

# Effects of Adolescent Mental Health Conditions on Costs and Future Employment Status

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## ABSTRACT

The World Health Organization defines mental health conditions to “include mental disorders and psychosocial disabilities as well as other mental states associated with significant distress, impairment in functioning, or risk of self-harm” (World Health Organization, 2022b). There has been an increasing trend of mental health conditions, specifically depression and anxiety, among adolescents (Racine et al., 2021). Previous studies typically look at the reverse effect (e.g. the effect of a worsening economy on adolescent mental health) or a more generalized effect (e.g. the effect of mental health conditions among all age groups on the whole economy). This review seeks to quantify the costs and effect on future employment status which adolescent mental health conditions have. While this review examines overall mental health conditions, it also specifies depression, anxiety, and psychological distress, along with general areas of mental health problems. Previous literature from the United States, Australia, and several European countries were reviewed using Google Scholar on costs on the indicators above. The results indicate that mental health conditions among adolescents increase costs to families and society while also hurting future employment status, and different types of mental health conditions have different levels of effects. Finally, we suggest specific areas needed for improvement in order to minimize the economic harms of mental health conditions in the researched areas.

## Introduction

About one in four American adults suffer from a diagnosable mental disorder in a given year (John Hopkins Medicine, 2019), and that number has been increasing worldwide (World Health Organization, 2019). A large reason for this is the COVID-19 pandemic, as global prevalence of anxiety and depression increased by 25% largely in the first year of the pandemic due to social isolation (World Health Organization, 2022a). Specifically among children and adolescents, the prevalence of depression and anxiety symptoms during COVID-19 have doubled compared to pre-COVID estimates (Racine et al., 2021), with one in four youth experiencing clinical depression and one in five youth experiencing clinical anxiety in the first year of the pandemic (Racine et al., 2021). Adolescents as a group are vulnerable to mental health issues due to multiple risk factors, such as a desire for greater autonomy, peer pressure, and increased access to technology (Farley, 2020). Addressing adolescent mental health conditions is important because it affects both of their adolescence and adulthood, and would limit health, well-being, and opportunities for fulfilling lives in the future (World Health Organization, 2021). Thus, half of mental health conditions in adulthood start by age 14 (Kessler et al., 2005).

Mental health conditions are commonly known for having implications for physical health, as mental disorders increase the risk for both communicable and non-communicable diseases, and contribute to injury (Prince et al., 2005). However, the economic implications of mental health conditions are not as commonly known. For example, anxiety and depression cost the global economy \$1 trillion every year (World Health Organization, 2019). Among previous literature on the economic effects of poor mental health, generally two aspects are examined. First is how a bad economy affects adolescent mental health, where findings indicate that

economic downturns worsen mental health (Golberstein et al., 2019). Second is a broader effect, such as how poor mental health among the general population has a negative effect on a country's GDP (World Health Organization, 2019). Because neither of those aspects focus on adolescents, the goal of this review is to examine the effect of adolescent mental health conditions on costs and future employment status (unemployment and earnings). Because mental disorders fall under mental health conditions, references to the effects of mental disorders in this paper will be considered effects of mental health conditions.

## Methods

### Defining Economic Outcomes

This paper categorized two main different economic outcomes: costs and future employment status. Both costs to families and societal costs were considered, as well as other economic outcomes relating to future employment status specific to the adolescent such as NEET (not being engaged in education, employment, or training) and earnings. While the future employment status section focused on the long-term impacts of mental health conditions on the adolescent only, the costs section looked at short-term impacts to others, namely families and society.

Direct, indirect, and out-of-pocket costs were the economic indicators considered for costs. The economic outcomes for this section were inherently short term because the studies included did not quantify adulthood costs as a result of adolescent mental health problems. Direct costs included direct healthcare costs such as institutionalized treatment and direct non-healthcare costs such as informal care. Indirect costs included costs such as lost work time for parents. Out-of-pocket costs included costs such as transportation. Costs to families and society were separated in order to identify disparities on both a household and societal level.

For future employment, five important concepts were used for evaluation: BEL (basic education level), NEET, work functioning, time unemployed, and earnings. BEL is tied in with future employment status, as people with higher levels of formal education are more satisfied with their jobs, because they are more likely to access jobs that provide greater satisfaction (Fabra & Camisón, 2009). NEET was included because it definitionally encompassed unemployed people. Both the ability to meet work functioning and time unemployed were direct factors to employment status. Earnings were reviewed because lower paid workers report a lower level of job satisfaction (Díaz-Serrano and Cabral Vieira, 2005).

### Methods for Searching

Previous literature was gathered using Google Scholar. For the search, adolescent mental health conditions were considered to include general mental health conditions, mental health problems, and mental health disorders, as well as three specific mental disorders: depression, anxiety, and psychological distress. Articles chosen included the keyword(s) "adolescent," "youth," or "child" with regards to the subjects studied. All articles studied age groups of those 21 years or younger. All studies focused on developed countries, which have similar national economic situations and demographics so that the data would be more similar within the studied countries. More specifically, for costs, studies could be large national, international, or small local ones to include various regional representations. Finally, all articles had to address the effects of adolescent mental health conditions on costs (both societal burden and burden to families) or future employment status (unemployment and earnings) with quantifiable results.

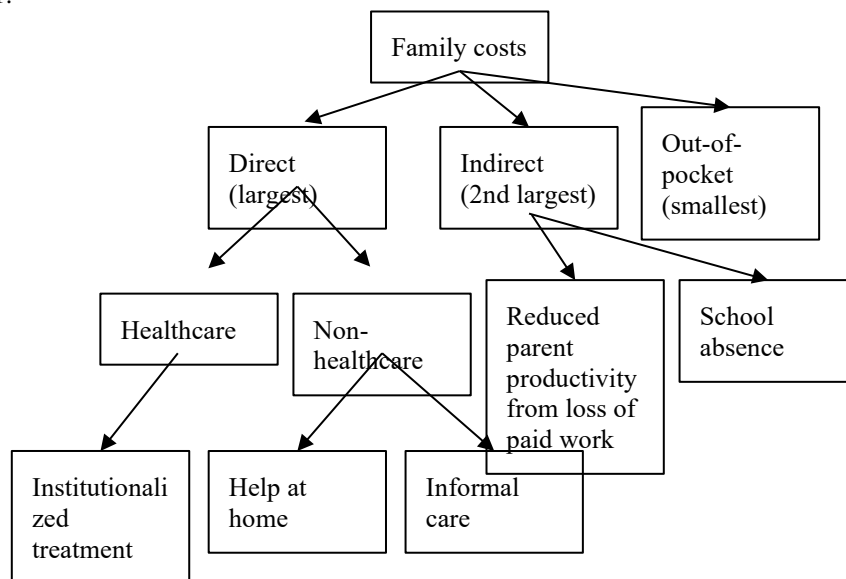
## Results

### Costs

In this section, five papers were analyzed. Three covered depression, one covered general mental health care, and one covered clinical anxiety. Most papers were large national or international studies using existing databases, with one being local. All research on this topic concluded that adolescent mental disorders generate serious costs for families and society. However, there were discrepancies among the exact costs, and among the sources of those costs. Possible explanations for the discrepancies include the difference in sample size for each study, whether or not studies were longitudinal, and the different countries the studies were done in. In addition, results for each study varied based on the mental disorder that was examined. The following data indicated that total costs for adolescents with depression were significantly higher than that of clinically anxious adolescents.

### *Family Costs*

Four papers were reviewed for this section. Costs were divided into direct, indirect, and out-of-pocket. Direct costs included both healthcare and non-healthcare costs. The main components for direct, indirect, and out-of-pocket costs were similar among all mental disorders. All major divisions of family costs are shown in the Figure 1.



**Figure 1.** Main divisions of family costs

Direct Healthcare Costs: Across both depression and anxiety, direct healthcare costs accounted for the highest percentage of total costs (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). This was consistent even after adding related costs, which included psychological, physical, and behavioral problems connected to the given mental disorder (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). A 2018 Dutch study of 56 clinically depressed adolescents aged 12-21 using cost questionnaires and 2009 prices found that yearly direct healthcare costs strictly related to depression amounted to €11,080.91 (D. Bodden et al., 2018). When accounting for related costs to depression, annual direct healthcare costs amounted to €14,647.73 (D. Bodden et al., 2018). A 2008 Dutch study of 118 clinically anxious adolescents aged 8-18 using cost diaries and 2003 prices found that direct healthcare costs strictly related to clinical anxiety equaled €1,396 each year (D. H. M. Bodden et al.,

2008). When considering related costs to clinical anxiety, direct healthcare costs summed to €1,559 annually (D. H. M. Bodden et al., 2008).

Out of direct healthcare costs, institutionalized treatment had the biggest impact for both depressed adolescents and anxious adolescents (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). Institutionalized treatment strictly related to depression represented 41% of total costs at €6,027.86 per year for families (D. Bodden et al., 2018), compared to €724 annually for costs strictly from anxiety, representing 26% of total costs (D. H. M. Bodden et al., 2008). When accounting for related costs to depression, total institutionalized treatment costs amounted to €8,562.53 yearly (D. Bodden et al., 2018), but accounting for related costs to anxiety did not change its cost burden (D. H. M. Bodden et al., 2008). The next biggest cost varied between adolescents with depression and adolescents with anxiety (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). For depressed adolescents, visiting a mental healthcare professional solely due to the depressive disorder of the adolescent amounted to 26% of total costs at €3,836.07 yearly (D. Bodden et al., 2018). After considering related costs, that number became €4,254.57 (D. Bodden et al., 2018). For anxious adolescents, day treatment strictly from clinical anxiety represented 23% of total costs at €634 each year (D. H. M. Bodden et al., 2008). Adding up related costs, that number did not change (D. H. M. Bodden et al., 2008).

Direct Non-healthcare Costs: Direct non-healthcare costs represented a small portion of total costs for both depression and anxiety (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). For depressed adolescents, annual direct non-healthcare costs directly from the depressive disorder amounted to €268.50 (D. Bodden et al., 2018), compared to €64.84 for costs directly from anxiety (D. H. M. Bodden et al., 2008). Adding related costs increased those numbers to €295.28 (D. Bodden et al., 2018) and €88.05 (D. H. M. Bodden et al., 2008) for depression and anxiety, respectively.

There were only two cost factors for direct non-healthcare costs: paying for help at home and informal care, with informal care representing a larger cost burden (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). Informal care included relatives, friends, or neighbors covering domestic or babysitting tasks (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). Paying for help at home costs €91.71 yearly for depressed adolescents, with no additional related costs (D. Bodden et al., 2018). For anxious adolescents, paid housekeeping strictly from anxiety reasons cost €5.61 annually, while adding related costs increased that number to €14.04 (D. H. M. Bodden et al., 2008). Informal care solely from depression reasons cost €176.79 annually, while adding up related costs amounted to €203.57 per year (D. Bodden et al., 2018). For anxious children, informal care for anxiety reasons cost €59.23 each year, and adding up related costs increased that number to €74.10 (D. H. M. Bodden et al., 2008).

Indirect Costs: Indirect costs represented the second largest cost burden, behind direct healthcare costs (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). Annual indirect costs totaled €3,231.67 for strictly depression reasons, and adding related costs totaled to €4,051.09 (D. Bodden et al., 2018). Annual indirect costs totaled €1,192 for strictly anxiety reasons, and adding related costs totaled to €1,315 (D. H. M. Bodden et al., 2008).

The two largest indirect costs were productivity loss from the parents due to absence from paid work and school absence (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). School absence was calculated through the price per hour of attending school (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). For depressed adolescents, school absence represented 10% of total costs whereas productivity loss from parents due to loss of paid work amounted to 9% of total costs (D. Bodden et al., 2018). School absence from depression reasons alone came to €1,504.03 annually, while adding related costs produced €1,844.47 per year (D. Bodden et al., 2018). Productivity loss from parents from only depression reasons amounted to €1,390.57 yearly, and adding related costs increased that number to €1,701.49 (D. Bodden et al., 2018). For anxious adolescents, productivity loss from parents amounted to 23% of total costs, whereas school absence totaled to 17% of all

costs (D. H. M. Bodden et al., 2008). School absence from anxiety reasons alone summed to €456 annually, while adding related costs totaled to €572 each year (D. H. M. Bodden et al., 2008). Productivity loss from parents due to anxiety reasons totaled €636 per year, and adding related costs increased that number to €644 (D. H. M. Bodden et al., 2008).

Out-of-pocket Costs: The last cost category was out-of-pocket costs, which had a very small cost burden (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). Out-of-pocket costs included transportation costs, parking costs, and own monetary contributions for health care services which are not fully reimbursed by health insurance companies (D. Bodden et al., 2018, D. H. M. Bodden et al., 2008). Because the divide between different out-of-pocket costs was different between the depression study and the anxiety study, this paper doesn't dive into the specifics of out-of-pocket costs. For depressed adolescents, out-of-pocket costs from depression reasons amounted to €213.95 annually, while adding related costs totaled to €392.92 per year (D. Bodden et al., 2018). For anxious adolescents, out-of-pocket costs from anxiety reasons amounted to €95.52 each year, while adding related costs totaled to €122 yearly (D. H. M. Bodden et al., 2008).

Total Family Costs: Total family costs varied based on the mental disorder studied. Total costs also varied between different studies on the same mental disorder possibly due to different severities in the disorder studied, sample sizes, and regions. Total annual costs for clinically depressed adolescents from depression reasons was €14,795.03, while adding related costs increased that number to €19,386.72 (D. Bodden et al., 2018). Total annual costs for clinically anxious adolescents from anxiety reasons only to be €2,748, whereas adding related costs totaled to €3,084 yearly (D. H. M. Bodden et al., 2008).

Findings were similar in the US. A 2003 study in Philadelphia composed of 76,662 children aged 3-15 in 1994, 1,633 of which had depression, found that the adjusted average three-year Medicare expenditures were \$6,688 for those with depression, compared to \$160 for those without a psychiatric disorder (Mandell et al., 2003). Depression had the highest cost burden compared to other mental disorders studied (Mandell et al., 2003). Another US study which used data from the 1996 Medicare Expenditure Panel Survey (MEPS) and had a sample size of 6323 children aged 18 and under, 54 of which had depression and manic depression (DMD), recorded annual costs for DMD to be \$3,792, compared with \$1,421 for other mental illnesses (Glieb & Neufeld, 2001).

### *Societal Costs*

Societal costs were defined as total monetary costs of a mental disorder in a specified region. Total costs to society varied by country and by mental disorder studied. A 2001 US study found that annual spending for mental health care in 1998 in the US totaled \$11.681 billion across all youth aged 1-17 (Sturm et al., 2001). For adolescents aged 12-17 specifically, costs totaled \$6.971 billion (Sturm et al., 2001). For clinically depressed adolescents, the total annual societal cost from depression reasons totaled to €37,697,736.44, while adding on other related reasons totaled to €49,397,362.56 (D. Bodden et al., 2018). Using a more recent and international prevalence rate, that number became €59,369,074.06 (D. Bodden et al., 2018). For clinically anxious adolescents, the total annual societal cost from families of clinically anxious children totaled €20,293,958, which was 21 times higher than families from the general population (D. H. M. Bodden et al., 2008).

### *Future Employment Status*

In this section, nine studies were analyzed. Several of the studies were longitudinal. All research on this topic concluded that adolescent mental disorders have a negative effect on future employment, such as increasing the likelihood of NEET. However, some noted that this effect was not seen across all types of mental health

problems. The factors considered in this section included BEL, NEET, work functioning, and time unemployed. In this section, a high-stable trajectory of mental health problems refers to persistent high scores of specific mental problems (de Groot et al., 2021). A moderate-stable trajectory of mental health problems refers to persistent moderate scores of specific mental health problems (de Groot et al., 2021). A decreasing trajectory of mental health problems refers to decreasing scores of specific mental health problems (de Groot et al., 2021). A low-stable trajectory of mental health problems refers to persistent low scores of specific mental health problems (de Groot et al., 2021). Externalizing problems were defined to include aggressive and disobedient behavior (Veldman et al., 2015). Internalizing problems were defined to include anxiety, depression, and other somatic problems (Veldman et al., 2015). Attention problems were defined to include problems which interfered with concentration, focusing for a long period of time, daydreaming, and getting lost in thoughts (Veldman et al., 2015).

### *Unemployment*

Five papers were reviewed for this section, one of which covered common mental disorders, two covered general mental health problems and specific types (externalizing, internalizing, etc.), one covered depressive disorders, and one covered psychological distress. The factors relating to employment status considered were BEL, NEET, work functioning, and length of unemployment.

**BEL/NEET:** Mental health conditions were correlated with a lower chance of having BEL and a higher chance of NEET. A 2021 Dutch study using TRacking Adolescents' Individual Lives Survey (TRAILS), a survey which measured trajectories of mental health problems for children born between 1989 and 1991 at ages 11, 13.5, 16, and 19, selected 1711 participants whose educational or employment status was known at age 19 (Veldman et al., 2015). It found that young adults with high-stable trajectories of total problems were more likely to be at work without BEL or in NEET, than to be at school or to work with BEL (28% vs 16%, respectively) (Veldman et al., 2015). The same was true for high-stable trajectories of externalizing problems (29% vs 18%, respectively) (Veldman et al., 2015). For internalizing and attention problems, no significant differences were found regarding the distribution of class membership (Veldman et al., 2015).

An Australian longitudinal study using data from the Victorian Adolescent Health Cohort Study (VAHCS), a longitudinal study documenting common mental disorders among children through adolescence with 8 waves, consisted of 1,938 participants 14-15 years old and found that adolescents with common mental disorder had a higher chance of NEET in young adulthood (Rodwell et al., 2017). Specifically, adolescents with no waves of common mental disorders had a 6.8% chance of NEET, adolescents with 1 wave of common mental disorders had a 9.5% chance of NEET, and adolescents with 2 or more waves of common mental disorders had a 11.7% chance of NEET (Rodwell et al., 2017).

**Work Functioning:** Work functioning refers to the ability of a person to meet work demands given a physical or mental health state. Mental health conditions during adolescence decreased work functioning as a young adult. A 2021 Dutch study used data from TRAILS, ultimately selecting 1,004 adults aged 29 who reported work functioning (de Groot et al., 2021). It found that those with a high-stable trajectory of internalizing problems couldn't meet work demands 29.5% of the time, compared to 24.5% for those with a decreasing trajectory, 24.1% for those with a moderate-stable trajectory, and 21.6% for those with a low-stable trajectory (de Groot et al., 2021). Those with a high-stable trajectory of externalizing problems couldn't meet work demands 29.3% of the time, compared to 27.5% for those with a moderate-stable trajectory, 25.7% for those with a decreasing trajectory, and 22.8% for those with a low-stable trajectory (de Groot et al., 2021). For both internalizing and externalizing problems, higher trajectories were correlated with a lower work functioning (de



Groot et al., 2021). There was no significant difference of work functioning for each trajectory between internalizing and externalizing problems (de Groot et al., 2021).

Time Unemployed: Mental health conditions were correlated with an increase in future unemployment for adolescents. A 2019 Swedish study which selected 929,191 males with valid information on physical and mental health status found that those diagnosed with any psychiatric conditions in adolescence experienced approximately an additional 10 days per year of unemployment compared to others (Mousteri et al., 2019). Specifically, depressive disorders were associated with an additional 6 days per year of unemployment (Mousteri et al., 2019).

The findings remained consistent for children with distress. A 2015 British study looked at two cohort studies: the Longitudinal Study of Young People in England (LSYPE), which consisted of 15,500 English residents born in 1989/90, and the National Child Development Study (NCDS), which consisted of 17,638 people born in Britain in a single week in March 1958 (Egan et al., 2015). It found that across both studies, children with high distress were 2.5 percentage points more likely to become unemployed (Egan et al., 2015). From LSYPE data specifically, those with high distress experienced 3.86 months of unemployment compared with 2.96 months from the low distress group (Egan et al., 2015). From NCDS data specifically, the high distress group experienced 5.21 months of unemployment, compared to 3.83 months for the medium distress group and 3.13 months for the low distress group (Egan et al., 2015).

### *Future Earnings*

Four papers were reviewed for this section, one of which covered general mental health problems and specific types, while the other three covered depression. All studies concluded that adolescent mental health problems reduced earnings in the future. A possible explanation for this is increased neuroticism and introversion, which are negatively linked to earnings (Johar & Truong, 2014).

A 2017 Norwegian study using data from the Young-HUNT study, a survey compiled in 1995-1997 of 8,949 adolescents aged 13-19 years old, found that one standard deviation increase in total mental health problems reduces earnings by 6.5% (Evensen et al., 2016). For internalizing problems specifically, that earnings reduction is halved to around 3.1% (Evensen et al., 2016). Negative effects were much stronger on those in the lower parts of the earnings distributions, with total mental health problems reducing earnings by 15% for those in the 10th percentile, compared to 16% for internalizing problems, 9% for attention problems, and 8% for conduct problems, which were defined to include rule-breaking behavior (Evensen et al., 2016).

Similar earnings reductions were seen for adolescents with depression. A 2020 Swedish study using registry data on year-by-year earnings along with data from the Uppsala Longitudinal Adolescent Depression Study (ULADS), a 1991 longitudinal study which assessed adolescents aged 16-17 years old and in follow-up interviews 15 years later, found that those with a history of adolescent depression had mean earnings 11% less than their non-depressed peers (Philipson et al., 2020). Earnings for early to middle adulthood were lower for both males and females with a history of persistent depressive disorder (PDD) in adolescence than for their non-depressed peers, with earnings reductions of 24% for males and 15% for females (Philipson et al., 2020).

A 2014 US study using data from the National Longitudinal Survey of Youth 1997 (NLSY97), a database nationally representative of adolescents aged 13-17 in 1997, found that adolescent depression was associated with a wage penalty of around 10-15% (Johar & Truong, 2014). The direct hourly wage penalty associated with adolescent depression is 13.8% for males and 9.9% females (Johar & Truong, 2014). Accounting for education and experience, those numbers drop to 9.2% and 4.2% for males and females, respectively (Johar & Truong, 2014).

Finally, a 2013 US study using data from the Add Health study, a longitudinal survey of those grades 7-12 in 1994-1995 with three followup waves, found that adolescents with depression had a lower educational

attainment and a negative correlation with lower earnings (Fletcher, 2013). Controlling for all variables, adolescent depression was shown to have a 15% reduction on adulthood earnings (Fletcher, 2013).

## Conclusion

Rising adolescent mental health conditions have both short term and long term economic implications on costs and future employment status. Out of costs, direct costs from adolescent mental health are the largest cost burden, followed by indirect costs, and then out-of-pocket costs. Depression had significantly higher costs than anxiety, possibly due to longer episodes and higher recurrence rates. For future employment status, mental health conditions increase the chance for NEET, reduce the chance of having BEL, reduce work functioning, increase time unemployed, and reduce earnings in young adulthood. Internalizing and attention problems did not have a significant effect on the likelihood for NEET or having BEL, and internalizing problems had less of a negative effect on future earnings.

To mitigate the negative consequences of adolescent mental health, awareness, early detection and prevention, and treatment are crucial. Increased awareness includes programs around schools educating adolescents and their families on mental health. Early detection and prevention programs can increase the availability and access to mental health psychiatrists for adolescents at school. Treatment can provide readily accessible therapy located at schools for quick access.

## Limitations

Limitations to the studies include small sample sizes and lack of recency for some of the studies. More recent literature would enhance the accuracy of the results found in this paper. In addition, there were only three mental health disorders which were specifically reviewed; examining more could provide a more robust and complete review of the impacts of adolescent mental health conditions. Age ranges also varied between studies, meaning that a more thorough review would study a consistent age range for subjects.

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