 3.75 *** | 0.15 *** [0.11–4.43 | 0.26 *** [0.16–0.36] | 3.71 *** [0.09–27. | 3.08 ** [0.03–22] | 3.08 ** [0.03–22] | 4.46 ** [0.03–24] |
| F20-F29: Schizophrenia, schizotypal and delusional disorders | 1.37 * | 0.03 [−0.008 to 0.06 | 0.95 [−0.09 to 0.11 | 1.43 [0.04 to 0.11] | 1.27 [−0.04 to 0.09] | 1.58 [−0.03 to 0.09] | 2.48 [−0.01 to 0.10] |
| F30-F39: Mood [affective] disorders | 1.83 *** | 0.06 *** [0.04–0.17 | 0.9 ** [0.03–1.36 | 0.08 ** [0.01–0.12] | 1.90 [0.07 to 0.15] | 1.93 * [0.05–0.12] | 3.01 ** [0.05–0.08] |
| F40-F48: Neurotic, stress-related and somatoform disorders | 1.51 *** | 0.04 *** [0.02–0.95 | 0.94 [0.05–1.17 | 1.18 [0.06 to 0.10 | 1.56 ** [0.04–0.09] | 0.81 [0.04–0.02] | 1.31 [0.04–0.02] |
| F60-F69: Disorders of adult personality and behaviour | 1.55 [0.04 to 0.10 | 1.34 [0.05 to 3.17 | 0.95 [0.21] | 0.34 [−0.29 to 0.77 | 0.02 [0.10 to 0.26] | 0.77 [0.11 to 1.27] | 1.61 [0.03–0.02] |
| F70-F79: Mental retardation | 0.59 [−0.09 to 0.09 | 0.08 [−0.19 to 0.18 | 0.08 [−0.17 to 0.05 | 0.12 [−0.24 to 0.06] | 0.31 [−0.07 to 0.01] | 0.19 [0.06–0.04] | 0.19 [0.06–0.04] |
| F80-F89: Disorders of psychological development | 0.95 [−0.03 to 0.02 | 1.01 [0.01 to 0.10 | 0.91 [−0.19 to 0.18 | 0.01 [−0.08 to 0.06] | 0.88 [−0.07 to 0.05] | 0.77 [−0.05 to 0.03] | 0.07 [−0.04 to 0.03] |
| F90-F98: Behavioural and emotional disorders with onset usually occurring in childhood and adolescence | 2.65 ** | 0.11 *** [0.07–2.38 | 0.15 *** [0.07–0.22 | 2.18 ** [0.03–2.71 | 0.11 ** [0.03–0.19] | 3.33 *** [0.03–0.17] | 6.61 ** [0.03–0.21] |
| Others (F00-F09: Organic, F50-59: Physiological, F99: Unspecified) | 0.9 [−0.04 to 0.03 | 1.31 [0.04–0.10 to 0.78 | 0.09 [−0.11 to 0.19] | 0.03 [−0.11 to 0.05] | 0.72 [−0.02 to 0.04] | 1.19 [−0.05 to 0.07] | 0.81 [−0.06 to 0.03] |

*aIncluding a variable of the income quintiles; Income quintiles based on equivalised disposable household income at age 16.

*bICD-10 = International Classification of Diseases and Health Related Problems, version 10.

In the analyses we have controlled for the origin, number of adults and children in the household at age 16, and for educational level, labour market status, hometown and living alone at age 24.

***P < 0.001, **P < 0.01, *P < 0.05.
Receiving social assistance at age 24: results of binary logistic regression analysis (odds ratios and marginal effects) for disorder groups among females, by household income quintile at age 16.

| Female diagnosis in ICD-10 disorder group by household income quintile at age 16 | All\(^a\) | Quintile 1 (N = 3261) | Quintile 2 (N = 3458) | Quintile 3 (N = 3383) | Quintile 4 (N = 3265) | Quintile 5 (N = 3327) |
|---|---|---|---|---|---|---|
| OR | Margin [95% CI] | OR | Margin [95% CI] | OR | Margin [95% CI] | OR | Margin [95% CI] | OR | Margin [95% CI] | OR | Margin [95% CI] |
| F10-F19: Mental and behavioural disorders due to psychoactive substance use | 3.01*** [0.08–16] | 2.91*** [0.08–28] | 3.38*** [0.08–29] | 1.89 | 0.06 [–0.01–0.12] | 4.48 | 0.14 * [0.02–0.27] | 2.26 | 0.03 [–0.006–0.16] |
| F20-F29: Schizophrenia, schizotypal and delusional disorders | 1.42 * [0.03–0.00 to 0.07] | 1.36 | 0.05 [0.05 to 0.14] | 1.18 | 0.02 [0.06–0.10] | 2.01 | 0.06 [0.02 to 0.14] | 0.79 | −0.01 [−0.07 to 0.05] | 3.45 | 0.05 * [0.01–0.08] |
| F30-F39: Mood [affective] disorders | 1.87 | 0.06 *** [0.04–0.08] | 1.52 | 0.07 ** [0.02–0.11] | 1.94 | 0.09 *** [0.05–0.13] | 2.29 | 0.07 *** [0.04–0.11] | 1.56 | 0.03 [−0.005–0.06] | 3.45 | 0.05 * [0.01–0.08] |
| F40-F48: Neurotic, stress-related and somatoform disorders | 1.82 | 0.06 *** [0.04–0.08] | 2.24 | 0.13 *** [0.08–0.18] | 1.45 * [0.006–0.09] | 1.56 * [0.02–0.07] | 2.09 | 0.05 * [0.01–0.09] | 2.09 | 0.05 * [0.01–0.09] | 1.24 | 0.06 [−0.01 to 0.03] |
| F60-F69: Disorders of adult personality and behaviour | 0.04 * [0.01–0.07] | 1.28 | 0.04 [0.05 to 0.13] | 1.12 | 0.01 [0.06 to 0.09] | 2.50 | 0.09 * [0.03–0.17] | 0.87 | −0.007 [−0.05 to 0.04] | 7.78 | 0.12 [0.02–0.23] |
| F70-F79: Mental retardation | 0.22 | ** [−0.13 to −0.05] | 0.48 | −0.09 [−0.26 to 0.07] | Omitted | 0.25 | −0.07 * [−0.13 to −0.02] | Omitted | Omitted | Omitted |
| F80-F89: Disorders of psychological development | 1.36 | 0.03 [−0.01 to 0.07] | 1.58 | 0.07 [0.05 to 0.20] | 1.27 | 0.03 [0.07 to 0.13] | 1.34 | 0.02 [−0.06 to 0.11] | 1.15 | 0.008 [−0.07 to 0.08] | Omitted |
| F90-F98: Behavioural and emotional disorders with onset usually occurring in childhood and adolescence | 1.83 ** [0.03–0.03] | 2.31 | 0.14 *** [0.06–0.21] | 1.52 | 0.05 [0.01 to 0.12] | 2.27 | 0.08 * [0.009–0.14] | 1.72 | 0.04 [−0.02 to 0.09] | 0.64 | −0.01 [−0.03 to 0.004] |
| Others (F00-F09: Organic, F50-59: Physiological, F99: Unspecified) | 0.83 | −0.02 [−0.04 to 0.005] | 1.18 | 0.02 [0.05 to 0.10] | 0.92 | −0.01 [−0.06 to 0.04] | −0.06 ** [−0.09 to −0.02] | 0.0005 [−0.04 to 0.04] | 0.52 | −0.01 [−0.03 to 0.005] |

\(^a\)Including a variable of the income quintiles; Income quintiles based on equivalised disposable household income at age 16.

\(^b\)ICD-10 = International Statistical Classification of Diseases and Health Related Problems, version 10.

In the analyses we have controlled for the origin, number of adults and children in the household at age 16, and for educational level, labour market status, hometown and living alone at age 24.

\(* * * P < 0.001, ** P < 0.01, * P < 0.05\)