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Mental health and labor supply: Evidence from Canada

Yichen Shen

School of Health Innovation, Kanagawa University of Human Services. 3F, Research Gate Building TONOMACHI 2-A 2, 3-25-10 Tonomachi, Kawasaki-ku, Kawasaki City, Kanagawa Prefecture, Japan

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A B S T R A C T

This study investigates the relationship between mental health and employment using an instrumental variable approach with the 2012 Canadian Community Health Survey–Mental Health. Using a family member's mental health problem(s) as an instrument for poor mental health, the estimates reveal that poor mental health significantly reduces employment outcomes. These findings are robust to various specifications, such as an alternative instrument and a relaxation of the exclusion restriction assumption. In addition, the relationship is driven mainly by men and younger workers. Moreover, the findings suggest that the relationship is mediated by a decline in cognitive abilities, such as difficulties in concentration and motivation, and social relations with acquaintances and friends. Finally, the estimates show that this phenomenon is contagious: poor mental health has a significant spillover effect on coworkers' mental health in workplaces. This study demonstrates the importance of mental health illness in Canada and other developed countries.

1. Introduction

The World Health Organization (WHO) estimated that untreated mental health problems account for nearly 13% of the global disease burden (World Health Organization, 2012). Based on current projections, depression, a mental health problem, will be the leading global disease burden in 2030. Moreover, the consequences of untreated mental health problems for society are extensive. For example, mental health patients are far more likely to commit violent crimes and be incarcerated (Fazel & Grann, 2006; Hall et al., 2019). In terms of economic costs, the total estimated cost of mental health problems in the United States alone is $83.1 billion, of which $26.1 billion are medical costs, and $51.5 billion are work-related costs (Greenberg et al., 2003).

One consequence of mental health problems is unemployment. Unlike many physical health disorders, mental health problems often occur early in life, especially during individuals' most productive years (Kessler et al., 2005). Mental health problems may affect labor market outcomes through several mechanisms, first, for example, through impacting workers' cognitive abilities. Mental health problems are associated with an overall lower cognitive ability (Abramovitch et al., 2021; Bauermeister & Bunce, 2015; Bunce et al., 2008, pp. P67–P74; Jokela, 2022), likely due to an increased allocation of cognitive capacity toward depressive thoughts and a reduced capacity for other processes (Hartlage et al., 1993). This decline in cognition can lead to a reduction in work and labor performance. This positive relationship between cognition ability and work performance is reported in the literature (ALMamari & Traynor, 2021; Gottfredson, 1986, 2003; Hunter, 1986; Nye et al., 2022; Schmitt, 2014). In other words, mental health problems diminish cognition ability, leading to a decline in work and labor performance or productivity.

Second, mental health problems can lower labor market outcomes by reducing emotional intelligence. Existing literature has documented that emotional intelligence is much lower among those with mental health problems (Downey et al., 2008; El Garhy et al., 2022; Lizeretti et al., 2012). Emotional intelligence is an important determinant of labor market outcomes. That is, emotional intelligence is associated with work performance in the literature (Khokhar & Kush, 2009; Mishra & Mohapatra, 2010; O'Boyle Jr. et al., 2011; Quoidbach & Hansenne, 2009; Rapisarda, 2002). For example, higher emotional intelligence was associated with effective leadership and better relationships with coworkers (Dhani, Nbsp, & T. S., 2016; Rosete & Ciarrochi, 2005). This implies that mental health problems may induce a decline in emotional intelligence, leading to workplace friction and poor labor market outcomes.

Finally, individuals may face discrimination during their job search and employment if (potential) employers know about their mental health problems. Though the evidence is sparse, some studies indicated that individuals with mental health problems were less likely to be hired (Hipes et al., 2016; Wahl, 1999). In fact, mental health patients face many stigmas that suggest their perceived lack of competence and

E-mail address: 263.joshuashen@gmail.com.

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unpredictability in workplace settings (Krupa et al., 2009; Rüsch et al., 2005). In sum, discrimination is an important factor affecting the relationship between mental health problems and poorer job and work outcomes.

Estimating the relationship between mental health and employment is complicated by the fact that it is confounded with unobserved factors. The presence of poor mental health in individuals may be highly correlated with unobserved household or neighborhood environments, which could also be correlated with labor market outcomes. To alleviate this endogeneity, previous literature has examined the effect of mental health on labor market outcomes using an instrumental variable (IV) approach (Alexandre & French, 2001; Banerjee et al., 2017; Chatterji et al., 2007, 2011; Ettner et al., 1997; Frijters et al., 2014; Hamilton et al., 1997; Marcotte & Wilcox-Gok, 2001). These studies have leveraged various instruments to account for the endogeneity of mental health, including parental mental health conditions, early-age mental health problems, social support, the death of a close friend, and religiosity.

These previous studies have revealed a negative relationship between mental health and employment. For instance, Ettner et al. (1997) estimated the effect of having a psychiatric disorder during the past 12 months on employment for men and women, using childhood and parental incidences of psychiatric disorders as instruments. They found that having any psychiatric disorder reduced employment by 12.6 percentage points for men and 14.2 percentage points for women. Similarly, Chatterji et al. (2007) estimated the effect of having a psychiatric disorder during the past 12 months on employment using childhood incidences of psychiatric disorders and attendance of religious services as instruments. They observed that having any psychiatric disorder reduced employment by 26.1 percentage points for Latino women but did not affect other races or genders. More recently, Chatterji et al. (2011) used the same instruments and found that having any psychiatric disorder reduced employment by 15.3 percentage points for men and 9.3 percentage points for women, although the estimates were marginally insignificant. Frijters et al. (2014) used the death of a close friend to instrument mental health indexes and found that a one-deviation increase in the mental health index reduced employment by 22.9 percentage points. Finally, Banerjee et al. (2017) estimated the effect of mental illness on employment using the number of psychiatric disorders an individual had in early life and Lewbel's (2012) instruments. Overall, they found that a one standard deviation increase in the mental illness index reduced employment by 24.3 percentage points for men and 13.7 percentage points for women.

This study contributes to the existing literature in several ways. First, this study examines the mechanisms mediating the relationship between mental health and employment through cognitive abilities, such as motivation and decisiveness, and social relations. Thus, this is the first study to present evidence that the relationship between mental health and employment is mediated by cognitive abilities and social relations. Second, this paper examines the workplace spillover effect of one's mental health on a coworker's mental health. Previous studies have not examined the spillover effect of mental health problems in the workplace. Finally, this study makes a small contribution by presenting the first evidence of the impacts of mental health on employment in Canada.

Using the 2012 Canadian Community Health Survey–Mental Health (CCHS-MH), this paper investigates the effect of mental health on employment using a family member's history of mental health problems as an instrument. The estimates show that a one-point increase in the Kessler-6 score significantly reduces employment by 3.4 percentage points. Similar results are found when alternative scores and mental health indicators, such as the Kessler-10 and self-reported poor mental health, are used. Multiple tests are also conducted to assess the validity of the exclusion restriction for the instrument. The instrument consistently passes the tests, suggesting that the exclusion restriction is plausible. After stratifying the results by gender and age, the estimates demonstrate that the effect is mainly driven by men and younger workers (<40 years old). In addition, this study investigates the mechanisms mediating the relationship between mental health and employment. As previously mentioned, there are several mechanisms through which mental health can affect employment. This study examines the pathway in which mental health affects individuals' cognitive abilities and social relations. Leveraging the questions in the survey, this study establishes that worsening mental health reduces cognitive abilities, such as concentration and motivation, and impacts social relations. Finally, it also indicates that declining mental health spreads to coworkers, increasing the probability of mental health problems among coworkers in workplaces.

The paper is organized as follows: Section 2 describes the method, and Sections 3 and 4 discuss the results and implications.

2. Method

2.1. Data description

This study leveraged the 2012 CCHS-MH, which collected mental health, access to mental health services, perceptions of service needs, and socioeconomic data for the Canadian population over the age of 15. The survey was telephone-based and covered approximately 97% of the population, excluding those living in Aboriginal settlements, full-time members of the Canadian Forces, and the institutionalized population.

2.2. Outcome variable

The outcome variable employed was created based on two questions asking if respondents worked in the past 12 months and if they had a job in the last week.[1] The employed variable was defined as a binary variable that was equal to one if 1) a respondent worked in the past 12 months and had a job in the last week or 2) the respondent did not work in the past 12 months but had a job in the last week and zero if 1) a respondent did not work in the past 12 months and had no job in the last week or 2) a respondent worked in the past 12 months but had no job in the last week.[2]

2.3. Mental health variables

The endogenous variables used in the model were Kessler-6 (K6) scores, Kessler-10 (K10) scores, and self-reported poor mental health. K6 and K10 scores have both been validated for screening mental health problems, such as depression, in public health literature in Canada (Cairney et al., 2007).

The K6 variable was constructed from a series of six survey questions that asked about the frequency of experiencing symptoms related to mental health distress over the past month. Each response was assigned a value from 0 to 4 based on severity, which was aggregated into a 24-point score. A higher score indicated a higher level of mental health distress. The K10 was constructed based on a similar set of questions, but the questions were more comprehensive. That is, 10 questions were used to construct the score. Finally, poor mental health was a binary variable based on one self-reported mental health question asking respondents to rate their mental health as excellent, very good, good, fair, or poor. It equaled one if the respondent reported poor or fair mental health, and zero otherwise.

[1] The questions used to construct all variables in this study are provided in Table S1 in the supplementary material.

[2] The respondents that reported not working in the past 12 months but had a job in the last week might have misreported or found a job in the last week, but their statuses were uncertain. In Section 3.4, these respondents were excluded in a robustness check.

2.4. Instrumental variable

The instrument was whether a respondent had a family member(s), such as a spouse, sibling, or parent, who had been treated for a mental health problem(s) in their lifetime. A binary variable was generated that equaled one if a respondent had a family member treated for a mental health problem(s), and zero otherwise.

2.5. Socioeconomic variables

A vector of binary socioeconomic variables was generated for questions regarding province, age, sex, marital status, household size, living arrangement, sense of belonging, immigration status, race, language spoken, respondent's education level, household's highest education level, spiritual value, and child maltreatment. The sample was limited to respondents between the ages of 24 and 59 to limit the effects of pension and other shocks.

2.6. Estimation strategy

To investigate the effect of mental health on labor market outcomes, a two-stage least squares (2SLS) approach was used. I implemented the following equation:

$$MH_i = \alpha RMH_i + X_i'\gamma + \eta_i, \quad (1)$$

$$L_i = \beta MH_i + X_i'\delta + \theta_i, \quad (2)$$

Equation (1) corresponds to the first stage and equation (2) the second stage. MH_i denoted the mental health indicator variables, and RMH_i was the instrument. X_i' was a vector of socioeconomic variables, L_i was the employment outcome, and η_i and θ_i were the error terms. All regressions were weighted with the survey sampling weights.

For an IV approach to be valid, the instrument must satisfy two conditions: instrumental relevance and exclusion restriction. The instrumental relevance suggests that an instrument should be sufficiently correlated with the endogenous variable. A family member having a mental health problem(s) is a strong instrument because many mental health problems, such as depression, autism, and bipolar disorder, have genetic links (Barnett & Smoller, 2009; Craddock & Sklar, 2013; Moon et al., 2018; Muhle et al., 2004). For example, the CASNA1C genes are shown to be associated with multiple mental health problems, such as depression (Bigos et al., 2010; Barnett & Smoller, 2009; Moon et al., 2018). In addition, studies have also shown that mental health problems can spread among family members, making it contagious like an infectious disease (Goodman & Shippy, 2002; Rosenquist et al., 2011; Wang et al., 2017).

The exclusion restriction condition requires that the instrument affect the outcome variables only through the endogenous variable without being correlated with the error term from the second stage. That is, a family member's mental health problem(s) may affect a respondent's labor market outcomes through household or environmental factors. For example, a family member with mental health problems may earn lower wages, potentially reducing investments in the education and health of their child, which could affect the child's job prospects. To gauge how unobserved factors affect the relationship, the observed household variables were sequentially excluded from the baseline to simulate omitted variable bias (Maruyama & Heinesen, 2020; Oster, 2019). If the estimates from the simulation do not significantly differ across each exclusion, then omitted variables bias does not significantly affect the instrument.

To further validate the exclusion restriction, I used multiple approaches to examine its validity. First, the endogenous variable was instrumented with a friend's mental health problem(s) to test unobserved environmental factor(s).[3] A friend should share similar environmental factors but not the same genetic makeup and would not be as strong a contagion. Second, the model was overidentified with two instruments to perform the Hansen J's test. The second instrument identified milder and broader problems—whether a respondent had a family member(s) treated for mental health, gambling, or alcohol problems—while the original captured only severe mental health problems. Both instruments still captured the heritability and transmissibility of mental health problems. Third, Nevo and Rosen's (2012) approach was used to relax the assumption and generate the 95% confidence intervals.[4] If the baseline estimates were within the confidence intervals of this approach, then the estimates were still valid and informative, even if the assumption was violated (Costa-Font & Flèche, 2020). Finally, Lewbel's (2012) approach was used to support the exogeneity. His approach used exogenous socioeconomic variables to construct exogenous "internal" instruments to identify the model through higher order heteroscedasticity. Thus, two sets of exogenous variables were used: namely, the province and language dummies.

3. Results

3.1. Summary statistics

Table 1 reports the means and standard deviations of all of the variables used in this study. Overall, 81.6% of respondents between the ages of 25 and 59 were employed. For mental health indicator variables, respondents reported having, on average, a K6 score of 3.110 and a K10 score of 5.373. Additionally, 35.2% of respondents reported having poor mental health. Finally, 35.9% of respondents had a family member with a mental health problem(s). The total number of observations in the sample is 12660.

3.2. Main results

Table 2 reports the regression results for the first stage of the 2SLS. Column (1) reports the estimate for K6, column (2) the estimate for K10, and column (3) the estimate for poor mental health. The estimates suggested that the effects of the instrument on endogenous variables were positive and statistically significant. Put differently, a family member with a mental health problem(s) significantly increased the K6 and K10 scores and the probability of respondents reporting poor mental health. A family member with a mental health problem(s) increased K6 by 0.697 points, increased K10 by 1.184 points, and increased the probability of respondents reporting poor mental health by 8.3percentage points, respectively. Overall, the magnitudes and directions of the first-stage estimates were consistent with expectations from the previous literature.

Table 3 reports the regression results for the ordinary least squares (OLS) and the second stage of 2SLS. Columns (1), (3), and (5) report the estimates for the OLS, and columns (2), (4), and (6) report the second-stage estimates for the 2SLS. The dependent variables are employed. First, the first-stage F-statistics of 2SLS were 45.542 for K6, 50.187 for K10, and 28.666 for poor mental health. All of the statistics were above

[3] An example of an environmental factor is childhood neighborhood. Chetty et al. (2016) and Chetty and Hendren (2018) determined that one's childhood neighborhood can affect their adult labor market outcomes.

[4] The assumptions are 1) the direction of correlation between the instrument and the error term is the same as the direction of correlation between the endogenous variable and the error term, and 2) the correlation between the endogenous variable and the error term is much higher than the correlation between the instrument and the error term.

Table 1
Summary statistics.

	(1) Mean	(2) S.D.	(3) Min.	(4) Max.
Outcome Variable:				
Employed	0.816	0.387	0	1
Mental Health Variables:				
K6	3.110	3.447	0	24
K10	5.373	5.502	0	40
Poor Mental Health	0.352	0.478	0	1
Instrumental Variable:				
A Family Member(s) With Mental Health Problem(s)	0.359	0.480	0	1
Socioeconomic Variables:				
PEI	0.004	0.063	0	1
Nova Scotia	0.025	0.157	0	1
New Brunswick	0.021	0.143	0	1
Quebec	0.234	0.423	0	1
Ontario	0.390	0.488	0	1
Manitoba	0.034	0.181	0	1
Saskatchewan	0.028	0.165	0	1
Alberta	0.116	0.321	0	1
British Columbia	0.133	0.340	0	1
30–34	0.130	0.337	0	1
35–39	0.133	0.339	0	1
40–44	0.148	0.355	0	1
45–49	0.144	0.351	0	1
50–54	0.165	0.372	0	1
55–59	0.143	0.350	0	1
Women	0.502	0.500	0	1
Common-Law	0.147	0.354	0	1
Widowed	0.008	0.086	0	1
Divorced/Separated	0.094	0.292	0	1
Single	0.191	0.393	0	1
Marital Status–Unknown	0.002	0.043	0	1
Household Size–1 Person	0.298	0.458	0	1
Household Size–2 Persons	0.220	0.414	0	1
Household Size–3 Persons	0.229	0.420	0	1
Household Size–4 or More Persons	0.123	0.329	0	1
Household Size–Unknown	0.000	0.008	0	1
Unattached Living with Others	0.050	0.218	0	1
Living with Spouse/Partner	0.228	0.420	0	1
Parent Living with Other (Spouse, Parents, and/or Children)	0.405	0.491	0	1
Single Parent with Children	0.061	0.240	0	1
Children Living with 1 Parent	0.021	0.142	0	1
Children Living with 2 Parents	0.028	0.165	0	1
Other Living Arrangement	0.072	0.258	0	1
Living Arrangement–Unknown	0.006	0.080	0	1
Sense of Belonging–Somewhat Strong	0.452	0.498	0	1
Sense of Belonging–Somewhat Weak	0.287	0.453	0	1
Sense of Belonging–Very Weak	0.104	0.305	0	1
Sense of Belonging–Don't Know	0.005	0.069	0	1
Sense of Belonging–Not Stated	0.000	0.020	0	1
Sense of Belonging–Refused to Answer	0.000	0.022	0	1
Immigrant–No	0.726	0.446	0	1
Immigrant–Unknown	0.007	0.081	0	1
Race–Nonwhite	0.256	0.437	0	1
Race–Unknown	0.004	0.059	0	1
French	0.196	0.397	0	1
English and French	0.030	0.170	0	1
Other Language	0.092	0.289	0	1
Language–Unknown	0.004	0.065	0	1
Respondent's Education–Secondary School	0.145	0.352	0	1
Respondent's Education–Some Post-Secondary	0.051	0.219	0	1
Respondent's Education–Post-Secondary	0.704	0.456	0	1
Respondent's Education–Unknown	0.004	0.066	0	1
Household's Education–Secondary School	0.087	0.282	0	1
Household's Education–Some Post-Secondary	0.036	0.185	0	1
Household's Education–Post-Secondary	0.766	0.423	0	1
Household's Education–Unknown	0.075	0.263	0	1
Spiritual Values–Somewhat Important	0.313	0.464	0	1
Spiritual Values–Somewhat Unimportant	0.192	0.394	0	1
Spiritual Values–Not Important At All	0.188	0.391	0	1
Spiritual Values–Not Reported	0.002	0.048	0	1
Spiritual Values–Refused to Answer	0.002	0.040	0	1
Childhood Maltreatment	0.499	0.500	0	1
Childhood Maltreatment–Unknown	0.016	0.127	0	1
N	12660			

Note. Column (1) reports the means, column (2) reports the standard deviation, column (3) reports the minimum, and column (4) reports the maximum. All statistics are weighted with the sampling weights provided by Canada Statistics.

Table 2
First-stage 2SLS regression results.

Dependent variable:	(1) K6	(2) K10	(3) Poor Mental Health
A family member(s) with a mental health problem(s)	0.697***	1.184***	0.083***
	(0.103)	(0.167)	(0.015)
N	12596	12590	12639

Note. The table reports the first-stage 2SLS estimates. Each column reports a different dependent variable. Column (1) reports the first-stage 2SLS estimates for K6; columns (2) the first-stage 2SLS estimates for K10; and column (3) the first-stage 2SLS estimates for poor mental health. All regressions control for the socioeconomic variables. The heteroskedastic-robust standard errors are reported in brackets.
*p < 0.10, **p < 0.05, ***p < 0.01.

the cutoff value of 10 proposed by Staiger and Stock (1997), suggesting that the instrument was strong.

Significant differences were observed in the magnitudes of estimates between the OLS and second-stage 2SLS across all endogenous variables. For the OLS in column (1), a one-point increase in the K6 score reduced the probability of being employed by 1.6percentage points. Similarly, a one-point increase in the K10 score reduced the probability of being employed by 1.0 percentage points, and poor mental health reduced the probability of being employed by 7.1 percentage points for the OLS in columns (3) and (5). All estimates were statistically significant. By contrast, the second-stage 2SLS estimates observed that a one-point increase in the K6 score reduced employment by 3.4percentage points, a one-point increase in the K10 score reduced employment by 2.0 percentage points, and poor mental health reduced employment by 26.5 percentage points. All estimates were also statistically significant. The second-stage 2SLS estimates for employment suggested that the OLS estimates underestimated the effect of mental health problems on employment, given that the second-stage 2SLS estimates were almost double the magnitude. In summary, the 2SLS estimates suggested that the effect of poor mental health on employment was significant once the endogeneity of mental health was addressed.[5]

Fig. 1 illustrates the simulation of omitted variable bias by sequentially excluding observed household variables from the baseline. Each panel represents a different endogenous variable. Panel A reports the estimates for K6; panel B the estimates for K10; and panel C the estimates for poor mental health. Each dot represents an estimation without one set of observed household variables, such as family living

[5] The questions existed for the intensive margins of employment, such as working hours. However, no statistically significant results were observed in either OLS or the second-stage 2SLS for hours worked. Moreover, these estimates may not have been reliable, as the selection into labor market participation was not accounted for as suggested in Wooldridge (2010). Identifying the estimates using the method proposed by Wooldridge (2010) would have required finding additional exclusion restrictions, which is a difficult task in itself. Therefore, the estimates were not reported. The results are available upon request.

Table 3
OLS and second-stage 2SLS regression results.

	Dependent variable: Employed					
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	2SLS	OLS	2SLS	OLS	2SLS
Panel A: K6						
K6	−0.016***	−0.034**				
	(0.002)	(0.017)				
1st Stage F-Stats		45.542				
Panel B: K10						
K10			−0.010***	−0.020**		
			(0.001)	(0.010)		
1st Stage F-Stats				50.187		
Panel C: Poor Mental Health						
Poor Mental Health					−0.071***	−0.265*
					(0.012)	(0.146)
1st Stage F-Stats						28.666
N	12596	12596	12590	12590	12639	12639

Note. The table reports the OLS and second-stage 2SLS estimates. Column (1), (3), and (5) report the OLS estimates; and columns (2), (4), and (6) report the second-stage 2SLS estimates. Each panel reports a different mental health indicator variable. All regressions control for the socioeconomic variables. The heteroskedastic-robust standard errors are reported in brackets.
*p < 0.10, **p < 0.05, ***p < 0.01.

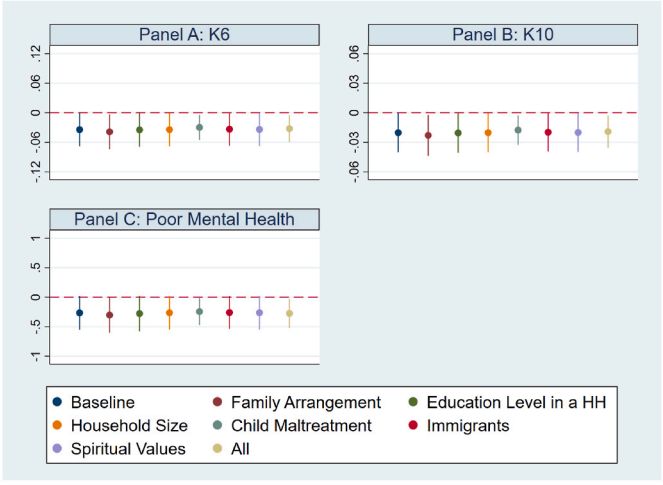

Fig. 1. The Omitted Variable Bias Simulation. Notes: The figure shows the second-stage 2SLS estimates and 95% confidence intervals of exclusion of each set of variables from baseline estimation. Each dot represents a different set of variables being excluded from baseline to simulate omitted variables. Each panel reports a different endogenous variable, and the dependent variables are Employed. The heteroskedastic-robust standard errors are used.

arrangement and household size. The caps around the dots represent the 95% confidence interval. Overall, the estimates did not vary significantly when each set of observed household socioeconomic variables was excluded. For the final dots across all panels, all the household variables were excluded from the baseline, and no significant differences between these estimates and the baseline estimates were observed, suggesting household variables were not likely affecting my instrument as unobserved omitted variables.

Table 4 reports various tests that examine the validity of the exclusion restriction. Column (1) reports the second-stage 2SLS estimates using having a friend(s) with a mental health problem(s) as an instrument. Given that a friend does not share genetic makeup or possess a strong contagion effect like a family member does—they only experience similar observed (and unobserved) environmental factors—estimates with the same direction and statistical significance would indicate that unobserved environmental factors influenced the results. The estimates were positive and statistically insignificant at any level, suggesting that the instrument was largely mediated through

Table 4
Falsification, over-identification, Nevo and Rosen's (2012), and Lewbel's (2012) approaches.

	Dependent variable: Employed			
	(1)	(2)	(3)	(4)
	Falsification	Overidentification	Nevo and Rosen (2012)	Lewbel (2012)
Panel A: K6				
K6	0.017	−0.029**	[-0.018, −0.034]	−0.016***
	(0.018)	(0.013)		(0.002)
1st Stage F-Stats	35.511	37.275		100.132
Hansen J-Stats		0.560		0.714
N	12514	12596	12590	12701
Panel B: K10				
K10	0.010	−0.017**	[-0.011, −0.020]	−0.010***
	(0.011)	(0.008)		(0.002)
1st Stage F-Stats	39.101	41.141		91.177
Hansen J-Stats		0.552		0.867
N	12508	12590	12639	12695
Panel C: Poor Mental Health				
Poor Mental Health	0.185	−0.226**	[-0.085, −0.265]	−0.076***
	(0.193)	(0.110)		(0.017)
1st Stage F-Stats	16.164	25.361		282.921
Hansen J-Stats		0.624		0.875
N	12555	12639	12639	12748

Note. The table reports the results for falsification, overidentification tests, Nevo and Rosen's (2012), and Lewbel's (2012) approaches. Column (1) reports the estimates of falsification tests using a friend's mental health condition(s) as an instrument; column (2) the estimates of overidentified model with two instruments; column (3) the confidence intervals of Nevo and Rosen's (2012) approach; and column (4) the estimates using Lewbel's (2012) approach. Each panel reports a different mental health indicator variable. All regressions control for the socioeconomic variables. The heteroskedastic-robust standard errors are reported in brackets.
*p < 0.10, **p < 0.05, ***p < 0.01.

genes and close contact, not shared environmental factors.

Column (2) of Table 4 reports the second-stage 2SLS estimates overidentified with two instruments. Hansen's J-Statistics are reported below the first-stage F-statistics. Overall, none of the null hypotheses were rejected across all panels. For instance, the p-value from Hansen's J-statistic was 0.560 for K6, suggesting that the instrument was not correlated with the error term in the second stage. A similar pattern could be observed for p-values of the K10 scores and poor mental health. Overall, the results increased the confidence in the validity of the exclusion restriction for the instrument.

Column (3) of Table 4 reports the confidence interval using Nevo and Rosen's (2012) approach. All confidence intervals included my point estimates for all endogenous variables, even when the exclusion restriction was substantially relaxed with weaker assumptions.[6] Overall, the findings from Nevo and Rosen's (2012) approach suggested that the estimates remained informative, even after the exclusion restriction was somewhat violated.

Column (4) reports the estimates using Lewbel's (2012) approach. Lewbel's (2012) internal instruments were constructed using the province and language dummies from the exogenous socioeconomic variables. All of Lewbel's (2012) IV estimates were negative and significant, similar to the standard IV estimates, though the magnitudes of Lewbel's (2012) estimates were substantially lower than standard IV. This implied that the relationship holds between mental health and employment.

3.3. Heterogeneity, mechanisms, and the spillover effect

Column (1) of Table 5 replicates the results from columns (2), (4), and (6) of Table 3. Columns (2)–(4) report the second-stage 2SLS estimates by gender and age. Based on columns (2) and (3), my estimates were largely driven by men, not women. A one-point increase in the K6 score reduced the probability of being employed by 7.6percentage points for men but reduced the probability of being employed by only 0.4 percentage points for women. A similar pattern was observed for the K10 scores and poor mental health. That is, a one-point increase in the K10 score reduced the probability of being employed by 4.2 percentage points, and poor mental health reduced the probability by 57.4 percentage points for men. By contrast, a one-point increase in the K10 score and poor mental health both reduced the probability of being employed by 0.3 percentage points for women. All estimates were only statistically significant for men and not women. Age was stratified by those below and above 45. The estimates showed that the effect was driven by younger respondents. That is, a one-point increase in the K6 score reduced the probability of being employed by 4.5 percentage points for respondents under 45 and reduced the probability of being employed by 3.2 percentage points for those who were older than 45. The estimates were only significant for those less than 45. The same pattern can be observed for K10 scores and poor mental health. Overall, the estimates suggested that the effect was primarily driven by men and younger workers.

Table 5
Heterogeneity by gender and age.

	Dependent variable: Employed				
	All	Gender		Age	
	(1)	(2)	(3)	(4)	(5)
	All	Men	Women	Age <45	Age ≥45
Panel A: K6					
K6	−0.034**	−0.076***	−0.004	−0.045**	−0.032
	(0.017)	(0.028)	(0.023)	(0.020)	(0.030)
1st Stage F-Stats	45.542	21.485	23.039	27.799	16.147
N	12596	5866	6730	6827	5769
Panel B: K10					
K10	−0.020**	−0.042***	−0.003	−0.026**	−0.019
	(0.010)	(0.015)	(0.014)	(0.011)	(0.018)
1st Stage F-Stats	50.187	27.473	22.011	30.791	17.988
N	12590	5865	6725	6824	5766
Panel C: Poor Mental Health					
Poor Mental Health	−0.265*	−0.574**	−0.003	−0.304**	−0.330
	(0.146)	(0.232)	(0.198)	(0.139)	(0.366)
1st Stage F-Stats	28.666	13.163	17.169	29.969	4.905
N	12639	5884	6755	6843	5796

Note. The table reports the second-stage 2SLS estimates by gender and age groups. Each panel reports a different mental health indicator variable. All regressions control for the socioeconomic variables. The heteroskedastic-robust standard errors are reported in brackets.
*p < 0.10, **p < 0.05, ***p < 0.01.

I proxied cognitive abilities and social relations with questions regarding a respondent's difficulty concentrating, managing a crisis, handling daily tasks, interacting with strangers, and maintaining friendships. Three binary variables were defined for difficulty with concentration, dealing with strangers, and maintaining friendships. These variables equaled one if a respondent had mild, moderate, severe, or extreme problems handling the respective task, and zero otherwise. For dealing with crises and handling day-to-day tasks, two binary variables were generated that equaled one if a respondent had good or excellent abilities in handling the respective task, and zero otherwise. Columns (1), (4), and (5) report the estimates for cognitive abilities, and columns (2) and (3) report the estimates for social relations. The estimates demonstrated that cognitive abilities decreased when K6 scores, K10 scores, and poor mental health increased. That is, a one-point increase in the K6 score increased difficulty with concentration by 5.3 percentage points, reduced the ability to deal with a crisis by 2.8 percentage points, and reduced the ability to handle day-to-day tasks by 7.7 percentage points. Only the estimates for dealing with a crisis were statistically insignificant. This suggested that mental health problems largely lead to significant declines in concentration and motivation but not decisiveness. The estimates for social relations revealed that a one-point increase in the K6 score increased difficulty with dealing with strangers by 4.4 percentage points and maintaining friendships by 4.1 percentage points. Similar patterns could also be observed for K10 scores and poor mental health. Overall, my estimates for mechanisms suggested that cognitive abilities and social relations may be important mediators in the relationship between mental health problems and employment.

Mental health problems may also be contagious (Golberstein et al., 2013). That is, a person's mental health problem(s) may spill over across workplaces and affect colleagues' mental health. To examine whether mental health problems can be passed on to coworkers, a variable was generated to indicate whether a coworker had a mental health problem (s) in the past 12 months. The binary variable equaled one if a respondent had worked with someone with a mental health problem(s) detected in the past 12 months, and zero otherwise. Column (6) of Table 6 reports the estimates of the spillover effect. A one-point increase in the K6 score increased the probability of having a coworker who was treated for a mental health problem(s) by 16.5 percentage points, a one-point increase in the K10 score increased the probability by 9.7 percentage points, and poor mental health increased the probability by 136.2 percentage points. All estimates were statistically significant. These estimates suggested a significant spillover effect of one's mental health problem(s) on coworkers' mental health.

3.4. Additional robustness check

The robustness of my estimates was further assessed by estimating

[6] For this approach to work, the instrument was reverse coded to obtain a two-sided bound of confidence intervals.

Table 6
Mechanisms and spillover effect.

	Mechanisms					Spillover Effect
	(1)	(2)	(3)	(4)	(5)	(6)
	Difficulty in Concentration	Difficulty in Dealing with Strangers	Difficulty in Maintaining Friendships	Able to Deal with A Crisis	Able to Handle Day-to-Day Tasks	Coworker Mental Health Problems
Panel A: K6						
K6	0.053***	0.044***	0.041***	−0.028	−0.077***	0.165***
	(0.014)	(0.012)	(0.009)	(0.022)	(0.021)	(0.032)
1st Stage F-Stats	47.494	46.165	46.179	45.448	45.275	43.048
N	12595	12596	12594	12593	12586	12459
Panel B: K10						
K10	0.031***	0.026***	0.024***	−0.016	−0.045***	0.097***
	(0.008)	(0.007)	(0.005)	(0.013)	(0.012)	(0.018)
1st Stage F-Stats	52.312	50.782	50.776	50.065	49.905	47.502
N	12589	12591	12588	12587	12580	12453
Panel C: Poor Mental Health						
Poor Mental Health	0.449***	0.375***	0.344***	−0.234	−0.642***	1.362***
	(0.133)	(0.112)	(0.090)	(0.188)	(0.174)	(0.296)
1st Stage F-Stats	28.414	28.929	29.204	28.792	28.809	28.537
N	12637	12639	12636	12637	12629	12499

Note. The table reports the second-stage 2SLS estimates for mechanism and spillover effect. Each column reports a different dependent variable. Each panel reports a different mental health indicator variable. All regressions control for the socioeconomic variables. The heteroskedastic-robust standard errors are reported in brackets.
*p < 0.10, **p < 0.05, ***p < 0.01.

Table 7
Additional robustness check.

	(1)	(2)	(3)	(4)
	Alt. DV	Alt. Instrument	Alt. Method	Unweighted
Panel A: K6				
K6	−0.035**	−0.025*	−0.128**	−0.013
	(0.017)	(0.013)	(0.062)	(0.009)
1st Stage F-Stats	45.832	69.365		140.445
N	12520	12701	12596	12596
Panel B: K10				
K10	−0.021**	−0.015*	−0.076**	−0.008
	(0.010)	(0.008)	(0.037)	(0.005)
1st Stage F-Stats	50.428	76.543		156.043
N	12514	12695	12590	12590
Panel C: Poor Mental Health				
Poor Mental Health	−0.266*	−0.196*	−0.065***	−0.120
	(0.143)	(0.109)	(0.006)	(0.094)
1st Stage F-Stats	29.687	46.666		75.143
N	12562	12748	12639	12639

Note. The table reports the second-stage 2SLS estimates using alternative dependent variable, instrument, method, and unweighted estimations. Each panel reports a different mental health indicator variable. All regressions control for the socioeconomic variables. Column (3) reports the marginal effects at means. For the bivariate probit in panel c of Column (3), the estimation cannot achieve convergence for bivariate probit when the model is estimated with all of the covariates. Household size is dropped from the specification in order to achieve convergence. The heteroskedastic-robust standard error is reported in brackets.
*p < 0.10, **p < 0.05, ***p < 0.01.

the models with an alternative definition of the dependent variable, instrument, and methods and without sampling weights. Table 7 reports the estimates for these robustness checks. As mentioned in Section 2, respondents who did not work in the past 12 months but did have a job in the last week were excluded. Column (1) reports the estimates using the alternative definition of the dependent variable. Overall, no significant differences between these and the baseline estimates were observed. I also substituted the current instrument with the instrument generated using a family member's mental health, alcohol, or gambling problem(s). As seen in column (2), the model lost some power when using the instruments due to the diminishing magnitudes of the estimates, but the signs were still consistent with the baseline estimates. The models were also estimated using ivprobit for K6 and K10 scores and bivariate probit for poor mental health. For the bivariate probit, I excluded household size from the baseline specification to achieve convergence. Column (3) reports the estimates using these methods. No significant differences between my estimates and the baseline estimates were observed. Finally, the sensitivity of the baseline estimates was tested by excluding sampling weights and is reported in Column (4). These estimates were similar to the baseline estimates, though the magnitudes were diminished. Overall, my results were robust to the alternative dependent variable, instrument, and methods and without sampling weights.

4. Discussion

Following an IV approach, this study used the 2012 CCHS-MH to investigate the effect of a mental health problem(s) on employment. Using a family member with a mental health problem(s) as an instrument, the estimates showed that rising levels of mental health problems increased the probability of unemployment. Stratified by gender and age groups, the estimates also revealed that the relationship was mainly driven by men and younger workers. I also examined the mechanism behind the relationship by proxying cognitive abilities and social relation channels. The estimates showed that mental health problems decreased cognitive abilities and social relations. Finally, the estimates implied that mental health problems were contagious; higher levels of mental health problems led to a higher probability of coworkers having mental health problems.

The findings indicated that mental health-related policies can have much larger impacts on labor market outcomes than expected. Without accounting for the endogeneity of mental health, OLS estimates underestimated the effect of mental health on employment. The 2SLS estimates suggested that mental health policies, such as mental health parity laws in the United States, may have much stronger impacts than OLS estimates implied. Moreover, as mentioned previously, mental health policies should focus on specific subpopulations, such as men and younger workers, to produce the largest benefits.

The proposed mechanism also sheds light on how the relationship

between mental health and employment was mediated. In particular, worsening mental health likely reduced individuals' cognitive abilities and social relations. This implies that treatment interventions should focus on helping employed individuals handle worsening cognitive abilities and social relations in the workplace by providing better access to counseling (Kirk & Brown, 2003; McLeod, 2010). Moreover, employers of individuals with a mental health problem(s) may wish to allocate roles that require less social contact between these individuals and other coworkers to reduce the likelihood of friction in the workplace.

These results also showed that worsening mental health can affect the mental health of one's coworkers in the workplace. Specifically, an individual's mental health problems worsen a coworker's mental health. This would suggest that treatment interventions just targeting a single individual in a workplace may not be sufficient to reduce the loss in productivity from mental health problems. Instead, coworkers of mental health patients should also be included in treatment programs if such programs aim to reduce loss since mental health problems are contagious (Golberstein et al., 2013).

Finally, the contagious nature of mental health problems could worsen the existing lack of disclosure and stigma surrounding mental health issues (Hipes et al., 2016; Krupa et al., 2009; Pescosolido, 2013; Wahl, 1999). Due to stigma and the fear of discrimination, mental health patients are often reluctant to disclose their status, which can be especially heightened in the context of this contagious nature (Brohan et al., 2012), further exacerbating the issue. Policymakers should prioritize efforts to educate the public about mental health issues and combat the associated stigma.

Interestingly, the results showed that the effect is stronger among younger workers. In particular, a study by Gulliver, Griffiths, and Christensen (2010) indicated that self-reliance is a factor in refusing mental health care. Similarly, studies done by Rickwood et al. (2007) and Salaheddin and Mason (2016) also reported that younger people prefer to manage mental health problems alone. While this presents a significant barrier, it also allows policymakers to intervene: It is possible that self-reliance stems from a lack of trust in the authorities. Therefore, policymakers should focus on building trust among younger workers to alleviate this barrier.

This study was not without limitations. First, as with any IV estimation, my identification strategy relied on the assumption of the exclusion restriction, which is inherently untestable. Second, my data were cross-sectional. This does not allow me to examine the dynamic effect of mental health on employment. Future research with access to panel data could further analyze this topic. Third, all of my dependent variables were self-reported, which could cause desirability bias if respondents want their responses to be desirable. Finally, this study could not fully rule out all of the channels mediating the relationship between mental health and employment due to the limitation of data collection. Future research with a more comprehensive set of variables should further investigate this topic.

Ethnical statement

No ethical approval was needed given the analysis was done using a secondary data.

Author Statements

Yichen Shen: Conceptualization, Methodology, Investigation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Project administration

Declaration of competing interest

Author declared that he/she has no competing interest.

Data availability

The authors do not have permission to share data.

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Appendix A. Supplementary data

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References

Abramovitch, A., Short, T., & Schweiger, A. (2021). The C Factor: Cognitive dysfunction as a transdiagnostic dimension in psychopathology. *Clinical Psychology Review, 86*, Article 102007. https://doi.org/10.1016/j.cpr.2021.102007

Alexandre, P. K., & French, M. T. (2001). Labor supply of poor residents in metropolitan miami, Florida: The role of depression and the Co-morbid effects of substance use. *The Journal of Mental Health Policy and Economics, 4*(4), 161–173.

Almamari, K., & Traynor, A. (2021). The role of general and specific cognitive abilities in predicting performance of three occupations: Evidence from bifactor models. *Journal of Intelligence, 9*(3), 40. https://doi.org/10.3390/jintelligence9030040

Banerjee, S., Chatterji, P., & Lahiri, K. (2017). Effects of psychiatric disorders on labor market outcomes: A latent variable approach using multiple clinical indicators. *Health Economics, 26*(2), 184–205. https://doi.org/10.1002/hec.3286

Barnett, J. H., & Smoller, J. W. (2009). The genetics of bipolar disorder. *Neuroscience, 164*(1), 331–343. https://doi.org/10.1016/j.neuroscience.2009.03.080

Bauermeister, S., & Bunce, D. (2015). Poorer mental health is associated with cognitive deficits in old age. *Aging, Neuropsychology, and Cognition, 22*(1), 95–105. https://doi.org/10.1080/13825585.2014.893554

Bigos, K. L., Mattay, V. S., Callicott, J. H., Straub, R. E., Vakkalanka, R., Kolachana, B., Hyde, T. M., Lipska, B. K., Kleinman, J. E., & Weinberger, D. R. (2010). Genetic variation in CACNA1C affects brain circuitries related to mental illness. *Archives of General Psychiatry, 67*(9), 939–945. https://doi.org/10.1001/archgenpsychiatry.2010.96

Brohan, E., Henderson, C., Wheat, K., Malcolm, E., Clement, S., Barley, E. A., Slade, M., & Thornicroft, G. (2012). Systematic review of beliefs, behaviours and influencing factors associated with disclosure of a mental health problem in the workplace. *BMC Psychiatry, 12*(1), 11. https://doi.org/10.1186/1471-244X-12-11

Bunce, D., Tzur, M., Ramchurn, A., Gain, F., & Bond, F. W. (2008). Mental health and cognitive function in adults aged 18 to 92 years. *The Journals of Gerontology: Serie Bibliographique, 63*(2), P67–P74. https://doi.org/10.1093/geronb/63.2.P67

Cairney, J., Veldhuizen, S., Wade, T. J., Kurdyak, P., & Streiner, D. L. (2007). Evaluation of 2 measures of psychological distress as screeners for depression in the general population. *Canadian Journal of Psychiatry. Revue Canadienne De Psychiatrie, 52*(2), 111–120. https://doi.org/10.1177/070674370705200209

Chatterji, P., Alegria, M., Lu, M., & Takeuchi, D. (2007). Psychiatric disorders and labor market outcomes: Evidence from the national Latino and asian American study. *Health Economics, 16*(10), 1069–1090. https://doi.org/10.1002/hec.1210

Chatterji, P., Alegria, M., & Takeuchi, D. (2011). Psychiatric disorders and labor market outcomes: Evidence from the national comorbidity survey-replication. *Journal of Health Economics, 30*(5), 858–868. https://doi.org/10.1016/j.jhealeco.2011.06.006

Chetty, R., & Hendren, N. (2018). The impacts of neighborhoods on intergenerational mobility I: Childhood exposure effects. *Quarterly Journal of Economics, 133*(3), 1107–1162. https://doi.org/10.1093/qje/qjy007

Chetty, R., Hendren, N., & Katz, L. F. (2016). The effects of exposure to better neighborhoods on children: New evidence from the moving to opportunity experiment. *The American Economic Review, 106*(4), 855–902. https://doi.org/10.1257/aer.20150572

Costa-Font, J., & Flèche, S. (2020). Child sleep and mother labour market outcomes. *Journal of Health Economics, 69*, 102258. https://doi.org/10.1016/j.jhealeco.2019.102258

Craddock, N., & Sklar, P. (2013). Genetics of bipolar disorder. *Lancet (London, England), 381*(9878), 1654–1662. https://doi.org/10.1016/S0140-6736(13)60855-7

Dhani, P., Nbsp, A. S., & T. S.. (2016). Relationship between emotional intelligence and job performance: A study in Indian context. *Indian Journal of Science and Technology, 9*(47), 1–12. https://doi.org/10.17485/ijst/2016/v9i47/103064

Downey, L. A., Johnston, P. J., Hansen, K., Schembri, R., Stough, C., Tuckwell, V., & Schweitzer, I. (2008). The relationship between emotional intelligence and depression in a clinical sample. *The European Journal of Psychiatry, 22*(2), 93–98.

El Garhy, N., Hegazy, G., Shata, M., Ibrahim, M., Kariem, H. A., Eleleedy, A., … Mohamed, K. (2022). The association between emotional intelligence and depression among medical students in suez canal universit. https://doi.org/10.1101/2022.08.31.22279446.

Ettner, S. L., Frank, R. G., & Kessler, R. C. (1997). The impact of psychiatric disorders on labor market outcomes. *Industrial and Labor Relations Review, 51*(1), 64–81. https://doi.org/10.2307/2525035

Fazel, S., & Grann, M. (2006). The population impact of severe mental illness on violent crime. *American Journal of Psychiatry, 163*(8), 1397–1403. https://doi.org/10.1176/ajp.2006.163.8.1397

Frijters, P., Johnston, D. W., & Shields, M. A. (2014). The effect of mental health on employment: Evidence from Australian panel data. *Health Economics, 23*(9), 1058–1071. https://doi.org/10.1002/hec.3083

Golberstein, E., Whitlock, J. L., & Downs, M. F. (2013). Social contagion of mental health: Evidence from college roommates. *Health Economics, 22*(8), 965–986. https://doi.org/10.1002/hec.2873

Goodman, C. R., & Shippy, R. A. (2002). Is it contagious? Affect similarity among spouses. *Aging & Mental Health, 6*(3), 266–274. https://doi.org/10.1080/13607860220142431

Gottfredson, L. S. (1986). Societal consequences of the g factor in employment. *Journal of Vocational Behavior, 29*(3), 379–410. https://doi.org/10.1016/0001-8791(86)90015-1

Gottfredson, L. S. (2003). Chapter 15—G, jobs and life. In H. Nyborg (Ed.), *The scientific study of general intelligence* (pp. 293–342). Pergamon. https://doi.org/10.1016/B978-008043793-4/50053-2.

Greenberg, P. E., Kessler, R. C., Birnbaum, H. G., Leong, S. A., Lowe, S. W., Berglund, P. A., & Corey-Lisle, P. K. (2003). The economic burden of depression in the United States: How did it change between 1990 and 2000? *The Journal of Clinical Psychiatry, 64*(12), 1465–1475. https://doi.org/10.4088/jcp.v64n1211

Gulliver, A., Griffiths, K. M., & Christensen, H. (2010). Perceived barriers and facilitators to mental health help-seeking in young people: A systematic review. *BMC Psychiatry, 10*(1), 113. https://doi.org/10.1186/1471-244X-10-113

Hall, D., Lee, L.-W., Manseau, M. W., Pope, L., Watson, A. C., & Compton, M. T. (2019). Major mental illness as a risk factor for incarceration. *Psychiatric Services, 70*(12), 1088–1093. https://doi.org/10.1176/appi.ps.201800425

Hamilton, V. H., Merrigan, P., & Dufresne, E. (1997). Down and out: Estimating the relationship between mental health and unemployment. *Health Economics, 6*(4), 397–406. https://doi.org/10.1002/(sici)1099-1050 (199707)6:4<397::aid-hec283>3.0.co;2-m.

Hartlage, S., Alloy, L. B., Vazquez, C., & Dykman, B. (1993). Automatic and effortful processing in depression. *Psychological Bulletin, 113*(2), 247–278. https://doi.org/10.1037/0033-2909.113.2.247

Hipes, C., Lucas, J., Phelan, J. C., & White, R. C. (2016). The stigma of mental illness in the labor market. *Social Science Research, 56*, 16–25. https://doi.org/10.1016/j.ssresearch.2015.12.001

Hunter, J. E. (1986). Cognitive ability, cognitive aptitudes, job knowledge, and job performance. *Journal of Vocational Behavior, 29*(3), 340–362. https://doi.org/10.1016/0001-8791(86)90013-8

Jokela, M. (2022). Why is cognitive ability associated with psychological distress and wellbeing? Exploring psychological, biological, and social mechanisms. *Personality and Individual Differences, 192*, Article 111592. https://doi.org/10.1016/j.paid.2022.111592

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry, 62*(6), 593–602. https://doi.org/10.1001/archpsyc.62.6.593

Khokhar, C. P., & Kush, T. (2009). Emotional intelligence and work performance among executives. *Europe's Journal of Psychology, 5*(1). https://doi.org/10.5964/ejop.v5i1.281. Article 1.

Kirk, A. K., & Brown, D. F. (2003). Employee assistance programs: A review of the management of stress and wellbeing through workplace counselling and consulting. *Australian Psychologist, 38*(2), 138–143. https://doi.org/10.1080/00050060310001707137

Krupa, T., Kirsh, B., Cockburn, L., & Gewurtz, R. (2009). Understanding the stigma of mental illness in employment. *Work, 33*(4), 413–425. https://doi.org/10.3233/WOR-2009-0890

Lewbel, A. (2012). Using heteroscedasticity to identify and estimate mismeasured and endogenous regressor models. *Journal of Business & Economic Statistics, 30*(1), 67–80. https://doi.org/10.1080/07350015.2012.643126

Lizeretti, N. P., Extremera, N., & Rodriguez, A. (2012). Perceived emotional intelligence and clinical symptoms in mental disorders. *Psychiatric Quarterly, 83*(4), 407–418. https://doi.org/10.1007/s11126-012-9211-9

Marcotte, D. E., & Wilcox-Gok, V. (2001). Estimating the employment and earnings costs of mental illness: Recent developments in the United States. *Social Science & Medicine, 53*(1), 21–27. https://doi.org/10.1016/s0277-9536(00)00312-9, 1982.

Maruyama, S., & Heinesen, E. (2020). Another look at returns to birthweight. *Journal of Health Economics, 70*, Article 102269. https://doi.org/10.1016/j.jhealeco.2019.102269

McLeod, J. (2010). The effectiveness of workplace counselling: A systematic review. *Counselling and Psychotherapy Research, 10*(4), 238–248. https://doi.org/10.1080/14733145.2010.485688

Mishra, P. S., & Mohapatra, A. K. D. (2010). Relevance of emotional intelligence for effective job performance: An empirical study. *Vikalpa, 35*(1), 53–62. https://doi.org/10.1177/0256090920100104

Moon, A. L., Haan, N., Wilkinson, L. S., Thomas, K. L., & Hall, J. (2018). CACNA1C: Association with psychiatric disorders, behavior, and neurogenesis. *Schizophrenia Bulletin, 44*(5), 958–965. https://doi.org/10.1093/schbul/sby096

Muhle, R., Trentacoste, S. V., & Rapin, I. (2004). The genetics of autism. *Pediatrics, 113*(5), e472–e486. https://doi.org/10.1542/peds.113.5.e472

Nevo, A., & Rosen, A. M. (2012). Identification with imperfect instruments. *The Review of Economics and Statistics, 94*(3), 659–671.

Nye, C. D., Ma, J., & Wee, S. (2022). Cognitive ability and job performance: Meta-analytic evidence for the validity of narrow cognitive abilities. *Journal of Business and Psychology, 37*(6), 1119–1139. https://doi.org/10.1007/s10869-022-09796-1

O'Boyle, E. H., Jr., Humphrey, R. H., Pollack, J. M., Hawver, T. H., & Story, P. A. (2011). The relation between emotional intelligence and job performance: A meta-analysis. *Journal of Organizational Behavior, 32*(5), 788–818. https://doi.org/10.1002/job.714

Oster, E. (2019). Unobservable selection and coefficient stability: Theory and evidence. *Journal of Business & Economic Statistics, 37*(2), 187–204. https://doi.org/10.1080/07350015.2016.1227711

Pescosolido, B. (2013). The public stigma of mental illness: What do we think; what do we know; what can we prove? *Journal of Health and Social Behavior, 54*(1), 1–21. https://doi.org/10.1177/0022146512471197

Quoidbach, J., & Hansenne, M. (2009). The impact of trait emotional intelligence on nursing team performance and cohesiveness. *Journal of Professional Nursing, 25*(1), 23–29. https://doi.org/10.1016/j.profnurs.2007.12.002

Rapisarda, B. A. (2002). The impact of emotional intelligence on work team cohesiveness and performance. *International Journal of Organizational Analysis, 10*(4), 363–379. https://doi.org/10.1108/eb028958

Rickwood, D. J., Deane, F. P., & Wilson, C. J. (2007). When and how do young people seek professional help for mental health problems? *Medical Journal of Australia, 187*(S7), S35–S39. https://doi.org/10.5694/j.1326-5377.2007.tb01334.x

Rosenquist, J., Fowler, J., & Christakis, N. (2011). Social network determinants of depression. *Molecular Psychiatry, 16*(3). https://doi.org/10.1038/mp.2010.13

Rosete, D., & Ciarrochi, J. (2005). Emotional intelligence and its relationship to workplace performance outcomes of leadership effectiveness. *The Leadership & Organization Development Journal, 26*(5), 388–399. https://doi.org/10.1108/01437730510607871

Rusch, N., Angermeyer, M. C., & Corrigan, P. W. (2005). Mental illness stigma: Concepts, consequences, and initiatives to reduce stigma. *European Psychiatry, 20*(8), 529–539. https://doi.org/10.1016/j.eurpsy.2005.04.004

Salaheddin, K., & Mason, B. (2016). Identifying barriers to mental health help-seeking among young adults in the UK: A cross-sectional survey. *British Journal of General Practice, 66*(651), e686–e692. https://doi.org/10.3399/bjgp16X687313

Schmitt, N. (2014). Personality and cognitive ability as predictors of effective performance at work. *Annual Review of Organizational Psychology and Organizational Behavior, 1*(1), 45–65. https://doi.org/10.1146/annurev-orgpsych-031413-091255

Staiger, D., & Stock, J. H. (1997). Instrumental variables regression with weak instruments. *Econometrica, 65*(3), 557–586. https://doi.org/10.2307/2171753

Wahl, O. F. (1999). Mental health consumers' experience of stigma. *Schizophrenia Bulletin, 25*(3), 467–478. https://doi.org/10.1093/oxfordjournals.schbul.a033394

Wang, J.-Y., Hsieh, M.-H., Lin, P.-C., Liu, C.-S., & Chen, J.-D. (2017). Parallel contagion phenomenon of concordant mental disorders among married couples: A nationwide cohort study. *Journal of Epidemiology & Community Health, 71*(7), 640–647. https://doi.org/10.1136/jech-2016-208283

World Health Organization, 65. (2012). *Global burden of mental disorders and the need for a comprehensive, coordinated response from health and social sectors at the country level: Report by the secretariat (A65/10)*. World Health Organization. https://apps.who.int/iris/handle/10665/78898.